INTERMOUNTAIN POWER SERVICE CORPORATION

November 30, 2020

Mr. Andrew R. Wheeler
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Mail Code: 5304-P
Washington, DC 20460

Subject: Intermountain Generation Facility Alternative Closure Demonstration

Dear Administrator Wheeler:

Intermountain Power Service Corporation submits the attached demonstration to the U.S. Environmental Protection Agency (EPA) for approval of a site-specific alternative deadline to initiate closure pursuant to 40 C.F.R. §257.103(f)(2) for the Bottom Ash Basin and Waste Water Basin at the Intermountain Generation Facility in Delta, Utah. Intermountain Power Service Corporation is requesting an extension pursuant to 40 C.F.R. § 257.103(f)(2) to allow the Bottom Ash Basin and Waste Water Basin to continue receiving coal combustion residual waste streams after April 11, 2021, to allow for the planned cessation of the coal-fired boilers at the Intermountain Generation Facility in July 2025.

Enclosed is a demonstration prepared by Stantec Consulting Services Inc. for Intermountain Power Service Corporation that addresses all of the criteria in 40 C.F.R. § 257.103(f)(2)(i-iv) and contains the documentation required in 40 C.F.R. § 257.103(f)(2)(v). As allowed by the agency, in lieu of hard copies of these documents, electronic files were submitted to Kirsten Hillyer, Frank Behan, and Rickard Huggins via email. The demonstration is also available on Intermountain Power Service Corporation's publicly available website: https://ipscenvironmental.weebly.com/. If you have any questions regarding this submittal, please contact Mike Utley at 435-864-6489 or mike.utley@ipsc.com.

Sincerely,

Jon A. Finlinson
President and Chief Operations Officer

MU/HBI:jmj

cc:
Kristen Hillyer
Frank Behan
Richard Huggins
Ty Howard
Mike Utley

Demonstration of Requirements for Alternative Closure Deadline under 40 C.F.R. §257.103(f)(2)

Intermountain Generating Facility
Delta, Utah

Prepared for:
Intermountain Power Service Corporation
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Delta, Utah 84624

Prepared by:
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Project No.: 203709098, 911

November 30, 2020

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: ______________________
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Principal Engineer

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LIST OF ATTACHMENTS

1.0 EXECUTIVE SUMMARY

1.1 PURPOSE OF REPORT

On behalf of Intermountain Power Agency ("IPA") and Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this report to demonstrate compliance with the new requirements of the Coal Combustion Residuals Rule ("CCR Rule") pursuant to 40 C.F.R. §257.103(f)(2), as promulgated on August 28, 2020. Information deemed pertinent to each criterion of §257.103(f)(2) is detailed herein, including sub-parts §257.103(f)(2)(i) through §257.103(f)(2)(x). Based on these demonstrations, IPSC requests a site-specific alternative deadline to initiate closure pursuant to §257.103(f)(2) so that IPSC's Bottom Ash Basin and Waste Water Basin may continue to receive CCR wastestreams after April 11, 2021, and complete closure no later than October 17, 2028 given that the facility will be ceasing operation of the coal-fired boilers.

1.2 BACKGROUND

IPA is the owner of the Intermountain Generating Facility ("IGF"), a 1900-megawatt coal-fired, steam electric generation station located approximately nine miles north of Delta, Millard County, Utah and allied transmission systems that deliver electricity to California, Utah, and Nevada. IPSC is the operating company responsible for the IGF's day-to-day operations. The IGF has been in continuous commercial operation since 1986 and delivers energy to 35 participants in the project that principally serve Utah and Southern California. The wet CCR wastestreams relevant to this demonstration are sluiced to two impoundments: the Bottom Ash Basin, and the Waste Water Basin. The IGF also has an on-site landfill, the Combustion By-products Landfill (CB Landfill), used for the disposal of dry CCR material from the conveyor system, pyrites rejected from the pulverizers, and Flue Gas Desulfurization (FGD) material removed from the scrubbers during maintenance. Reference Figures 1 and 2 for general and site-specific maps that identify the locations of the three CCR Rule-regulated units at the IGF.

The IGF also has several non-CCR impoundments. The Onsite Reservoir is lined with 80-mil high density polyethylene (HDPE) material. It receives water from the Sevier River located approximately 8 miles from the IGF and is used for cooling. The Coal Pile Runoff Basin is lined with bentonite and collects runoff from the coal pile area. The Settling Basin is lined with bentonite and collects water from the site drains, washdowns, stormwater, and overflow from Coal Pile Runoff Basin. The Ash Recycle Basin is lined with 80-mil HDPE material and receives water decanted from the Bottom Ash Basin and the Settling Basin. The Evaporation Ponds are lined with 80-mil HDPE material and receive water decanted from the Waste Water Basin and pumped from the Ash Recycle Basin. None of the non-CCR impoundments at IGF was designed to receive CCR material or to meet the requirements of the CCR Rule for receiving CCR material. None of the non-CCR impoundments receive CCR wastestreams.

The Bottom Ash Basin and Waste Water Basin are described in further detail in following report Section 2.0. The Bottom Ash Basin is a single containment structure approximately 101 acres in size that is divided into three cells of approximately 35 acres. The cells are divided by two interior earthen dikes that do not contribute to the basin's compliance with the dam safety requirements. The cells are designed to facilitate dewatering and removal of CCR from the impoundment to the CB Landfill, functioning together to achieve this purpose, and are surrounded by a perimeter dike that provides the structural support and engineering containment that impounds CCR and liquids within the entirety of the 101-acre structure. The Bottom Ash Basin is regulated as a single impoundment by the Utah State Engineer's Office, see Permit No. UT00463 (permitting the containment structure, including the cells, under a single permit); the Utah Department of Environmental Quality, Division of Water Quality, see Ground Water Discharge Permit, Permit No. UGW270004 at p. 6, Table 2; and the Division of Waste Management and Radiation Control Coal Combustion Residual Solid Waste Permit, Permit No. SW419.

IPA and IPSC have been diligently implementing all substantive and procedural requirements of the U.S. Environmental Protection Agency's ("U.S. EPA's") CCR Rule since its effective date in October 2015 and have been monitoring recent changes including the addition of §257.103(f).

Meanwhile, due to a potential loss of existing customers, a weak market for coal-fueled electricity and environmental regulatory issues that impact the project's economic viability, IPA and IPSC announced in May 2017 that they will cease electricity generation using coal in 2025. The IGF participants are already moving forward with plans to develop new natural gas and hydrogen-fueled electricity generation at the project site. Power sales contracts for the IGF require that the coal units be replaced with natural gas-fired power blocks by July 1, 2025.[1] As part of these plans, IPA and IPSC have relied on previous versions of the CCR Rule, 80 Fed. Reg. at 21,490 (Apr. 17, 2015), 83 Fed. Reg. at 36,454 (Jul. 30, 2018), outlining cease receipt of waste deadlines and alternative closure timelines for facilities ceasing operation by a date certain. IPA and IPSC posted their Notice of Intent to Comply with the Alternative Closure Requirements on September 12, 2018.

IPSC has posted extensive documents on its public Internet website[2] documenting regulatory compliance with the United States Environmental Protection Agency's ("US EPA") Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah

[1] The July 1, 2025 deadline was outlined in a December 8, 2015 amendment to Section 44.3 of each of those certain Power Sales Contracts, originally dated as of September 28, 1978 with respect to the Utah Purchasers, and August 6, 1980 with respect to the California Purchasers, between Intermountain Power Agency ("IPA") and each of the purchasers of IPF power party to such Power Sales Contracts (the "Purchasers"), as amended (the "Power Sales Contracts"). Appendix C to the Power Sales Contracts further describes the Intermountain Generating Station as coal-fueled generating facilities that will be replaced by natural gas fired power blocks.

[2] Available at https://ipscenvironmental.weebly.com/ (accessed Oct. 16, 2020).

CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")) at the IGF from 2015 to date. This report has been prepared to demonstrate IPSC's fulfillment of the compliance criteria specified within the US EPA's *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; A Holistic Approach to Closure Part A: Deadline to Initiate Closure*, 85 Fed. Reg. 53516 (Aug. 28, 2020).

Previous reports summarize IPSC's groundwater monitoring and recovery program pursuant to IPSC's compliance program prescribed by CCR Rule Parts §257.90 (R315-319-90) Applicability; §257.91 (R315-319-91) Groundwater Monitoring Systems; §257.93 (R315-319-93) Groundwater Sampling and Analysis Requirements; §257.95 (R315-319-95) Assessment Monitoring Program; and §257.96 (R315-319-96) Assessment of Corrective Measures. Pertinent historical report titles and submission dates include:

- January 2019 Assessment of Corrective Measures and Amended Corrective Action Plan Attachment 1 herein);
- January 2019 Annual Groundwater Monitoring and Corrective Action Summary Report (Attachment 2);
- June 2019 Semi-Annual Progress, Selecting and Designing of Groundwater Corrective Action Remedy report (Attachment 3);
- December 2019 Semi-Annual Progress, Selecting and Designing of Groundwater Corrective Action Remedy report (Attachment 4)
- January 2020 Annual Groundwater Monitoring and Corrective Action Summary Report (Attachment 5);
- June 2020 Semi-Annual Progress Report (Attachment 6); and
- November 2020 Amended Assessment of Corrective Measures Report (Attachment 7).

The prior reports presented IPSC's approach for addressing requirements specified by the Federal CCR Rule as well as the facility's Utah Department of Environmental Quality ("UDEQ"), Division of Water Quality ("DWQ") Groundwater Discharge Permit No. UGW270004. The most recent permit renewal was issued by the UDEQ to IPSC's Intermountain Generating Facility ("IGF"), effective May 24, 2016, and the permit will be renewed again in 2021.

The DWQ has regulatory oversight for IPSC's compliance with its Groundwater Discharge Permit. The UDEQ Division of Waste Management and Radiation Control ("DWMRC") also has regulatory oversight pursuant to the State CCR Rule. The CCR Rules apply to each of IPSC's three (3) CCR units:

- Combustion By-Products Landfill ("CB Landfill");
- Bottom Ash Basin (surface impoundment); and
- Waste Water Basin (surface impoundment).[3]

Notwithstanding the provisions of CCR Rule Parts §257.101(a), and (b)(1), a CCR surface impoundment may continue to receive CCR and/or non-CCR waste streams, if the facility will

[3] We note that the new provisions at 40 C.F.R. § 257.103(f) apply only to CCR surface impoundments, or IPSC's Bottom Ash and Waste Water Basins, and not to the CB Landfill.

cease operation of the coal-fired boiler(s) and complete closure of the impoundment within the timeframes specified in §257.103(f)(2)(iv), and in the interim period (prior to closure of the coal-fired boiler) the facility must continue to use the CCR surface impoundment due to the absence of alternative disposal capacity both on and off-site of the facility.

The following checklist cross-references CFR §257.103(f)(2) regulatory requirements with corollary sections within this report:

Regulatory Compliance Checklist Demonstration of Requirements for Alternative Closure Deadline under 40 C.F.R. §257.103(f)(2)										
Description									Report Section	Page Number
257	**Criteria for Classification of Solid Waste Disposal Facilities and Practices**									
	103	**Alternative Closure requirements**								
		(a)	CCR Landfills (1) No Alternative CCR Disposal Capacity						N/A	
		(b)	CCR Landfills (1) Permanent Cessation of a Coal-Fired Boiler						N/A	
		(c)	Required Notices and Progress Reports for CCR Landfills						N/A	
		(d)	CCR Landfill Record Keeping						N/A	
		(e)	Reserved						N/A	
		(f)	**Site-Specific Alternative Deadlines to Initiate Closure of CCR Surface Impoundments**							
			(1)	Development of Alternative Capacity is Technically Infeasible					N/A	
			(2)	**Permanent Cessation of a Coal-Fired Boiler by a Certain Date**					Sec 1 & 5	1-1 & 5-1
				(i)	No Alternative Disposal Capacity				Sec 2	2-1-2-5
				(ii)	Mitigation of Potential Risk to Human Health and the Environment				Sec 3	3-1-3-9
				(iii)	Facility Compliance				Sec 4	4-1
				(iv)	Coal-Fired Boiler Cessation/Impoundment Closure				Sec 1 & 5	1-1 & 5-1
				(v)	Documentation of Criteria Met				Sec 2	2-1–2-7
					(A)	Alternative Disposal Capacity Narrative of Considerations			Sec 2	2-1-2-7
					(B)	Risk Mitigation Plan			Sec 3	3-1
						(1)	Measures to Limit Future Releases		Sec 3.1	3-1-3-2
						(2)	Ground Water Monitoring Data/Receptors/Response		Sec 3.2	3-2-3-9
						(3)	Plume Containment Plan		Sec 3.3	3-9-3-15
					(C)	Demonstrate Facility Compliance			Sec 4	4-1
						(1)	Facility Certification of Compliance		Sec 4.1	4-1
						(2)	Hydrogeologic Information		Sec 4.2	4-1-4-3
							(i)	Monitoring Well Locations	Sec 3.2.1	3-3-3-4
							(ii)	Well Logs	Sec 3 & Attachment 9	3-5
							(iii)	Groundwater Flow	Sec 3.2.1.2	3-4
						(3)	Tabulated Constituent Concentrations		Sec 3 & Attachment 10	3-5
						(4)	Site Hydrogeology		Sec 4.2	4-1-4-3
						(5)	Corrective Measures Assessment §257.96		Sec 4.3	4-4-4-7
						(6)	Remedy Selection §257.97(a)		Sec 4.3	4-4-4-7
						(7)	Most Recent Structural Stability Assessment §257.73(d)		Attachment 8	3-2
						(8)	Most Recent Safety Factor Assessment §257.73(e)		Attachment 8	3-2
					(D)	Closure Plan §257.102(b): Closure Schedules in Attachment 12			Attachment 12	5-1
				(vi)	Responsibility for Demonstration				Sec 4	4-1
				(vii)	Recordkeeping, Notification and Posting Compliance §257.105(i), §257.106(i) and §257.107(i)				Sec 4	4-1
				(viii)	Facility Operating Record of Submission				Sec 4	4-1
				(ix)	Facility Operating Record of Decision				Sec 4	4-1

Regulatory Compliance Checklist Demonstration of Requirements for Alternative Closure Deadline under 40 C.F.R. §257.103(f)(2)								
Description							Report Section	Page Number
				(x)	Annual Progress Reporting and Posting		Sec 4	4-1
			(3)	Process to Obtain Authorization				
				(i)	Deadlines for Submission			
					(A)	Feasibility of Alternative Capacity §257.103(f)(1)	N/A	
					(B)	Submitting a New Demonstration of Feasibility	N/A	
					(C)	Demonstration of No Alternative Capacity §257.73(f)(2) – November 30, 2020	Sec 2	2-1-2-5

2.0 NO ON- OR OFF-SITE ALTERNATIVE DISPOSAL CAPACITY §257.103(f)(2)(i)

The following narrative provides the new demonstration now required by 40 C.F.R. § 257.103(f)(2)(i), documenting that no alternative disposal capacity is currently available on-site or off-site for each CCR wastestream that IPA and IPSC seek to continue placing into the Bottom Ash Basin and Waste Water Basin after April 11, 2021.

The Bottom Ash Basin was commissioned in 1986 and provides decant water to the Ash Water Recycle Basin for reuse in the ash water system. The major waste sources contained within the Basin are bottom ash and boiler slag. The Bottom Ash Basin previously received boiler chemical clean residue. The final boiler chemical cleanings were completed in April 2016 for Unit 1 and May 2017 for Unit 2. IPSC will not be performing boiler chemical cleaning on either of the units again. The basin contains approximately 5,000,000 CY of CCR waste covering an approximate area of 101 acres at closure and consists of three adjacent cells-oriented north to south, each about 2,200 feet (ft) long by 650 ft wide. The cells are bounded by dikes constructed of local borrow materials, rising 30 to 36 ft above the surrounding topography. The bottom elevation of each cell is 4,639 ft above mean sea level (amsl), and the top of each berm is at 4,685 ft amsl (the total basin depth is 46 ft). Each cell is underlain by an 80 mil HDPE liner. Refer to Figure 3 for a block flow diagram showing the CCR process streams discharging to the Bottom Ash Basin.

The Waste Water Basin was commissioned in 1986. The major waste source to the Waste Water Basin is flue gas emissions control residual. The basin was designed and constructed with an 80-mil HDPE liner. The 20-feet deep Waste Water Basin contains approximately 1,300,000 CY of CCR waste, covering an area of approximately 51 acres at closure. It is impounded by approximately 6,000 feet of perimeter berm, the top of which is located approximately 10 feet above natural surrounding grade, with a crest width of approximately 20 feet. The top of the berm is elevated above the surrounding ground elevation to prevent surface water run-on into the Basin. The basin bottom elevation is 4,630.0 feet (ft) above mean sea level (amsl; i.e., approximately 10 feet below natural grade) and the top of the basin berm is at elevation 4,650.0 ft amsl. The upstream and downstream berm side slopes are 3H:1V. The existing operating procedures require that a minimum pond freeboard depth of three (3) ft be maintained to provide adequate storage for the 50-year, 24-hr storm event. Refer to Figure 3 for a block flow diagram showing the CCR process streams discharging to the Waste Water Basin.

Under the new requirements of the CCR Rule promulgated on August 28, 2020, in order to qualify for an alternative closure deadline for CCR surface impoundments to continue to receive CCR wastestreams under § 257.103(f)(2), a facility must demonstrate that no alternative disposal capacity is available on-site or off-site. 40 C.F.R. § 257.103(f)(2)(i).

As noted previously, IPA and IPSC have been diligently implementing all requirements of the CCR Rule since its effective date in October 2015, including preparation of the annual progress report documenting the continued absence of disposal capacity and submittal of the

September 12, 2018 Notification of Intent to Comply with the Alternative Closure Requirements, although the 2015 CCR Rule relied upon by IPA and IPSC was self-implementing and did not specify how the lack of alternative disposal capacity had to be documented. 80 Fed. Reg. 21,424 (Apr. 17, 2015).

Several years into IPA and IPSC's implementation of its compliance and closure plan pursuant to the 2015 CCR Rule, EPA issued its December 2, 2019 proposal to allow facilities permanently ceasing operation of coal-fired boilers to continue to receive CCR wastestreams upon a showing of a continued need to use the surface impoundment due to lack of capacity. 84 Fed. Reg. 65,941, 65,956 (Dec. 2, 2019). During the attendant comment period for the proposed rule, EPA received comments from utilities contending that if a facility sluices CCR to its surface impoundment, its off-site disposal options are significantly limited (versus dry-handled CCR, for which disposal options greatly increase), which EPA did not dispute. 85 Fed. Reg. 53,516, 53,541 (Aug. 28, 2020). This noted significant limitation applies to both the bottom ash that IPA and IPSC sluice to the Bottom Ash Basin, and to the flue gas residual sluiced to the Waste Water Basin. IPA and IPSC note that each impoundment only receives CCR materials.

The final rule preamble provides that, for sluiced CCR wastestreams, EPA expects the owner or operator to evaluate the viability of other wet temporary storage, such as tanks, to use in lieu of the CCR surface impoundment while permanent capacity is developed. 85 Fed. Reg. at 53,541. EPA acknowledged that some of these wastestreams can be very large, and therefore tanks may not be a viable or realistic option to handle such volumes; however, tanks could be a viable option for small volume wastestreams. 85 Fed. Reg. at 53,541. As documented in Table 1 below, IGF's wastestreams are high volume, and as such, tanks are not a viable or realistic option for these wastestreams. For dry CCR, EPA expects the owner or operator to evaluate the option of transporting the CCR to landfills, 85 Fed. Reg. at 53,541, and consistent with this expectation, IGF's dry CCR is either stored in silos to be shipped off-site for beneficial use or sent to IGF's on-site CCR Landfill.

IPA and IPSC evaluated each CCR wastestream placed in its CCR impoundments. For the reasons discussed below in Table1, each of the following CCR wastestreams must continue to be placed in the Waste Water Basin and the Bottom Ash Basin due to lack of alternative capacity both on and off-site.

Table 1 – CCR Wastestreams

CCR Wastestreams	Average Volume	Alternative Disposal Capacity Available? YES/NO	Details	
Bottom ash – wet CCR sluiced to the Bottom Ash Basin	estimated average rate of 3,000,000 to 4,000,000 GPD	NO	There is not another potential disposal alternative off-site for this wet- CCR wastestream. <u>Off-site</u> It is infeasible to transport wet CCR waste to an off-site disposal facility, as there is no other facility in Utah that is currently permitted to accept wet CCR waste. IGF has the only approved CCR permit in Utah. Indeed, any such facility would have to comply with the requirements of the CCR Rule. Even if a facility were permitted to accept wet CCR waste in the state, at an estimated maximum truck volume of 10,000 gallons, based on the estimated average flow volume of the unit, a minimum of 300 trucks per day would be required to transport the waste year-round, which would be logistically infeasible. A planned landfill approximately 160 miles north of IGF that applied for a Class V permit with the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control in 2017 had included a focus on	There is not another potential disposal alternative on-site for this wet-CCR wastestream. <u>On-site</u> No wet waste is permitted to be disposed of in the IGF's on-site landfill. Further, the Bottom Ash Basin and Waste Water Basin are the only on-site impoundments that are authorized to receive wet CCR material; the remaining on-site impoundments are not authorized or permitted to receive wet CCR waste. There is no on-site wastewater treatment facility nor on-site infrastructure to support dry handling conversion. It would not be logical to pursue alternative capacity technology options given that design, permitting, construction and installation of such technologies would involve a multi-year process,

CCR Wastestreams	Average Volume	Alternative Disposal Capacity Available? YES/NO	Details	
			coal ash in its Class V Needs Assessment submitted to the Division. However, the planned landfill at issue withdrew its Class V permit application in February 2018 and has indicated that it "may not receive CCR today… [and] does not anticipate accepting CCR." Even if this planned landfill was permitted to receive CCR, IPSC would need to convert to dry handling in order to prepare the waste for off-site transport, which would be illogical given the impending closure of the unit. It is also infeasible to transport wet CCR waste to the small public wastewater treatment facility in Delta City, Utah based on its limited capacity, treatment capabilities, and permitted waste streams. There is no other publicly owned treatment works in the Delta area. This leaves IPA and IPSC with no off-site, in-state disposal option.	which would be counterproductive to the facility's closure efforts given the planned permanent cessation of the unit by a date certain.

CCR Wastestreams	Average Volume	Alternative Disposal Capacity Available? YES/NO	Details	
Flue Gas Desulfurization ("FGD") residual – wet CCR sluiced to the Waste Water Basin	estimated average rate of 800,000 to 850,000 GPD	NO	There is not another potential disposal alternative offsite for this wet-generated CCR wastestream. Off-site It is infeasible to transport wet CCR waste to an off-site disposal facility, as there is no other facility in Utah that is currently permitted to accept wet CCR waste. IGF has the only approved CCR permit in Utah. Indeed, any such facility would have to comply with the requirements of the CCR Rule. Even if a facility were permitted to accept wet CCR waste in the state, at a maximum truck volume of 10,000 gallons, based on the estimated average flow volume of the unit, a minimum of 80 trucks per day would be required to transport the waste year-round, which would be logistically infeasible. A planned landfill approximately 160 miles north of IGF that applied for a Class V permit with the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control in 2017 had included a focus on coal ash in its Class V	There is not another potential disposal alternative on-site for this wet-generated CCR wastestream. On-site No wet waste is permitted to be disposed of in the IGF's on-site landfill. Further, the Bottom Ash Basin and Waste Water Basin are the only on-site impoundments that are authorized to receive wet CCR material; the remaining on-site impoundments are not authorized or permitted to receive wet CCR waste. There is no on-site wastewater treatment facility nor on-site infrastructure to support dry handling conversion. It would not be logical to pursue alternative capacity technology options given that design, permitting, construction and installation of such technologies would involve a multi-year process,

CCR Wastestreams	Average Volume	Alternative Disposal Capacity Available? YES/NO	Details	
			Needs Assessment submitted to the Division. However, the planned landfill at issue withdrew its Class V permit application in February 2018 and has indicated that it "may not receive CCR today… [and] does not anticipate accepting CCR." Even if this planned landfill was permitted to receive CCR, IPSC would need to convert to dry handling in order to prepare the waste for off-site transport, which would be illogical given the impending closure of the unit. It is also infeasible to transport wet CCR waste to the small public wastewater treatment facility in Delta City, Utah based on its limited capacity, treatment capabilities, and permitted waste streams. There is no other publicly owned treatment works in the Delta area. This leaves IPA and IPSC with no off-site, in-state disposal option.	which would be counterproductive to the facility's closure efforts given the planned permanent cessation of the unit by a date certain.
Dry/non-sluiced CCR	average 458,000 tons per year	YES	IPP's dry CCR is either stored in silos to be shipped off-site for beneficial use (pozzolan for commercial use in concrete) or sent to IPP's on-site Combustion By-products Landfill (average 157,000 tons shipped off-site per year).	

Consistent with EPA's explanation in the preamble to the proposed Part A revisions, "it would be illogical to require facilities [ceasing power generation] to construct new capacity to manage CCR and non-CCR wastestreams." 84 Fed. Reg. 65,941, 65,956 (Dec. 2, 2019). EPA again reiterated in the preamble to the final rule that "[i]n contrast to the provision under § 257.103(f)(1), the owner or operator does not need to develop alternative capacity because of the impending closure of the coal fired boilers. Since the coal-fired boilers will shortly cease power generation, it would be illogical to require these facilities to construct new capacity to manage CCR and non-CCR wastestreams." 85 Fed. Reg. at 53,547. Thus, new construction or the development of new alternative disposal capacity, including building a new wastewater treatment facility onsite, building a new CCR surface impoundment, or converting to dry handling, were not considered viable options for any of the wastestreams discussed above because the IGF will cease operation of the coal-fired boilers and will not need alternative capacity in the future.

As EPA previously explained in the preamble of the 2015 rule, it is not possible for sites that sluice CCR material to an impoundment to eliminate the impoundment and dispose of the material off-site. See 80 Fed. Reg. 21,301, 21,423 (Apr. 17, 2015) ("While it is possible to transport dry ash off-site to [an] alternate disposal facility that is simply not feasible for wet-generated CCR. Nor can facilities immediately convert to dry handling systems."). At this time, there continues to be no alternative wet CCR disposal capacity available on-site or off-site for the IGF. Consistent with EPA's example provided in the preamble to the CCR Rule, the two CCR surface impoundments provide the only on-site or off-site disposal option for wet CCR waste. The IGF's only disposal option is in the on-site impoundments for wet-generated CCR waste. When the site was first developed in the early1980s, extensive geotechnical studies were conducted to guide the design of facilities and advance environmental controls, including a process water and groundwater monitoring system, and lined impoundments. IPSC has taken a proactive approach to CCR management to ensure protection of the environment and promote reuse of resources.

In accordance with EPA's preamble discussion and given IPA and IPSC's plans and contractual requirements to shutter the coal units in 2025, the IGF owners and operator are not obligated to demonstrate efforts to develop alternative capacity. Following IPA and IPSC's September 12, 2018 Notification of Intent to Comply with the Alternative Closure Requirements, substantial steps have been taken towards shuttering the coal units at the IGF. These steps include contracting with the engineering firm Sargent & Lundy to complete a conceptual decommissioning cost study for the coal units, which is expected to guide decommissioning going forward, as well as retention of the engineering firm Stantec to prepare a detailed report evaluating closure alternatives for the CCR units.

As a result, the conditions at IGF satisfy the demonstration requirement in § 257.103(f)(2)(i). For the reasons discussed above, the bottom ash and flue gas residual must continue to be placed in the Bottom Ash Basin and Waste Water Basin due to lack of alternative capacity both on and off-site.

3.0 POTENTIAL RISKS ARE ADEQUATELY MITIGATED §257.103(f)(2)(ii)

As detailed within this report section, IPSC believes that potential risks to human health and the environment from continued operation of its CCR units have been adequately mitigated. To demonstrate compliance with §257.103(f)(2)(ii), and as prescribed specifically by §257.103(f)(2)(v)(B), the owner or operator must prepare and implement a *Risk Mitigation Plan* describing the measures that will be taken to expedite any required corrective action, and the report must contain the following elements, each of which is discussed in the following report sub-sections below. By way of summary, this section discusses physical or chemical measures taken to limit future releases to groundwater, a discussion of groundwater monitoring data and exceedances, plume delineation, and identification of receptors and mitigation of exposures, and a plan to expedite and maintain plume containment.

3.1 LIMITING FUTURE RELEASES TO GROUNDWATER §257.103(F)(2)(V)(B)(1)

This subsection provides documentation demonstrating discussion of any physical or chemical measures that IGF can take to limit any future releases to groundwater during operation, per 40 CFR § 257.103(f)(2)(v)(B)(1).

Identified as Best Available Technology (BAT) within the IGF's DWQ-issued, Groundwater Discharge Permit, each of the two surface impoundments is underlain by a liner constructed of 80-mil, high density polyethylene (HDPE) material that lines the interior sidewalls (compacted embankment material) of each impoundment. As part of its DWQ permit, historically, currently, and for the foreseeable future, IPSC implements Best Management Practices (BMPs) that are intended to help inspect for and remediate (if and when necessary) the potential release of CCR material contained within the two CCR surface impoundments.

On a daily basis, IPSC conducts visual inspections of the CCR surface impoundments to monitor water levels in the impoundments. IPSC conducts a more detailed inspection of the CCR units weekly to investigate for visible signs of actual and/or potential conditions that have resulted and/or might result in a potential release of CCR material from a surface impoundment to the surrounding environment. BMPs include monitoring of water levels inside each impoundment, inspecting exposed (daylighted) sections of HDPE liner material, inspecting interior and exterior embankment material, and inspecting for any other abnormal conditions that might result in, and/or indicate, actual and/or potential release of CCR material from a surface impoundment. Every 30 days, IPSC conducts an instrumentation inspection on each of the CCR units. A Professional Engineer completes an annual visual inspection of the CCR units and reviews the facility's operating record each year. Additionally, on an annual basis, IPSC contracts an independent contractor to conduct liner inspections.

Likewise, routine groundwater quality monitoring is also used as a means by which potential releases of CCR constituents can be identified. For instance, in the event that one or more CCR constituents is identified within a groundwater monitoring well for the first time, and/or there is an apparent anomalous increase in a constituent concentration in a monitoring well, IPSC will utilize the groundwater quality data as part of its basin monitoring program. If such data indicates the potential of a new leak, IPSC will investigate (and repair, if needed) the potential for a leak in the up-gradient, surface impoundment.

IPSC field staff are required to report any such potential release incident or threat of release to IPSC's Environmental Group immediately. IPSC investigates and remediates (if and where necessary) the suspect and/or apparent release area. Additionally, as stipulated by its Groundwater Discharge Permit, IPSC must report a release incident to the DWQ, typically within five days of identification of the release incident. The report must include a description of the release and its cause; the timeframe of the release; the estimated timeframe of ongoing release, whether it can be repaired immediately; as well as measures implemented to reduce, eliminate, and prevent reoccurrence of the release.

Liner reparation equipment and trained personnel are located at the IGF facility. In addition, IPSC works with contractors who are able to provide any needed repairs in an efficient and timely manner. Typically, for instance, if a liner tear is identified, the liner tear is repaired by means of fusion welding and testing to verify satisfactory liner repair and integrity.

IPSC's October 2016 Structural Stability Assessment and Safety Factor Assessment reports (included within Gerhart Cole, Inc.'s 2016 Engineering Assessments of CCR Facilities, Intermountain Power Plant report) are posted on IPSC's public website and presented herein as Attachment 8. The assessments indicated that the Bottom Ash Basin and Waste Water Basin berms were structurally stable and safe, as determined by an independent professional engineering firm. Ongoing, routine monitoring and reporting of the berms for stability and safety will continue in accordance with CCR Rule compliance.

3.2 GROUNDWATER QUALITY §257.103(F)(2)(V)(B)(2)

The following subsections provide documentation demonstrating discussion of groundwater monitoring data and any found exceedances; identification of any nearby receptors that might be exposed to current or future groundwater contamination; and how such exposures could be promptly mitigated, per 40 CFR § 257.103(f)(2)(v)(B)(2).

3.2.1 Groundwater Monitoring Data and Exceedances

This § 257.103(f)(2)(v)(B)(2) subsection presents a summary of groundwater monitoring data and CCR constituent exceedances. Regional and site-specific geologic and hydrogeologic characteristics associated with the site are discussed in detail within following report section *4.2 Site Hydrogeology,* as specified by §257.103(F)(2)(V)(C)(4).

3.2.1.1 Groundwater Discharge Permit Compliance Monitoring

Prior to the CCR Rule, IPSC's historical groundwater monitoring program associated with its DWQ Groundwater Discharge Permit monitored for Total Dissolved Solids (TDS), boron, chloride, sulfate, and other water quality parameters. Historical groundwater monitoring results associated with the permit indicated that localized groundwater near, and in a down-gradient direction in relation to (generally southwest of), the Bottom Ash Basin, contained TDS concentrations in excess of the permit compliance concentration of 1,100 milligrams per liter (i.e., parts per million-ppm). Groundwater quality down-gradient of the CB Landfill is consistent with typical background concentrations for all CCR constituents.

As identified on Figure 4-1, which is excerpted from IPSC's September 2016 Updated Corrective Action Plan, monitoring wells RW-6, RW-9, WDB-7, WDB-19, EP-W-19, EP-W-23, and EP-W-27 are Groundwater Discharge Permit compliance wells. Other wells identified on Figure 4-1 are not permit compliance monitoring wells. Many of the wells were associated with historical test borehole and pre-construction investigations, and as such were not sampled as part of the DWQ permit monitoring program.

In accordance with its DWQ Groundwater Discharge Permit, IPSC initiated a groundwater recovery program in 2010 which included recovery of groundwater from wells WR-101, WR-102, and WR-103, identified on Figure4-1. As highlighted on Figures 4-2, 4-3-, and 4-4 and discussed in more detail within following report section *3.3. Plan for Containment*, Stantec conducted numerous pump-tests and developed a groundwater model to help design supplemental recovery and monitoring well placements.

Historically, DWQ Groundwater Discharge Permit monitoring indicated that the TDS plume was located well within IGF property boundaries and posed no on- or off-site risk to human health. The DWQ and IPSC agreed that IPSC would implement a phased groundwater recovery program that focused initially on removal of TDS-impacted groundwater from areas located in relatively close proximity to the Bottom Ash Basin. Additional monitoring, including sampling and pump-testing of wells that were associated with CCR Rule compliance, would be used to help investigate and delineate more precisely the location and orientation of the down-gradient leading edge of the TDS plume. The proposed remedial approach included installation of supplemental recovery wells to recover groundwater near the down-gradient leading edge of the TDS plume.

3.2.1.2 CCR Rule Compliance Monitoring

During 2015 through 2017, IPSC implemented its Detection Monitoring Program in compliance with the CCR Rule. Subsequently, IPSC transitioned to an Assessment Monitoring Program which continues currently. Through such monitoring, IPSC refined its Conceptual Site Model and understanding of the TDS plume associated with the Bottom Ash Basin. Likewise, IPSC discovered the presence of TDS plumes located down-gradient of the Waste Water Basin (southwest of the southeastern corner of the basin and west of the northwestern corner of the basin). Groundwater quality down-gradient of the CB Landfill is consistent with typical background concentrations for all CCR constituents.

Specific to CCR Rule compliance monitoring, IPSC monitors groundwater quality at a total of 84 monitoring wells, located at the boundaries and down-gradient of the CCR-regulated units. TDS, heavy metals, boron, pH, and other CCR constituents will continue to be monitored in compliance with both the DWQ Groundwater Discharge Permit and the CCR Rule.

Groundwater monitoring wells have been installed sequentially since CCR Rule Assessment Monitoring began to further delineate CCR constituents in groundwater and refine IPSC's Conceptual Site Model of subsurface hydrogeologic characteristics. Additional monitoring wells were installed sequentially to more accurately define the down-gradient leading edges of TDS plumes located down-gradient of both the Bottom Ash Basin and the Waste Water Basin.

Aside from some of the Groundwater Discharge Permit monitoring wells, the following wells and installation dates are associated with IPSC's CCR Rule compliance program affiliated with the Bottom Ash Basin:

- Up-gradient monitoring wells BA-U-1 and BA-U-2 were installed during July 2015;
- Wells BAC-1 through BAC-7 were installed during July and August 2015;
- Wells BAC-8, BAC-9, and BAC-10 were installed during April and May 2019;
- Wells BAC-11 through BAC-17 were installed during November and December 2019; and
- Wells BAC-18 through BAC-38 were installed during May 2020.

The following wells and installation dates comprise IPSC's CCR Rule compliance program associated with the Waste Water Basin:

- Wells WWC-1 through WWC-5 were installed during July 2015;
- Up-gradient monitoring wells SI-U-1, WW-U-1, and WW-U-2 were installed during August 2015;
- Wells WWC-6 and WWC-7 were installed during March 2018;
- Wells WWC-8, WWC-9, and WWC-10 were installed during April 2019; and
- Wells WWC-11, WWC-12, and WWC-13 were installed during November 2019; and
- Wells WWC-14 through WWC-17 were installed during April 2020.

The following wells and installation dates comprise IPSC's CCR Rule compliance program associated with the CB Landfill:

- Up-gradient monitoring wells CL-U-1 and CL-U-2 were installed during July 2015;
- Wells CL-W-1 through CL-W-8 were installed during July 2015;
- Well CL-W-9 was installed during March 2018; and
- Up-gradient monitoring well CL-U-3 was installed during March 2018.

Figure 5 identifies the locations of those CCR Rule compliance monitoring wells installed and sampled as of April 2020, the most recent sampling event for which IPSC has received analytical result reports. The figure includes a groundwater potentiometric map as well as TDS and Appendix IV metal analytical data, as discussed in more detail within following paragraphs.

Wells BAC-18 through BAC-38 and WWC-14 through WWC-17 were installed, developed, and pump-tested during the Spring and Summer of 2020. All 25 of these additional wells were installed such that each well can be used as a recovery well, if needed, in support of TDS plume control and containment, as is discussed in more detail within following report sections pertaining to corrective actions. Reference Figure 6 for the locations of all BAC and WWC monitoring wells, including the 25 new BAC and WWC wells.

The 25 wells were sampled, along with other wells during October 2020; however, IPSC has not received the analytical laboratory results as of this report. Upon receipt, the analytical results will be presented within IPSC's *December 2020 Semi-Annual Progress Report* and/or *Annual Progress Report* to be prepared in January 2021, which, as with other CCR Rule reports, will be posted on IPSC's public website. Upon receipt and analysis of the forthcoming water quality data associated with the 25 new wells, Stantec will prepare updated TDS iso-concentration maps for the apparent TDS plumes located down-gradient of the two impoundments. Likewise, similar maps will be developed, if any other CCR constituents exceed corollary Groundwater Protection Standards, including Appendix IV metals.

Table 2 herein presents monitoring and recovery well construction details associated with CCR Rule compliance monitoring wells. Attachment 9 presents copies of all CCR Rule monitoring well drilling logs and schematic well diagrams. Attachment 10 tabulates all historical CCR Rule compliance groundwater quality analytical results compiled to date (i.e., through the Spring 2020 semi-annual sampling event).

Also highlighted on Figure 5 are the results of the Appendix IV metal constituent Detection and Assessment Monitoring programs under the CCR Rule. The data indicated the following constituent-specific Lower Confidence Limit (LCL) exceedances above corollary Groundwater Protection Standards (GWPSs) at groundwater monitoring wells located at the two CCR-regulated surface impoundments (all concentrations in mg/L):

CCR Unit	Well	App. IV Constituent	LCL Concentration	GWPS Concentration
CB Landfill		No Exceedances		
Bottom Ash Basin	BAC-2	Molybdenum	0.1506	0.1
	BAC-3	Lithium	0.812	0.7415
Waste Water Basin	WWC-1	Arsenic	0.01496	0.01275
	WWC-2	Arsenic	0.01415	0.01275
	WWC-3	Arsenic	0.02045	0.01275

Although it is documented throughout Utah and in proximity to the site that Arsenic and Lithium can be present naturally at elevated concentrations, IPSC will continue monitoring these and other CCR constituents in groundwater as part of its routine groundwater monitoring program. As additional groundwater quality data are generated, CCR constituent concentrations will be evaluated through statistical analysis for potential SSI, in accordance with CCR Rule requisites. Ongoing/future water quality data will be evaluated in terms of whether additional monitoring and/or recovery wells might be warranted.

Individual sample results of CCR constituents above the GWPS are not necessarily a demonstration of statistically significant exceedances of the GWPS. The LCL must exceed the GWPS to demonstrate a statistically significant increase (SSI). If individual constituent concentrations exceed GWPSs, then Assessment Monitoring is to continue at that specific CCR unit – as was conducted for each unit by IPSC during 2019 and 2020 and will continue for the foreseeable future.

In accordance with §257.95(d), IPSC has been sampling wells on a semi-annual basis in compliance with CCR Rule Assessment Monitoring and every six months as prescribed by its Groundwater Discharge Permit. As additional groundwater quality data are generated at the site, water quality data and analyte-specific GWPSs will continue to be reported in annual reports and evaluated per statistical analyses performed in accordance with CCR Rule §257.95(d)(2) and §257.95(h) [R315-319-95(d)(2) and R315-319-95(h)] and the following general guidance sources, as has been used for reference to date:

- US EPA "Unified Guidance" document (Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009, EPA 530/R-09-007);
- the Interstate Technology and Regulatory Council's ("ITRC") 2013, Groundwater Statistics for Monitoring and Compliance, Statistical Tools for the Project Lifecycle, Online Guidance; and
- Ofungwu, J. (2014) Statistical Applications for Environmental Analysis and Risk Assessment. Hoboken, New Jersey: John Wiley and Sons, Inc.

As Assessment Monitoring to date indicates, arsenic, lithium, and/or molybdenum have only been quantified at slightly-elevated concentrations in excess of respective GWPSs at localized areas of the boundaries of the two basins. As discussed in more detail within following report section 4*.2 Site Hydrogeology*, it is believed that the clay-rich soils that underlie the two surface impoundments and the IGF property are retarding the rate of vertical and horizontal migration of heavy metals within the subsurface environment. As discussed in following report section *3.3 Plan for Containment*, IPSC intends to remediate where necessary, all CCR constituents which exceed corollary GWPSs, including Appendix IV metals, using the array of monitoring and recovery wells that are being designed currently, as well as new recovery wells if needed.

Since 2001 when groundwater quality monitoring began at IGF with issuance of the Groundwater Discharge Permit, and as observed to date, TDS is the CCR constituent found to be the most wide-spread and has migrated further down-gradient from the surface impoundments than any other CCR constituent. In compliance with its Groundwater Discharge Permit, IPSC commenced recovery of TDS-impacted groundwater in 2010. TDS will continue to be used as the leading indicator parameter of impacted groundwater quality for fashioning a groundwater remediation approach to address both TDS and slower-migrating CCR constituents including heavy metals. This is appropriate because TDS is expected to continue to migrate at a much faster rate than dissolved metals in the clay-rich aquifer that underlies the property.

As discussed in IPSC's November 2020 Amended Assessment of Corrective Measures report, a copy of which is presented herein as Attachment 7, Stantec constructed and calibrated a three-dimensional, numerical model to simulate groundwater flow and fate and transport of TDS in groundwater beneath the Site, based on pump-testing of different groundwater recovery and monitoring wells. The model was developed generally in accordance with ASTM International's (American Standard for Testing and Materials) Standard Guide for Application of Groundwater Model to a Site-Specific Problem and the current version of United States Geological Survey (USGS) Modular Three-Dimensional Finite Difference Groundwater Flow Model (MODFLOW-2005).

Groundwater modeling, pump-testing, flow characteristics, and water quality data are used to help refine IPSC's Conceptual Site Model, including ongoing investigation and characterization of the uppermost aquifer beneath localized areas of the site. IPSC is utilizing the model to fashion a groundwater recovery program that is protective of human health and the environment, as discussed in detail within following report sections *3.3 Plan for Containment* and *4.0 Compliance and Corrective Action*.

3.2.2 Current and Future Potential Receptors §257.103(F)(2)(V)(B)(2)

As detailed in following report section *4.2 Site Hydrogeology*, during drilling and installation of monitoring wells, Stantec observed that uppermost groundwater was typically encountered within 50 to 70 feet of the ground surface. Upon well installation, static water levels rose to varying heights within each well, indicating the aquifer is under confined to semi-confined, hydraulic conditions.

Currently, and for the foreseeable future, groundwater containing CCR constituents within the uppermost aquifer located southwest/down-gradient of the two surface impoundments poses no risk to on- or off-site human health or the environment. IPSC's groundwater monitoring has indicated that the TDS plume is located within IGF property boundaries and poses no on- or off-site risk to human health. On-site groundwater is located at an approximate depth of 50 to 70 feet below natural grade, generally between the two surface impoundments and the closest, down-gradient property boundary (reference Figure 1), and is not being recovered for potable, irrigation, or any other domestic and/or industrial use.

Because the uppermost aquifer is located approximately 50 to 70 feet below natural grade, there is no current or anticipated means by which humans might come into direct contact with groundwater containing CCR constituents, including no dermal, inhalation, and/or ingestion exposure scenarios. Groundwater being recovered at recovery wells is pumped directly from each recovery well to a trunkline for direct discharge into the on-site, 80-mil lined, HDPE Ash Recycle Basin. No IPSC staff or other on-site potential receptors come into contact with the recovered water.

Stantec's review of the Utah Department of Natural Resources, Division of Water Rights' web-based, public, water well inventory (DWRi) indicates that presently the closest reported, off-site groundwater production well located down-gradient (southwest) of the IPSC property is approximately 2.5 miles southwest of the IGF's southwestern-most property boundary (e.g., southwest of the Brush Wellman roadway). The well (Water Right #68-1529) is owned and operated by Cal-Maine Foods, Inc. of Delta, Utah for use at its shell egg production plant. The well is reported to be located at South 4510 East 420 feet from the northwestern corner of Section 28 in Township 15 South, Range 7 West. The six-inch diameter well is approximately 300 feet deep, with a well screen interval of 223 to 245 feet below grade. This well replaced an abandoned well owned by former business owner Delta Egg Farm, LLC.

The DWRi database also identifies the following nearby, off-site potable wells, each of which is identified on Figure 7 herein:

Well or Water Right #	Diameter (inches)	Total Depth (feet)	Well Screen Interval (feet)	Usage	Owner	Year Installed
44-3260	8	650	210 to 650	Non-Production	Cal-Maine Foods	2019
68-2558	6	180	160 to 180	No Details	Ernest Saxton	1984
68-3115	6	326	297 to 326	No Details	Lionel B. Tyree	2007
43-6058	2	500	None	Abandoned, temperature gradient monitoring borehole	Utah Geological Survey	2012

As also identified on Figure 7 herein, the DWRi database identifies several additional off-site "Non-Production" (cathodic protection) and geotechnical engineering, investigatory boreholes located approximately 0.5-mile south of the IPSC southern property boundary. Most of the boreholes are only 40 feet deep. All of the boreholes, including the geotechnical borings subcontracted to IGES, Inc., are reportedly owned or installed by Magnum Energy, LLC; Magnum Holdings, LLC; and/or Cathodic Protection Masters. The cathodic protection boreholes range generally between 180 feet to 1,450 feet deep and are not associated with potable water usage.

Magnum Development's Western Energy Hub project entails subsurface storage of natural gas liquids within a below-grade, natural salt dome. The salt dome (high natural TDS characteristics) is located approximately 3,000 feet below grade; approximates one-mile thick; and extends over an acreage approximating 3-miles in lateral extent.

3.2.3 Potential Exposure Scenarios and Mitigation Program §257.103(F)(2)(v)(B)(2)

Historical groundwater quality data are summarized in section *3.2.1. Groundwater Monitoring Data and Exceedances*. Currently, and for the foreseeable future, it is anticipated that TDS-impacted groundwater beneath the IGF property poses little to no risk to on- and off-site human health and the environment, including the closest, off-site wells (approximately 2.5-miles away) that might be producing groundwater for potable and/or non-potable usage. As detailed within following report section *3.5 Plan for Containment,* IPSC's enhanced groundwater recovery program will mitigate potential off-site exposure scenarios.

No on-site TDS-impacted groundwater is used currently or for the foreseeable future for potable or other usage. Thus, there will be no dermal, inhalation, or ingestion contact with TDS-impacted groundwater. Likewise, since the vertical depth to TDS-impacted groundwater is between 50 to 70 feet below grade, it is anticipated that there will be no direct dermal, inhalation, or ingestion exposure pathways between on-site humans and potential environmental receptors. All recovered groundwater will be containerized/conveyed within steel and/or polyvinyl chloride (PVC) conveyance piping, such that there will be no direct exposure pathways for on-site potential receptors.

3.3 PLAN FOR CONTAINMENT §257.103(F)(2)(V)(B)(3)

This subsection provides documentation demonstrating a plan to expedite and maintain the containment of any contaminant plume that is either present or identified during continued operation of the Bottom Ash Basin and Waste Water Basin, per 40 CFR § 257.103(f)(2)(v)(B)(3).

Currently, IPSC and Stantec are finalizing design of an enhanced groundwater recovery program designed to contain CCR constituents in groundwater at concentrations in excess of corollary GWPSs. In summary, groundwater will be recovered by means of dedicated, submersible pumps in recovery wells. Each wellhead will be interconnected with a buried trunkline that will discharge recovered groundwater to the 80-mil, HDPE-lined Ash Recycle Basin. The recovery network will be integrated with the existing recovery system and include all necessary equipment and appurtenances to transfer recovered groundwater from the wells to the Ash Recycle Basin and permit future monitoring and sampling of all the recovery wells.

The Ash Recycle Basin is operated and managed in similar fashion as the two surface impoundments, as part of compliance with IPSC's Groundwater Discharge Permit. IPSC implements BMPs, liner inspections, and mandatory, prompt repairs of any leaks.

Currently, IPSC is designing a new Evaporation Pond system that will be installed before the June 2025 transition from the existing coal units to the new natural gas and hydrogen fired units. Once constructed, IPSC intends to use the proposed Evaporation Pond system rather than the Ash Recycle Basin for future evaporation of recovered groundwater as part of its CCR and Groundwater Discharge Permit compliance programs.

As part of IPSC's ongoing CCR Rule compliance program, IPSC intends to monitor water quality to help gauge the success of the proposed groundwater recovery network. IPSC is prepared to install additional groundwater monitoring and recovery wells, if and where necessary, in the event that additional CCR constituent delineation is deemed warranted and/or if additional mitigation is needed to eliminate unacceptable risks to human health and the environment.

Given the vast real property acreage that is owned by IPA (4,614-acres), as well as the relatively significant distances to off-site potential receptors who might use groundwater for potable and/or non-potable uses (approximately 2.5-miles away), IPSC anticipates that it can implement supplemental plume control measures so as to mitigate any such future potential exposures in a prompt and timely manner.

3.3.1 Bottom Ash Basin

3.3.1.1. Sequential Delineation and Modeling of TDS in Groundwater in Support of Design of Containment Program

As discussed in IPSC's November 2020 Amended Assessment of Corrective Measures report, a copy of which is presented herein as Attachment 7, IPSC initiated groundwater recovery activities in compliance with its Groundwater Discharge Permit to address localized TDS along the apparent plume centerline located near and southwest (down-gradient) of the Bottom Ash Basin, utilizing recovery wells WR-101, WR-102, and WR-103 identified on Figure 4-1. This figure is excerpted from IPSC's September 2016 Updated Corrective Action Plan, a document that is summarized within IPSC's January 2019 report and details historical groundwater quality and remedial information as reported to the DWQ as part of IPSC's Groundwater Discharge Permit compliance program.

The three recovery wells WR-101, WR-102, and WR-103 were not originally intended to provide TDS plume control but rather removal of total TDS mass from subsurface areas deemed to be located along the generalized TDS plume centerline and in relatively-close proximity to the Bottom Ash Basin. Since the TDS plume was located well within IPSC-owned lands and posed no risk to human health, IPSC and the DWQ agreed that additional monitoring wells, which could be used as recovery wells if needed, would be installed in a sequential manner to investigate and remediate the down-gradient leading edge of the plume. Ongoing CCR Rule monitoring data and proposed sampling of historical monitoring wells RW-5, RW-6, and RW-9, each of which were located near the down-gradient leading edge of the TDS plume, were also used to help locate supplemental groundwater monitoring and recovery wells.

As detailed within report section *3.0 Stantec's Groundwater Model Investigation and Analysis of Alternative TDS Plume Containment Options* of IPSC's January 2019 report, Stantec constructed and calibrated a three-dimensional numerical model to simulate ground water flow and fate and transport of TDS in ground water beneath the IGF in an effort to better understand the hydraulic characteristics of the uppermost aquifer beneath the site and for better containment of expansion of the TDS plume. The model was developed generally in accordance with ASTM International's (American Standard for Testing and Materials) Standard Guide for Application of Groundwater Model to a Site-Specific Problem and the current version of United States Geological Survey (USGS) Modular Three-Dimensional Finite Difference Groundwater Flow Model (MODFLOW-2005).

Stantec used the model to help estimate the total number of vertical ground water recovery wells that might be needed to intercept the TDS plume's southwestern-most, down-gradient leading edge. Each proposed well would be constructed as a 6-inch diameter well, with 20- to 25-lineal feet of well screen at the bottom of each well. The model examined use of a line of equally-spaced, ground water recovery wells located perpendicular to the natural, southwesterly ground water flow direction. Since the three existing recovery wells WR-101, WR1-02, and WR-103 had sustainable yields between 8 to 15 gallons per minute (gpm), Stantec's model estimated that the following scenarios should provide satisfactory containment of the TDS plume southwest of the Bottom Ash Basin:

- 15 wells, located at approximate 188-ft. equidistant, lateral spacings; each well producing at 15 gpm

to

- 19 wells, located at approximate 146-ft. equidistant, lateral spacings; each well producing at 10 gpm.

The model indicated that the lateral capture zone for a recovery well pumping ground water at a rate of 10 gpm should extend out approximately 146 feet to either, lateral side of the well (i.e., generally perpendicular to the southwesterly groundwater flow direction). The lateral capture zone for a well pumping ground water at a rate of 15 gpm was projected to extend out approximately 188 feet to either side of the well. Figures 4-2, 4-3, and 4-4 herein are figures excerpted from the 2016 and 2019 reports that depict groundwater modeling results and proposed supplemental groundwater recovery well locations, based on plume orientation estimated in 2016.

Subsequently, as noted on Figure 4-4, well RW-5 was determined to not contain TDS in excess of the Groundwater Discharge Permit action level of 1,100 ppm, including the most recent sampling event of April 2020. Ongoing monitoring also indicated that Groundwater Discharge Permit monitoring well RW-9 contained elevated TDS concentrations, deemed attributable to the southwesterly migration of the down-gradient leading edge of the TDS plume. In summary, water quality data indicated that the down-gradient leading edge of the plume was positioned northwest of what had been predicted previously.

As part of subsequent investigation and pursuit of more accurate delineation of the down-gradient leading edge of the TDS plume, IPSC installed additional monitoring wells (constructed such that all may be used for recovery, if needed) west of wells RW-5 and RW-9, namely wells

BAC-8, BAC-9, BAC-10 (April-May 2019) and wells BAC-11 through BAC-17 (November-December 2019). The TDS water quality data indicated that the down-gradient leading edge of the TDS plume had migrated farther west than monitoring well BAC-11 and appeared to be located somewhere between wells WDB-5 and WDB-7 to the north and wells BAC-10, BAC-14, and BAC-15 to the south (all TDS concentrations of latter five wells are well below 1,100 ppm), as presented on Figure 5.

Several of the BAC wells were pump-tested during May and June 2019, with results evaluated by Stantec's groundwater model. Each well yielded between 10 to 15 gpm. The model was used to investigate where additional down-gradient wells might be installed for more precise delineation and possible recovery of the down-gradient leading edge of the TDS plume. The model estimated that wells should be positioned at approximate 150-foot lateral distances between one another to provide appropriate capture zones, based on an approximate recovery rate of 10 gpm for each proposed well.

During April through June 2020, 21 additional wells (BAC-18 through BAC-38 on Figure 5) were installed, developed, and pump-tested to investigate areas farther west of the existing network of monitoring wells. The wells were arranged along generalized northwest-to-southeast orientations, anticipated to be perpendicular to the regional, southwesterly groundwater flow direction and deemed most suitable for possible use as groundwater recovery wells, if needed. In a conservative mode and instead of well placements every 150 feet, in case the yields of the proposed wells were less than 10 gpm, the 21 new wells were installed at approximate 100- to 125-foot lateral spacings between one another, typically.

All 21 new wells were sampled along with other CCR Rule monitoring wells during the recent October 2020 sampling event. IPSC has not received the analytical result reports, as yet. The analytical results will be evaluated upon receipt of laboratory result reports. It is anticipated that the analytical results will be reported within IPSC's forthcoming December 2020 Semi-Annual Summary Report and/or IPSC's January 2021 Annual Report. The analytical results will be used to help identify if additional monitoring and/or recovery wells are needed to provide appropriate monitoring and containment of the TDS plume.

3.3.1.2 Proposed Containment of CCR Rule Constituents in Groundwater, Bottom Ash Basin

IPSC will continue recovering groundwater from wells WR-101, WR-102, and WR-103 to help with ongoing TDS mass removal down-gradient of and in close proximity to the Bottom Ash Basin. IPSC is also planning to utilize most, if not all, newly-installed wells BAC-20 through BAC-38 for purposes of groundwater recovery and containing the down-gradient leading edge of the TDS plume. Likewise, IPSC intends to recover groundwater from wells BAC-11, BAC-13, BAC-14, and RW-9 to help reduce total mass of TDS within the plume. Contingent upon the analytical results associated with newly-installed BAC wells, IPSC is prepared to install additional wells for both plume delineation and containment, if needed. Other existing BAC wells might also be used in the future as recovery wells, if deemed warranted.

Currently, IPSC and Stantec are finalizing design of an enhanced ground water recovery network that will intercept TDS-impacted groundwater associated with the Bottom Ash Basin in pursuit of containment of the down-gradient leading edge of the plume. Groundwater will be recovered by means of a dedicated, submersible pump in each recovery well. Each wellhead will be interconnected with a buried trunkline that will discharge recovered groundwater to the Ash Recycle Basin. The recovery network will be integrated with the existing recovery system and include all necessary equipment and appurtenances to transfer recovered groundwater from the wells to the Ash Recycle Basin and permit future monitoring and sampling of all the recovery wells.

Submersible pumps, recovered water conveyance piping, and appurtenances will be installed as soon as practicable, which is anticipated to be during Spring 2021. Following installation and start-up, the final specifications and details will be documented within an installation summary report that will be posted on IPSC's public website.

At this time, IPSC anticipates that the proposed, enhanced groundwater recovery system, in conjunction with ongoing use of recovery wells WR-101, WR-102, and WR-103, will provide effective containment of any Appendix III and IV constituent that exceeds corollary Groundwater Protection Standards. If future groundwater quality monitoring indicates that any CCR constituent in excess of corollary Groundwater Protection Standard concentrations has migrated beyond the existing monitoring well network, IPSC is prepared to install additional wells for both plume delineation and containment, if needed.

As additional water quality data are generated (including numerous recently-installed wells for which there is limited historical water quality data for appropriate statistical analysis), IPSC will evaluate the data in terms of plume delineation, statistical exceedance of Groundwater Protection Standards, and appropriate containment. For instance, it is possible that additional groundwater recovery wells may be installed in closer proximity to the basin, and/or other existing wells might be used for recovery, to reduce the total timeframe for groundwater remediation.

3.3.2 Waste Water Basin

3.3.2.1 Sequential Delineation and Modeling of TDS in Groundwater in Support of Design of Containment Program

As identified on Figure 5, the following wells and installation dates comprise IPSC's CCR Rule compliance program associated with the Waste Water Basin:

- Wells WWC-1 through WWC-5 were installed during July 2015;
- Up-gradient monitoring wells SI-U-1, WW-U-1, and WW-U-2 were installed during August 2015;
- Wells WWC-6 and WWC-7 were installed during March 2018;
- Wells WWC-8, WWC-9, and WWC-10 were installed during April 2019; and
- Wells WWC-11, WWC-12, and WWC-13 were installed during November 2019; and

- Wells WWC-14 through WWC-17 were installed during April 2020.

WWC wells were installed sequentially to delineate more accurately the down-gradient leading edge of the TDS plume that appears to be generally down-gradient (southwest) of the southeastern-most corner of the basin. All wells were constructed such that each well could be used as a groundwater recovery well, if needed. Historical wells RW-4 and RW-7 are also being used for monitoring of groundwater located in apparent down-gradient directions in relation to the western-most side of the Waste Water Basin, where localized groundwater flow appears to be toward the west/southwest.

Several WWC wells were pump-tested (yields between 10 to 15 pgm) and evaluated by Stantec's groundwater model to help forecast optimal well placement of wells WWC-14 through WWC-17 for possible use as groundwater recovery wells. The model projected that the optimal placement of wells for possible use as recovery wells was at approximate 200-foot lateral spacings between each of the four wells. The well array was projected to provide appropriate capture of TDS-impacted groundwater located between wells WWC-14 to the west and well WWC-17 to the east.

3.3.2.2 Proposed Containment of CCR Rule Constituents in Groundwater, Waste Water Basin

Currently, IPSC and Stantec are finalizing design of a ground water recovery network in pursuit of containment of the down-gradient leading edge of the plume that is southwest of the southeastern-most corner of the basin, as well as removal of TDS mass from areas located immediately adjacent to the basin. At this time, IPSC intends to recover groundwater from the following wells: RW-4, WWC-5, WWC-4, WWC-1, WWC-8, WWC-6, and wells WWC-14 through WWC-17. IPSC is prepared to use other WWC wells and/or additional wells for groundwater recovery, if needed in the future.

Groundwater will be recovered by means of a dedicated, submersible pump in each recovery well. Each wellhead will be interconnected with a buried trunkline that will discharge recovered groundwater to the Ash Recycle Basin. The recovery network will be integrated with the existing recovery system and include all necessary equipment and appurtenances to transfer recovered groundwater from the wells to the Ash Recycle Basin and permit future monitoring and sampling of all the recovery wells.

Submersible pumps, recovered water conveyance piping, and appurtenances will be installed as soon as practicable, which is anticipated to be during Spring 2021. Following installation and start-up, the final specifications and details will be documented within an installation summary report that will be posted on IPSC's public website.

At this time, IPSC anticipates that the proposed, enhanced groundwater recovery system will provide effective containment of any Appendix III and IV constituent that exceeds corollary GWPSs. If future groundwater quality monitoring indicates that any CCR constituent in excess of corollary Groundwater Protection Standard concentrations has migrated beyond the existing monitoring well network, IPSC is prepared to install additional wells for both plume delineation and containment, if needed.

As additional water quality data are generated (including numerous recently-installed wells for which there is limited historical water quality data), IPSC will evaluate the data in terms of plume delineation, statistical exceedance of GWPSs, and appropriate containment. For instance, it is possible that additional groundwater recovery wells may be installed in closer proximity to the basin, and/or other existing wells might be used for recovery, to reduce the total timeframe for groundwater remediation.

4.0 COMPLIANCE AND CORRECTIVE ACTION §257.103(F)(2)(iii)

IPSC believes that its CCR Rule compliance and BMP program satisfy requirements specified under CCR Rule §257.103(f)(2), including implementation of corrective actions. As prescribed by §257.103(f)(2)(v)(C)…to demonstrate that the criteria in paragraph §257.103(f)(2)(iii) of this section have been met, the owner or operator must submit certification that the IGF complies with the CCR Rule; site hydrogeologic and water quality data; corrective measures assessment; progress reports regarding remedy selection; and structural stability and safety factor assessments, as detailed in the following report subsections.

4.1 CCR RULE COMPLIANCE CERTIFICATION §257.103(F)(2)(V)(C)(1)

The following certifies that the facility is in compliance with all of the requirements of this subpart:

> I hereby certify that, based on my inquiry of those persons who are immediately responsible for compliance with environmental regulations for the IGF, the facility complies with all of the requirements contained in 40 C.F.R. Part 257, Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments. The IPSC CCR compliance website is current and contains all the necessary documentation and notifications.

IPSC Representative

Name, Printed: Jon A. Finlinson
Title: President and Chief Operations Officer

4.2 SITE HYDROGEOLOGY §257.103(F)(2)(V)(C)(2 THROUGH 4)

4.2.1 Regional Geology and Hydrogeology

The IGF is located within the northern reach of the approximate 3,000-square mile Sevier Desert in the Basin and Range Physiographic Province. Stantec's review of Utah Geological Survey Map 184 (*Geology Map of the Delta Quadrangle*, 2002) indicates that the IGF and lands extending to at least a one mile radius around the site are underlain by Quaternary-aged, Lake Bonneville and pre-Lake Bonneville lacustrine, alluvial, and eolian re-worked clays, silts, and sands that extend several hundred feet below grade.

The area is located in the arid Sevier Lake drainage system within a broad alluvial fan dissected by small stream and ephemeral drainages. Sevier Lake is located approximately 35 miles southwest of the IGF. Site topography and land surface stormwater runoff grade generally toward the southwest across the IGF and surrounding lands within at least a one-mile radius of the site.

There is no natural surface water located on the property. Aside from off-site, manmade surface water canals, the closest body of surface water and regional groundwater sink in relation to the IGF is the Sevier River, located approximately 8-miles south and east of the site. The perennial river flows generally from the northeast toward the southwest in this part of Millard County and ultimately grades into Sevier Lake.

According to Western Regional Climate Center's public website database, the average annual precipitation for Delta, Utah during the past 50 years was 7.87 inches. WRCC records also report that the average annual pan evaporation rate for the closest monitoring station in relation to the IGF during the past century was 78.3 inches (Milford, Utah located approximately 70-miles southwest of the IGF). Precipitation and evaporation data indicate the region is characterized by a dry, arid climate.

Groundwater in the Sevier Desert occurs principally within valley-fill deposits consisting of clays, silts, sands, gravels, and evaporites. Recharge is primarily infiltration of precipitation, surface water runoff, and snow melt. Groundwater recharge to the IGF and surrounding lands is anticipated to be predominantly from the Tintic Mountains located approximately 20 miles northeast of the site. Regionally, groundwater flow within the Sevier Desert is generally from the northeast toward the southwest.

Stantec's review of well drilling logs published on the DWRi's public well inventory database indicates that potable and non-potable, groundwater production wells and soil test boreholes located within a mile southwest of the IGF typically recover groundwater from sand-rich aquifers located at subsurface depths of 200 to several hundred feet below grade. Many of the drill logs report tight clays extending from land surface to subsurface depths between 200 to 600 feet of the subsurface, depending on completion depths. A few of the drill logs reported thin (a few feet or less) sand and/or silt stringer layers interspersed within the predominantly clay-rich soils.

4.2.2 Site-Specific Geology and Hydrogeology

During the past 15 years, several different Stantec (and JBR Environmental Consultants, Inc., which was acquired by Stantec in 2014) field geologists and engineers have been involved with overseeing monitoring and recovery well drilling, installation, and pump-testing activities associated with most of the historical monitoring wells associated with the Groundwater Discharge Permit and all of the CCR monitoring wells at the IGF. As additional monitoring wells have been installed, Stantec and IPSC have gained increasingly more data and understanding regarding subsurface hydrogeologic conditions beneath the site.

All CCR monitoring wells and many of the Groundwater Discharge Permit monitoring wells were drilled and installed by the sonic drilling method, whereby subsurface soil samples were collected in six-inch diameter, 10-foot (10-ft.) long, clear plastic, sampling cores for visual inspection and logging of soil characteristics, such as lithologic composition and moisture. Attachment 9 presents copies of all CCR Rule monitoring well drilling logs and schematic well diagrams. Attachment 10 tabulates all historical CCR Rule compliance groundwater quality analytical results compiled to date. Attachment 11 presents geologic cross-sections pertinent to subsurface lithologic characteristics identified during drilling of some of the CCR wells located near and down-gradient of the Bottom Ash Basin and the Waste Water Basin.

Currently, Stantec is preparing additional, more expansive cross-sectional figures that include subsurface data associated with drilling and sampling of many of the 25 recently installed monitoring wells that are not included in the attached cross-sections. IPSC intends to include the expanded cross-sectional figures within its forthcoming December 2020 Semi-Annual Progress Report.

As may be noted by review of the cross-sectional figures in Attachment 11 herein, the uppermost 10 to 30 feet of subsurface soils are characterized by sands and silty to fine-grained sands. As noted on drilling logs in Attachment 9, many of the sand-rich soils are highly-heterogenous, including silt- and clay-rich matrices, as well as silt and clay ‘stringer’ layers of varying thickness. Typically, relatively thick (several feet to 40 feet thick) clay-rich layers underlie the upper more sand- and silt-rich unit. Another sand-rich layer, which approximates a few feet to 10 feet thick, is located beneath the upper clay-rich unit. However, there are localized areas within this lower sand-rich layer that include silt and clay layers that vary between inches to a couple of feet in thickness. Soil material at greater depths tends to be more heterogenous matrices and layers of intermingled clay- silt- and sand-rich soil materials.

Stantec’s visual inspection of soil samples collected during the drilling of the wells indicated that many of the clay layers exhibited relatively impermeable vertical permeability characteristics that appeared to be on the order of 1×10^{-6} to 10^{-9} centimeters per second (cm/sec), based on Stantec experience. Likewise, more clastic-rich (sand, silt, etc.) soil layers also included varying degrees of clay-rich matrices and interbedded, clay layers. Prior to construction of the IGF in the early 1980s, geotechnical investigations, which included collection of numerous undisturbed soil samples for analysis by different geotechnical engineering laboratories, revealed that many clay layers beneath the IGF exhibited vertical and horizontal permeability values in the range of 1×10^{-7} to 1×10^{-9} cm/sec, indicative of relatively-impermeable material.

Stantec found that uppermost saturated soil conditions were typically encountered beneath much of the site between approximately 50 to 60 feet below natural grade. The depth to the uppermost aquifer tends to be slightly deeper (60 to 70 feet below grade) in areas located generally south of the Waste Water Basin in the general vicinity of groundwater monitoring wells located immediately north of the IPSC southern property boundary north of State Route 174. As a result of impermeable clay layers beneath the site, the uppermost aquifer is under confined to semi-confined hydraulic conditions, whereby during drilling groundwater was encountered at depths much deeper than subsequent, steady-state, static water levels. After an hour or two following well installation, the static water level in each well rose to reflect the potentiometric surface.

4.3 GROUNDWATER CORRECTIVE MEASURES ASSESSMENT AND REMEDY SELECTION §257.103(F)(2)(V)(C)(5 THROUGH 8)

This subsection provides documentation demonstrating that required corrective measures assessments, progress reports on remedy selection and design, and structural stability and safety factor assessments, have been made and reported on IPSC's public website (https://ipscenvironmental.weebly.com) per 40 CFR § 257.103(f)(2)(v)(C)(5)-(8).

Copies of IPSC's October 2016 Structural Stability Assessment and Safety Factor Assessment reports are posted on IPSC's public website and presented in Attachment 8 herein. The reports noted that an independent professional engineer's inspections of the two surface impoundment berm structures found that the impoundments satisfied CCR Rule standards, as regarded berm structural stability and safety factors.

The following reports, which are posted on IPSC's public website and attached as Attachments herein, provide historical details regarding IPSC's corrective measures assessments and progress reports regarding remedial selection and design:

- January 2019 Assessment of Corrective Measures and Amended Corrective Action Plan;
- January 2019 Annual Groundwater Monitoring and Corrective Action Summary Report;
- June and December 2019 Semi-Annual Progress, Selecting and Designing of Groundwater Corrective Action Remedy reports;
- January 2020 Annual Groundwater Monitoring and Corrective Action Summary Report;
- June 2020 Semi-Annual Progress Report; and
- November 2020 Amended Assessment of Corrective Measures Report.

As part of the assessment of alternative corrective measures for addressing CCR constituents in groundwater and ongoing remedy selection and design, IPSC is evaluating various remedial options, including: ongoing use and expansion of the existing groundwater recovery network used in compliance with its Groundwater Discharge Permit; possible use of horizontal interceptor trenches and Ranney-type, collector wells; possible use of Monitored Natural Attenuation (MNA); and possible use of evaporation ponds and possible construction of a water treatment facility for treatment of recovered groundwater.

IPSC is waiting to review the pending October 2020 water quality analytical data before completing its final remedy selection. However, as discussed within IPSC's November 2020 Amended Assessment of Corrective Measures Report, IPSC expects that the most effective (and conservative) remedial approach will be groundwater recovery and removal from the subsurface and subsequent evaporation of groundwater containing CCR constituents, in consideration of the following evaluation criteria prescribed by §257.96(c) and §257.97(c):

§257.96(c)(1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;

§257.96(c)(2) The time required to begin and complete the remedy; and

§257.96(c)(3) The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).

More exhaustive evaluation criteria also included the following evaluation criteria prescribed by §257.97(c):

§257.97(c)(1) The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following: (i) Magnitude of reduction of existing risks; (ii) Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy; (iii) The type and degree of long-term management required, including monitoring, operation, and maintenance; (iv) Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal of contaminant; (v) Time until full protection is achieved; (vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment; (vii) Long-term reliability of the engineering and institutional controls; and (viii) Potential need for replacement of the remedy.

§257.97(c)(2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors: (i) The extent to which containment practices will reduce further releases; and (ii) The extent to which treatment technologies may be used.

§257.97(c)(3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors: (i) Degree of difficulty associated with constructing the technology; (ii) Expected operational reliability of the technologies; (iii) Need to coordinate with and obtain necessary approvals and permits from other agencies; (iv) Availability of necessary equipment and specialists; and (v) Available capacity and location of needed treatment, storage, and disposal services.

§257.97(c)(4) The degree to which community concerns are addressed by a potential remedy(s).

The following provides a generalized summary of IPSC's evaluation of various possible corrective measures that might be employed at the site. More specific details are presented within IPSC's November 2020 Amended Assessment of Corrective Measures Report, a copy of which is presented at Attachment 7 herein.

Historically and to date, TDS is the CCR constituent found to be the most wide-spread and located farthest down-gradient from both the two surface impoundments. Water quality beneath the IGF poses no risk to on- or off-site human health, currently and for the foreseeable future, such that there are no imminent health risks that might warrant immediate abatement of all CCR constituent-impacted groundwater beneath the site.

Since 2010, TDS has been recovered from the subsurface via an existing network of recovery wells and interconnected buried, water conveyance piping, pumphouses, and appurtenances as part of compliance with its Groundwater Discharge Permit. IPSC is removing TDS-impacted groundwater from existing recovery wells WR-101, WR-102, and WR-103 located down-gradient of the Bottom Ash Basin. The three wells recover groundwater within close proximity to the basin and within the generalized middle of the plume and along the TDS plume centerline.

Currently, IPSC and Stantec are finalizing design of an enhanced ground water recovery network that will intercept TDS-impacted groundwater associated with both the Bottom Ash Basin and the Waste Water Basin TDS plumes at the down-gradient leading edges and within the middle of the TDS plumes, as detailed in preceding report section 3.3 Plan for Containment. If other CCR constituents are detected in excess of corollary GWPSs, data to date indicate that any such constituents will migrate at considerably slower migration rates, and most likely along similar groundwater flow paths, as TDS. If this occurs, any such CCR constituent would be intercepted and removed from the subsurface by means of the expanded, groundwater recovery network that is being designed currently, if needed. As will be reported in future reports, IPSC will monitor the progress of the expanded groundwater recovery network and is prepared to install additional groundwater monitoring and/or recovery wells, if needed to address any unanticipated release and/or migration of CCR constituents in the future and provide appropriate protection to on- and off-site human health.

IPSC believes that recovery of groundwater from beneath the IGF using vertical groundwater recovery wells, in conjunction with evaporation of recovered groundwater, is the most conservative, practical, reliable, effective, flexible, and timely measure for remediating contaminated groundwater beneath the IGF while providing appropriate protection to on- and off-site human health. Existing and proposed water recovery infrastructure can be expanded readily and in a timely manner to accommodate any supplemental groundwater recovery wells that might be needed in the future.

As discussed within IPSC's November 2020 Amended Assessment of Corrective Measures Report, historical water quality data indicate that MNA is not a viable option, as the down-gradient leading edges of the TDS plumes continue to migrate down-gradient, generally toward the southwest; i.e., limiting attenuation or retardation of TDS in groundwater. Even if MNA were viable, the timeframe for completing the remedy would likely be excessive as compared to other options.

Likewise, as discussed in the report, Stantec's groundwater model investigated possible use of one or more Ranney-type, collector wells (each a 13-ft diameter, vertical concrete shaft driven to a depth of approximately 70-ft below grade with 300 feet long, horizontal collector screens radiating out from the bottom of the concrete shaft), instead of vertical recovery wells for containment of the TDS plume. The model indicated that use of vertical recovery wells, when compared to use of a Ranney collector well network, provides similar cumulative yield/volume of ground water recovery. However, use of vertical wells is deemed more practical, efficient, and beneficial for TDS Plume containment for numerous reasons, including:

- Greater flexibility and precision for well locating and installation;

- More extensive lateral and vertical aquifer characterization (i.e., individual well pump-testing for investigation of localized hydraulics throughout different areas within the aquifer); and

- Recovery of ground water throughout the approximate 20- to 25-foot thick aquifer (i.e., deeper ground water recovery within the aquifer, when compared to a horizontal ground water recovery network that would be placed at the bottom of the aquifer).

IPSC also evaluated possible use of horizontal groundwater interceptor trenches located at various locations across the site. Discussions with a horizontal trench installation company indicated that installation of any such trenches would be problematic at the IGF. In consideration of the relatively-deep depth of the uppermost aquifer (approximately 50 to 70 feet below grade), as well as the clay-rich lithologic characteristics of the subsurface, installation, operation, and management of any such horizontal trench is deemed impractical and less efficient than use of vertical recovery wells, for numerous reasons including those listed above for comparison to horizontal Ranney-type wells.

Lastly, the anticipated timeframe of a few years to design, permit, and construct an appropriate water treatment facility to treat recovered groundwater was deemed impractical and unnecessary. Evaporation of recovered groundwater has been used successfully to date and will continue to be the most viable option in this regard for the foreseeable future. Treated water from a hypothetical treatment plant would be directed to on-site evaporation ponds anyway, in consideration of the remote location of the IGF and the extremely dry and arid climate of the area.

5.0 OCTOBER 17, 2028 PROJECTED SURFACE IMPOUNDMENT CLOSURES §257.103(F)(2)(iv)

IPSC will close its two surface impoundments by October 17, 2028, the deadline prescribed by §257.103(f)(2)(iv)(B).

As prescribed by §257.103(f)(2)(v)t*he "owner or operator of the CCR surface impoundment must submit the following documentation that the criteria in paragraphs* [§257.103] *(f)(2)(i) through (iv) of this section have been met as specified in paragraphs (f)(2)(v)(A) through (D) of this section."*

Preceding report sections address items prescribed within §257.103 (f)(2)(v)(A) through (C). §257.103 (f)(2)(v)(D) stipulates that:

> *(D) To demonstrate that the criteria in paragraph (f)(2)(iv) of this section have been met, the owner or operator must submit the closure plan required by § 257.102(b) and a narrative that specifies and justifies the date by which they intend to cease receipt of waste into the unit in order to meet the closure deadlines.*

IPSC has recorded and posted its October 2020 *Surface Impoundment Closure Plans*, accordingly. In the event that such Plans are amended, all amendment reports will also be recorded and posted appropriately. Copies of anticipated CCR surface impoundment closure schedules are presented as Attachment 12 herein and brief narrative regarding the closure approach for each CCR unit is provided below.

5.1 COMBUSTION BY-PRODUCT LANDFILL

The Combustion By-Product (CB) Landfill will be closed in two phases. The first phase will involve completing detailed grading and capping of the eastern portion of the CB Landfill following approval of the closure plan by the governing regulatory agency. Following cessation of the coal fired boilers on July 1, 2025, the western portion of the CB Landfill will be fine graded and capped. The final cover system for the CB Landfill will consist of a 18-inch compacted clay liner with a maximum hydraulic conductivity of $1x10^{-5}$ cm/sec and a 6-inch thick erosion layer that will be reseeded.

5.2 WASTE WATER BASIN

The closure of the Basin will be completed in steps as described below:

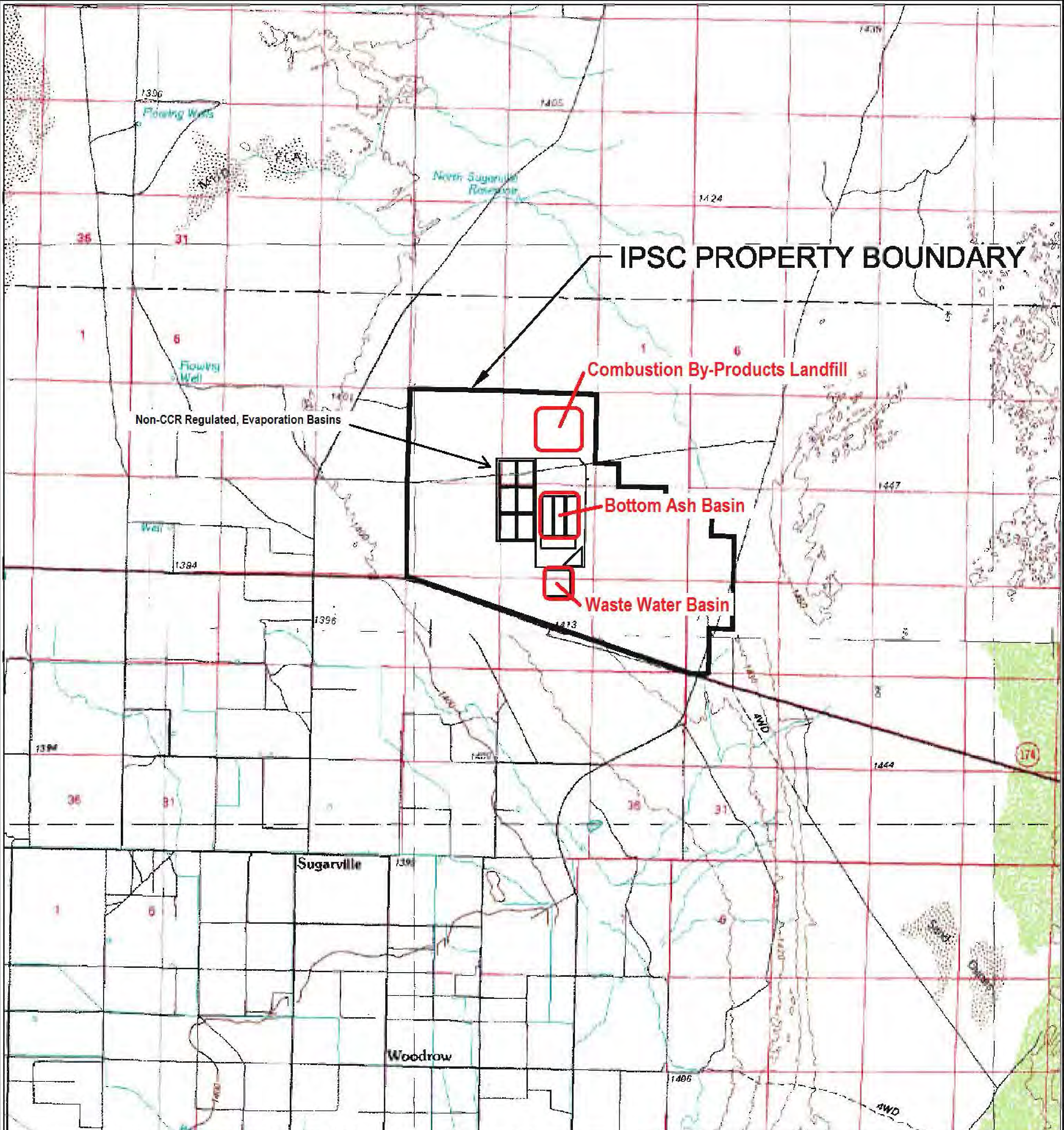
- Bifurcate the Basin into operating and non-operating portions by construction of a divider berm to reduce the footprint of the Basin receiving CCR material.
- Allow for pumping of standing water on the southern (non-operating) portion of the Basin to begin to dry the CCR solids in this area.

- Allow for placement of fill on the southern (non-operating) portion of the Basin to allow for pre-consolidation of the CCR solids prior to installation of the final cover system to mitigate the potential for differential settlement of the final cover system.
- Allow for pumping of standing water on the Northern (operating) portion of the Basin to begin to dry the CCR solids in this area.
- Allow for placement of fill on the Northern (operating) portion of the Basin to allow for pre-consolidation of the CCR solids prior to installation of the final cover system to mitigate the potential for differential settlement of the final cover system.
- Install LLDPE liner cover over 3% sloped crown.
- Construction of an 18-inch soil protection layer.
- Construction of a 6-inch topsoil/vegetation layer.

5.3 BOTTOM ASH BASIN

The Bottom Ash Basin cells will be closed following cessation of the coal fired boilers on July 1, 2025. Prior to placing any fill on the cells, the bottom ash will be dewatered by pumping out free-liquid and discharging the water to the future evaporation pond to be constructed as part of the facilities conversion to gas. Once the free liquid has been removed, the bottom ash within each cell will be graded to provide a base for the placement of general fill that will form the subgrade for the final closure cover. Additionally, to facilitate achieving a 1.5% minimum slope of the subgrade from the north to the south, a portion of the embankments surrounding the three cells will be cut down and the existing liner re-anchored. Fill from the cut areas will be used for general fill to generate the subgrade. Following construction of the subgrade to the required lines and grades, the final closure cover will be installed. The final closure cover will consist of a 60 mil HDPE liner, an 18-inch thick protective earthen cover, and a 6-inch erosion control layer.

FIGURES



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES

N

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

DATE DRAWN	1-26-17
REVISION	

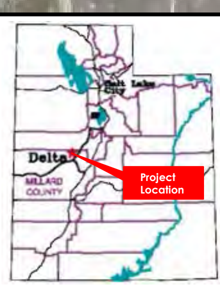
DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'

drawings\ipsc-04\Fig2 Site Topographic Map.dwg

Legend

CCR Unit

N



INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

Stantec

DRAWN BY JR	DATE DRAWN 9/30/2016
SCALE 1 in. approx. 1700 ft.	
PROJECT 203709098.409	

FIGURE 3. IPSC PROCESS FLOW DIAGRAM

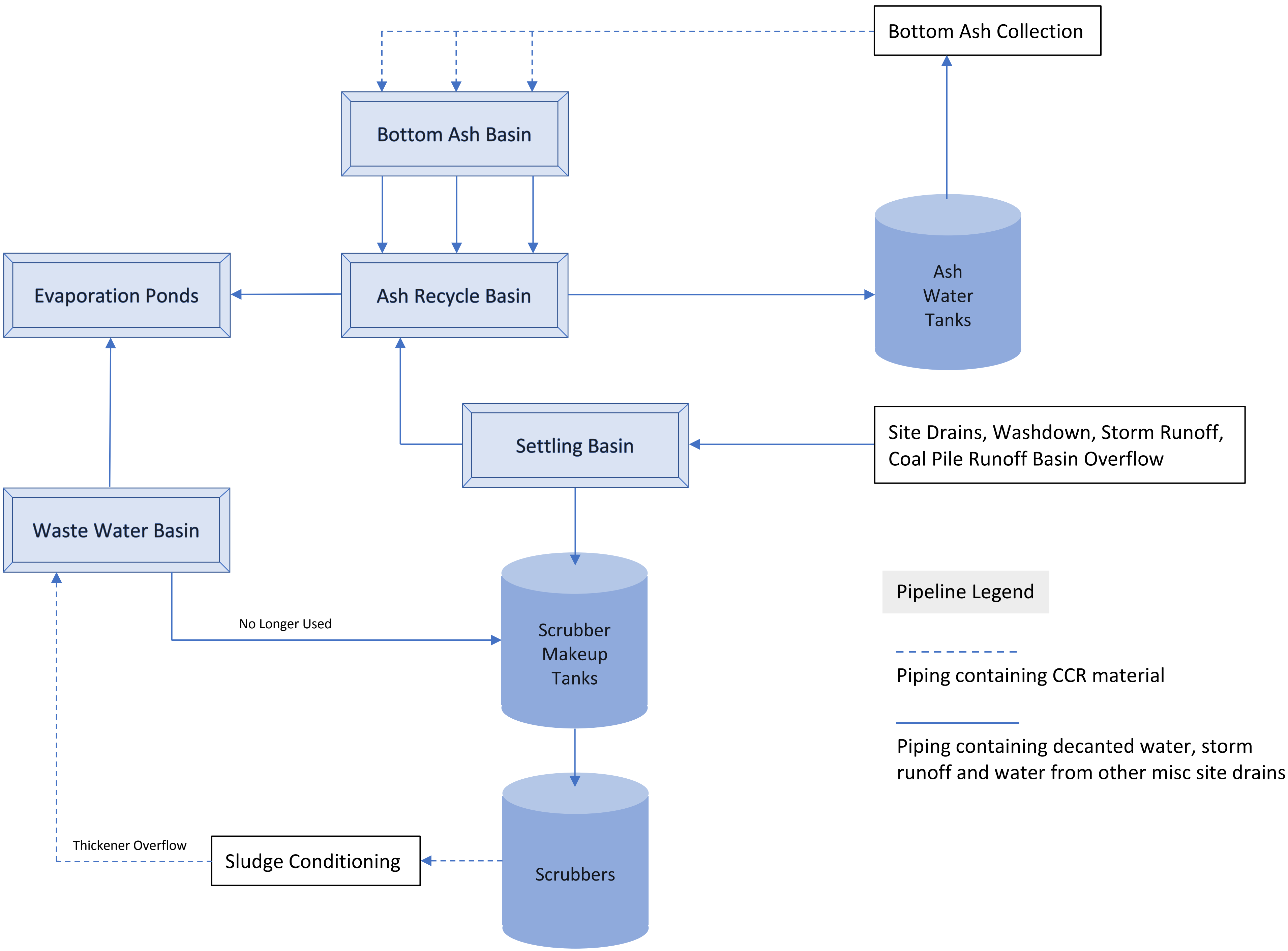
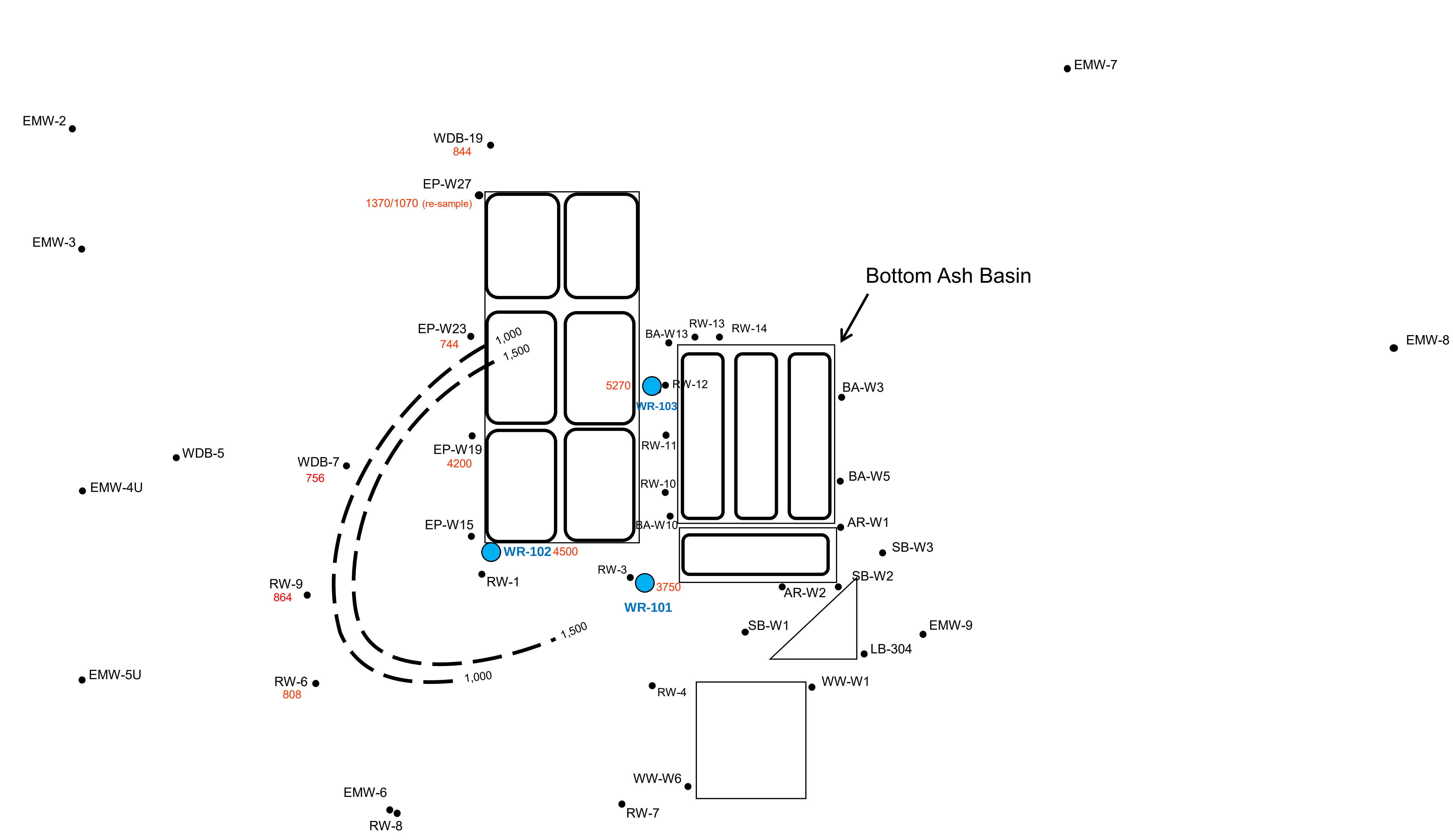


FIGURE 4-1.

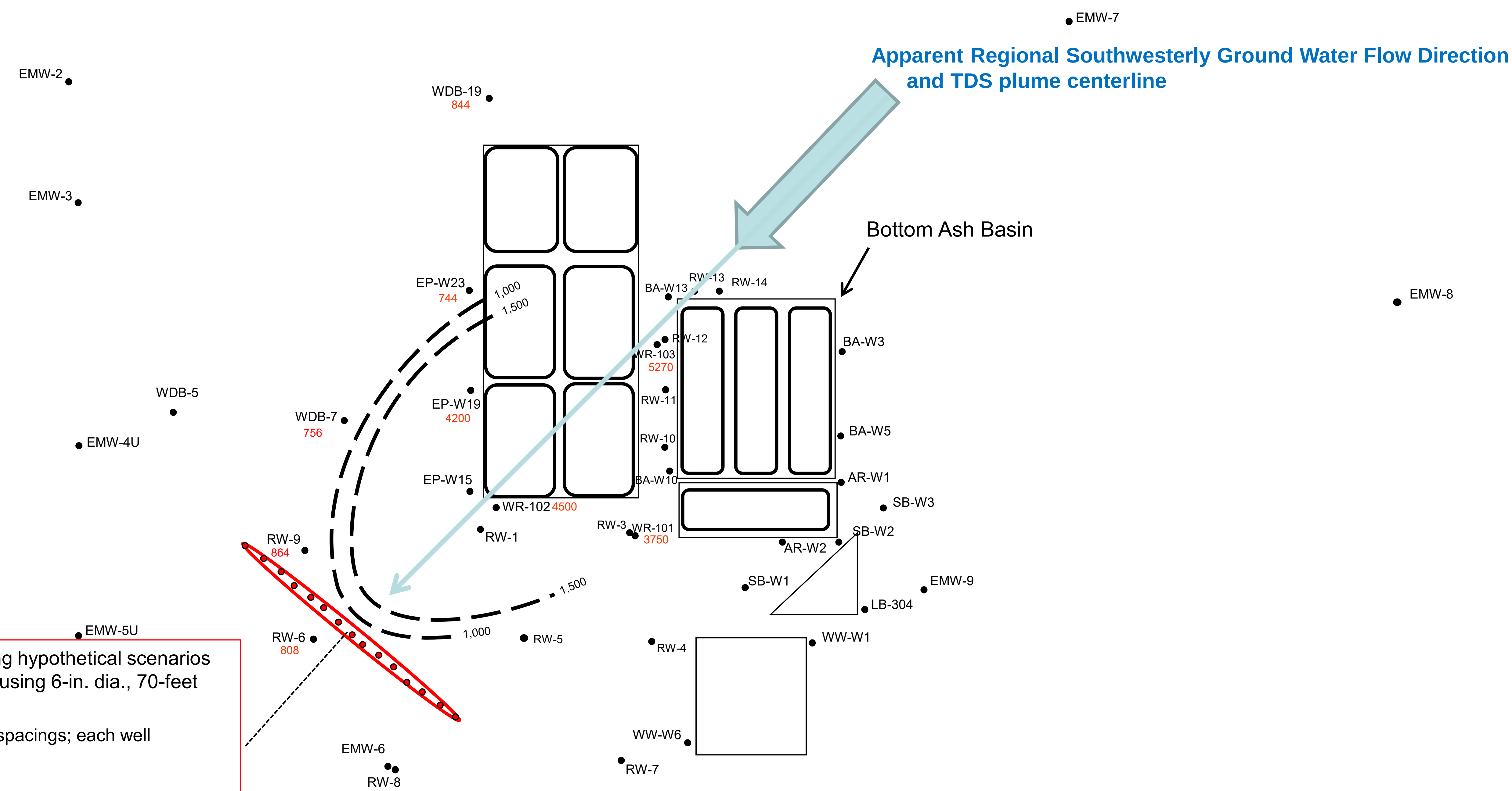
Excerpted Figure 1 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



Stantec	INTERMOUNTAIN GENERATING FACILITY 850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH **Figure 1 – GROUND WATER TDS ISO-CONCENTRATION MAP, APRIL 2016**	**LEGEND** Monitoring Well Location Existing Recovery Well Location - 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours Concentration values in milligrams / liter (ppm) 0 FEET 2000 SCALE N

FIGURE 4-2.

Excerpted Figure 2 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



Model estimates the following hypothetical scenarios for intercepting TDS plume, using 6-in. dia., 70-feet deep recovery wells:

- 15 wells @ ~ 188-ft. lateral spacings; each well producing @ 15 gpm

to

- 19 wells @ ~ 146-ft. lateral spacings @; each well producing @ 10 gpm

Stantec

INTERMOUNTAIN GENERATING FACILITY

850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 2. Model-Simulated, Recovery Well Placement for TDS Plume Containment

LEGEND

● Monitoring Well Location

- 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours

Concentration values in milligrams / liter (ppm) ; April 2016

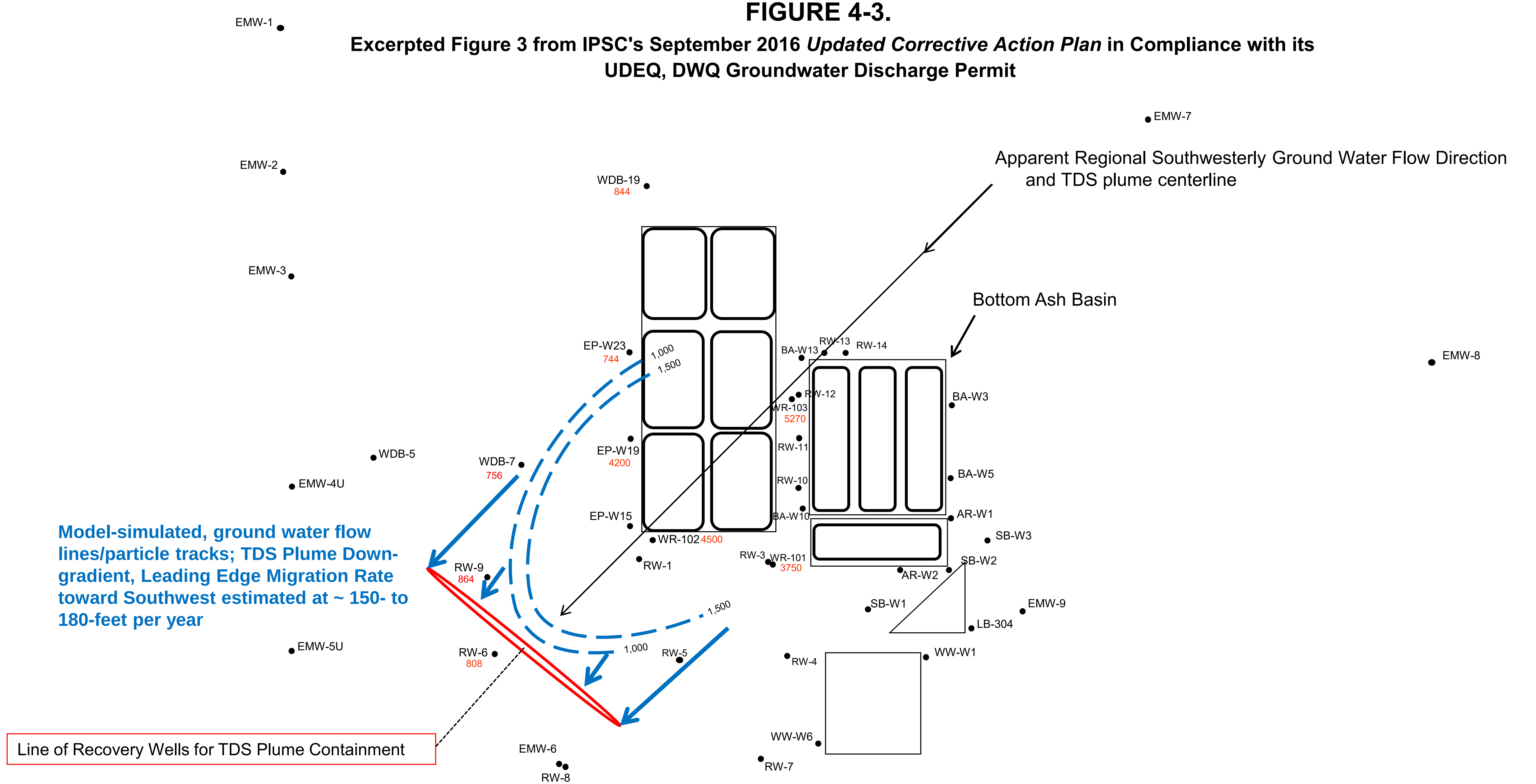
0 FEET 2000

SCALE

N

FIGURE 4-3.

Excerpted Figure 3 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



GROUND WATER TDS ISO-CONCENTRATION MAP, **APRIL 2016**

INTERMOUNTAIN GENERATING FACILITY

850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 3. Model-Simulated, Ground Water Flow Paths, Particle-Tracking

LEGEND

- ● Monitoring Well Location
- \- 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours

Concentration values in milligrams / liter (ppm)

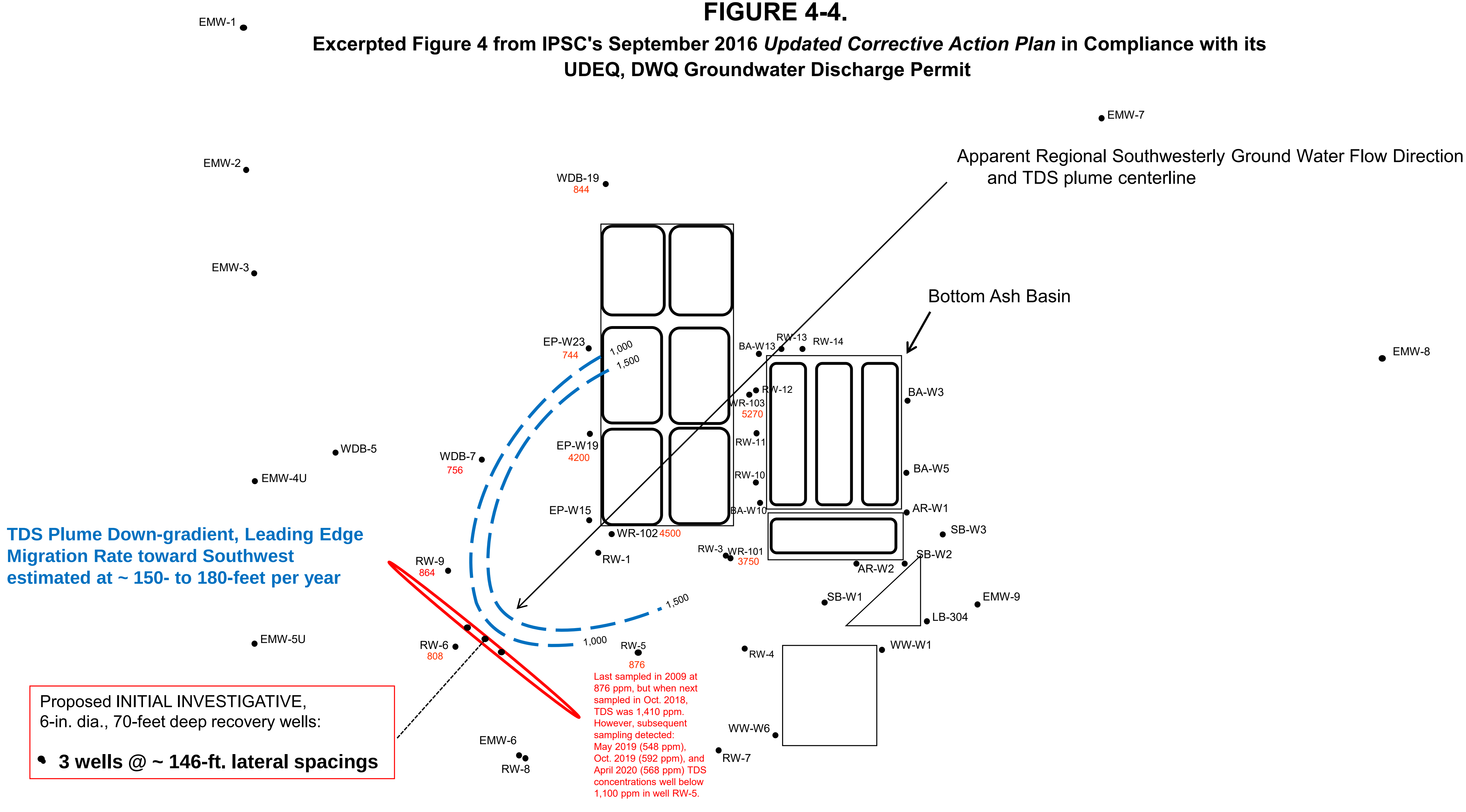
0 FEET 2000

SCALE

N

FIGURE 4-4.

Excerpted Figure 4 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



Stantec

INTERMOUNTAIN GENERATING FACILITY

850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 4. Proposed Preliminary Investigative, Recovery Well Locations

LEGEND

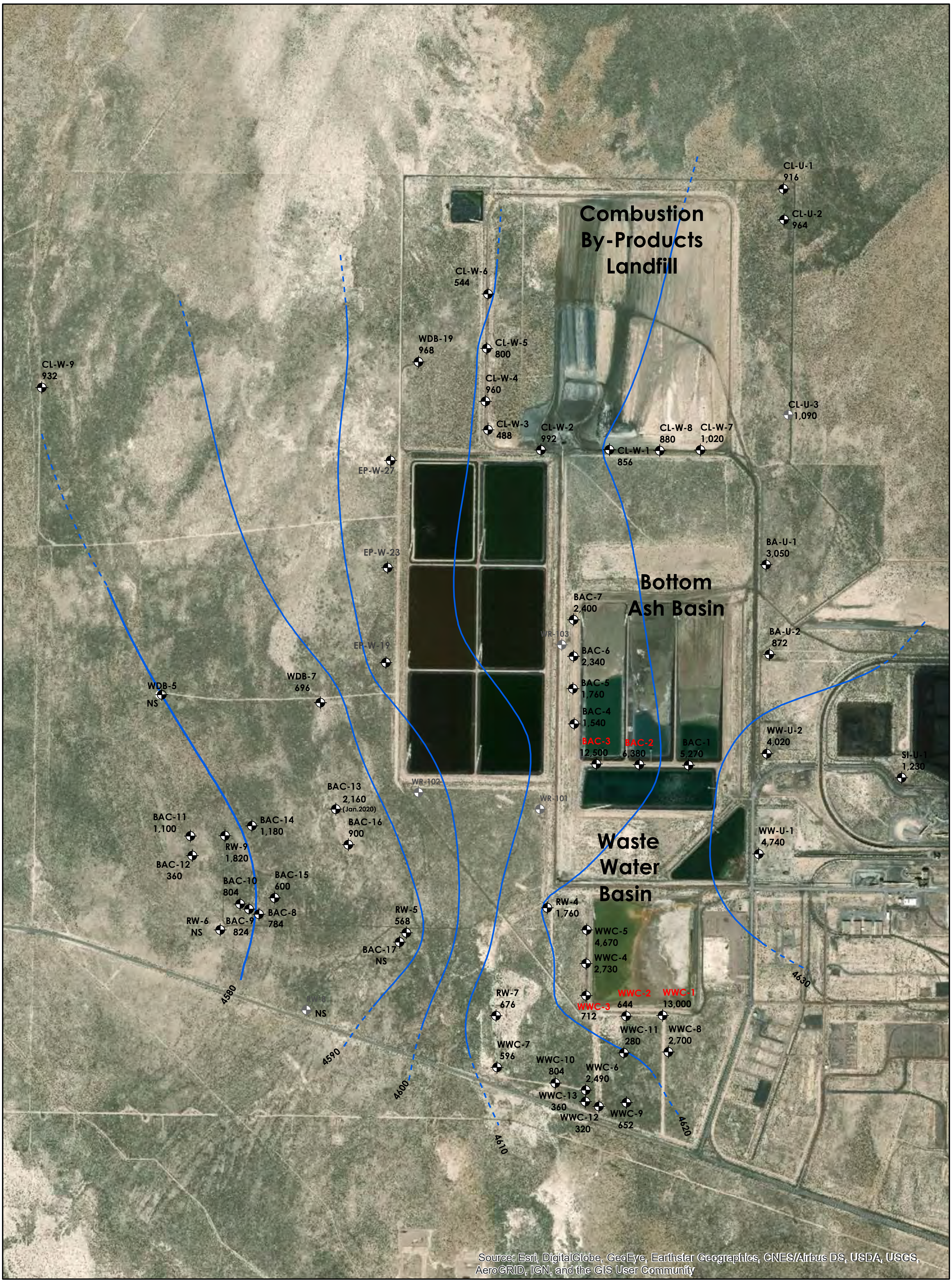
- ● Monitoring Well Location
- - 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours

Concentration values in milligrams / liter (ppm)

SCALE: 0 – FEET – 2000

N

C:\Users\ckwiatkowski\Desktop\203709098 Intermountain Power\GIS\2020_04\fig04_March2020GWE_DeltaUT_20200413_11x17.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 600 Total Dissolved Solids (TDS) Concentration in milligrams per liter; mg/L
- GROUNDWATER CONTOUR, mean sea level elevations
- NS NOT SAMPLED

NOTES: ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

Appendix IV Metal Constituent Exceedances:

CCR Unit	Well	CCR Constituent	Lower Confidence Limit (LCL) Concentration	Groundwater Protection Standard (GWPS) Concentration
Bottom Ash Basin	BAC-2	Molybdenum	0.1506	0.1
	BAC-3	Lithium	0.812	0.7415
Waste Water Basin	WWC-1	Arsenic	0.01496	0.01275
	WWC-2	Arsenic	0.01415	0.01275
	WWC-3	Arsenic	0.02045	0.01275

Metal concentrations in mg/L

0 1,300 2,600
Feet
1 in = 1,300 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH

APRIL 2020 TDS CONCENTRATIONS and Appendix IV Metal GWPS Exceedances
SUPERIMPOSED ON MARCH 2020 POTENTIOMETRIC MAP

FIGURE: 5

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL	JR	05/04/20

Legend

Monitoring Well

1,100 Total Dissolved Solids (TDS) Concentration in milligrams per liter; mg/L; RED if > greater than Groundwater Discharge Permit Action Level of 1,100 mg/L

NS - Not Sampled in April 2020

NI - Not Installed as of April 2020

Stantec

N

0 175 350 Feet 1 in = 350 feet

T15S, R7W Millard County, UT
NAD 1983 UTM Zone 12N

DRAWN BY: JT | 1ST REVIEW: JR | 2ND REVIEW: JR

DATE: 10/29/2020 | PROJECT NO: 203709098

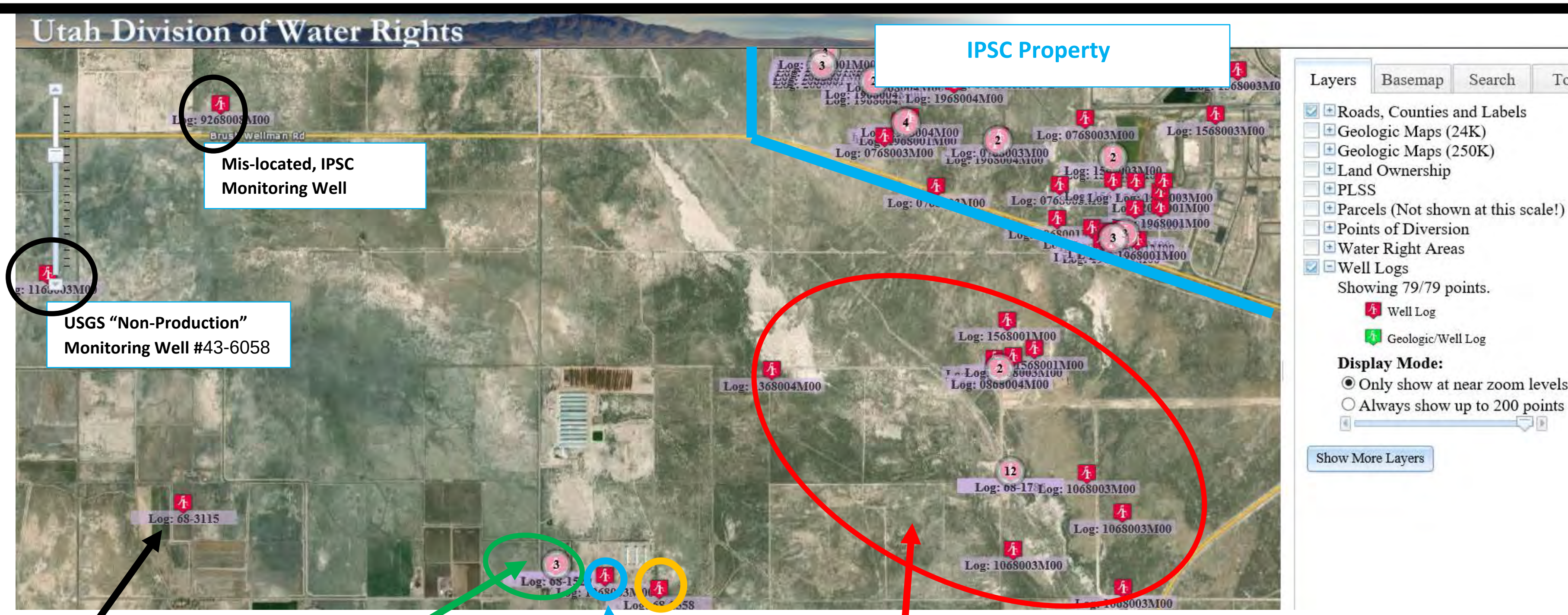
Figure **6**

25 New Wells Installed, Developed, and Surveyed During Summer 2020 with April 2020 TDS Concentrations

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,

IPSC's Western and Southern Property Boundaries

(including on-site, groundwater monitoring/recovery wells)



Lionel B. and Kimberly Tyree
Water Right Number: 68-3115

Cal-Maine Foods, Inc.
Water Right Number: 68-1529
Repaired, Abandoned, & Replaced One Well

Earnest Saxton
Water Right Number: 68-2558

Magnum Development's Non-Production and Geotechnical Engineering Boreholes

Cal-Maine Foods' Non-Production Well #44-3260

NORTH

0 2,000 4,000

Feet

1 in = 4,000 ft

Stantec	FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH	**Aerial of Well Database, Excerpted from Utah Division of Water Rights' Public Website**	FIGURE: 7

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	JR	CK	JR	09/1/20

TABLE 2 GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

Table 2
Well Construction Summary
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4615.615
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4665.367
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BAC-8	4/29/2019	6-inch PVC	77	52-77	4626.42
BAC-9	5/1/2019	6-inch PVC	77	52-77	4626.27
BAC-10	5/3/2019	6-inch PVC	87	62-87	4626.27
BAC-11	12/7/2019	6-inch PVC	75	50-75	4624.96
BAC-12	12/6/2019	6-inch PVC	78	53-78	4625.055
BAC-13	11/18/2019	6-inch PVC	90	65-90	4629.834
BAC-14	12/4/2019	6-inch PVC	78	53-78	4627.506
BAC-15	12/9/2019	6-inch PVC	75	50-75	4626.494
BAC-16	11/21/2019	6-inch PVC	89	64-89	4630.426

Table 2
Well Construction Summary
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL)
BAC-17	12/10/2019	6-inch PVC	81	56-81	4629.648
BAC-18	5/8/2020	6-inch PVC	78	53-78	4621.504
BAC-19	5/9/2020	6-inch PVC	78	58-78	4615.62
BAC-20	5/9/202	6-inch PVC	78	53-78	4617.848
BAC-21	5/10/2020	6-inch PVC	88	61-88	4619.625
BAC-22	5/10/2020	6-inch PVC	78	53-78	4619.905
BAC-23	5/11/2020	6-inch PVC	78	53-78	4619.582
BAC-24	5/12/2020	6-inch PVC	76	51-76	4619.207
BAC-25	5/12/2020	6-inch PVC	78	53-78	4619.327
BAC-26	5/13/2020	6-inch PVC	78	53-78	4627.704
BAC-27	5/13/2020	6-inch PVC	78	53-78	4627.355
BAC-28	5/14/2020	6-inch PVC	78	53-78	4625.411
BAC-29	5/15/2020	6-inch PVC	78	53-78	4625.29
BAC-30	5/142020	6-inch PVC	78	53-78	4624.88
BAC-31	5/15/2020	6-inch PVC	78	53-78	4625.024
BAC-32	5/192020	6-inch PVC	78	53-78	4626.583
BAC-33	5/18/2020	6-inch PVC	78	53-78	4626.629
BAC-34	5/21/2020	6-inch PVC	78	53-78	4624.702
BAC-35	5/282020	6-inch PVC	78	53-78	4624.805
BAC-36	5/30/2020	6-inch PVC	78	53-78	4619.231
BAC-37	5/29/2020	6-inch PVC	78	53-78	4618.397
BAC-38	5/31/2020	6-inch PVC	78	53-78	4619.593
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 2
Well Construction Summary
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL)
Wastewater Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WWC-6	3/24/2018	4-inch PVC	87	67-77	4635.945
WWC-7	3/22/2018	4-inch PVC	87	77-87	4630.487
WWC-8	4/25/2019	6-inch PVC	96	71-96	4647.799
WWC-9	4/28/2019	6-inch PVC	87	62-87	4642.58
WWC-10	4/26/2019	6-inch PVC	87	62-87	4633.72
WWC-11	11/16/2019	6-inch PVC	90	65-90	4641.919
WWC-12	11/12/2019	6-inch PVC	90	65-90	4636.661
WWC-13	11/15/2019	6-inch PVC	90	65-90	4635.128
WWC-14	5/6/2020	6-inch PVC	85	60-85	4635.927
WWC-15	5/6/2020	6-inch PVC	88	63-88	4636.864
WWC-16	5/7/2020	6-inch PVC	88	63-88	4635.921
WWC-17	5/8/2020	6-inch PVC	88	63-88	4641.487
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59
WW-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WW-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46
Groundwater Discharge Permit Groundwater Recovery Wells					
WR-101	2/11/2007	6-inch PVC	66	46-66	4646.28
WR-102	3/3/2009	6-inch PVC	57	37-57	4637.62
WR-103	3/31/2009	6-inch PVC	55	35-55	4649.82

Below Ground Surface
MSL = Mean Sea Level

ATTACHMENTS

ATTACHMENT 1 - JANUARY 2019 ASSESSMENT OF CORRECTIVE MEASURES AND AMENDED CORRECTIVE ACTION PLAN

Assessment of Corrective Measures and Amended Corrective Action Plan

Intermountain Generating Facility
Delta, Utah

Prepared for:
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

Prepared by:
Stantec Consulting Services, Inc.
8160 South Highland Drive
Sandy, UT 84093

Project No.: 203709098

January 9, 2019

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: ______________________

John G. Russell, III
Utah PG #5216074-2250
Sr. Hydrogeologist, Environmental Risk Manager

Reviewed by: ______________________

Chris LaLonde
Risk Assessor

Reviewed by: ______________________

J. Clinton Rogers, PE
Sr. Principal, Water

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Abbreviations

CB Landfill	Combustion By-Products Landfill
CoC	Chain-of-Custody
DQO	Data Quality Objective
ft	Foot or feet
IGF	Intermountain Generating Facility
IPSC	Intermountain Power Service Corporation
LCL	Lower Confidence Limit
MCL	Maximum Contaminant Level
mg/l	milligrams per liter
msl	mean sea level
ORP	Oxygen Reduction Potential
QA/QC	Quality Assurance and Quality Control
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SOPs	Standard Operating Procedures
Stantec	Stantec Consulting Services Inc.
SSI	Statistically Significant Increase
UDEQ	Utah Department of Environmental Quality
UTL	Upper Tolerance Limit
US EPA	United States Environmental Protection Agency

1.0 EXECUTIVE SUMMARY

1.1 PURPOSE OF THIS *REPORT*

On behalf of Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this report to finalize the assessment of corrective measures required by the coal combustion residuals rules and to supplement IPSC's September 2016 *Updated Corrective Action Plan* report, at the request of the Utah Department of Environmental Quality ("UDEQ"), Division of Water Quality ("DWQ"). The 2016 report presented IPSC's approach for addressing requirements specified by the facility's DWQ Ground Water Discharge Permit No. UGW270004. The most recent permit renewal was issued by the UDEQ to IPSC's Intermountain Generating Facility ("IGF"), effective May 24, 2016.

This 2019 report incorporates by reference IPSC's September 2016 *Updated Corrective Action Plan* report. This 2019 report also incorporates by reference IPSC's routine, semi-annual reports that IPSC has submitted historically to the DWQ as part of ongoing compliance with its Ground Water Discharge Permit.

During the generalized timeframe of December 2015 through today, IPSC has been complying with facility monitoring measures prescribed by the United States Environmental Protection Agency's 2015 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")). IPSC implemented a ground water quality monitoring program prescribed by the CCR Rules that included monitoring of CCR units and installation, monitoring, and sampling of several new, additional monitoring wells that were not part of IPSC's Ground Water Discharge Permit.

IPSC commenced a ground water quality monitoring program prescribed sequentially by CCR Rules Parts §257.90 (R315-319-90) Applicability; §257.91 (R315-319-91) Ground Water Monitoring Systems; §257.93 (R315-319-93) Ground Water Sampling and Analysis Requirements; §257.94 (R315-319-94) Detection Monitoring Program; §257.95 (R315-319-95) Assessment Monitoring Program; and §257.96 (R315-319-96) Assessment of Corrective Measures. The CCR Rules apply to each of IPSC's three (3) CCR units (reference Figures 1 and 2 for regional and site-specific, location maps):

- Combustion By-Products Landfill ("CB Landfill");
- Bottom Ash Basin; and
- Waste Water Basin.

The DWQ has regulatory oversight for IPSC's compliance with its Ground Water Discharge Permit. The UDEQ Division of Waste Management and Radiation Control ("DWMRC") also has regulatory oversight pursuant to the State CCR Rule, under which DWMRC will be issuing a separate permit for the CCR Units. IPSC has prepared this report to provide a summary of its CCR

Rule compliance activities while proposing a dove-tailed, ground water monitoring and recovery program intended to comply with the Federal and State CCR Rules and its Ground Water Discharge Permit.

1.2 BACKGROUND

Historically, when complying with its Ground Water Discharge Permit, and as reported to the UDEQ, whenever IPSC identified a potential release from a permitted basin, IPSC implemented investigative and remedial actions to identify the source and then repair the leak area (typically a localized tear in the 80-mil high-density, polyethylene [HDPE] liner material). Investigative and remedial measures were implemented and communicated to the UDEQ in a timely manner and in accordance with Ground Water Discharge Permit requisites.

As a result of localized, historical releases from the Bottom Ash Basin, a plume of Total Dissolved Solids (TDS) in excess of background concentrations impacted the uppermost ground water quality and migrated with ground water toward the southwest (the predominant, uppermost aquifer flow direction in relation to the Bottom Ash Basin). Since March 2010, IPSC has operated three ground water recovery wells that recover ground water from areas that exhibit elevated TDS concentrations within the uppermost aquifer beneath the site. The three recovery wells (wells WR-101, WR-102, and WR-103) collectively recover approximately 25 gallons per minute (gpm) and route recovered ground water to the Recycle Basin.

The three recovery wells were designed to remove TDS mass from the apparent center of the TDS plume, as proposed in IPSC's original June 2007 *Corrective Action Plan Report*, which was 'approved' by the UDEQ and implemented sequentially, as documented in IPSC's March 2010 *Ground Water Recovery Well Installation Report*. At the time of installation, the three recovery wells were not intended to control the downgradient migration of the TDS plume, but rather to reduce TDS mass within the uppermost aquifer at locations positioned in relatively close proximity to release source areas. In turn, it is anticipated that reduction of total TDS mass in the aquifer should also help promote natural attenuation processes (such as dilution, dispersion, diffusion, etc.), which ultimately should help remediate the TDS plume.

As of September 2016, TDS water quality data indicated that the down-gradient, leading edge of the TDS plume was moving beyond ground water recovery measures in place at the time. IPSC's September 2016 *Updated Corrective Action Plan* report included a summary of Stantec's ground water modeling and preliminary analysis of subsurface, hydraulic characteristics which were used in part to formulate a proposed enhanced, ground water recovery program. The model was developed generally in accordance with ASTM International's (American Standard for Testing and Materials) *Standard Guide for Application of Groundwater Model to a Site-Specific Problem* and the current version of United States Geological Survey (USGS) *Modular Three-Dimensional Finite Difference Groundwater Flow Model* (MODFLOW-2005).

IPSC proposed to install and test additional ground water recovery wells near the downgradient, leading edge of the TDS plume to enhance TDS plume control measures and help IPSC gain a clearer understanding of the hydraulic characteristics of the leading edge of the TDS plume. The

TDS plume associated with historical releases at the Bottom Ash Basin is located within the boundaries of IPSC-owned property and as such poses no risk to potential on- and/or off-site receptors.

2.0 CCR RULE *DETECTION MONITORING* PROGRAM, 2015-2017

As detailed in IPSC's November 2015 *CCR Unit Monitoring Well Design and Installation Summary Report*, IPSC installed a series of ground water monitoring wells to monitor uppermost ground water quality in up-gradient (e.g., "background" water quality) and down-gradient directions in relation to the CB Landfill, Bottom Ash Basin, and Waste Water Basin. Table 1 presents a summary of all CCR Rules-related, ground water monitoring well construction details and completion dates. Appendix A includes copies of the drilling logs and well schematic diagrams.

During late-October 2015, IPSC initiated its CCR unit-specific, monitoring, sampling, and analysis program for background and down-gradient, monitoring wells, in accordance with §257.94 (R315-319-94) Detection Monitoring Program and IPSC's November 2015 *Ground Water Sampling and Analysis Plan*. As prescribed by §257.94(b) (R315-319-94(b)) for existing CCR-regulated landfills and surface impoundments, IPSC analyzed all ground water samples for Appendix III and Appendix IV constituents. As of October 2017, IPSC completed eight (8) independent sampling events from each background and down-gradient monitoring well in accordance with §257.94(b) (R315-319-94(b)).

In accordance with §257.90(e) (R315-319-90(e)), IPSC's January 2018 *Annual Ground Water Monitoring Summary Report* presented the results of IPSC's eight ground water monitoring and sampling events that comprised its Detection Monitoring Program pursuant to §257.94 (R315-319-94). All monitoring and sampling procedures were implemented in accordance with IPSC's November 2015 *CCR Unit Monitoring Well Design and Installation Summary Report* and corollary *Ground Water Sampling and Analysis Plan* report. All three predecessor reports are stand-alone documents that are incorporated by reference herein.

As reported in IPSC's January 2018 summary report, statistical analyses indicated potential statistically significant increases ("SSIs") over background concentrations of certain Appendix III constituents associated with each of the three CCR units. Therefore, as of the first quarter of 2018, IPSC initiated implementation of an Assessment Monitoring Program at each of the three CCR units in accordance with measures and timeframes prescribed by CCR Rule §257.95 (R315-319-95), as detailed in following report section *3.0 CCR Rule, Assessment Monitoring Program, 2018*. Table 2 herein provides a summary of all ground water sampling results associated with the 2015-2017 Detection Monitoring Program, the March and June 2018 Assessment Monitoring Program, and the subsequent October 2018 data discussed in the following report section.

3.0 CCR RULE ***ASSESSMENT MONITORING*** PROGRAM, 2018-2019

3.1 ASSESSMENT MONITORING RESULTS

Activities conducted during 2018-2019 entailed implementation of an Assessment Monitoring Program prescribed by CCR Rule §257.95 (R315-319-95), including evaluation of ground water monitoring data, establishment of Ground Water Protection Standards ("GWPSs") for Appendix IV constituents, and §257.96 (R315-319-96) Assessment of Corrective Measures, if and where needed. Simultaneously and as reported to the UDEQ under separate cover, IPSC also continued its Ground Water Discharge Permit compliance program, which included ongoing monitoring and localized recovery of uppermost ground water containing elevated TDS concentrations down-gradient of the Bottom Ash Basin.

3.1.1 Ground Water Flow Characteristics

During each ground water monitoring and sampling event, field personnel implemented consistent water level measurement procedures, field techniques, and quality assurance/quality control (QA/QC) protocol in accordance with methodologies specified within IPSC's CCR Rules-specific and Ground Water Discharge Permit-specific, *Ground Water Sampling and Analysis Plans*. Water levels were measured prior to purging and sampling of each well with field data recorded in a dedicated, project notebook for archiving.

The depth to static water in each well was measured utilizing an electronic meter, capable of measuring to 0.01-foot (ft.). The meter was decontaminated prior to each use to minimize the potential for cross-well contamination, when using the meter between wells. During each sampling event, static ground water level measurements were made to the nearest 0.01-ft. from a consistent, reference point established on the northern top of each PVC monitoring well casing.

Figures 3 and 4 depict estimated, regional ground water flow patterns based on Assessment Monitoring Program March and June 2018 water level measurements at the CCR unit-specific monitoring wells. Regional and localized ground water flow patterns were similar to those observed during the 2015-2017 Detection Monitoring Program, as reported in IPSC's January 2018 *Annual Ground Water Monitoring Summary Report*.

Upon preliminary review of Appendix III and IV constituent analytical results, and in accordance with Assessment Monitoring Program §257.95(g)(1)(iii) (R315-319-95(g)(1)(iii)), IPSC contracted Stantec and Cascade Drilling, Environmental Drilling Services of Salt Lake City, Utah, a Utah-certified water well driller, to install supplemental monitoring wells at the facility property boundaries located in presumed down-gradient directions in relation to the three CCR units. The wells were drilled, soil sampled, installed, developed, and surveyed in relation to all other monitoring wells in similar fashion as the original CCR unit boundary monitoring wells.

One (1) ground water monitoring well was installed at the property boundary located in a presumed down-gradient direction in relation to the CB Landfill (well CL-U-9), while two (2) ground water monitoring wells were installed in a presumed down-gradient direction in relation to the Waste Water Basin (wells WWC-6 and WWC-7). Additionally, new monitoring well CL-U-3 was installed in a presumed up-gradient direction in relation to the CB Landfill to provide additional, up-gradient/background information, supplemental to the other up-gradient monitoring wells CL-U-1 and CL-U-2.

Copies of drilling logs and schematic well diagrams are presented in Appendix A herein. As may be noted by review of the drilling logs, subsurface lithologic characteristics were generally similar to those encountered during the drilling and installation of the original monitoring wells, including similar depth ranges to uppermost ground water and varied, heterogeneity of subsurface lithologic characteristics. Well screen intervals were placed to permit monitoring of the uppermost aquifer at each location.

The first-time water level measurements were monitored at the expanded array of CCR monitoring wells was during October 2018, following surveying of the new property boundary wells. Reference Figure 5 for a potentiometric map estimating ground water flow patterns across the site, utilizing the October 2018 data (excluding well CL-U-9, whose water level was not measured at this time).

As may be noted by review of the potentiometric maps, the predominant regional ground water flow direction appears to be generally from the east toward the west, with more southwesterly, localized components of flow near the Bottom Ash Basin and Waste Water Basin. Although there were slight, localized changes in hydraulic gradient across the site during each individual monitoring event, in totem, the gradient patterns appear relatively similar to one another during each of the eight Detection Monitoring Program monitoring events and the 2018 Assessment Monitoring Program monitoring events.

Stantec's review of natural topographic elevations presented on the 1971 USGS *Rain Lake, Utah Quadrangle* topographic map indicates that the natural topography grades generally from the east toward the west across the generalized vicinity of the CB Landfill (T15S, R7W, Section 11), while the natural grade becomes more southwesterly in the vicinity of the Bottom Ash Basin (T15S, R7W, Section 14) and the Waste Water Basin (T15S, R7W, Sections 14 and 23) and on-site land located south and southwest of the surface impoundments and north of the Brush Wellman Highway (i.e., State Route 174). In summary, and on a generalized scale, the potentiometric maps tend to mimic the expression of the topography of the land surface across the site.

3.1.2 CCR Unit-Specific, Ground Water Quality Results

Background and down-gradient, CCR unit-specific ground water monitoring wells were purged and sampled as part of the Assessment Monitoring Program during March and June 2018 and subsequent monitoring during October 2018. All purging, sampling, laboratory analysis, and Quality Assurance/Quality Control ("QA/QC") protocols were administered as specified by §257.95 (R315-319-95) Assessment Monitoring Program and as proposed within IPSC's November

2015 *Ground Water Sampling and Analysis Plan*. Tabulated analytical results and water level measurement data associated with the CCR Rule Detection and Assessment Monitoring Program events are presented in Table 2 herein.

Detection and Assessment Monitoring Program ground water quality results were utilized by Stantec to establish groundwater protection standards ("GWPSs") for each Appendix IV constituent and each CCR-regulated unit in accordance with CCR Rule §257.95(d)(2) and §257.95(h) (R315-319-95(d)(2) and R315-319-95(h)) and the following general guidance sources:

- US EPA "Unified Guidance" document (*Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, Unified Guidance,* March 2009, *EPA 530/R-09-007*);
- the Interstate Technology and Regulatory Council's (ITRC) 2013, *Groundwater Statistics for Monitoring and Compliance, Statistical Tools for the Project Lifecycle*, Online Guidance; and
- Ofungwu, J. (2014) *Statistical Applications for Environmental Analysis and Risk Assessment*. Hoboken, New Jersey: John Wiley and Sons, Inc.

The Unified Guidance recommends the use of Upper Tolerance Limits ("UTLs") for Assessment Monitoring. Tolerance limits consist of two values expected to contain a pre-specified proportion of the underlying data population with a specified level of confidence. For example, a 95% tolerance interval with a 95% confidence level, there is 95% confidence that, on average, 95% of the data population is contained within the interval. The upper, one-sided UTL is used commonly in environmental monitoring and is constructed using background data (Ofungwu 2014).

In the context of the CCR Rule, data from all background wells is used to estimate a 95% UTL with 95% coverage for each Appendix IV constituent at each CCR-regulated unit. This represents a 95% upper confidence limit on the 95th percentile. In Assessment Monitoring, the UTL may be used to represent the GWPS if: 1) the constituent does not have an established MCL; or 2) the background UTL exceeds the established MCL.

Three Appendix IV constituents do not have a US EPA-promulgated MCL: Cobalt, Lithium, and Molybdenum. However, the US EPA amended the original CCR rule in July 2018 and established the following alternate, regulatory limits for these compounds: Cobalt (0.006 milligrams per liter, mg/L), Lithium (0.04 mg/L), and Molybdenum (0.1 mg/L).

As specified by CCR Rule §257.95(d)(2) and §257.95(h) (R315-319-95(d)(2) and R315-319-95(h)), each constituent-specific GWPS shall be either the MCL for that constituent (or above-referenced, CCR Rule-established, alternate, regulatory limits for Cobalt, Lithium, and Molybdenum) or the UTL in instances where the UTL exceeds the established MCL. Appendix B presents a tabulation of UTL and GWPS data for each CCR unit and each monitoring well.

During Assessment Monitoring, the site is assumed to be free of impacts, unless proven otherwise through statistical testing. The statistical null hypothesis (Ho) represents a mean downgradient concentration less than or equal to the GWPS, while the alternate hypothesis (Ha) represents a mean downgradient concentration greater than the GWPS (ITRC, 2013). To test this hypothesis, the Lower Confidence Limits (LCL) around the mean downgradient Appendix IV concentrations are estimated using data collected during the Detection Monitoring and Assessment Monitoring programs. The LCL for each constituent/well pair are then compared to their respective GWPS. If the LCL exceeds the GWPS, then downgradient concentrations are at a statistically significant level (SSL) above the GWPS, which *may* trigger corrective action at the Site.

It should be noted that individual sample results of Appendix IV constituents above the GWPS during Assessment Monitoring are not necessarily a demonstration of statistically significant exceedances of the GWPS. The LCL must exceed the GWPS to conclude a statistically significant increase (SSI). However, if individual constituent concentrations exceed GWPSs, then Assessment Monitoring is to continue at that specific CCR unit. Appendix B presents a tabulation of UTL, GWPS, and Confidence Limit data for each CCR unit and each monitoring well.

In summary, and as presented on Figure 6, the quantitative analytical results associated with monitoring under the CCR Rules indicated the following Appendix IV constituent-specific, LCL exceedances above corollary GWPS concentrations at ground water monitoring wells located at each CCR-regulated unit (all concentrations in mg/L):

CCR Unit	Well	Appendix IV Constituent	LCL Concentration	GWPS Concentration
CB Landfill		NONE	------	-----
Bottom Ash Basin	BAC-2	Molybdenum	0.1506	0.1
	BAC-3	Lithium	0.812	0.7415
Waste Water Basin	WWC-1	Arsenic	0.01496	0.01275
	WWC-2	Arsenic	0.01415	0.01275
	WWC-3	Arsenic	0.02045	0.01275

It must be noted that recently-installed, down-gradient monitoring wells WWC-6 and WWC-7 (southwest of the Waste Water Basin), as well as other down-gradient wells that will be integrated into future ground water monitoring/sampling events (as proposed in more detail in following report section *4.0 Assessment of Corrective Measures*), will require additional sampling data for comparative analysis to corollary GWPSs; i.e., one sampling event, such as October 2018, is insufficient for appropriate statistical analysis. Additional monitoring wells will be added to IPSC's ongoing, future CCR Rule monitoring network, as part of IPSC's future-proposed, ground water monitoring program.

3.1.2.1 Regional Ground Water Quality

The site is located within the Basin and Range Physiographic Province and the Sevier Desert on a more localized scale. It is well-documented throughout arid Utah that localized, historical Lake Bonneville basin-fill sediments (that underlie the site) and associated uppermost ground water located in close proximity to igneous/volcanic and metamorphic formations contain high concentrations of abundant, naturally-occurring Arsenic (typically attributable to chemical and physical weathering of arsenopyrite). Likewise, Basin and Range Physiographic Province sediments, surface water, and ground water can also exhibit elevated concentrations of natural Lithium – especially in areas that are characterized by hydrologically-closed basins and thermal ground water.

Arsenic and Lithium concentrations within uppermost ground water can vary considerably, over short, lateral distances, in many instances. Indeed, ground water quality data associated with the site exhibits considerable variation in Arsenic and Lithium concentrations across relatively-short, lateral distances, including up-gradient monitoring wells.

Stantec's familiarity with the regional geology surrounding the site, as well as review of United States Geological Survey (USGS) geologic maps associated with areas surrounding, and in a presumed up-gradient direction (northeast of) in relation to the site, indicate vast acreages encompassing square miles of volcanic and metamorphic mountainous areas with interspersed Lake Bonneville-related sediments, which could provide source material for soluble Arsenic and Lithium to impact localized, uppermost ground water quality. Baker Hot Springs and the mountainous Butte Fumarole formation are located a few miles northwest of the site, for instance. Reportedly, there are third-party companies investigating the possibility of Lithium mining/brine processing within nearby areas such as the Sevier Lake watershed and Tule Valley, areas located several miles southwest and west of the site.

3.2 GROUND WATER QUALITY, OVERVIEW SUMMARY

Figure 6 presents Appendix IV constituent concentrations within wells that exceeded corollary CCR Rule Appendix IV GWPSs. Figure 7 presents Appendix III TDS concentrations quantified within CCR Rule monitoring wells during October 2018, including those concentrations in excess of the Ground Water Discharge Permit Limit for TDS of 1,100 mg/L.

It is anticipated that the rate at which dissolved metals migrate vertically within the unsaturated, vadose zone soil column located above uppermost ground water, as well as once dissolved metals migrate laterally/horizontally upon encountering the uppermost aquifer, should be considerably less than the migration rate/advection of TDS beneath the site. Subsurface soils were identified as containing numerous clay stringers and lenses while also comprising a large percentage of interstitial soil matrix. Clay-rich, highly-porous soils promote adsorption and ionic exchange of metals to soil material, which in turn tends to retard the natural migration of dissolved metals in ground water (i.e., greater retardation than TDS). Thus, it is anticipated that TDS constituents have migrated farther down-gradient from apparent source areas in comparison to dissolved metals in ground water.

In summary, IPSC's recent CCR Rule and Ground Water Discharge Permit ground water quality data indicate the following:

- TDS concentrations at the CB Landfill reflect background concentrations. No Appendix IV metal concentration was quantified to date in excess of its corollary GWPS.

- The down-gradient, leading edge of the historical TDS plume associated with the Bottom Ash Basin has migrated farther southwest in comparison to its generalized location in September 2016, impacting wells RW-9 and RW-5 in excess of 1,100 mg/L (both wells' TDS concentrations were less than 1,100 mg/L in 2016). The October 2018 TDS concentration in well RW-6, located farther down-gradient of wells RW-9 and RW-5 and along the generalized, historical, TDS plume centerline, as well all historical TDS data to date associated with well RW-6, did not exceed the Ground Water Discharge Permit Limit of 1,100 mg/L. TDS is a Ground Water Discharge Permit compliance analyte and is also identified as an Appendix III constituent by the CCR Rules – warranting monitoring but not necessarily remediation under the CCR Rules.

  The estimated down-gradient, leading edge of the TDS plume located southwest of the Bottom Ash Basin appears to remain within IPSC-owned land and poses no risk to human health, currently. IPSC continues to recover ground water from on-site recovery wells – and as discussed in detail in following report sections, IPSC intends to install many additional ground water recovery wells to help contain this TDS plume (and any potential metal plumes, if present).

  Appendix IV metal monitoring indicates two monitoring wells at which one metal constituent exceeds its corollary GWPS: well BAC-2, Molybdenum and well BAC-3, Lithium. Down-gradient well RW-5 did not contain either metal at a concentration exceeding a GWPS. Future-proposed ground water monitoring at other down-gradient wells (for instance, monitoring well RW-3 and adjacent recovery well WR-101, as identified on Figure 7) will help investigate the degree to which ground water located in closer proximity to the basin might be impacted by metals.

  As may be noted by review of Figures 6 and 7, existing recovery well WR-101 is located immediately down-gradient of (southwest), and along the general TDS plume centerline in relation to the two monitoring wells with elevated metals concentrations at the Bottom Ash Basin (wells BAC-2 and BAC-3). Thus, in the event there has been migration of metals from these areas, recovery well WR-101 is well-positioned as a recovery well.

- TDS concentrations in localized, CCR-related, ground water monitoring wells WWC-1, WWC-4, WWC-5, and WWC-6, which were not part of the Ground Water Discharge Permit monitoring program, exceed Background TDS concentrations, indicating localized areas near the southeastern and western boundaries of the basin that appear to have been impacted by historical releases. Interestingly however, of these particular wells, only well WWC-1 contained an elevated Arsenic concentration in excess of the GWPS.

  The Appendix IV metal results indicate that there are localized areas along the south side of the Waste Water Basin that exceed GWPSs. Future-proposed, ground water monitoring at other down-gradient wells (well RW-4, RW-7, WWC-6, and WWC-7, for instance) will help investigate the degree to which ground water located down-gradient of the basin might be impacted by metals. As detailed in following report sections, IPSC intends to install additional monitoring and recovery wells to address the TDS plume (and any potential metal plumes, if present) associated with the Waste Water Basin.

4.0 ASSESSMENT OF CORRECTIVE MEASURES

The primary contaminant of potential concern at the site is TDS, as there are two localized TDS plumes beneath the site, namely: one plume located southwest of the Bottom Ash Basin and a second, smaller plume located southwest of the Waste Water Basin. TDS should be considered a leading indicator parameter of impacted ground water quality in relation to fashioning a suitable ground water remediation approach. It is also anticipated that recovery of TDS-impacted ground water at select recovery wells will also intercept any metal constituents that might be present, as TDS is expected to migrate at a faster rate than dissolved metals in ground water.

In light of the relatively great depth to the uppermost aquifer beneath most of the down-gradient leading edges of the TDS plumes (55 to 75 feet below grade), it is impractical to install horizontal, ground water interceptor trenches. Stantec and IPSC are unaware of any other effective and practicable means for *in-situ* treatment and reduction of TDS mass within the uppermost aquifer.

In summary, and as outlined in more detail in the following report sub-section, IPSC believes the most effective and practical means of reducing the mass of TDS beneath the site, as well as controlling the down-gradient leading edge migration of TDS plumes, is through ground water recovery/removal from the subsurface – as is ongoing with recovery wells WR-101, WR-102, and WR-103, the locations of which are identified on Figure 7 herein. However, as proposed in the following report sections, IPSC proposes installing additional ground water recovery wells to recover a greater volume of contaminated ground water, specifically located near the down-gradient, leading edges of the two TDS plumes.

In summary, IPSC intends to implement supplemental investigative and remedial measures to remediate the two TDS plumes (and any dissolved metal plumes, if identified through future-proposed monitoring), including installation of additional, ground water recovery wells. The following is a summary of information presented in detail within IPSC's 2016 *Updated Corrective Action Plan* report, as the findings relate directly to IPSC's remedial actions for enhanced, ground water recovery and down-gradient, leading edge plume control proposed in following report section *5.0 Proposed Corrective Actions*.

4.1 SUMMARY GROUND WATER MODELING RESULTS AND FINDINGS

IPSC's September 2016 *Updated Corrective Action Plan* report included a summary of Stantec's ground water modeling and preliminary analysis of subsurface, hydraulic characteristics which were used to formulate a proposed enhanced, ground water recovery program, designed to control the down-gradient, leading edge of the TDS plume located down-grade/southwest of the Bottom Ash Basin. Stantec constructed and calibrated a three-dimensional, numerical model to simulate ground water flow and fate and transport of TDS in ground water. The model was developed generally in accordance with ASTM's *Standard Guide for Application of*

Groundwater Model to a Site-Specific Problem and the current version of USGS *Modular Three-Dimensional Finite Difference Groundwater Flow Model* (MODFLOW-2005).

In summary, the model was based on site-specific, hydrogeologic and hydraulic characteristics identified during Stantec's past drilling and sampling of soil test borings and ground water monitoring wells located in relatively close proximity to the Bottom Ash Basin, as well as historical pump-testing of the three existing, ground water recovery wells WR-101, WR-102, and WR-103. Stantec also reviewed historical soil boring and ground water monitoring well drilling logs associated with mid- to late-1980s well installations overseen by other consulting firms prior to the construction of the facility.

Stantec's analysis of all hydrogeologic data indicates that the depth to uppermost ground water varies across the site but approximates a range between 55 to 75 feet below grade. Subsurface lithologic conditions in the immediate vicinity of each of the three CCR units were generally as follows:

CCR Unit	Depth to Uppermost Sand Aquifer (feet below ground surface-bgs)	Thickness of Clay-Rich Soils Above the Aquifer (in feet-ft.)
CB Landfill	between 52 to 78	33 to 57 ft. thick
Bottom Ash Basin	between 55 to 60	17 to 33 ft. thick
Waste Water Basin	between 48 to 65	8 to 20 ft. thick

Static water level measurements indicate that the uppermost aquifer beneath the site is under semi-confined to confined, hydraulic conditions, whereby static water levels rose within the wells following well installation and development. In other words, during the drilling of each borehole, uppermost, saturated soils were encountered at a certain subsurface depth. Subsequently, and as evidenced by recent water level measurements, the potentiometric surface of the water table was under such hydraulic pressure that the static water level within each monitoring well rose to a height 20 to 40 feet higher than the original depth at which uppermost saturated soils were first encountered. Water levels have been measured consistently to date, utilizing an electronic water level indicator that measures depth to static water in each well from the northern top of each well casing.

Stantec extrapolated that the down-gradient, leading edge of the TDS plume appears to be migrating naturally toward the southwest at an approximate rate of 150 to 180 feet per year. However, this is a generalized plume migration rate estimate, considering the relatively large, lateral distances between water quality monitoring well locations and the highly-varied, lithologic characteristics of the uppermost aquifer underlying the site.

Stantec used the model to help estimate the total number of vertical ground water recovery wells that *might* be needed to intercept the southwestern-most, down-gradient, leading edge of the TDS plume located southwest of the Bottom Ash Basin. Each proposed well would be constructed as a 6-inch diameter well, with 20- to 25-lineal feet of well screen at the bottom of each well, completed to approximately 70 feet below grade; i.e., generally the top of the lower confining aquitard layer. The model examined use of a line of equally-spaced, ground water recovery wells located perpendicular to the natural, southwesterly ground water flow direction.

The model was also used to investigate possible use of Ranney-type, collector wells (a 13-ft diameter, vertical concrete shaft driven to a depth of approximately 70-ft below grade with 300 feet long, horizontal collector screens radiating out from the bottom of the concrete shaft), instead of vertical recovery wells for containment of the TDS plume. The model indicates that use of vertical recovery wells, when compared to use of a Ranney collector well network, provides similar cumulative yield/volume of ground water recovery. However, use of vertical wells is deemed more practical, efficient, and beneficial for TDS Plume containment for numerous reasons, including:

- Greater flexibility and precision for well locating and installation;
- More extensive lateral and vertical aquifer characterization (i.e., individual well pump-testing for investigation of localized hydraulics throughout different areas within the aquifer); and
- Recovery of ground water throughout the approximate 20- to 25-foot thick aquifer (i.e., deeper ground water recovery within the aquifer, when compared to a horizontal ground water recovery network that would be placed at the bottom of the 20 to 25-foot thick aquifer).

Stantec recommends that the location of the line of proposed, vertical recovery wells be located as close as practicable near the estimated down-gradient leading edge of the TDS plume's 1,000 ppm iso-concentration line. The permit compliance concentration for TDS for Compliance Wells in the Ground Water Discharge Permit is 1,100 ppm. Figure 8 herein is original Figure 2 excerpted from IPSC's 2016 *Updated Corrective Action Plan* report. The figure presents the predominant southwesterly TDS plume centerline associated with the Bottom Ash Basin, as well as projected TDS-impacted, ground water recovery well placements.

Initially, and as modeled, the three recovery wells' (WR-101, WR-102, and WR-103) recovery rates were between 8 to 15 gallons per minute (gpm). The model indicated that the lateral capture zone for a recovery well pumping ground water at a rate of 10 gpm should extend out approximately 146 feet to either lateral side of the well (i.e., generally along the northwest-southeast oriented line of recovery wells). The lateral capture zone for a well pumping ground water at a rate of 15 gpm is projected to extend out approximately 188 feet to either side of the well.

Since the three existing recovery wells had initial sustainable yields between 8 to 15 gpm, Stantec's model estimated that the following scenarios would provide satisfactory containment of the TDS plume (using 6-inch diameter, approximately 70-feet deep recovery wells, with well screen intervals of approximately 25 feet):

- 15 wells, located at approximate 188-ft. equidistant, lateral spacings; each well producing at 15 gpm

to

- 19 wells, located at approximate 146-ft. equidistant, lateral spacings; each well producing at 10 gpm.

However, according to IPSC's most recent 2018 monitoring data, the three recovery wells' recovery rates have declined since initial pumping began in 2010 and approximate 3.5 to 9 gpm, currently. Actual recovery well pumping/recovery rates will ultimately dictate the lateral extents of each well's capture zone.

In general, it is anticipated that the model's representation of projected capture zones provides adequate estimation of the general number and locations of hypothetical recovery wells for TDS plume interception, which in turn may serve as a basis for design of TDS containment in the vicinity of the down-gradient, leading edge of the TDS plume. Considering the most recent recovery well yield data (approximately 3.5 to 9 gpm), it may be extrapolated that an approximate 100-ft. equidistant lateral spacing between each recovery well may provide adequate control at the down-gradient leading edge of the TDS plume located southwest of the Bottom Ash Basin. Thus, it is anticipated that a greater number of recovery wells may be needed for TDS plume control than those estimated by the 2016 ground water model.

The model also estimated that the down-gradient capture zone (i.e., not lateral extent but rather southwesterly direction in relation to a well) of each recovery well (regardless as to total number of wells) might extend approximately 50 feet down-gradient of each well. In the event that localized ground water containing elevated concentrations of TDS is not recovered by the recovery wells, it is probable that any such residual TDS concentrations not captured by the recovery wells would be reduced as a result of natural attenuation processes. If recovery rates are indeed only 3 to 9 gpm, it is anticipated that the down-gradient/southwesterly capture zone will be considerably smaller than the 50 feet estimated in the 2016 model.

5.0 PROPOSED CORRECTIVE ACTIONS

5.1 ONGOING GROUND WATER RECOVERY AT EXISTING RECOVERY WELLS WR-101, WR-102, AND WR-103

IPSC intends to continue operation of existing ground water recovery wells WR-101, WR-102, and WR-103 identified on Figure 8. The three wells are recovering ground water that contains elevated concentrations of TDS, located in relatively close proximity to the apparent historical TDS release areas associated with the Bottom Ash Basin. Wells WR-102 and WR-103 are located generally along the apparent TDS plume centerline, as explained in detail in IPSC's 2016 *Updated Corrective Action Plan*. Continued removal of TDS-enriched ground water from each of these three wells is helping reduce the total mass of TDS within the uppermost aquifer beneath the site in a generalized down-gradient/southwesterly direction in relation to the Bottom Ash Basin.

5.2 SUMMARY OF PROPOSED ACTIONS

IPSC and Stantec have reviewed analytical data and are proposing supplemental, ground water recovery and investigative Tasks, designed to:

1) Expand the current network of recovery wells intended to control the down-gradient, leading edge of the TDS plume associated with historical releases from the Bottom Ash Basin.

   Additional recovery wells would be installed at approximate 100-ft. lateral spacings, generally northeast of existing well RW-6, which currently contains TDS concentrations representative of background TDS concentrations. The proposed wells will be installed to intercept ground water near the down-gradient, leading edge of the TDS plume, along a generalized northwest-southeast oriented line of wells (i.e., perpendicular to the predominant, southwesterly ground water flow direction), as discussed in detail in IPSC's 2016 *Updated Corrective Action Plan*. The line of wells will be positioned approximately 600 feet due northeast of well RW-6. Each proposed recovery well should be constructed of 6-inch diameter, Schedule 40 polyvinyl chloride (PVC) piping, approximately 80-feet deep with well screen intervals of approximately 25 feet. The wells will be located in close proximity to the apparent, centerline of the TDS plume.

   Additionally, 6-inch diameter, 76-ft. deep, well RW-5 (20-ft. well screen interval) is anticipated to be a suitable recovery well in light of its total depth, well screen interval, and static water level measurements (~ 46-ft. below grade) to date. Once supplemental recovery wells are installed northeast of well RW-6, IPSC intends to conduct a series of pump-tests to investigate well yields and radial cones of influence/capture associated with the newly-installed wells and existing well RW-5. The respective well yields will be analyzed using the ground water model to extrapolate potential lateral extent of capture for each well and help extrapolate yields and possible capture zones for supplemental ground water recovery wells.

2) Delineate ground water quality more thoroughly in apparent down-gradient directions in relation to recently-discovered, apparent release areas (west and south sides) at the Waste Water Basin by installing additional monitoring wells located: south of WWC-1; east of WWC-6; and between wells WWC-6 and WWC-7.

   Well installations would be sequenced such that initial wells will be installed on-site, followed-by off-site wells located farther south/southwest, depending on water quality and ground water flow characteristics identified during the sequenced phases of investigation. Select wells will be pump-tested to help investigate local hydrogeologic characteristics, in similar fashion as proposed above and conducted at the site in the past.

   Well RW-4 (4-inch diameter, 36-ft. deep; well screen: 26-36 feet; static water level approximates 20.5-ft. below top of casing), which is located in close proximity to and down-gradient from, the northwestern-most corner of the Waste Water Basin, would also be pump-tested in similar fashion as other wells. The respective well yield will be analyzed using the ground water model to extrapolate potential lateral extent of capture for each well and help extrapolate yields and possible capture zones for supplemental ground water recovery wells.

3) Following the sequential TDS plume investigation proposed in above Task #2, IPSC intends to initiate ground water recovery to control the migration of the TDS plume down-gradient of the Waste Water Basin. Select ground water recovery wells will be installed based on Task #2 findings. The intent of the recovery well program will be to control the down-gradient leading edge of the TDS plume associated with the Waste Water Basin.

4) For the foreseeable future, the following wells will be monitored as part of CCR Rule compliance. It is recommended that the following list be amended, as site conditions and future monitoring results warrant:

   - Monitoring of CB Landfill: wells CLU-1; CLU-2; CLW-1 through CLW-9; and WDB-17.

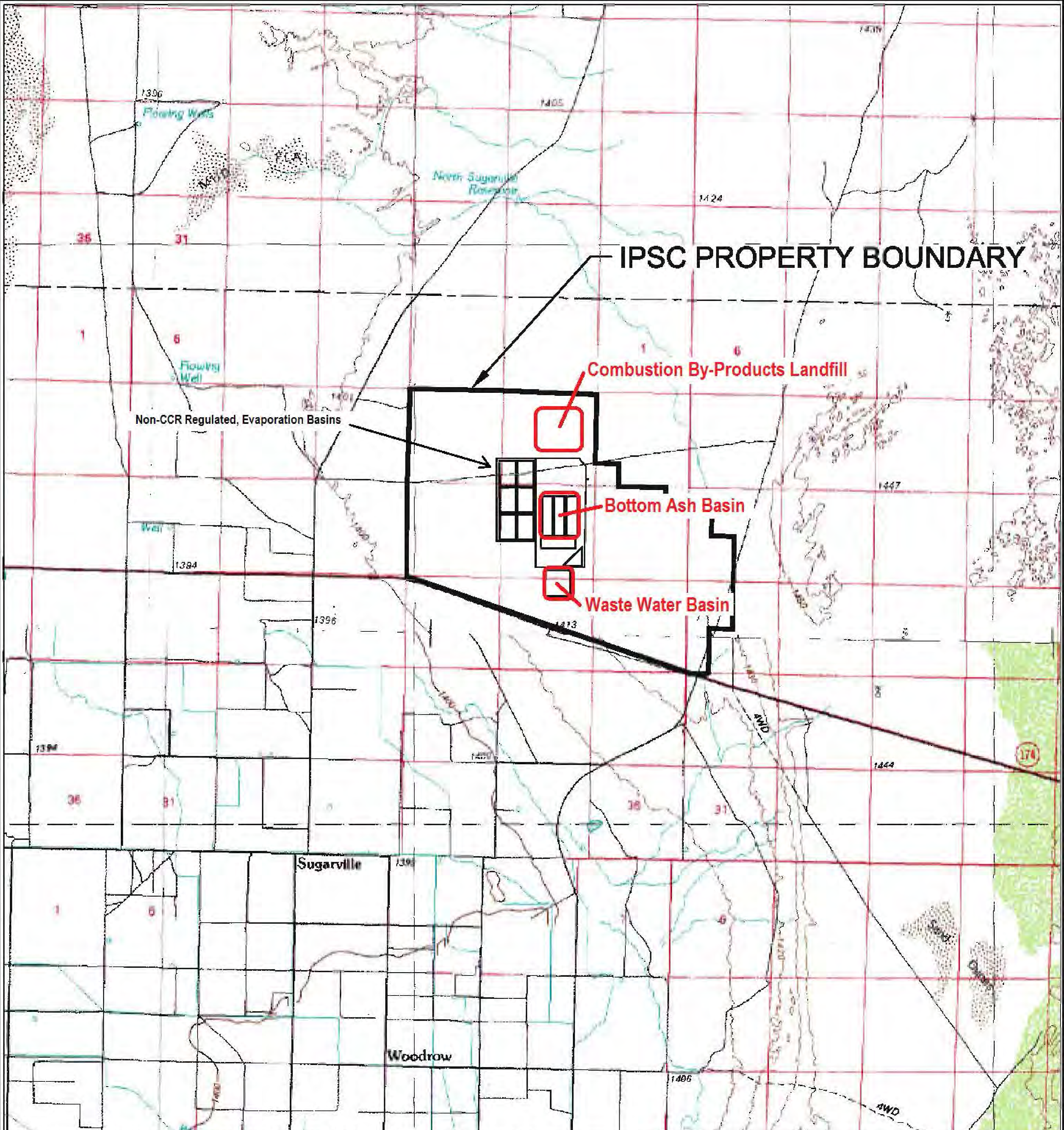
   - Monitoring of Bottom Ash Basin: wells BAU-1; BAU-2; BAC-1 through BAC-7; RW-1; RW-3; RW-5, RW-8; WDB-5; EMW-4U; and EMW-5U (reference Figures 7 and 8).

   - Monitoring of Waste Water Basin: WWU-1; WWU-2; WWC-1 through WWC-7; RW-4; and RW-7.

Upon implementation of the enhanced ground water recovery and monitoring program proposed in this report, IPSC will evaluate the degree to which ground water recovery and natural attenuation processes control the down-gradient leading edges of TDS plumes located down-gradient of the Bottom Ash Basin and the Waste Water Basin. IPSC also intends to evaluate potential, alternative means for ongoing enhancement of remediating TDS mass from the uppermost aquifer beneath the site. IPSC will continue to conduct and report to the UDEQ its routine, semi-annual, ground water monitoring and remediation program in formal Summary Reports.

January 9, 2019

Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES

N

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'

DATE DRAWN 1-26-17

REVISION

drawings\ipsc-04\Fig2 Site Topographic Map.dwg

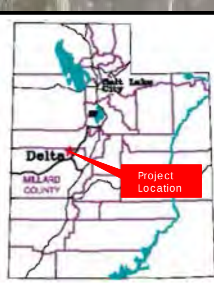
January 9, 2019

Figure 2. CCR Units Location Map

Legend

CCR Unit

N



INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

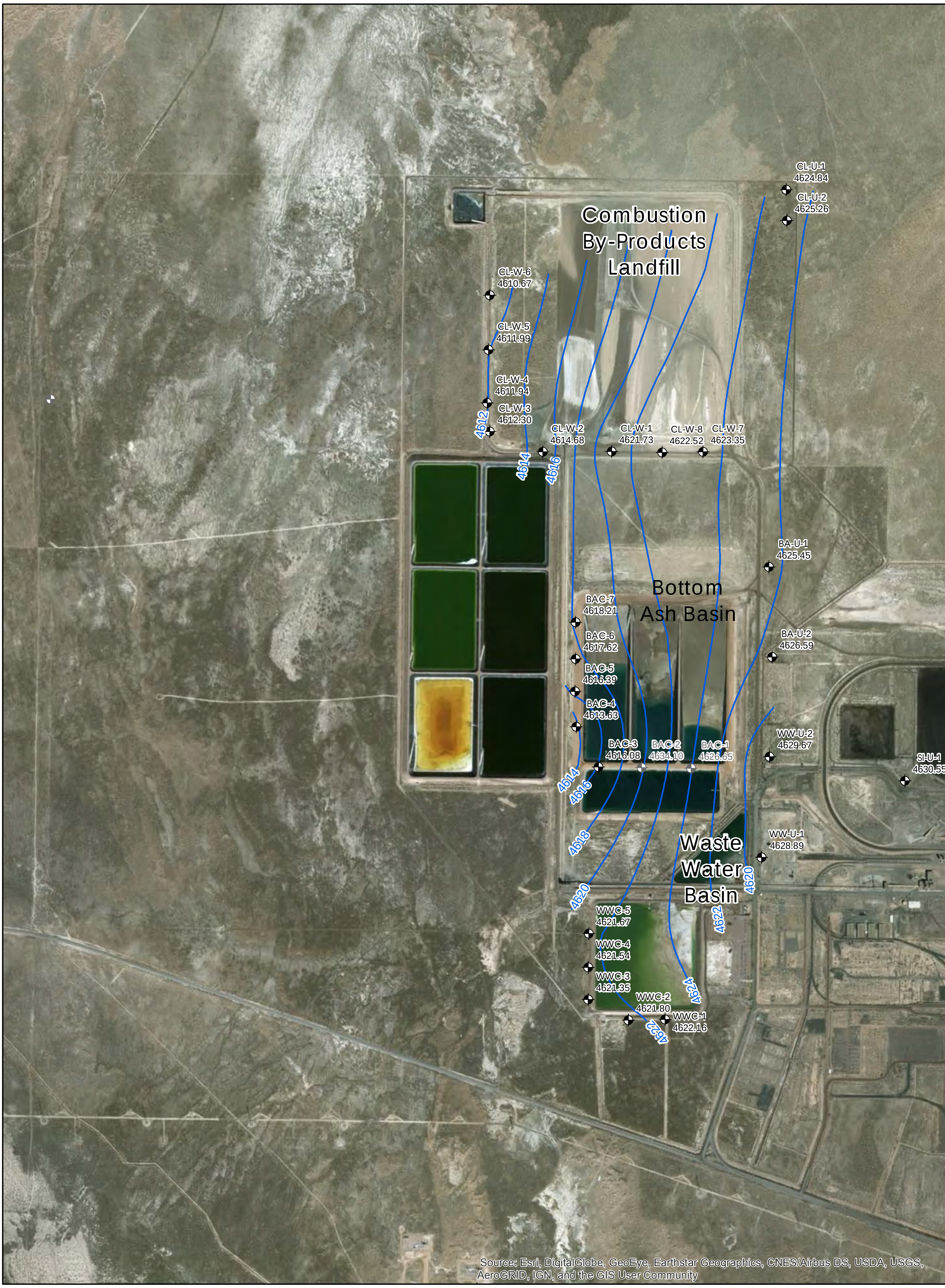
Stantec

DRAWN BY JR	DATE DRAWN 9/30/2016
SCALE 1 in. approx. 1700 ft.	
PROJECT 203709098.409	

January 9, 2019

Figure 3. Potentiometric Map for March 2018 Water Levels

Q:\active\203709098 Intermountain Power\GIS\2018_08\fig11_2018q1gwe.mxd



LEGEND:

- MONITORING WELL
- GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED MARCH 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

FIRST QUARTER 2018 POTENTIOMETRIC SURFACE MAP

FIGURE: 3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL		08/13/18

January 9, 2019

Figure 4. Potentiometric Map for June 2018 Water Levels

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LEGEND:

- MONITORING WELL
- GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED JUNE 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

N

0 1,300 2,600
Feet
1 in = 1,350 ft

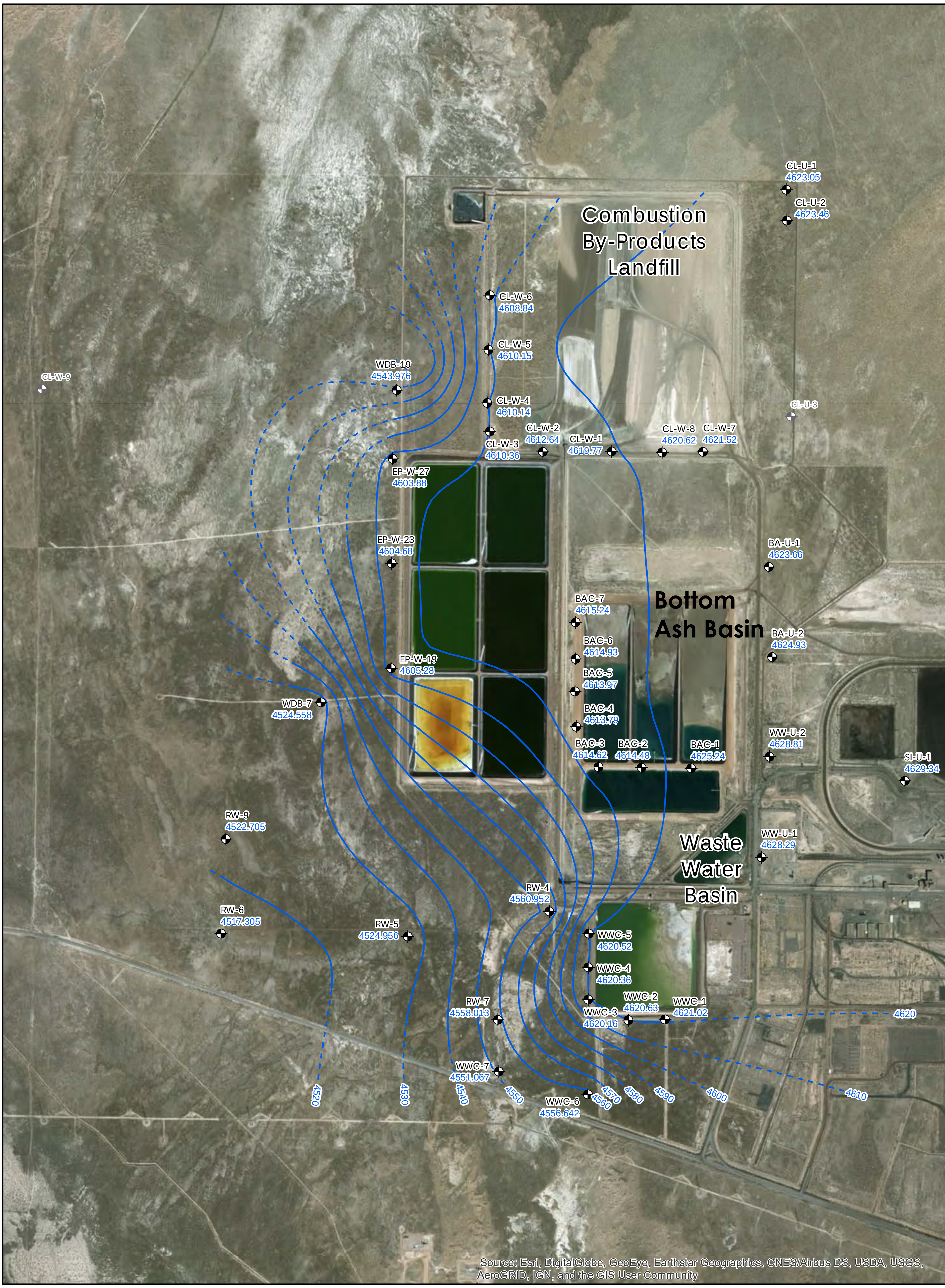
Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		SECOND QUARTER 2018 POTENTIOMETRIC SURFACE MAP		FIGURE: 4
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 08/13/18

January 9, 2019

Figure 5. Potentiometric Map for October 2018 Water Levels

Q:\active\203709098 Intermountain Power\GIS\2018_11\fig12_Oct2018GWE_20181105.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED OCTOBER 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

N

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

OCTOBER 2018
POTENTIOMETRIC SURFACE MAP

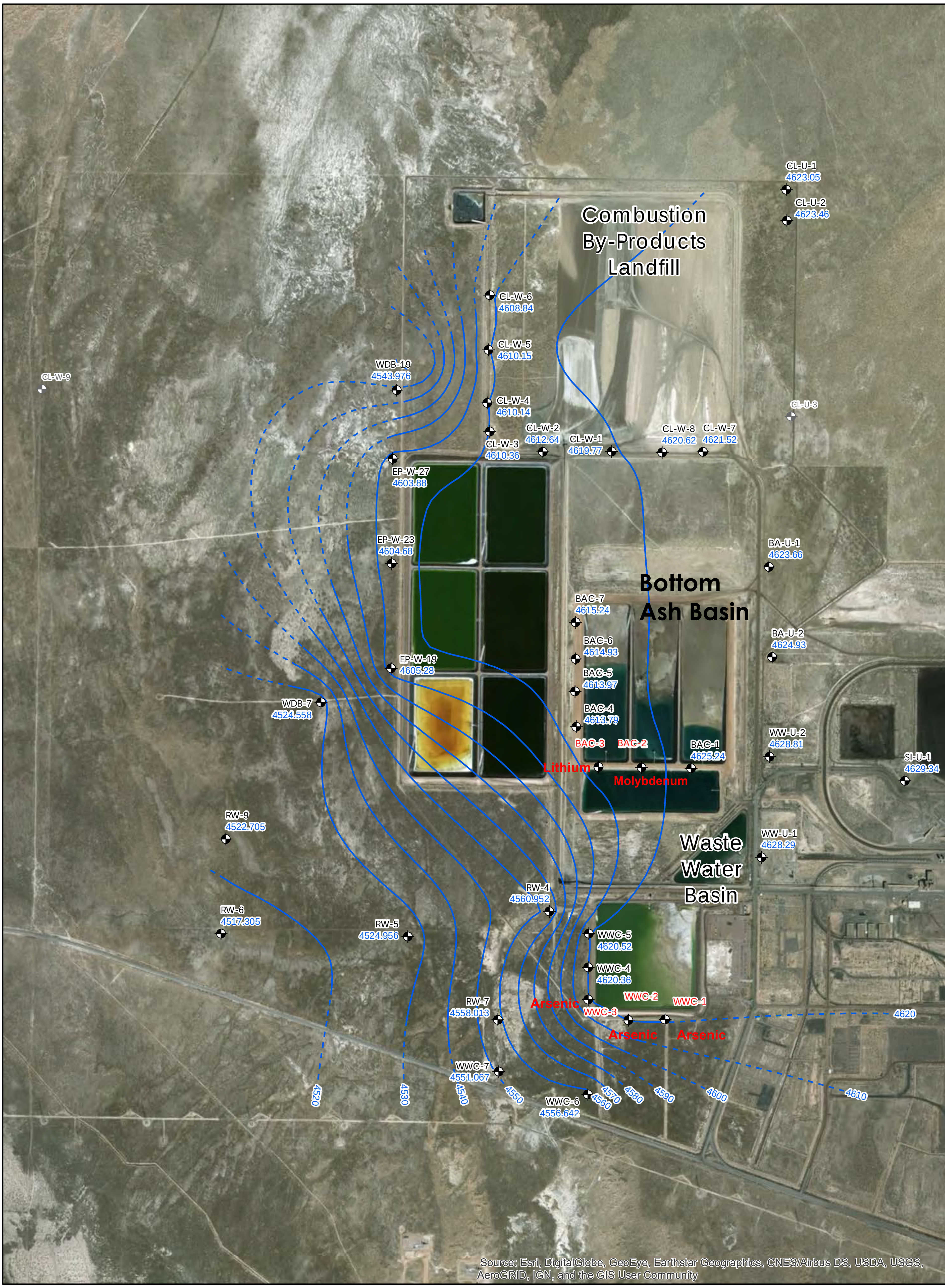
FIGURE: 5

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL		11/12/18

January 9, 2019

Figure 6. October 2018 Appendix IV Constituent Exceedances

Q:\active\203709098 Intermountain Power\GIS\2018_11\fig12_Oct2018GWE_20181105.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING) Red Constituents Exceed GWPS.
- GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED OCTOBER 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

N

0 1,300 2,600

Feet

1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

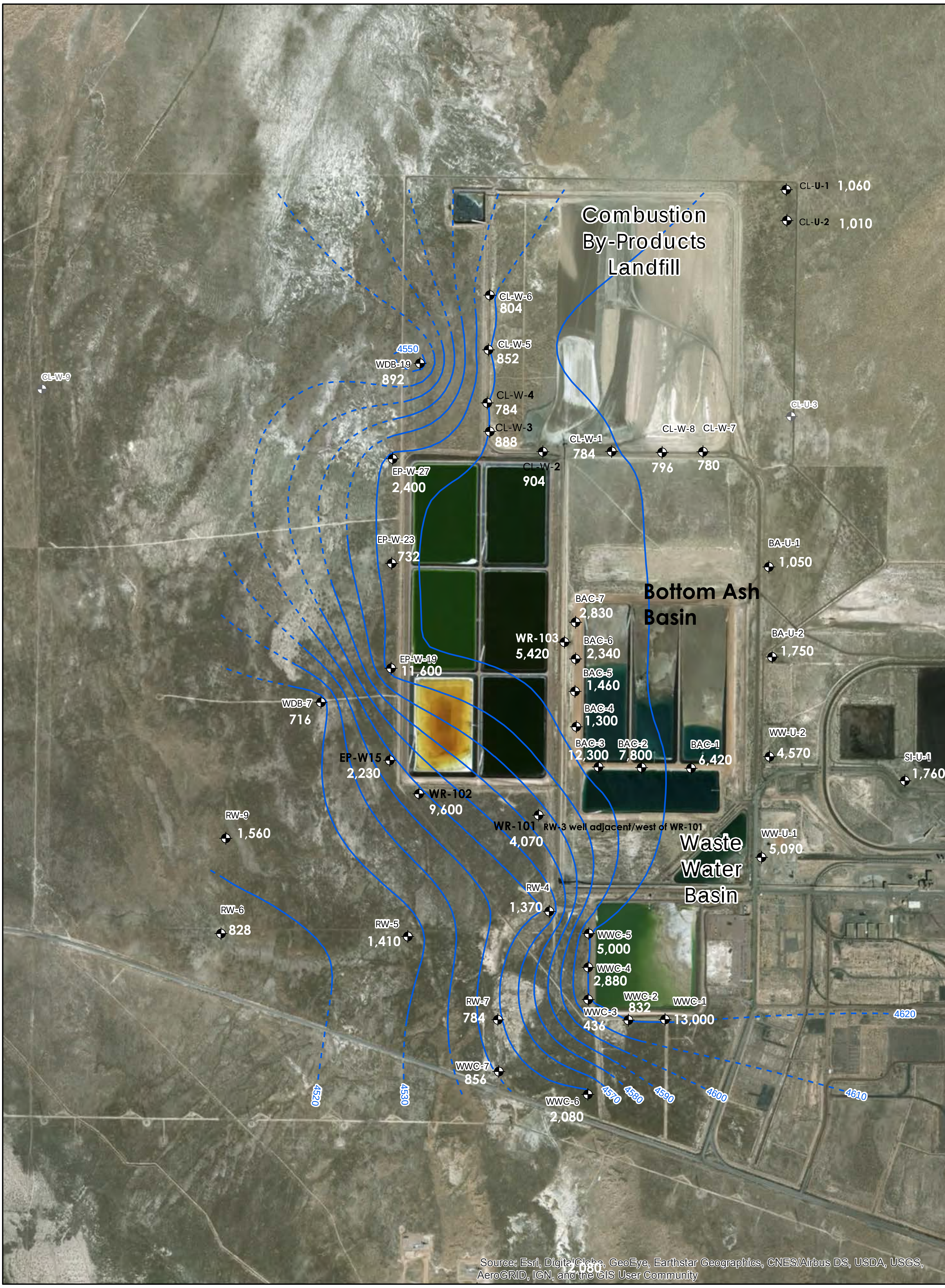
Appendix IV Constituent Exceedances
superimposed on
OCTOBER 2018 POTENTIOMETRIC SURFACE MAP

FIGURE: 6

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL		11/12/18

Figure 7. October 2018 TDS Concentration Map

Q:\active\203709098 Intermountain Power\GIS\2018_11\fig12_Oct2018GWE_20181105.mxd



LEGEND:

MONITORING WELL TDS Concentration (milligrams per Liter; i.e., ppm)

GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED OCTOBER 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

OCTOBER 2018
TDS Concentrations
Superimposed atop
Oct. 2018 Potentiometric Map

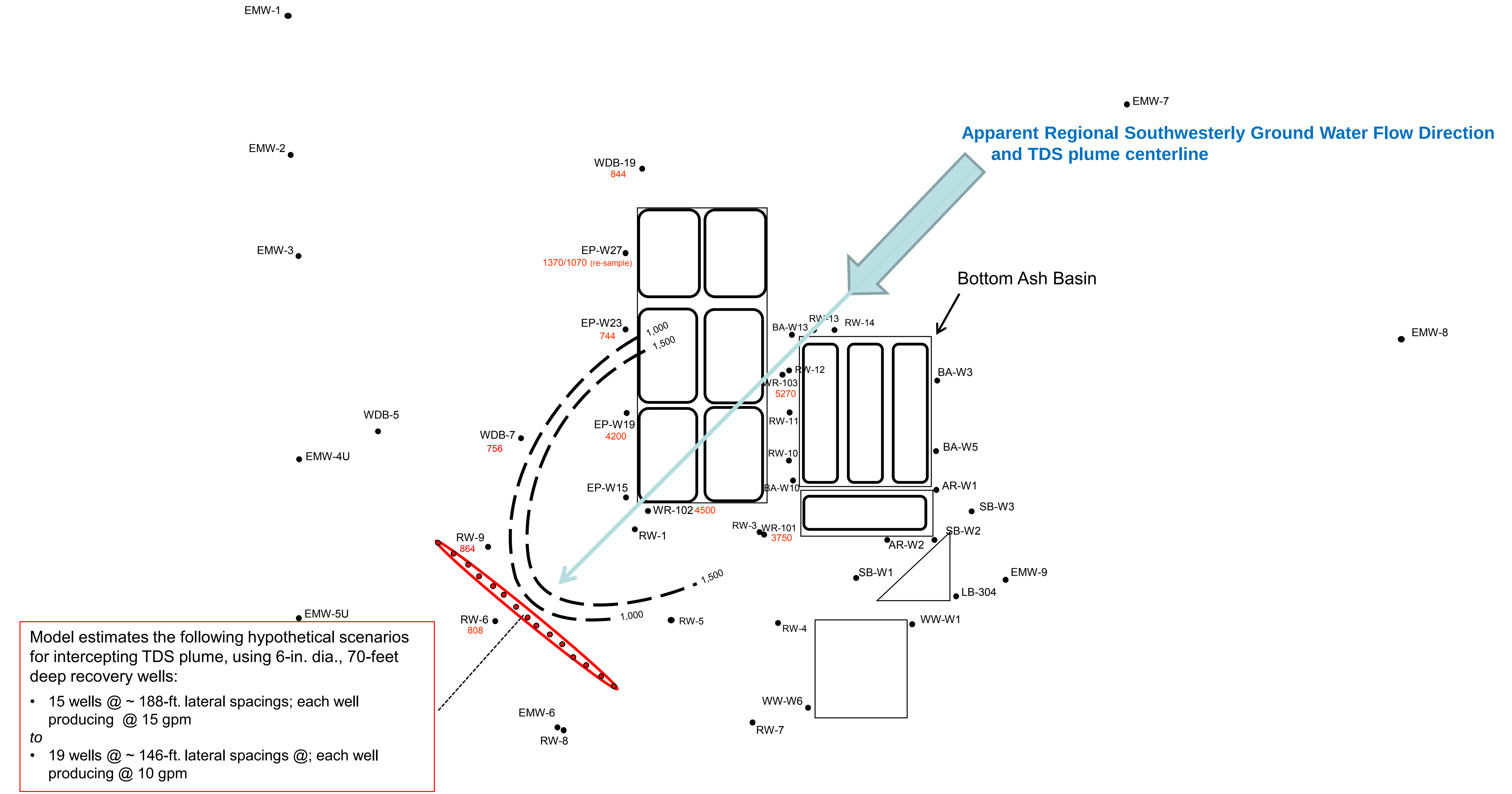
FIGURE: 7

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	JR	ALL		11/21/18

January 9, 2019

Figure 8. Excerpted Figure 2 from IPSC's 2016 Updated Corrective Action Plan Report

Excerpted Figure 2 from IPSC's 2016 Updated Corrective Action Plan Report



Model estimates the following hypothetical scenarios for intercepting TDS plume, using 6-in. dia., 70-feet deep recovery wells:

- 15 wells @ ~ 188-ft. lateral spacings; each well producing @ 15 gpm

to

- 19 wells @ ~ 146-ft. lateral spacings @; each well producing @ 10 gpm

Stantec

INTERMOUNTAIN GENERATING FACILITY

850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 8. Model-Simulated, Recovery Well Placement for TDS Plume Containment

LEGEND

● Monitoring Well Location

- 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours

Concentration values in milligrams / liter (ppm) ; April 2016

0 FEET 2000

SCALE

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TABLE 1 GROUND WATER MONITORING WELL CONSTRUCTION DETAILS

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4555.98
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4606.01
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WC-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WC-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46
WWC-6	3/24/2018	4-inch PVC	87	67-77	4576.26
WWC-7	3/22/2018	4-inch PVC	87	77-87	4570.78
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59

BGS = Below Ground Surface
MSL = Mean Sea Level

January 9, 2019

TABLE 2 GROUND WATER LEVEL MEASUREMENT AND WATER QUALITY ANALYTICAL RESULTS

CCR Well Levels

Well	Depth	Date
WW-U-1	33.23	12/7/2015
WW-U-2	23.42	12/7/2015
SI-U-1	32.47	12/7/2015
CL-U-1	32.02	12/7/2015
CL-U-2	37.55	12/7/2015
CL-W-1	31.05	12/7/2015
CL-W-2	33.14	12/7/2015
CL-W-3	31.54	12/7/2015
CL-W-4	30.56	12/7/2015
CL-W-5	29.76	12/7/2015
CL-W-6	28.71	12/7/2015
CL-W-7	35.23	12/7/2015
CL-W-8	32.37	12/7/2015
BA-U-1	39.21	12/7/2015
BA-U-2	33.26	12/7/2015
BAC-1	39.32	12/7/2015
BAC-2	51.38	12/7/2015
BAC-3	51.02	12/7/2015
BAC-4	35.35	12/7/2015
BAC-5	32.62	12/7/2015
BAC-6	29.76	12/7/2015
BAC-7	31.26	12/7/2015
WWC-1	21.16	12/7/2015
WWC-2	22.16	12/7/2015
WWC-3	16.42	12/7/2015
WWC-4	17.85	12/7/2015
WWC-5	18.78	12/7/2015

CCR Well Levels

Well	Depth	Date
WW-U-1	33.08	3/3/2016
WW-U-2	23.52	3/3/2016
SI-U-1	32.45	3/3/2016
CL-U-1	31.53	3/3/2016
CL-U-2	37.09	3/3/2016
CL-W-1	31.56	3/3/2016
CL-W-2	32.59	3/3/2016
CL-W-3	30.91	3/3/2016
CL-W-4	30.02	3/3/2016
CL-W-5	28.17	3/3/2016
CL-W-6	28.13	3/3/2016
CL-W-7	34.75	3/3/2016
CL-W-8	31.89	3/3/2016
BA-U-1	38.82	3/3/2016
BA-U-2	33.05	3/3/2016
BAC-1	39.85	3/3/2016
BAC-2	51.31	3/3/2016
BAC-3	51.29	3/3/2016
BAC-4	34.97	3/3/2016
BAC-5	32.07	3/3/2016
BAC-6	29.27	3/3/2016
BAC-7	29.78	3/3/2016
WWC-1	20.92	3/3/2016
WWC-2	21.79	3/3/2016
WWC-3	16.12	3/3/2016
WWC-4	17.56	3/3/2016
WWC-5	18.5	3/3/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	34.2	6/24/2016
WW-U-2	24.21	6/24/2016
SI-U-1	32.93	6/24/2016
CL-U-1	31.88	6/24/2016
CL-U-2	37.41	6/24/2016
CL-W-1	30.67	6/24/2016
CL-W-2	32.49	6/24/2016
CL-W-3	30.78	6/24/2016
CL-W-4	29.86	6/24/2016
CL-W-5	27.97	6/24/2016
CL-W-6	27.9	6/24/2016
CL-W-7	34.98	6/24/2016
CL-W-8	32.07	6/24/2016
BA-U-1	39.13	6/24/2016
BA-U-2	33.49	6/24/2016
BAC-1	40.42	6/24/2016
BAC-2	51.38	6/24/2016
BAC-3	51.35	6/24/2016
BAC-4	34.85	6/24/2016
BAC-5	31.79	6/24/2016
BAC-6	28.86	6/24/2016
BAC-7	30.26	6/24/2016
WWC-1	21.47	6/24/2016
WWC-2	22.33	6/24/2016
WWC-3	16.63	6/24/2016
WWC-4	18.07	6/24/2016
WWC-5	19.03	6/24/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	34.42	8/30/2016
WW-U-2	24.57	8/30/2016
SI-U-1	33.49	8/30/2016
CL-U-1	32.74	8/30/2016
CL-U-2	38.31	8/30/2016
CL-W-1	31.52	8/30/2016
CL-W-2	33.5	8/30/2016
CL-W-3	31.81	8/30/2016
CL-W-4	30.89	8/30/2016
CL-W-5	28.99	8/30/2016
CL-W-6	28.95	8/30/2016
CL-W-7	35.84	8/30/2016
CL-W-8	32.93	8/30/2016
BA-U-1	39.95	8/30/2016
BA-U-2	34.24	8/30/2016
BAC-1	40.97	8/30/2016
BAC-2	52.1	8/30/2016
BAC-3	51.94	8/30/2016
BAC-4	35.68	8/30/2016
BAC-5	32.67	8/30/2016
BAC-6	29.64	8/30/2016
BAC-7	31.09	8/30/2016
WWC-1	22.4	8/30/2016
WWC-2	22.87	8/30/2016
WWC-3	17.17	8/30/2016
WWC-4	18.61	8/30/2016
WWC-5	19.6	8/30/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	34.74	11/9/2016
WW-U-2	24.81	11/9/2016
SI-U-1	33.74	11/9/2016
CL-U-1	33.04	11/9/2016
CL-U-2	38.59	11/9/2016
CL-W-1	31.89	11/9/2016
CL-W-2	34.00	11/9/2016
CL-W-3	32.34	11/9/2016
CL-W-4	31.43	11/9/2016
CL-W-5	29.58	11/9/2016
CL-W-6	29.55	11/9/2016
CL-W-7	36.20	11/9/2016
CL-W-8	33.28	11/9/2016
BA-U-1	40.27	11/9/2016
BA-U-2	34.59	11/9/2016
BAC-1	41.51	11/9/2016
BAC-2	52.61	11/9/2016
BAC-3	52.10	11/9/2016
BAC-4	35.98	11/9/2016
BAC-5	32.90	11/9/2016
BAC-6	29.81	11/9/2016
BAC-7	30.92	11/9/2016
WWC-1	22.27	11/9/2016
WWC-2	23.22	11/9/2016
WWC-3	17.43	11/9/2016
WWC-4	18.88	11/9/2016
WWC-5	19.85	11/9/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	33.88	3/30/2017
WW-U-2	22.19	3/30/2017
SI-U-1	32.89	3/30/2017
CL-U-1	31.99	3/30/2017
CL-U-2	37.56	3/30/2017
CL-W-1	32.84	3/30/2017
CL-W-2	32.72	3/30/2017
CL-W-3	31.08	3/30/2017
CL-W-4	30.25	3/30/2017
CL-W-5	28.41	3/30/2017
CL-W-6	28.40	3/30/2017
CL-W-7	35.15	3/30/2017
CL-W-8	32.04	3/30/2017
BA-U-1	39.29	3/30/2017
BA-U-2	33.67	3/30/2017
BAC-1	40.89	3/30/2017
BAC-2	51.32	3/30/2017
BAC-3	51.94	3/30/2017
BAC-4	34.73	3/30/2017
BAC-5	31.71	3/30/2017
BAC-6	28.74	3/30/2017
BAC-7	30.03	3/30/2017
WWC-1	18.91	3/30/2017
WWC-2	22.21	3/30/2017
WWC-3	16.53	3/30/2017
WWC-4	17.97	3/30/2017
WWC-5	17.94	3/30/2017

CCR Well Levels

Well	Depth	Date
WW-U-1	34.70	6/21/2017
WW-U-2	24.75	6/21/2017
SI-U-1	33.46	6/21/2017
CL-U-1	32.13	6/21/2017
CL-U-2	37.72	6/21/2017
CL-W-1	30.74	6/21/2017
CL-W-2	32.35	6/21/2017
CL-W-3	30.72	6/21/2017
CL-W-4	29.90	6/21/2017
CL-W-5	28.06	6/21/2017
CL-W-6	28.01	6/21/2017
CL-W-7	35.16	6/21/2017
CL-W-8	32.21	6/21/2017
BA-U-1	39.41	6/21/2017
BA-U-2	33.90	6/21/2017
BAC-1	41.29	6/21/2017
BAC-2	50.94	6/21/2017
BAC-3	51.14	6/21/2017
BAC-4	34.08	6/21/2017
BAC-5	30.98	6/21/2017
BAC-6	28.03	6/21/2017
BAC-7	29.30	6/21/2017
WWC-1	21.95	6/21/2017
WWC-2	22.74	6/21/2017
WWC-3	17.04	6/21/2017
WWC-4	18.48	6/21/2017
WWC-5	19.44	6/21/2017

CCR Well Levels

Well	Depth	Date
WW-U-1	35.43	10/4/2017
WW-U-2	25.49	10/5/2017
SI-U-1	34.28	10/6/2017
CL-U-1	33.25	10/7/2017
CL-U-2	38.81	10/8/2017
CL-W-1	31.80	10/9/2017
CL-W-2	33.60	10/10/2017
CL-W-3	31.93	10/11/2017
CL-W-4	31.09	10/12/2017
CL-W-5	29.26	10/13/2017
CL-W-6	29.26	10/14/2017
CL-W-7	36.23	10/15/2017
CL-W-8	33.28	10/16/2017
BA-U-1	40.42	10/17/2017
BA-U-2	34.85	10/18/2017
BAC-1	41.78	10/19/2017
BAC-2	52.03	10/20/2017
BAC-3	52.31	10/21/2017
BAC-4	35.29	10/22/2017
BAC-5	32.19	10/23/2017
BAC-6	29.24	10/24/2017
BAC-7	30.48	10/25/2017
WWC-1	22.69	10/26/2017
WWC-2	23.51	10/27/2017
WWC-3	17.80	10/28/2017
WWC-4	19.27	10/29/2017
WWC-5	20.26	10/30/2017

CCR Well Levels

Well	Depth	Date
WW-U-1	36.14	3/26/2018
WW-U-2	25.79	3/26/2018
SI-U-1	34.04	3/26/2018
CL-U-1	32.64	3/26/2018
CL-U-2	38.22	3/26/2018
CL-W-1	31.73	3/26/2018
CL-W-2	33.49	3/26/2018
CL-W-3	31.73	3/26/2018
CL-W-4	30.94	3/26/2018
CL-W-5	29.00	3/26/2018
CL-W-6	28.96	3/26/2018
CL-W-7	35.99	3/26/2018
CL-W-8	33.11	3/26/2018
BA-U-1	40.28	3/26/2018
BA-U-2	34.74	3/26/2018
BAC-1	42.05	3/26/2018
BAC-2	34.62	3/26/2018
BAC-3	52.76	3/26/2018
BAC-4	35.82	3/26/2018
BAC-5	33.28	3/26/2018
BAC-6	30.53	3/26/2018
BAC-7	31.88	3/26/2018
WWC-1	22.56	3/26/2018
WWC-2	23.31	3/26/2018
WWC-3	17.55	3/26/2018
WWC-4	19.04	3/26/2018
WWC-5	20.08	3/26/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.20	6/13/2018
WW-U-2	25.95	6/13/2018
SI-U-1	34.27	6/13/2018
CL-U-1	32.83	6/13/2018
CL-U-2	38.42	6/13/2018
CL-W-1	31.92	6/13/2018
CL-W-2	33.53	6/13/2018
CL-W-3	31.72	6/13/2018
CL-W-4	30.79	6/13/2018
CL-W-5	28.95	6/13/2018
CL-W-6	29.12	6/13/2018
CL-W-7	36.19	6/13/2018
CL-W-8	33.31	6/13/2018
BA-U-1	40.54	6/13/2018
BA-U-2	35.00	6/13/2018
BAC-1	42.29	6/13/2018
BAC-2	52.68	6/13/2018
BAC-3	53.92	6/13/2018
BAC-4	35.83	6/13/2018
BAC-5	33.32	6/13/2018
BAC-6	30.52	6/13/2018
BAC-7	31.83	6/13/2018
WWC-1	22.89	6/13/2018
WWC-2	23.64	6/13/2018
WWC-3	17.92	6/13/2018
WWC-4	19.34	6/13/2018
WWC-5	20.19	6/13/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.74	10/24/2018
WW-U-2	26.65	10/24/2018
SI-U-1	35.25	10/24/2018
CL-U-1	34.43	10/24/2018
CL-U-2	40.02	10/24/2018
CL-W-1	33.69	10/24/2018
CL-W-2	35.53	10/24/2018
CL-W-3	33.67	10/24/2018
CL-W-4	32.74	10/24/2018
CL-W-5	30.84	10/24/2018
CL-W-6	30.79	10/24/2018
CL-W-7	37.82	10/24/2018
CL-W-8	35.01	10/24/2018
BA-U-1	42.07	10/24/2018
BA-U-2	36.40	10/24/2018
BAC-1	43.46	10/24/2018
BAC-2	54.24	10/24/2018
BAC-3	54.22	10/24/2018
BAC-4	35.66	10/24/2018
BAC-5	35.70	10/24/2018
BAC-6	33.22	10/24/2018
BAC-7	34.85	10/24/2018
WWC-1	23.70	10/24/2018
WWC-2	24.48	10/24/2018
WWC-3	18.74	10/24/2018
WWC-4	20.22	10/24/2018
WWC-5	21.23	10/24/2018

Assessment Well Levels

Well	Depth	Date
RW-4	20.49	10/24/2018
RW-5	46.01	10/24/2018
RW-7	14.55	10/24/2018
WDB-19	28.97	10/24/2018
WWC-6	19.62	10/24/2018
WWC-7	19.71	10/24/2018

Round 1

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	0	68.9	418	0.813	7.82	131	1040	0	0.0378	0.126	0	0	0.00537	0	0	0.346	0	0.00459	0	0	0.52	0.5	1.02
CL-U-2	0	73.8	404	0.611	7.73	132	1020	0	0.0317	0.129	0	0	0.00613	0	0	0.325	0	0.00406	0	0	0.55	1.2	1.75
CLW-1	0	55.7	322	0.844	7.95	76.5	832	0	0.0264	0.105	0	0	0.00814	0	0	0.3	0	0.00574	0	0	0.56	1.6	2.16
CLW-2	0	53.9	432	0.695	7.75	108	976	0	0.0283	0.0957	0	0	0.00576	0	0	0.36	0	0.00472	0	0	0.51	1.1	1.61
CLW-3	0	45	367	0.948	7.86	123	928	0	0.0375	0.111	0	0	0.00346	0	0	0.337	0	0.00492	0	0	0.4	1.3	1.7
CLW-4	0	44.5	320	1.37	7.87	73.3	828	0	0.0308	0.122	0	0	0.00336	0	0	0.319	0	0.00584	0	0	0.34	1.9	2.24
CLW-5	0	38.4	345	1.51	7.81	88.3	872	0	0.0188	0.0864	0		0	0	0	0.0325	0	0.00841	0	0	0.37	1.6	1.97
CLW-6	0	33.6	325	1.38	7.71	74.5	820	0	0.0249	0.0879	0	0	0.00335	0	0	0.316	0	0.0104	0	0	0.37	0.63	1
CLW-7	0	47.3	339	0.792	7.81	66.4	812	0	0.0234	0.0593	0	0	0.00421	0	0	0.282	0	0.00331	0	0	0.14	0.52	0.66
CLW-8	0	43.6	324	0.797	7.8	70.5	772	0	0.0155	0.107	0	0	0.00463	0	0	0.285	0	0.00626	0	0	0.4	0.74	1.14
CLW-9																							
CL-U-3																							

Round 1

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	13.46	7.74	-42	1720	443	2.12	-
CL-U-2	14.72	6.92	-38	1750	604	2.6	-
CLW-1	14.84	7.69	-45	1490	383	2.28	0.952
CLW-2	9.95	7.86	-144	1810	99.6	1.76	1.16
CLW-3	11.24	7.95	-158	1740	128	1.9	1.11
CLW-4	14.9	7.95	-165	1540	25.1	1.67	0.98
CLW-5	15.12	7.96	-134	1620	46.4	1.6	1.04
CLW-6	15.3	8	-193	1550	30.8	0.98	0.998
CLW-7	16.38	7.54	8	1430	90.9	7.01	0.917
CLW-8	15.01	7.58	0	1530	11.3	2.09	0.976
CLW-9							
CL-U-3							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	0	51.4	430	1.21	8.06	121	984	0	0.0163	0.133	0	0	0.00305	0	0	0.313	0	0.0408	0	0	0.66	0.7	1.36
BA-U-2	0	53	343	0.727	8.9	48.9	82.4	0	0.0154	0.148	0	0	0.00971	0	0	0.297	0	0.0121	0	0	0.32	2.1	2.42
BAC-1	7.49	274	3280	0.299	7.37	3060	8860	0.00237	0.0146	0.1	0	0	0.00503	0.00605	0	1.52	0	0.143	0.0204	0	0.71	1.6	2.31
BAC-2	10.7	267	2000	0.741	7.29	3620	7820	0	0.0386	0.0472	0	0	0.0116	0	0	1.38	0	0.151	0.0164	0	0.48	0.94	1.42
BAC-3	6.09	387	2900	0.648	7.6	3840	9800	0	0.0191	0.0827	0	0	0.0615	0	0	2.13	0	0.0367	0.019	0	0.99	1.1	2.09
BAC-4	0	53	473	1.35	7.96	181	1150	0	0.0407	0.0821	0	0	0.0022	0	0	0.476	0	0.0104	0	0	0.19	0.5	0.69
BAC-5	0	51.1	483	1.11	7.83	129	1010	0	0.0357	0.0928	0	0	0.0161	0	0	0.479	0	0.00926	0	0	0.29	0.96	1.25
BAC-6	4.36	142	516	0.754	7.68	1080	2410	0	0.0134	0.0622	0	0	0.0363	0	0	0.599	0	0.0968	0	0	0.39	1.4	1.79
BAC-7	4.65	148	665	1.01	7.77	1360	2910	0	0.0191	0.0577	0	0	0.0264	0	0	0.681	0	0.0699	0.00276	0	0.46	0.92	1.38

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	14.56	7.93	-67	1590	106	2.51	-
BA-U-2	13.58	8.33	-85	1510	96.4	2.9	-
BAC-1	11.8	7.32	111	15100	54.8	1.84	9.35
BAC-2	15.7	7.12	79	11800	100	1.82	7.33
BAC-3	16.24	7.51	75	15000	34.2	1.36	9.28
BAC-4	14.36	7.93	12	2230	12.5	2.07	1.43
BAC-5	13.96	7.88	-18	2020	113	0.97	1.29
BAC-6	12.49	7.69	-157	3610	96.1	1.2	2.31
BAC-7	14.17	7.76	-96	4430	789	1.12	2.84

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	0.594	171	667	0	7.4	918	2300	0	0.00266	0.112	0	0	0.0099	0	0	0.49	0	0.00554	0	0	0.56	1.7	2.26
WW-U-1	1.05	374	2180	0	7.06	1470	5430	0	0.00453	0.178	0	0	0.0032	0	0	0.983	0	0.00619	0.00549	0	1	2.3	3.3
WW-U-2	1.6	358	2430	0	7.23	1370	5540	0	0.00309	0.123	0	0	0.00582	0.0072	0	0.934	0	0.0237	0.00543	0	0.84	2.1	2.94
WWC-1	9.62	561	4840	0	7.19	3150	11800	0	0.0181	0.0536	0	0	0.0139	0	0	2.69	0.00031	0.00701	0.0152	0	0.31	0.83	1.14
WWC-2	0	66.5	381	0.158	7.91	147	940	0	0.0155	0.0511	0	0	0.00348	0	0	0.241	0	0.00383	0	0	0.12	1.1	1.22
WWC-3	0	34.5	284	1.01	8.11	82.2	688	0	0.0102	0.0638	0	0	0.00577	0	0	0.243	0	0.0459	0	0	0.32	0.55	0.87
WWC-4	1.09	247	1270	0.387	7.61	800	3250	0	0.0116	0.09	0	0	0.00877	0	0	0.909	0	0.00467	0.00207	0	0.5	0.45	0.95
WWC-5	2.4	345	1810	0.331	7.47	1610	5020	0	0.00783	0.103	0	0	0.00892	0.0055	0	4.41	0	0.0265	0	0	0.51	1.1	1.61
WWC-6																							
WWC-7																							

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	10.79	7.27	-14	3720	74	6.93	-
WW-U-1	13.11	7.01	2	7920	32.9	3.2	-
WW-U-2	12.59	7.23	-11	7920	93.4	5.09	-
WWC-1	14.94	7.06	15	1850	110	1.28	11.5
WWC-2	17.36	7.88	-44	1680	79.9	1.08	1.07
WWC-3	13.92	8.1	-249	1430	121	1.29	0.918
WWC-4	14.73	7.4	-20	5230	61.1	1.52	3.3
WWC-5	15.35	7.3	-122	7740	348	0.97	4.88
WWC-6							
WWC-7							

Date 12/14/2015

Results below reporting limit are recorded as 0.

Date

Round 2

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	47.7	391	0.839	8.52	123	908	0	0.0415	0.0953	0	0	0	0	0	0.401	0	0.00733	0	0	0.27	1.6	1.87
CL-U-2	0	59.9	372	0.873	7.75	119	940	0	0.0243	0.0934	0	0	0	0	0	0.387	0	0.00414	0	0	0.28	1	1.28
CLW-1	0	35.1	301	0.834	7.89	71.6	808	0	0.0266	0.0648	0	0	0.00235	0	0	0.361	0	0.00506	0	0	0.36	1.5	1.86
CLW-2	0	45.9	378	1.18	7.66	90.5	936	0	0.0243	0.0882	0	0	0	0	0	0.438	0	0.00481	0	0	0.51	0.53	1.04
CLW-3	0	40.5	336	1.35	7.92	96	884	0	0.0437	0.103	0	0	0	0	0	0.435	0	0.0049	0	0	0.47	1.1	1.57
CLW-4	0	32.1	282	1.53	7.87	80.9	776	0	0.0271	0.109	0	0	0	0	0	0.375	0	0.00762	0	0	0.37	0.7	1.07
CLW-5	0	35.4	318	1.82	7.91	85.7	824	0	0.0214	0.0869	0	0	0	0	0	0.411	0	0.00922	0	0	0.27	0.32	0.59
CLW-6	0	32.1	306	1.72	7.97	75.4	816	0	0.0246	0.095	0	0	0	0	0	0.4	0	0.0117	0	0	0.02	0.96	0.98
CLW-7	0	42.8	290	0.825	7.65	67.6	832	0	0.0239	0.0794	0	0	0	0	0	0.327	0	0.146	0	0	0.14	0.29	0.43
CLW-8	0	41.5	293	0.782	7.8	70.3	808	0	0.022	0.0839	0	0	0.00224	0	0	0.35	0	0.00499	0	0	0.32	0.32	0.64
CLW-9																							
CL-U-3																							

Round 2

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	14.18	8.74	-209	1750	4.3	2.15	1.12
CL-U-2	14.41	7.75	-89	1820	4.6	1.85	1.17
CLW-1	15.84	7.95	-60	1560	3.8	1.4	0.996
CLW-2	17.53	7.81	-137	1840	2	9.35	1.17
CLW-3	14.99	7.87	-203	1710	0	3.96	1.09
CLW-4	17.08	7.81	-211	1490	11.5	1.82	0.955
CLW-5	17.06	7.82	-168	1650	10.9	8.45	1.06
CLW-6	15.83	7.91	-194	1600	6.2	0.95	1.02
CLW-7	16.53	7.75	9	1560	3.5	2.67	0.996
CLW-8	15.86	7.81	-25	1560	8	1.92	0.996
CLW-9							
CL-U-3							

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	28.7	258	1.67	8.55	64.2	852	0	0.023	0.0969	0	0	0	0	0	0.376	0	0.0359	0	0	0.33	1.3	1.63
BA-U-2	0	67.4	529	0.938	8.02	55.7	1230	0	0.0199	0.175	0	0	0	0	0	0.514	0	0.00298	0	0	0.2	1	1.2
BAC-1	2.85	155	1730	0	7.86	1390	5240	0	0.0174	0.39	0	0	0.00536	0	0	0.63	0	0.0607	0.0131	0	0.96	1.6	2.56
BAC-2	9.83	196	1600	0	7.35	2900	7640	0	0.0411	0.0385	0	0	0.00742	0	0.00221	1.22	0	0.167	0.0128	0	0.4	2.5	2.9
BAC-3	6.55	406	3240	0	7.62	3960	10400	0	0.0192	0.0553	0	0	0.00676	0	0	1.12	0	0.0337	0.0184	0	0.44	0.68	1.12
BAC-4	0	57.4	488	1.36	7.87	191	1290	0	0.0371	0.0806	0	0	0	0	0	0.532	0	0.0106	0	0	0.48	0.5	0.98
BAC-5	0	41.3	433	1.34	7.95	111	1010	0	0.0392	0.0736	0	0	0	0	0	0.476	0	0.00758	0	0	0.25	-0.03	0.22
BAC-6	2.67	98.4	491	0.734	7.72	636	1880	0	0.0144	0.0736	0	0	0	0	0	0.597	0	0.0569	0	0	0.61	0.6	1.21
BAC-7	4.43	132	623	1.07	7.89	1230	2980	0	0.0225	0.0372	0	0	0	0	0	0.699	0	0.0681	0.00274	0	0.16	0.51	0.67

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	13.53	8.63	5	1550	11.3	2.59	0.995
BA-U-2	15.78	7.94	-167	2240	19.7	1.06	1.44
BAC-1	17.51	8.16	39	6.5	10.7	3	4.11
BAC-2	16.74	7.2	322	9.96	3.2	2.59	6.26
BAC-3	14.4	7.36	29	1590	3.8	3.35	9.84
BAC-4	15.9	7.81	-55	2370	3.9	2.08	1.51
BAC-5	16.34	7.92	-23	1980	4	2.89	1.27
BAC-6	18.19	7.67	-8	2.94	0	1.73	1.88
BAC-7	14.22	7.9	-9	4560	3.9	2.46	2.92

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	168	752	0.557	7.65	665	2320	0	0.00781	0.0846	0	0	0.00346	0	0	0.634	0	0.00671	0	0	0.43	-0.16	0.27
WW-U-1	1.03	346	2430	0	7.23	1440	5330	0	0.00446	0.123	0	0	0	0	0	1.33	0	0.00669	0.00432	0	1	2.2	3.2
WW-U-2	1.59	362	2410	0	7.34	1370	5780	0	0.00846	0.0761	0	0	0.00735	0	0	1.35	0	0.0126	0.0108	0	0.51	1.2	1.71
WWC-1	6.01	458	4530	0.256	7.24	2710	10800	0	0.00331	0.072	0	0	0.00369	0.00842	0	1.08	0	0.0103	0.00919	0	0.91	1.6	2.51
WWC-2	0	61.3	352	0.208	7.97	131	932	0	0.0147	0.0421	0	0	0.00335	0	0	0.162	0	0.00391	0	0	0.18	1	1.18
WWC-3	0	29.2	203	0.845	8.2	78.5	660	0	0.021	0.0357	0	0	0	0	0	0.172	0	0.00593	0	0	0.16	0.52	0.68
WWC-4	0.826	185	1100	0.39	7.31	716	3100	0	0.00923	0.101	0	0	0	0	0	0.75	0	0.00783	0	0	0.6	0.84	1.44
WWC-5	1.59	320	1640	0.319	7.22	1210	4790	0	0.00371	0.0882	0	0	0	0	0	1.41	0	0.0205	0.00345	0	0.52	1.9	2.42
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	12.99	7.49	11	3790	7.4	1.37	2.42
WW-U-1	15.75	7.21	-117	8030	19.6	4.07	5.06
WW-U-2	14.5	7.34	-22	9240	12.9	2.4	5.82
WWC-1	15.29	7.11	-108	1400	11.8	7.82	8.62
WWC-2	14.19	7.75	-86	1720	9.1	2.37	1.1
WWC-3	15.63	8.1	-183	1190	2	1.36	0.759
WWC-4	15.58	7.37	-8	5004	4.7	1.61	3.18
WWC-5	15	7.22	19	7510	6.4	2	4.75
WWC-6							
WWC-7							

Date 2/29/2016

Results below reporting limit are recorded as 0.

Date

Round 3

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	0	51.2	414	1.01	7.83	122	1080	0	0.0507	0.0887	0	0	0	0	0	0.378	0	0.00491	0	0	0.11	0.72	0.83
CL-U-2	0	53.7	390	1.14	7.75	121	976	0	0.0245	0.0933	0	0	0	0	0	0.346	0	0.00391	0	0	0.26	1.5	1.76
CLW-1	0	34.6	312	1.13	7.9	70.1	716	0	0.0285	0.0621	0	0	0	0	0	0.318	0	0.00438	0	0	0.28	0.89	1.17
CLW-2	0	43.9	402	1.21	7.84	87.9	976	0	0.0264	0.0819	0	0	0	0	0	0.396	0	0.00427	0	0	0.25	1.1	1.35
CLW-3	0	36.2	346	1.3	7.86	104	876	0	0.0402	0.0992	0	0	0	0	0	0.375	0	0.00463	0	0	0.35	1.2	1.55
CLW-4	0	30.6	294	1.58	7.79	77.9	748	0	0.0196	0.119	0	0	0	0	0	0.338	0	0.0092	0	0	0.45	0.72	1.17
CLW-5	0	33	336	1.81	7.86	84.9	848	0	0.0182	0.0851	0	0	0	0	0	0.352	0	0.00868	0	0	0.27	0.65	0.92
CLW-6	0	29.8	313	1.73	7.9	73.2	756	0	0.0181	0.0901	0	0	0	0	0	0.333	0	0.0105	0	0	0.34	1.4	1.74
CLW-7	0	39.3	328	1.16	7.64	67.4	732	0	0.0246	0.0581	0	0	0.00891	0	0	0.331	0	0.00638	0	0	0.19	0.55	0.74
CLW-8	0	40.3	312	1.08	7.82	69.7	808	0	0.0225	0.0797	0	0	0	0	0	0.32	0	0.00435	0	0	0.27	0.32	0.59
CLW-9																							
CL-U-3																							

Round 3

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	18.94	8.04	-204	1910	22.6	1.2	1.22
CL-U-2	18.47	7.7	-136	1900	1	2.72	1.22
CLW-1	23.71	7.77	62	1550	0	1.34	0.99
CLW-2	22.15	7.66	-169	1840	0	1.31	1.17
CLW-3	20.8	7.71	-225	1720	0.8	1.8	1.1
CLW-4	19.51	7.8	-235	1480	0	4.39	0.95
CLW-5	21.24	7.77	-209	1570	11.5	4.22	1.01
CLW-6	18.81	7.87	-235	1600	0	1.7	1.02
CLW-7	16.73	7.62	66	1580	8.9	3.82	1.01
CLW-8	20.93	7.66	55	1510	0	12.58	0.966
CLW-9							
CL-U-3							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	0	195	1130	0.801	7.63	339	2520	0	0.0177	0.0935	0	0	0	0	0	0.773	0	0.00317	0.00426	0	0.3	1.6	1.9
BA-U-2	0	15.9	284	0.865	12	40.6	720	0	0	0.128	0	0	0.0032	0	0	0.315	0	0.016	0	0	0.22	1.5	1.72
BAC-1	4.73	191	2240	0.402	7.59	1840	6420	0	0.0164	0.081	0	0	0.0033	0	0	1.3	0	0.0669	0.0168	0	0.51	1.3	1.81
BAC-2	11.2	216	1650	0.986	7.17	3220	7520	0	0.0416	0.0248	0	0	0.00488	0	0	1.32	0	0.14	0.0142	0	0.17	1.6	1.77
BAC-3	6.82	445	3230	0.794	7.42	4490	10900	0	0.0158	0.048	0	0	0.00707	0	0	2.53	0	0.0269	0.0198	0	0.25	1.6	1.85
BAC-4	0	66.1	551	1.38	7.73	223	1280	0	0.0334	0.0772	0	0	0.00461	0	0	0.509	0	0.0122	0	0	0.16	0.68	0.84
BAC-5	0	50.4	541	1.26	7.79	122	1220	0	0.0337	0.0839	0	0	0	0	0	0.494	0	0.00738	0	0	0.11	1.7	1.81
BAC-6	1.7	89.5	521	1.04	7.72	448	1560	0	0.0122	0.0859	0	0	0	0	0	0.542	0	0.0359	0	0	0.27	0.76	1.03
BAC-7	4.51	132	685	1.31	7.69	1370	2870	0	0.0234	0.0315	0	0	0	0	0	0.674	0	0.0749	0.00319	0	0.17	2.4	2.57

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	18.51	7.48	-114	4730	4.9	1.73	3.03
BA-U-2	20.17	11.9	-206	1980	5.1	4.04	1.26
BAC-1	20.91	7.43	-5	10.3	33.2	3.43	6.41
BAC-2	19.81	7.01	33	11.6	2	0.69	7.18
BAC-3	18.81	7.19	16	16.6	2.6	1.26	10.3
BAC-4	18.21	7.71	83	2490	2.6	3.05	1.59
BAC-5	18.58	7.75	51	2260	0	1320	1.45
BAC-6	20.42	7.7	50	2740	0.4	21.84	1.75
BAC-7	21.43	7.63	-7	4510	8	15.04	2.89

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	0	129	901	0.564	7.6	318	1880	0	0.00989	0.0929	0	0	0.0156	0	0	0.499	0	0.00411	0	0	0.45	0.64	1.09
WW-U-1	1.18	296	2030	0.386	7.21	1300	5820	0	0.0052	0.115	0	0	0	0	0	1	0	0.00888	0.00637	0	0.64	0.92	1.56
WW-U-2	1.49	412	2300	0.534	7.33	1180	5400	0	0.00538	0.0746	0	0	0.0114	0	0	1.08	0	0.0126	0.0107	0	0.64	1.1	1.74
WWC-1	3.59	526	3950	0	7.12	1990	8820	0	0.00401	0.077	0	0	0	0.00532	0	2.18	0	0.00653	0.00824	0	0.47	2	2.47
WWC-2	0	59.1	369	0.833	7.79	145	956	0	0.0151	0.0408	0	0	0	0	0	0.225	0	0.00402	0	0	0.22	0.39	0.61
WWC-3	0	26.4	197	1.02	8.12	85.6	664	0	0.0213	0.0328	0	0	0	0	0	0.23	0	0.00574	0	0	0.13	3.3	3.43
WWC-4	0.627	138	902	0.576	7.57	406	2010	0	0.00498	0.0768	0	0	0	0	0	0.606	0	0.0082	0	0	0.27	1.7	1.97
WWC-5	1.65	406	1730	0.3	7.24	1140	5060	0	0.00608	0.067	0	0	0	0	0	1.4	0	0.0119	0.00363	0	0.42	0.85	1.27
WWC-6																							
WWC-7																							

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	18	7.54	-69	3350	0.3	8.11	2.14
WW-U-1	22.73	7.15	34	7560	0	4.74	4.76
WW-U-2	18.42	7.25	-66	8820	25.9	1.6	5.56
WWC-1	18.38	6.9	62	14.7	1.6	1.86	9.13
WWC-2	18.22	7.74	-101	1.74	1.9	5.2	1.12
WWC-3	16.62	7.99	-168	1.2	0	0.59	0.765
WWC-4	16.85	7.43	-8	3.63	1.2	0.85	2.32
WWC-5	17.35	7.01	15	7.44	1	0.78	4.69
WWC-6							
WWC-7							

Date 6/13/2016

Results below reporting limit are recorded as 0.

Date

Round 4

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	54.8	424	1.03	7.63	124	1030	0	0.0301	0.0911	0	0	0	0	0	0.375	0	0.00428	0	0	0.36	0.44	0.8
CL-U-2	0	57.7	406	1.17	7.69	113	948	0	0.0265	0.0961	0	0	0.00227	0	0	0.351	0	0.00508	0	0	0.31	1.1	1.41
CLW-1	0	35	315	1.18	7.89	65.4	832	0	0.0279	0.0594	0	0	0	0	0	0.316	0	0.00454	0	0	0.52	0.86	1.38
CLW-2	0	46.8	424	1.29	7.75	89.2	992	0	0.0284	0.0823	0	0	0	0	0	0.391	0	0.00462	0	0	0.31	0.62	0.93
CLW-3	0	38.7	349	1.33	7.75	109	896	0	0.0412	0.0995	0	0	0	0	0	0.368	0	0.00472	0	0	0.3	0.15	0.45
CLW-4	0	32.1	318	1.53	7.81	84.5	808	0	0.0316	0.104	0	0	0	0	0	0.336	0	0.00577	0	0	0.39	0.62	1.01
CLW-5	0	34.3	350	1.83	7.75	92.1	860	0	0.0189	0.0803	0	0	0	0	0	0.346	0	0.00798	0	0	0.24	0.27	0.51
CLW-6	0	31.5	331	1.73	7.84	77.1	812	0	0.0164	0.0966	0	0	0	0	0	0.342	0	0.011	0	0	0.2	1	1.2
CLW-7	0	42.1	336	1.1	7.71	70	760	0	0.024	0.0529	0	0	0	0	0	0.302	0	0.00396	0	0	0.17	0.33	0.5
CLW-8	0	40.1	327	1.08	7.73	75	720	0	0.0224	0.0761	0	0	0	0	0	0.308	0	0.00459	0	0	0.35	1	1.35
CLW-9																							
CL-U-3																							

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	180	1170	0.888	7.62	327	2390	0	0.0191	0.0802	0	0	0	0	0	0.684	0	0.00386	0.00384	0	0.45	0.84	1.29
BA-U-2	0	10.4	317	0.975	11.8	39.9	748	0	0.00225	0.114	0	0	0.00216	0	0	0.337	0	0.0147	0	0	0.26	1.1	1.36
BAC-1	4.95	221	2520	0.401	7.52	2380	7210	0	0.0146	0.0643	0	0	0.0028	0	0	1.42	0	0.0603	0.0148	0	0.63	0.64	1.27
BAC-2	10.5	203	1640	1.03	7.22	3180	7620	0	0.0431	0.0237	0	0	0.0081	0	0	1.17	0	0.166	0.0136	0	0.33	0.23	0.56
BAC-3	6.77	399	3350	1.28	7.36	4630	11700	0	0.0213	0.0436	0	0	0.00386	0	0	2.37	0	0.0294	0.019	0	0.38	0.76	1.14
BAC-4	0	56.1	498	1.35	7.62	210	1460	0	0.0358	0.0757	0	0	0	0	0	0.508	0	0.0103	0	0	0.19	0.83	1.02
BAC-5	0	49.4	561	1.25	7.68	127	1200	0	0.0331	0.0879	0	0	0	0	0	0.538	0	0.0077	0	0	0.1	0.46	0.56
BAC-6	1.38	80.2	546	0.901	7.61	502	1540	0	0.0115	0.0781	0	0.000677	0.00283	0	0	0.54	0	0.034	0	0	0.31	0.24	0.55
BAC-7	3.96	126	612	1.28	7.68	1370	2770	0	0.0232	0.0274	0	0	0	0	0	0.669	0	0.0942	0.00257	0	0.37	-0.17	0.2

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	131	922	0.564	7.57	281	1880	0	0.00926	0.0858	0	0	0.00217	0	0	0.467	0	0.00295	0	0	0.45	0.96	1.41
WW-U-1	1.25	304	2200	0.327	7.21	1280	5270	0	0.00439	0.0916	0	0	0.00337	0	0	1.01	0	0.00835	0.00689	0	0.54	2	2.54
WW-U-2	0.641	308	2140	0.614	7.42	854	4550	0	0.00258	0.117	0	0	0.00424	0	0	0.994	0	0.0342	0.00617	0	0.82	1.6	2.42
WWC-1	10.2	457	4680	0.213	7.11	3130	12100	0	0.02	0.0335	0	0	0	0	0	2.41	0.00019	0.00966	0.0145	0	0.33	0.86	1.19
WWC-2	0	57.9	389	0.508	7.86	151	960	0	0.0152	0.0406	0	0	0	0	0	0.243	0	0.0034	0	0	0.69	1.2	1.89
WWC-3	0	27.3	220	1.03	8.02	78	628	0	0.0217	0.0342	0	0	0	0	0	0.241	0	0.00559	0	0	0.2	-0.34	-0.14
WWC-4	1.17	225	1330	0.422	7.37	868	3230	0	0.0131	0.065	0	0	0	0	0	0.879	0	0.00237	0.00238	0	0.27	0.48	0.75
WWC-5	2.87	326	1920	0.366	7.18	1700	5440	0	0.00717	0.0439	0	0	0	0	0	1.33	0	0.00742	0.00312	0	0.41	0.51	0.92
WWC-6																							
WWC-7																							

Date 8/26/2016

Results below reporting limit are recorded as 0.

Round 4

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.53	7.66	-180	1.84	4.1	1.72	1.18
CL-U-2	19.27	7.65	-151	1.81	0	9.25	1.16
CLW-1	18.96	7.85	34	1.55	0	5.66	0.992
CLW-2	19.41	7.7	-177	1.81	0	10.68	1.16
CLW-3	19.1	7.74	-225	1.66	0	10.74	1.07
CLW-4	21.52	7.8	-244	1.54	0	5.07	0.985
CLW-5	20.36	7.74	-195	1.67	45.2	9.17	1.07
CLW-6	18.53	7.79	-235	1.61	0	4.22	1.03
CLW-7	19.86	7.62	-71	1.57	0.01	12.06	1.01
CLW-8	20.81	7.7	-78	1.53	0	5.02	0.976
CLW-9							
CL-U-3							

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	20.11	7.46	-160	4.24	0	3.38	2.72
BA-U-2	17.77	11.83	-224	2.11	9.1	8.94	1.35
BAC-1	22.39	7.33	10	11.8	8.7	2.54	7.3
BAC-2	21.36	7.04	0	10200	0	2.17	6.33
BAC-3	22.52	7.22	34	15.4	0	2.18	9.58
BAC-4	19.45	7.62	-94	2350	0	11.45	1.51
BAC-5	19.21	7.62	-96	2340	0	10.71	1.5
BAC-6	19.95	7.59	9	2650	0	24.99	1.7
BAC-7	19.38	7.56	-77	4270	0	2.75	2.73

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	21.31	7.57	-21	3.25	1.6	14.7	2.08
WW-U-1	20.96	7.12	34	8.06	10.9	3.52	5.08
WW-U-2	19.51	7.41	-63	7.34	4.7	8.24	4.62
WWC-1	20.69	6.94	-34	18400	0	0.54	11.4
WWC-2	17.91	7.64	-153	1720	2.6	3.57	1.1
WWC-3	17.39	7.97	-176	1200	0	0.54	0.766
WWC-4	17.14	7.22	-68	5320	0	2.25	3.35
WWC-5	17.85	7.01	-89	7790	0.9	0.59	4.91
WWC-6							
WWC-7							

Date

Round 5

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.4	424	0.959	7.7	115	912	0	0.037	0.089	0	0	0	0	0	0.217	0	0.00404	0	0	0.25	0.18	0.43
CL-U-2	0	59.5	395	0.99	7.73	113	864	0	0.0269	0.101	0	0	0	0	0	0.206	0	0.00401	0	0	0.36	0.84	1.2
CLW-1	0	38.9	325	1.15	7.8	67.8	824	0	0.0295	0.0668	0	0	0	0	0	0.189	0	0.0043	0	0	0.27	0.19	0.46
CLW-2	0	49.2	422	1.13	7.82	85.3	984	0	0.0258	0.0855	0	0	0	0	0	0.223	0	0.00456	0	0	0.31	0.34	0.65
CLW-3	0	40.8	366	1.19	7.83	100	944	0	0.0412	0.104	0	0	0	0	0	0.214	0	0.00508	0	0	0.35	0.13	0.48
CLW-4	0	34.6	335	1.39	7.84	85.9	828	0	0.0385	0.0932	0	0	0	0	0	0.203	0	0.00414	0	0	0.59	-0.37	0.22
CLW-5	0	35.3	339	1.69	7.89	82.1	928	0	0.0206	0.0812	0	0	0	0	0	0.204	0	0.00723	0	0	0.31	0.84	1.15
CLW-6	0	33.9	325	1.46	7.85	77.9	972	0	0.0287	0.0908	0	0	0	0	0	0.203	0	0.00638	0	0	0.35	0.18	0.53
CLW-7	0	42.8	343	1.14	7.9	68.6	796	0	0.0235	0.0551	0	0	0.00234	0	0	0.182	0	0.00413	0	0	0.27	0.32	0.59
CLW-8	0	41.7	334	1.11	7.77	68.9	744	0	0.0258	0.0797	0	0	0	0	0	0.189	0	0.00428	0	0	0.37	-0.28	0.09
CLW-9																							
CL-U-3																							

Round 5

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.15	7.72	-195	1900	0.7	2.79	1.22
CL-U-2	16.89	7.67	-102	1820	0.4	0.82	1.17
CLW-1	16.85	7.77	-50	1520	2	1.57	0.974
CLW-2	17.05	7.76	-202	1900	0.4	3.82	1.21
CLW-3	15.28	7.75	-231	1720	1.8	1.29	1.1
CLW-4	14.67	7.78	-235	1620	7	1.4	1.04
CLW-5	17.4	7.71	-209	1690	8.1	1.41	1.08
CLW-6	15.85	7.83	-249	1620	1.1	1.72	1.04
CLW-7	17.42	7.7	-73	564	0	13.65	0.361
CLW-8	17.18	7.7	-100	1530	2.2	1.03	0.978
CLW-9							
CL-U-3							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	16.7	327	1.65	9.08	60.2	832	0	0.0362	0.0679	0	0	0	0	0	0.215	0	0.0163	0	0	0.67	0.13	0.8
BA-U-2	0	38.1	357	1.02	8.56	51.9	824	0	0.0234	0.131	0	0	0	0	0	0.21	0	0.00449	0	0	0.57	0.42	0.99
BAC-1	3.42	131	1850	0.437	8.8	1610	7720	0	0.0103	0.049	0	0	0.00612	0	0	0.402	0	0.0498	0.00852	0	0.34	0.27	0.61
BAC-2	9.71	216	1620	1.11	7.34	2980	7040	0	0.0444	0.0228	0	0	0.00644	0	0	0.414	0	0.165	0.0131	0	0.25	-0.03	0.22
BAC-3	7.04	401	3160	0.76	7.39	4260	11400	0	0.0226	0.0404	0	0	0.00362	0	0	0.812	0	0.0275	0.0195	0	0.24	0.14	0.38
BAC-4	0	59.2	534	1.34	7.8	222	1230	0	0.0352	0.0723	0	0	0.00212	0	0	0.243	0	0.00992	0	0	0.09	0.4	0.49
BAC-5	0	40.5	479	1.33	7.85	110	1070	0	0.0359	0.0909	0	0	0	0	0	0.219	0	0.00715	0	0	0.2	-0.01	0.19
BAC-6	4.35	133	606	0.97	7.61	1080	2620	0	0.022	0.0287	0	0	0.00257	0	0	0.266	0	0.0858	0.00369	0	0.13	0.69	0.82
BAC-7	3.97	135	628	1.42	7.69	1340	2880	0	0.0241	0.026	0	0	0.00217	0	0	0.279	0	0.0944	0.00279	0	0.26	1.1	1.36

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.41	9.07	6	1660	3.2	1.88	1.06
BA-U-2	16.67	8.77	-318	1600	1.7	1.76	1.03
BAC-1	18.66	7.57	-144	8800	7.7	0.55	6.19
BAC-2	19.51	7.01	-2	10200	0.6	0.46	6.34
BAC-3	18.63	7.15	2	16700	20	4.99	10.4
BAC-4	16.35	7.72	-120	0.859	3	4.2	0.55
BAC-5	16.43	7.85	-64	726	1.4	12.41	0.464
BAC-6	16.07	7.62	-86	1370	11.4	1.77	0.879
BAC-7	16.64	7.59	-67	1560	4.6	12.42	0.998

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	132	863	0.514	7.52	286	1850	0	0.00895	0.0871	0	0	0	0	0	0.254	0	0.00276	0	0	0.32	0.11	0.43
WW-U-1	1.23	348	2190	0.346	7.18	1230	5370	0	0.0041	0.0771	0	0	0.00538	0	0	0.479	0	0.00891	0.00579	0	0.73	0.17	0.9
WW-U-2	1.47	383	2340	0.416	7.22	1120	5540	0	0.00573	0.0704	0	0	0.00396	0	0	0.512	0	0.0111	0.0116	0	0.78	0.46	1.24
WWC-1	9.83	513	4540	0.133	7.04	2960	12500	0	0.0197	0.0317	0	0	0.00348	0	0	0.819	0.000198	0.00936	0.0153	0	0.23	0.73	0.96
WWC-2	0	58.5	369	0.42	7.88	140	960	0	0.0129	0.0543	0	0	0.0243	0	0	0.112	0	0.00809	0	0	0.1	0.45	0.55
WWC-3	0	27.7	224	1.08	8.01	86.1	612	0	0.0218	0.0332	0	0	0	0	0	0.123	0	0.00543	0	0	0.07	0.1	0.17
WWC-4	1.19	227	1200	0.509	7.32	763	3200	0	0.0136	0.0629	0	0	0	0	0	0.351	0	0.00222	0.00216	0	0.08	0.75	0.83
WWC-5	3.02	343	1850	0.401	0.71	1570	5300	0	0.00778	0.0389	0	0	0.00238	0	0	0.497	0	0.00498	0.0041	0	0.43	1.1	1.53
WWC-6																							
WWC-7																							

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.62	7.47	-22	3370	1	9	2.16
WW-U-1	17.72	6.99	7	8330	3	1.89	5.25
WW-U-2	17.84	7.19	-10	8400	2.6	1.89	5.29
WWC-1	15.78	6.93	-22	18600	0	0.51	11.6
WWC-2	15.91	7.75	-210	1680	6	1.08	1.07
WWC-3	16.26	7.94	-166	1210	0	0.24	0.772
WWC-4	16.51	7.22	-41	5140	0.2	1.09	3.24
WWC-5	15.83	7.02	-87	7930	0.2	0.37	4.99
WWC-6							
WWC-7							

Date 10/17/2016

Results below reporting limit are recorded as 0.

Date

Round 6

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.1	403	0.876	7.83	113	908	0	0.0322	0.0867	0	0	0	0	0	0.214	0	0.00365	0	0	0.62	0.22	0.62
CL-U-2	0	61.2	374	0.903	7.89	110	852	0	0.0272	0.0976	0	0	0	0	0	0.208	0	0.00386	0	0	0.4	0.39	0.4
CLW-1	0	38.4	295	1.05	7.83	62.4	768	0	0.0309	0.0631	0	0	0.0187	0	0	0.185	0	0.00654	0	0	0.41	0.78	1.2
CLW-2	0	49.7	377	1.07	7.85	92.9	936	0	0.0277	0.0811	0	0	0	0	0	0.219	0	0.00437	0	0	0.31	0.72	1
CLW-3	0	42.4	333	1.23	7.87	94.4	876	0	0.0423	0.103	0	0	0	0	0	0.214	0	0.00473	0	0	0.35	0.7	1.1
CLW-4	0	35.2	306	1.27	8.02	79.1	808	0	0.0388	0.0898	0	0	0	0	0	0.202	0	0.00439	0	0	0.39	0.12	0.39
CLW-5	0	36	320	1.71	7.88	79.9	748	0	0.0216	0.0801	0	0	0.00214	0	0	0.025	0	0.00666	0	0	0.4	0.38	0.4
CLW-6	0	33.4	302	1.48	7.91	66	752	0	0.0164	0.0976	0	0	0	0	0	0.193	0	0.00805	0	0	0.25	-0.35	0.25
CLW-7	0	46.4	312	1.02	7.68	61	824	0	0.0257	0.0545	0	0	0.00772	0	0	0.182	0	0.00425	0	0	0.14	0.18	0.14
CLW-8	0	42.8	301	1.03	7.71	63.8	772	0	0.0255	0.0707	0	0	0.012	0	0	0.189	0	0.00526	0	0	0.25	0.29	0.25
CLW-9																							
CL-U-3																							

Round 6

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.27	7.52	-194	957	4.2	2.53	0.613
CL-U-2	15.81	7.48	-139	929	0	10.45	0.598
CLW-1	14.45	7.6	-173	1540	0	5.98	0.984
CLW-2	16.63	7.58	-221	950	0	9.29	0.609
CLW-3	16.58	7.66	-235	840	0	10.64	0.539
CLW-4	16.67	7.68	-253	785	0	2.14	0.502
CLW-5	16.63	7.6	-222	834	0	2.29	0.534
CLW-6	15.51	7.65	-245	790	0	8.85	0.505
CLW-7	15.48	7.52	-150	1600	0	1.94	1.02
CLW-8	15.08	7.57	-159	1550	0	1.55	0.991
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	24.5	259	1.57	8.59	48.8	648	0	0.0359	0.0856	0	0	0	0	0	0.193	0	0.0124	0	0	0.28	0.15	0.28
BA-U-2	0	3.76	328	0.886	12.1	39.2	728	0	0.00254	0.122	0	0	0	0	0	0.221	0	0.00986	0	0	0.3	0.47	0.3
BAC-1	4.01	188	2170	0	7.47	1650	6320	0	0.0202	0.279	0	0	0.0412	0	0	0.429	0	0.0391	0.0152	0	1.1	1.5	2.6
BAC-2	10.5	193	1480	0.871	7.2	2780	7320	0	0.0469	0.022	0	0	0.0145	0	0	0.44	0	0.194	0.0144	0	0.34	0.22	0.56
BAC-3	7.57	408	3140	0	7.36	4290	13000	0	0.0239	0.0376	0	0	0.00447	0	0	0.974	0	0.026	0.0211	0	0.2	0.5	0.7
BAC-4	0	59	461	1.13	7.68	206	1260	0	0.0362	0.0705	0	0	0.011	0	0	0.237	0	0.012	0	0	0.13	0.18	0.13
BAC-5	0	59.5	576	0.994	7.73	190	1430	0	0.032	0.0893	0	0	0.00204	0	0	0.277	0	0.00666	0	0	0.21	0.24	0.45
BAC-6	4.44	128	594	0.763	7.6	1040	2500	0	0.0237	0.0269	0	0	0.00205	0	0	0.28	0	0.0873	0.0045	0	0.12	-0.21	-0.09
BAC-7	3.31	151	591	0.936	7.43	1140	3120	0	0.0237	0.0253	0	0	0	0	0	0.327	0	0.0702	0.007	0	0.21	0.7	0.91

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.08	8.22	55	783	1.8	6.02	0.501
BA-U-2	17.77	11.71	-250	2120	1.9	7.87	1.36
BAC-1	16.44	7.24	-131	9640	11.2	2.14	6.07
BAC-2	15.89	6.86	-53	10400	0.1	0.6	6.44
BAC-3	15.61	7.1	-44	18000	3.4	0.5	11.2
BAC-4	14.42	7.58	-165	2400	0	2.76	1.53
BAC-5	15.18	7.53	-155	2550	0.1	0.57	1.63
BAC-6	16.07	7.42	-115	4030	0	0.32	2.58
BAC-7	16.54	7.34	-124	4780	1.5	0.38	3.06

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	131	785	0.458	7.54	247	1760	0	0.00941	0.08	0	0	0	0	0	0.25	0	0.00227	0	0	0.33	0.24	0.33
WW-U-1	1.15	336	1880	0.2	7.26	1180	4890	0	0.00593	0.0568	0	0	0	0	0	0.477	0	0.00558	0.00583	0	0.53	0.89	1.42
WW-U-2	0.6	317	1860	0.438	7.38	734	4300	0	0.00355	0.095	0	0	0	0	0	0.479	0	0.021	0.00749	0	0.51	1.6	2.11
WWC-1	11.2	479	4510	0	6.98	2940	12200	0	0.0213	0.0288	0	0	0	0	0	0.932	0.000328	0.00995	0.0149	0	0.26	1.1	1.36
WWC-2	0	52	318	0.405	7.79	125	856	0	0.0149	0.0361	0	0	0	0	0	0.122	0	0.00357	0	0	0.17	0.61	0.78
WWC-3	0	25.7	195	0.852	8.13	76	680	0	0.0227	0.0302	0	0	0.00309	0	0	0.137	0	0.00537	0	0	0.24	-0.21	0.03
WWC-4	1.3	233	1250	0.319	7.38	819	3230	0	0.0135	0.061	0	0	0	0	0	0.382	0	0	0.00239	0	0.18	-0.2	-0.02
WWC-5	1.72	318	1520	0.292	7.13	1190	4560	0	0.01	0.0501	0	0	0	0	0	0.555	0	0.00523	0.00399	0	0.23	0.95	1.18
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.03	7.37	-45	3340	1.1	8.42	2.14
WW-U-1	18.15	6.96	-57	7980	11.5	1.02	5.02
WW-U-2	17.03	7.29	-15	7470	2.3	1.36	4.71
WWC-1	15.08	6.74	-32	19700	0.3	1.8	12.2
WWC-2	15.4	7.75	-134	1650	1	0.44	1.06
WWC-3	15.31	8.09	207	1230	1.2	0.22	0.784
WWC-4	15.85	7.18	-70	5390	0.5	3.15	3.39
WWC-5	16.2	6.84	-61	7180	0	0.62	4.52
WWC-6							
WWC-7							

Date 3/23/2017

Results below reporting limit are recorded as 0.

Date

Round 7

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	53	480	0.996	7.74	132	1010	0	0.0344	0.0826	0	0.00065	0	0	0	0.202	0	0.00402	0	0	0.36	0.95	1.31
CL-U-2	0	55.1	444	1	7.8	134	952	0	0.0247	0.0938	0	0	0	0	0	0.19	0	0.00408	0	0	2.7	1	3.7
CLW-1	0	36.4	322	1.06	7.85	68.2	772	0	0.0289	0.0615	0	0	0	0	0	0.173	0	0.00389	0	0	0.2	0.14	0.34
CLW-2	0	44.7	436	1.19	7.83	102	964	0	0.0246	0.0754	0	0	0.00411	0	0	0.211	0	0.00461	0	0	0.24	1	1.24
CLW-3	0	37.3	380	1.23	7.85	106	856	0	0.0378	0.0951	0	0	0	0	0	0.197	0	0.00498	0	0	0.27	0.29	0.56
CLW-4	0	30.6	345	1.44	7.89	86.3	816	0	0.0352	0.0885	0	0	0	0	0	0.189	0	0.00481	0	0	0.29	0.3	0.59
CLW-5	0	32.4	358	1.82	7.86	91.6	860	0	0.0203	0.0732	0	0	0	0	0	0.188	0	0.00572	0	0	1.4	1.2	2.6
CLW-6	0	31	336	1.61	7.9	77.5	768	0	0.02	0.0893	0	0	0	0	0	0	0.183	0	0.0068	0	0.01	0.5	0.51
CLW-7	0	41.5	352	1.01	7.88	70.4	832	0	0.0241	0.0514	0	0	0	0	0	0.169	0	0.0033	0	0	0.14	0.75	0.89
CLW-8	0	38.4	339	1.02	7.81	73.1	812	0	0.0239	0.0681	0	0	0	0	0	0.176	0	0.00391	0	0	0.18	0.81	0.99
CLW-9																							
CL-U-3																							

Round 7

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.35	7.59	-206	1920	0	1.51	1.23
CL-U-2	15.98	7.5	-177	1860	0	1.62	1.19
CLW-1	18.47	7.79	-160	768	0	0.9	0.491
CLW-2	16.77	7.73	-210	945	0	1.52	0.605
CLW-3	17.35	7.78	-246	879	0	213	0.562
CLW-4	17.86	7.75	-252	1580	0	4.35	1.01
CLW-5	18.97	7.66	-232	1680	0	2.65	1.08
CLW-6	16.95	7.75	-258	1590	0	5.1	1.02
CLW-7	18.07	7.7	-131	805	0	2.21	0.516
CLW-8	17.59	7.74	-130	776	0	1.58	0.497
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	26.3	317	1.75	8.32	52.9	776	0	0.0323	0.0901	0	0	0	0	0	0.191	0	0.0109	0	0	0.15	0.73	0.88
BA-U-2	0	3.58	366	0.821	11.8	39.6	748	0	0	0.0899	0	0	0	0	0	0.215	0	0.0086	0	0	0.09	0.98	1.07
BAC-1	1.91	88.7	914	0.266	8.92	702	2920	0	0.0145	0.0563	0	0	0.00666	0	0	0.305	0	0.0317	0.00643	0	0.2	0.99	1.19
BAC-2	10.6	216	1730	0	7.21	3260	7720	0	0.042	0.0211	0	0	0.00799	0	0	0.586	0	0.177	0.0138	0	0.14	0.64	0.78
BAC-3	7.76	401	3510	0	7.29	4900	13200	0	0.0251	0.0316	0	0	0.00858	0	0	1.17	0	0.0292	0.0212	0	0.3	0.76	1.06
BAC-4	0	56.1	612	1.13	7.84	212	1220	0	0.0329	0.0666	0	0	0	0	0	0.228	0	0.0113	0	0	0.37	0.47	0.84
BAC-5	0	58.3	654	1.1	7.76	217	1180	0	0.0297	0.0881	0	0	0	0	0	0.259	0	0.00728	0	0	0.31	0.28	0.59
BAC-6	4.25	135	697	0.779	7.63	1110	2810	0	0.0229	0.0256	0	0	0	0	0	0.257	0	0.0921	0.00414	0	0.24	0.76	1
BAC-7	3.4	146	632	0.864	7.78	1290	3170	0	0.0154	0.0288	0	0	0.00398	0	0	0.36	0	0.0888	0.00457	0	2.5	0.88	3.38

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.46	8.13	-138	1500	0	2.32	0.963
BA-U-2	19.9	11.43	-301	1870	0	0.58	1.2
BAC-1	22.57	9.92	-118	5180	15.6	2.32	3.27
BAC-2	19.02	7.09	-80	10900	2.2	0.84	6.76
BAC-3	18.87	7.1	-69	17800	3.2	1.02	11
BAC-4	17.01	7.62	-158	2380	0	1.61	1.52
BAC-5	17.31	7.69	-131	2560	0	2.62	1.64
BAC-6	19.46	7.59	-128	3900	35.2	0.85	2.5
BAC-7	17.97	7.5	-147	4610	2.9	1.16	2.95

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	116	763	0.522	7.56	427	1800	0	0.0101	0.0599	0	0.00128	0.00274	0	0	0.235	0	0.00233	0	0	0.2	1.3	1.5
WW-U-1	1.18	312	2340	0.181	7.41	1450	4540	0	0.00568	0.0521	0	0	0.00212	0	0	0.441	0	0.00556	0.00625	0	1.2	1.5	2.7
WW-U-2	0.741	338	2590	0.287	7.36	1040	12500	0	0.00325	0.0803	0	0	0.067	0	0	0.512	0	0.0226	0.00846	0	0.52	1.6	2.12
WWC-1	9.88	413	4410	0	7.14	2770	11000	0	0.0173	0.0326	0	0	0	0	0	1.11	0.000175	0.0147	0.0147	0	0.39	1.5	1.89
WWC-2	0	49.5	326	0.447	7.85	134	832	0	0.0141	0.0339	0	0	0	0	0	0.138	0	0.00405	0	0	0.24	0.24	0.48
WWC-3	0	25.9	220	0.974	8.12	84.3	696	0	0.0214	0.0281	0	0	0	0	0	0.146	0	0.00504	0	0	0.1	0.45	0.55
WWC-4	1.33	229	1330	0.466	7.22	912	3060	0	0.013	0.0545	0	0	0	0	0	0.421	0	0	0.00241	0	0.22	0.74	0.96
WWC-5	2.25	287	1790	0	7.49	1420	4810	0	0.00753	0.0379	0	0	0.00202	0	0	0.567	0	0.00531	0.00336	0	0.2	1.5	1.7
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.96	7.27	-138	3170	0	0.57	2.03
WW-U-1	18.63	6.87	-32	8050	0	1	5.07
WW-U-2	18.21	7.22	-161	7610	0	0.91	4.79
WWC-1	16.96	6.95	-34	15200	0.1	0.67	9.48
WWC-2	16.11	7.72	-169	1500	1.3	0.94	0.96
WWC-3	16.94	7.99	-194	1210	0.7	0.63	0.773
WWC-4	16.15	7.16	-73	5.48	0.5	0.6	3.46
WWC-5	16.54	7.01	-42	7225	0.9	0.76	4.57
WWC-6							
WWC-7							

Date

Results below reporting limit are recorded as 0.

Date

Round 8

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	52.1	422	1.07	7.73	116	1130	0	0.0291	0.088	0	0	0	0	0	0.228	0	0.00398	0	0	0.25	1.6	1.85
CL-U-2	0	53.8	390	1.1	7.67	120	1060	0	0.0262	0.0941	0	0	0	0	0	0.212	0	0.00415	0	0	0.17	1.4	1.57
CLW-1	0	35.7	310	1.15	7.85	71.7	808	0	0.0308	0.0614	0	0	0	0	0	0.192	0	0.00407	0	0	0.21	1.7	1.91
CLW-2	0	43.5	407	1.23	7.76	97.3	1040	0	0.0257	0.0793	0	0	0	0	0	0.229	0	0.00467	0	0	0.12	3	3.12
CLW-3	0	36.2	347	1.34	7.8	100	884	0	0.0408	0.102	0	0	0	0	0	0.223	0	0.00474	0	0	0.16	1.1	1.26
CLW-4	0	30.5	313	1.6	7.81	85.1	856	0	0.0333	0.09	0	0	0.0516	0	0	0.199	0	0.0115	0	0	0.24	1.8	2.04
CLW-5	0	33.2	344	1.82	7.8	88.5	824	0	0.023	0.0727	0	0	0	0	0	0.211	0	0.0052	0	0	0.2	2.2	2.4
CLW-6	0	30.5	317	1.73	7.82	74.5	828	0	0.0143	0.0961	0	0	0	0	0	0.199	0	0.00721	0	0	0.29	1.7	1.99
CLW-7	0	45.5	319	1.11	7.7	64.5	868	0	0.0244	0.0539	0	0	0	0	0	0.189	0	0.00389	0	0	0.45	0.95	1.4
CLW-8	0	37.9	319	1.13	7.77	70.6	788	0	0.0252	0.0689	0	0	0	0	0	0.192	0	0.00431	0	0	0.25	1.6	1.85
CLW-9																							
CL-U-3																							

Round 8

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.07	7.45	-199	1930	0.4	0.56	1.24
CL-U-2	15.67	7.43	-176	1880	0.8	0.58	1.2
CLW-1	20.49	7.68	-172	1.48	0	0.41	0.949
CLW-2	16.63	7.63	-199	1880	0.7	0.64	1.2
CLW-3	16.82	7.59	-251	1750	1.5	2.9	1.12
CLW-4	17.63	7.56	-269	1620	1.6	1.56	1.03
CLW-5	17.21	7.71	-244	1690	3.7	1.12	1.09
CLW-6	15.97	7.75	-259	1.6	2.3	3.3	1.02
CLW-7	16.72	7.59	-147	1640	0	0.86	1.05
CLW-8	18.26	7.65	-145	1.53	1.1	1.89	0.975
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	169	1040	1.02	7.53	343	2310	0	0.0215	0.0745	0	0	0	0	0	0.368	0	0.00296	0.00375	0	0.07	1.3	1.37
BA-U-2	0	46.3	479	0.993	8.04	53.7	1140	0	0.0249	0.156	0	0	0	0	0	0.241	0	0.00294	0	0	0.24	1.5	1.74
BAC-1	4.86	229	2620	0.854	7.4	2150	8400	0	0.0148	0.702	0	0	0.114	0.00461	0	0.52	0	0.0467	0.0174	0	0.39	1.6	1.99
BAC-2	10.1	221	1690	1.33	7.62	2970	7940	0	0.0469	0.0202	0	0	0.00547	0	0	0.431	0	0.154	0.0149	0	0.11	0.14	0.25
BAC-3	8.76	353	3370	2.51	7.43	5340	12700	0	0.054	0.0306	0	0	0.0114	0	0	0.897	0	0.0525	0.0287	0	0.23	1.3	1.53
BAC-4	0	62.4	482	1.26	7.76	231	1280	0	0.0359	0.0703	0	0	0	0	0	0.262	0	0.0139	0	0	0.1	2.5	2.6
BAC-5	0	67.5	593	1.17	7.74	269	1450	0	0.0325	0.0877	0	0	0	0	0	0.294	0	0.00838	0	0	0.26	2.7	2.96
BAC-6	0.978	77.2	516	1.01	7.97	301	1510	0	0.0156	0.0833	0	0	0	0	0	0.265	0	0.0213	0	0	0.27	3.8	4.07
BAC-7	3.41	144	633	1.15	7.65	1220	2990	0	0.0191	0.0223	0	0	0	0	0	0.285	0	0.074	0.00446	0	0.15	0.84	0.99

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.04	7.21	-166	4300	1.7	0.78	2.75
BA-U-2	16.58	8.07	-272	2030	0	1.63	1.3
BAC-1	15.36	6.93	-28	7170	1	0.54	4.52
BAC-2	16.95	6.92	-20	11500	2	0.9	7.11
BAC-3	16.87	7.07	-102	18.7	43.3	0.94	11.6
BAC-4	16.67	7.68	-148	2470	1.1	0.62	1.58
BAC-5	16.66	7.71	-140	2740	0.8	1.12	1.75
BAC-6	17.02	7.83	-47	2610	0.9	2.54	1.67
BAC-7	15.97	7.45	-121	4500	3.3	2.56	2.88

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	110	820	0.618	7.55	263	1810	0.002	0.00969	0.0783	0	0	0	0	0	0.257	0	0.00251	0	0	0.44	0.56	1
WW-U-1	1.2	311	2130	0.539	7.23	1280	5260	0	0.0055	0.0545	0	0	0.003309	0	0	0.459	0	0.00792	0.00697	0	0.34	1.2	1.54
WW-U-2	1.66	314	2280	0.721	7.31	1220	5510	0	0.0104	0.0659	0	0	0.00415	0	0	0.485	0	0.00647	0.0122	0	0.24	1.3	1.54
WWC-1	9.55	492	4430	0.507	7.37	2990	11500	0	0.0177	0.0272	0	0	0	0	0	0.755	0.000262	0.0068	0.014	0	0.26	1.2	1.46
WWC-2	0	53.6	347	0.452	7.78	137	936	0	0.0142	0.0361	0	0	0	0	0	0.112	0	0.00341	0	0	0.04	1.2	1.24
WWC-3	0	25.3	207	1.13	8.14	84	704	0	0.0207	0.0242	0	0	0	0	0	0.127	0	0.00477	0	0	0.08	2	2.08
WWC-4	1.11	201	1100	0.57	7.38	744	3280	0	0.0135	0.0529	0	0	0	0	0	0.313	0	0	0.00214	0	0.38	0.4	0.78
WWC-5	1.48	327	1620	0.544	7.16	1240	4590	0	0.0104	0.0438	0	0	0	0	0	0.496	0	0.00395	0.00407	0	0.41	0.65	1.06
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.02	7.36	-123	3490	0	1.25	2.24
WW-U-1	16.41	6.96	-135	8820	0.7	1.56	5.56
WW-U-2	16.68	7.09	-34	9.23	0.6	3.75	5.82
WWC-1	16.21	6.78	48	18900	0.8	1.92	11.7
WWC-2	16.38	7.64	-110	1740	1	2.87	1.12
WWC-3	15.49	8.16	-207	1220	1.3	0.45	0.781
WWC-4	16.11	7.17	-77	4980	1.2	0.46	3.19
WWC-5	15.42	6.94	-31	7180	1.3	0.53	4.52
WWC-6							
WWC-7							

Date

Results below reporting limit are recorded as 0.

Date

Round 9

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	62.6	402	0.971	7.66	94.9	1090	0	0.0283	0.0758	0	0	0.000529	0	0	0.209	0	0.00359	0	0	0.18	0.81	0.99
CL-U-2	0	64.1	352	0.895	7.65	92.7	980	0	0.0236	0.0873	0	0	0	0	0	0.194	0	0.00376	0	0	0.34	0.16	0.5
CLW-1	0	37.8	318	1.02	7.67	59.5	720	0	0.0265	0.053	0	0	0.0271	0	0	0.179	0	0.0068	0	0	0.09	0.53	0.62
CLW-2	0	51.4	421	1.13	7.8	79.4	1020	0	0.0258	0.0711	0	0	0	0	0	0.212	0	0.00439	0	0	0.24	0.94	1.18
CLW-3	0	42.8	334	1.23	7.86	82.3	956	0	0.0364	0.089	0	0	0.000505	0	0	0.2	0	0.00464	0	0	0.37	0.94	1.31
CLW-4	0	35.8	301	1.35	7.77	70.4	864	0	0.0352	0.0788	0	0	0.000762	0	0	0.189	0	0.00477	0	0	0.46	0.59	1.05
CLW-5	0	37.4	354	1.71	7.66	79.9	876	0	0.021	0.0671	0	0	0.000712	0	0	0.194	0	0.0054	0	0	0.15	0.96	1.11
CLW-6	0	34.2	292	1.62	7.74	60.4	916	0	0.0104	0.0885	0	0	0.000612	0	0	0.182	0	0.00729	0	0	0.56	0.48	1.04
CLW-7	0	47	316	0.972	7.59	51.3	792	0	0.0215	0.0475	0		0	0	0	0.183	0	0.00341	0	0	0.28	0.22	0.5
CLW-8	0	44.1	303	0.981	7.63	54.2	792	0	0.0231	0.0609	0	0	0	0	0	0.188	0	0.00376	0	0	0.25	0.8	1.05
CLW-9																							
CL-U-3																							

Round 9

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	14.91	7.28	-193	1940	0.6	0.54	1.24
CL-U-2	14.84	7.24	-174	1890	0.2	0.67	1.21
CLW-1	16.76	7.7	-186	1530	0.2	0.7	0.98
CLW-2	15.47	7.6	-204	1880	0.4	0.96	1.22
CLW-3	16.64	7.49	-236	1720	0	1.61	1.1
CLW-4	16.15	7.51	-259	1610	0	2.2	1.03
CLW-5	16.46	7.43	-239	1720	3	1	1.1
CLW-6	15.56	7.47	-250	1600	0.1	3.61	1.03
CLW-7	18.88	7.52	-123	1570	0	1.89	1
CLW-8	18.47	7.58	-129	1520	0	0.45	0.973
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	33.5	296	1.64	8.05	50.7	872	0	0.0276	0.0837	0	0	0.00126	0	0	0.199	0	0.00914	0.0022	0	0.07	0.31	0.38
BA-U-2	0	46.2	399	0.943	8.2	46.9	1080	0	0.0227	0.125	0	0	0	0	0	0.209	0	0.00311	0.000691	0	0.12	0.34	0.46
BAC-1	3.88	192	1890	0.507	7.63	1470	6120	0.00138	0.0127	0.0501	0	0	0.00451	0	0	0.581	0	0.028	0.00924	0	0.31	0.48	0.79
BAC-2	9.89	283	1940	1.32	7.72	3070	8590	0	0.0508	0.0238	0	0	0.00777	0	0	0.524	0	0.142	0.0173	0	0.29	0.89	1.18
BAC-3	7.91	417	3480	1.62	7.84	4460	13000	0	0.0441	0.0331	0	0	0.00468	0	0	1.05	0	0.0396	0.0228	0	0.28	1.25	1.53
BAC-4	0	67.4	489	1.14	7.74	221	1300	0	0.0316	0.0605	0	0	0	0	0	0.249	0	0.0143	0	0	0.1	0.81	0.91
BAC-5	0	74.8	524	1.07	7.68	234	1480	0	0.0275	0.0706	0	0	0	0	0	0.284	0	0.00915	0	0	0.24	0.5	0.74
BAC-6	4.58	145	595	1.15	7.48	1100	2600	0	0.0214	0.0227	0	0	0	0	0	0.28	0	0.0898	0.00249	0	0.08	0.72	0.8
BAC-7	4.51	137	1980	0.388	7.57	1100	2730	0	0.0235	0.0195	0	0	0	0	0	0.288	0	0.0752	0.0048	0	0.14	0.71	0.85

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	15.13	7.78	-33	1600	0.6	3.82	1.02
BA-U-2	16.14	8.65	-281	1750	0.2	0.25	1.12
BAC-1	16.99	7.23	-189	9190	8.1	0.52	5.79
BAC-2	15.94	6.82	-77	12000	1.2	0.51	7.44
BAC-3	15.37	7.03	-82	18900	5	3.65	11.7
BAC-4	15.79	7.47	-150	2500	0.5	0.7	1.6
BAC-5	18.41	7.47	-149	2570	0.5	3.97	1.63
BAC-6	19.15	7.32	-92	3810	0.5	0.55	2440
BAC-7	19.26	7.4	-101	4190	3	3.14	2.68

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	129	739	0.506	7.5	201	1840	0	0.00929	0.0741	0	0	0.00137	0	0	0.241	0	0.00227	0	0	0.04	0.73	0.77
WW-U-1	1.34	339	1900	0.406	7.05	1050	5280	0	0.005	0.0486	0	0	0.00193	0	0	0.436	0	0.00702	0.00653	0	0.45	0.91	1.36
WW-U-2	1.47	370	2010	0.532	7.16	925	5260	0	0.00642	0.0499	0	0	0.00144	0	0	0.475	0	0.00467	0.0115	0	0.34	0.94	1.28
WWC-1	11.9	638	4100	0.236	6.89	2640	12700	0	0.02	0.0209	0	0	0	0	0	0.805	0.000205	0.00596	0.015	0	0.25	1.21	1.46
WWC-2	0	57.2	308	0.41	7.62	111	784	0	0.014	0.031	0	0	0	0	0	0.104	0	0.00356	0	0	0.1	0.55	0.65
WWC-3	0	28.9	200	0.985	7.96	67.8	628	0	0.0214	0.0245	0	0	0	0	0	0.131	0	0.00464	0	0	0.07	0.27	0.34
WWC-4	1.19	200	1010	0.365	7.3	593	2790	0	0.0128	0.0463	0	0	0	0	0	0.355	0	0	0	0	0.22	0.58	0.8
WWC-5	2.86	321	1600	0.384	6.92	1450	5030	0	0.0096	0.0302	0	0	0	0	0	0.511	0	0.00301	0.00415	0	0.2	1.64	1.84
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.11	7.56	-31	3240	0	0.71	2.07
WW-U-1	16.35	7.11	-75	8010	0.7	0.4	5.03
WW-U-2	16.11	7.27	-10	8450	0.2	0.47	5.32
WWC-1	16.03	6.65	-17	19900	0	2.51	12.4
WWC-2	15.75	7.52	-124	1650	0.4	0.55	1.05
WWC-3	14.89	7.81	-190	1250	1.1	0.79	0.8
WWC-4	16.17	7.26	-64	4600	2.3	0.37	2.92
WWC-5	17.27	7.02	-36	7300	0	0.34	4.6
WWC-6							
WWC-7							

Date 3/26/2018

Results below reporting limit are recorded as 0.

Date

Round 10

Results

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	54.7	372	0.853	7.7	98	984	0	0.0272	0.0799	0	0	0	0	0	0.208	0	0.00361	0	0	0.18	0.67	0.85
CL-U-2	0	56.4	365	0.862	7.64	108	952	0	0.0242	0.09	0	0	0	0	0	0.195	0	0.0038	0	0	-0.02	0.67	0
CLW-1	0	35.2	298	1.02	7.93	57.8	748	0	0.0285	0.0568	0	0	0.00102	0	0	0.184	0	0.00388	0.000928	0	0.29	1.01	1.3
CLW-2	0	44.6	399	1.14	7.79	86.8	980	0	0.0247	0.072	0	0	0	0	0	0.222	0	0.00433	0	0	0.25	0.96	1.21
CLW-3	0	37.5	323	1.16	7.91	94.2	876	0	0.0382	0.0948	0	0	0	0	0	0.214	0	0.00483	0	0	0.18	0.55	0
CLW-4	0	31.8	289	1.35	7.91	76.4	836	0	0.0358	0.0801	0	0	0	0	0	0.204	0	0.00459	0	0	0.13	0.85	0.85
CLW-5	0	33.1	318	1.59	7.79	75.3	804	0	0.0215	0.0689	0	0	0	0	0	0.21	0	0.00519	0	0	0.11	0.76	0
CLW-6	0	29.9	292	1.45	7.88	66.3	796	0	0.0109	0.0902	0	0	0	0	0	0.199	0	0.00711	0	0	0.27	0.85	1.12
CLW-7	0	40.6	321	0.945	7.68	58.6	900	0	0.0234	0.0514	0	0	0	0	0	0.186	0	0.00329	0	0	0.16	0.97	0.97
CLW-8	0	38.8	314	0.933	7.73	63.5	768	0	0.0244	0.0632	0	0	0	0	0	0.188	0	0.00359	0	0	0.18	1.26	1.26
CLW-9																							
CL-U-3																							

Results

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	140	799	0.818	7.54	254	1970	0	0.0199	0.0636	0	0	0.000506	0	0	0.337	0	0.00279	0.00324	0	0.39	1.94	2.33
BA-U-2	0	70.1	578	0.73	7.68	63.5	1330	0	0.0208	0.145	0	0	0	0	0	0.279	0	0.00215	0.00201	0	0.16	1.13	1.13
BAC-1	2.16	113	1190	0.315	7.92	971	3120	0.00158	0.0141	0.0393	0	0	0.00714	0	0	0.314	0	0.0288	0.00694	0	0.24	1.06	1.3
BAC-2	8.44	263	2210	0.684	7.1	3430	7720	0	0.0445	0.021	0	0	0.00483	0	0	0.463	0	0.143	0.0154	0	0.12	1.03	1.03
BAC-3	7.26	347	3870	1.52	7.42	5080	12700	0	0.0588	0.0327	0	0	0.00511	0	0	0.944	0	0.0467	0.0229	0	0.27	1.44	1.71
BAC-4	0	62.8	510	1.01	7.95	221	1290	0	0.0322	0.0672	0	0	0	0	0	0.247	0	0.0165	0	0	0.06	0.92	0
BAC-5	0	73.5	591	0.916	7.82	302	1180	0	0.0292	0.0763	0	0	0	0	0	0.288	0	0.0128	0	0	0.19	1.56	1.75
BAC-6	4.12	134	694	0.582	7.65	1120	2980	0	0.0217	0.0235	0	0	0	0	0	0.25	0	0.0938	0.00229	0	0.14	1.02	1.02
BAC-7	4.36	130	709	1.09	7.74	1280	2760	0	0.0275	0.0204	0	0	0	0	0	0.269	0	0.0757	0.00541	0	0.06	0.87	0

Results

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	123	873	0.499	7.62	209	2040	0	0.00839	0.0653	0	0	0.000602	0	0	0.254	0	0.00182	0	0	0.32	1.34	1.66
WW-U-1	1.19	289	1940	0.265	7.17	1140	5450	0	0.00477	0.0479	0	0	0.00124	0	0	0.443	0	0.00591	0.00663	0	0.23	1.49	1.72
WW-U-2	1.23	337	2130	1.01	7.3	985	5120	0	0.0102	0.0459	0	0	0.00137	0	0	0.508	0	0.00277	0.0112	0	0.05	0.93	0.93
WWC-1	8.22	504	4710	0.114	7.2	2730	11100	0	0.0173	0.0268	0	0	0	0	0	0.831	0.000168	0.00896	0.0139	0	0.25	1.16	1.16
WWC-2	0	50	340	0.358	7.91	119	852	0	0.0143	0.0338	0	0	0	0	0	0.11	0	0.00372	0	0	0.08	0.27	0
WWC-3	0	27.3	230	0.897	8.05	88.4	644	0	0.0226	0.0278	0	0	0	0	0	0.125	0	0.00527	0	0	-0.03	0.15	0
WWC-4	0.998	184	1080	0.435	7.43	620	2640	0	0.0129	0.0495	0	0	0	0	0	0.309	0	0.00215	0.00201	0	0.28	0.35	0
WWC-5	2.64	314	1820	0.219	7.26	1660	5200	0	0.0104	0.0327	0	0	0	0	0	0.472	0	0.00324	0.00395	0	0.1	1.58	1.58
WWC-6																							
WDB-7																							

Date 6/7/2018

Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:

Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
0.001	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Round 10

Field Results

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.54	7.56	-196	1888	1.7	0.39	1.2
CL-U-2	17.81	7.55	-171	1830	0.7	2.53	1.17
CLW-1	19.97	7.67	-159	1480	2.1	4.08	9.45
CLW-2	17.54	7.63	-220	1830	4.5	0.63	1.18
CLW-3	17.95	7.73	-260	1680	5.5	1.57	1.07
CLW-4	17.85	7.73	-278	1570	2.8	1.64	1
CLW-5	17.16	7.72	-276	1660	8.2	1.29	1.07
CLW-6	17.86	7.83	-280	1570	8	2.56	1.01
CLW-7	17.32	7.6	-150	1610	15.7	3.84	1.03
CLW-8	17.1	7.61	-194	1550	2	0.73	0.985
CLW-9							
CL-U-3							

Field Results

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	19.26	7.41	-163	3640	1	0.46	2.33
BA-U-2	18.16	7.63	-187	2370	2.1	1.31	1.51
BAC-1	17.87	8.86	-418	6480	53.2	2.95	4.04
BAC-2	16.94	6.98	-63	12400	2.3	4.29	7.68
BAC-3	17.19	7.16	-356	18300	15.2	0.87	11.4
BAC-4	17.11	7.64	-149	2500	1.5	0.75	1.6
BAC-5	17.63	7.61	-126	2850	1.2	0.65	1.83
BAC-6	17.58	7.51	-112	4210	0	0.51	2.63
BAC-7	17.32	7.6	-127	4440	0	0.56	2.84

Field Results

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	18.38	7.39	-108	3510	1.7	0.79	2.25
WW-U-1	21.81	6.92	-77	8180	0.1	0.51	5.14
WW-U-2	18.76	7.09	-16	8130	7.6	1.06	5.12
WWC-1	16.92	6.94	-84	15600	1.5	4.48	9.65
WWC-2	17.4	7.75	-163	1570	1.2	0.4	1
WWC-3	17.01	7.89	-191	1220	2.6	0.42	0.782
WWC-4	18.39	7.27	-106	4320	2.4	1.17	2.77
WWC-5	15.81	6.98	-84	7740	0.8	0.58	4.88
WWC-6							
WWC-7							

Date

Round 11 (all results ppm)

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	0	61.9	415	0.981	7.79	122	1060	0	0.029	0.0796	0	0	0	0	0	0.229	0	0.00383	0	0	0.09	0.32	0
CL-U-2	0	67.5	414	0.995	7.73	128	1010	0	0.0255	0.0919	0	0	0	0	0	0.212	0	0.00408	0	0	0.12	0.94	0.94
CLW-1	0	39.6	288	1.06	7.76	61.9	784	0	0.0298	0.0582	0	0	0.0157	0	0	0.194	0	0.00589	0	0	0.11	1.2	1.2
CLW-2	0	49.7	475	1.19	7.72	88.1	904	0	0.0244	0.0716	0	0	0.014	0	0	0.227	0	0.00593	0	0	0.17	0.39	0
CLW-3	0	42	325	1.27	7.79	95	888	0	0.0384	0.0941	0	0	0	0	0	0.217	0	0.0052	0	0	0.33	0.68	0
CLW-4	0	35.2	297	1.45	7.85	80.7	792	0	0.0375	0.0786	0	0	0	0	0	0.211	0	0.00525	0	0	1.89	0.65	1.89
CLW-5	0	36.9	320	1.7	7.72	85.3	852	0	0.0229	0.0714	0	0	0.00999	0	0	0.213	0	0.00679	0	0	1.87	0.17	1.87
CLW-6	0	33.8	292	1.6	7.82	73.3	804	0	0.0152	0.0873	0	0	0.0116	0	0	0.204	0	0.00746	0	0	0.18	0.41	0
CLW-7	0	46.5	399	1.02	7.65	73.2	780	0	0.0232	0.0491	0	0	0	0	0	0.19	0	0.00416	0	0	0.05	0.07	0
CLW-8	0	43	300	1.04	7.71	66.5	796	0	0.0254	0.0643	0	0	0	0	0	0.192	0	0.00503	0	0	0.19	1.2	1.2
CLW-9																							
CL-U-3																							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	0	73.9	561	0.881	7.97	62.2	1050	0	0.0216	0.149	0	0	0	0	0	0.276	0	0.00237	0	0	0.44	0.74	1.18
BA-U-2	0	143	885	0.977	7.58	298	1750	0	0.0209	0.0728	0	0	0.0125	0	0	0.321	0	0.00574	0	0	0.22	0.62	0
BAC-1	4.87	225	1840	0.582	7.57	1760	6420	0	0.0129	0.0391	0	0	0.0184	0	0	0.629	0	0.0232	0.00818	0	0.45	0.88	0
BAC-2	9.98	255	1660	1.1	7.35	2730	7800	0	0.0565	0.0204	0	0	0.0111	0	0	0.472	0	0.156	0.0157	0	0.08	0.96	0.96
BAC-3	8.33	469	3280	1.63	7.31	4450	12300	0	0.0496	0.0317	0	0	0.00968	0	0	1.06	0	0.038	0.022	0	0.39	1.06	1.45
BAC-4	0.523	68.1	501	1.15	7.96	273	1300	0	0.00882	0.0171	0	0	0	0	0	0.267	0	0.017	0	0	-0.16	0.48	0
BAC-5	0	82.2	557	1.04	7.86	353	1460	0	0.0325	0.0714	0	0	0	0	0	0.323	0	0.0134	0	0	0.26	0.81	0
BAC-6	4.57	138	624	0.847	7.75	1080	2340	0	0.0248	0.0245	0	0	0	0	0	0.276	0	0.0842	0	0	0.17	1.02	0
BAC-7	4.24	143	649	1.51	7.75	1210	2830	0	0.0434	0.0214	0	0	0	0	0	0.303	0	0.075	0.00579	0	0.19	0.71	0

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	0	139	805	0.533	7.63	394	1760	0	0.0103	0.0575	0	0	0	0	0	0.265	0	0.00241	0	0	0.07	0.85	0.85
WW-U-1	1.36	357	2150	0.41	7.28	1360	5090	0	0	0.0449	0	0	0.0258	0	0	0.456	0	0.0101	0.00682	0	0.43	1.2	1.63
WW-U-2	1.23	380	2160	0.604	7.31	1090	4570	0	0.0109	0.0446	0	0	0	0	0	0.519	0	0.00338	0.0105	0	0.14	0.83	0.83
WWC-1	12	607	4430	0.331	7.25	3210	13000	0	0.0243	0.0223	0	0	0	0	0	0.964	0.000312	0.00835	0.0145	0	0.15	1.2	0
WWC-2	0	59.5	344	0.448	7.85	139	832	0	0.0152	0.0344	0	0	0	0	0	0.124	0	0.00304	0	0	0.17	0.03	0
WWC-3	0	29.7	209	1.06	7.92	84.2	436	0	0.0247	0.0289	0	0	0	0	0	0.139	0	0.00482	0	0	0	0.76	0
WWC-4	1.34	219	1030	0.481	7.46	692	2880	0	0.0145	0.0507	0	0	0	0	0	0.36	0	0	0	0	0.03	0.8	0
WWC-5	3.07	364	1720	0.431	7.38	1620	5000	0	0.0131	0.034	0	0	0	0	0	0.523	0	0.0031	0.00478	0	0.2	-0.56	0
WWC-6																							
WDB-7																							

Date Oct. 2018

Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:

	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
RL	*0.001*	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Round 11

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	17.4	7.85	-132	1800	40.9	0.61	1.15
CL-U-2	18.15	7.83	-97	1770	0	3.95	1.13
CLW-1	17.83	7.93	-114	1490	0	1.48	0.951
CLW-2	16.04	7.84	-184	1850	0.6	2.72	1.18
CLW-3	17.52	7.98	-178	1660	3.6	3.1	1.06
CLW-4	18.53	8.02	-192	1530	7.2	1.63	0.983
CLW-5	21	7.94	-175	1640	0	1.29	1.05
CLW-6	16.49	8.02	-210	1560	0	2.23	1
CLW-7	17.12	7.83	-81	1560	2.4	2.97	1
CLW-8	17.05	7.91	-130	1510	0	1.37	0.963
CLW-9							
CL-U-3							

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	16.4	7.71	-41	3010	0	0.7	1.94
BA-U-2	18.72	8.31	-138	2010	0	0.56	1.28
BAC-1	16.12	7.43	-228	9840	77.8	0.85	6.2
BAC-2	16.79	7.15	-22	11200	2.5	1.3	6.93
BAC-3	16.79	7.31	42	18300	7	5.15	11.3
BAC-4	15.08	7.77	-69	2500	0.2	0.61	1.6
BAC-5	16.95	7.88	-43	2860	0	0.52	1.83
BAC-6	17.13	7.74	-35	3970	0	0.49	2.54
BAC-7	17	7.76	-71	4420	1.9	0.48	2.84

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	17.1	7.65	-6	3290	0	0.58	2.11
WW-U-1	16.29	7.25	-7	8350	0.6	0.87	5.27
WW-U-2	16.41	7.44	55	7730	0	1.5	4.87
WWC-1	16.6	7.11	40	19600	0	4.49	12.1
WWC-2	17.73	7.91	-84	1600	2.1	0.62	1.03
WWC-3	16.97	8.12	-179	1190	0.2	0.56	0.759
WWC-4	16.27	7.4	-32	4780	0.7	0.54	3.06
WWC-5	15.76	7.16	-11	7580	1	3.51	4.77
WWC-6	15.05	7.63	-148	3550	1.8	0.7	2.27
WWC-7	15.18	8.07	-195	1510	8.4	0.65	0.967

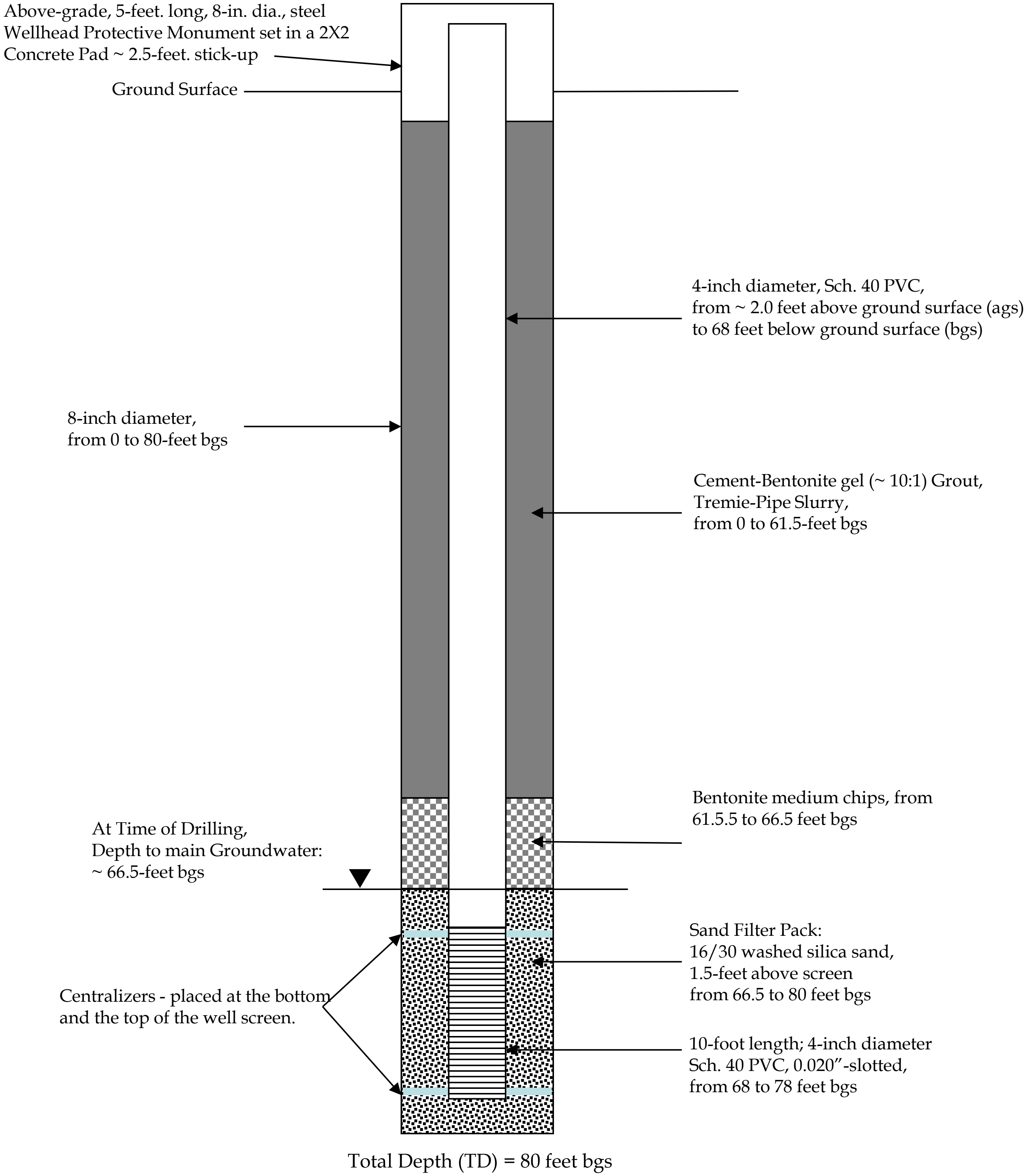
Date

Engineering Assessment

Assessment Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
RW-4	0.659	65.4	150	0.556	7.84	109	508	0	0.0298	0.0857	0	0	0	0	0	0.245	0	0.00311	0	0			
RW-5	0	32.1	569	0.86	7.73	224	1410	0	0.0308	0.0253	0	0	0.00472	0	0	0	0	0.00486	0	0			
RW-7	0	46.9	308	0.576	7.8	128	784	0	0.0217	0.033	0	0	0.00366	0	0	0.146	0	0.00436	0	0			
WDB-19	0	35	339	1.46	7.9	784	892	0	0.0287	0.0501	0	0	0.016	0	0	0.209	0	0.00623	0	0	0.16		
WWC-6	0.509	142	802	0.244	7.57	370	1920	0	0.0142	0.0795	0	0	0.00296	0	0	0.207	0	0.00542	0	0			
WWC-7	0	63.7	298	0.415	7.76	146	728	0	0.0141	0.046	0	0	0.00407	0	0	0.112	0	0.00473	0	0			

Assessment Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
RW-5	15.56	7.92	72	2630	2.5	0.51	1.69
RW-4	15.98	8.2	-64	0.96	0.3	0.96	0.615
RW-7	14.72	7.83	-79	1550	7	0.72	0.99
WDB-19	15.61	7.94	-197	1580	0	0.9	1.01
EMW-9	15.05	7.63	-148	3550	1.8	0.7	2.27
EMW-4u	15.18	8.07	-195	1510	8.4	0.65	0.967

Appendix A Drilling Logs and Well Schematic Diagrams



Stantec

IPSC – COMBUSTION BYPRODUCT LANDFILL AREA

DELTA, UTAH

Well CL-U-1 Schematic

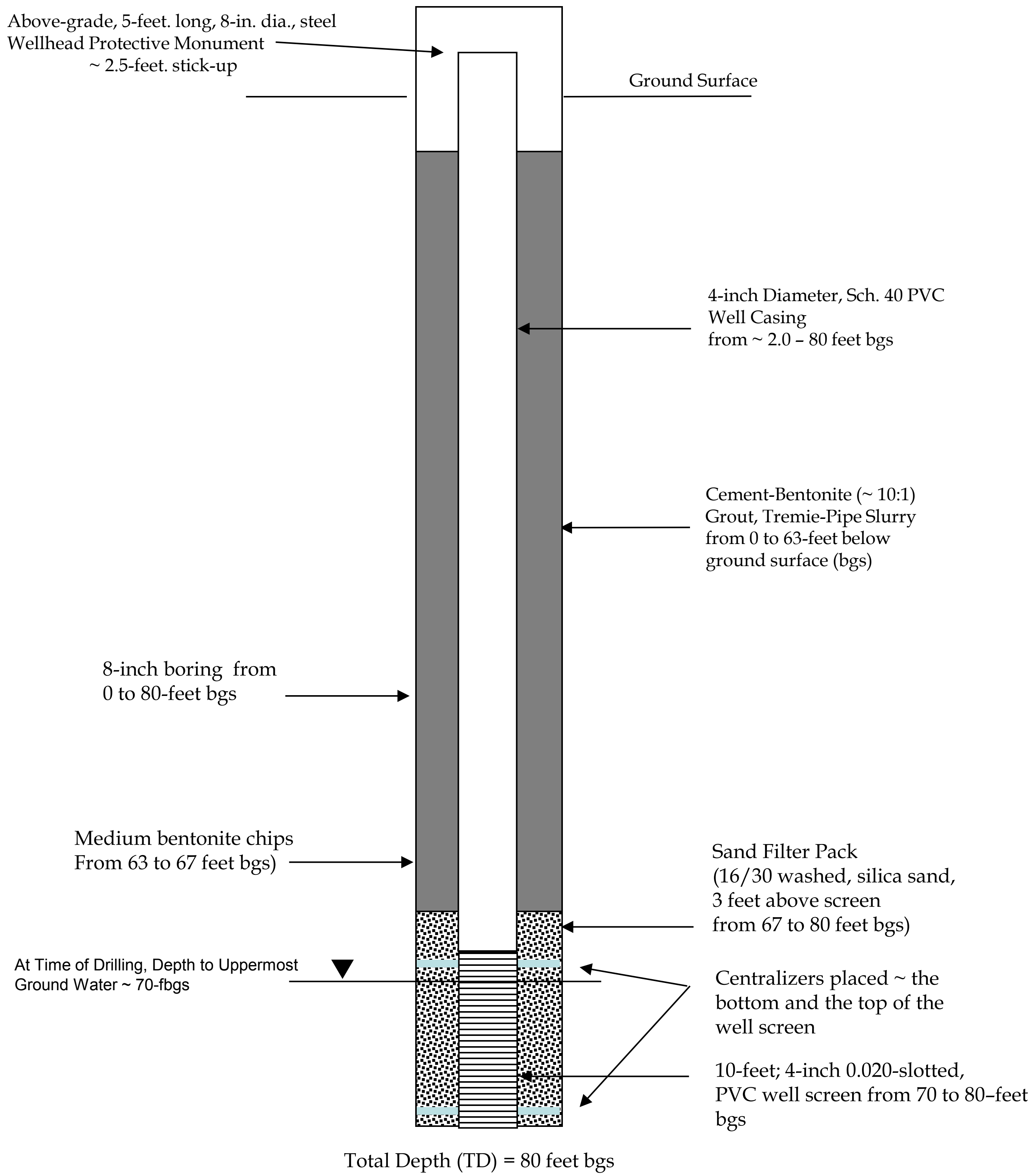
Date Drawn 7/23/15

Last Revision Date

Design by

Drawn by MS

Scale

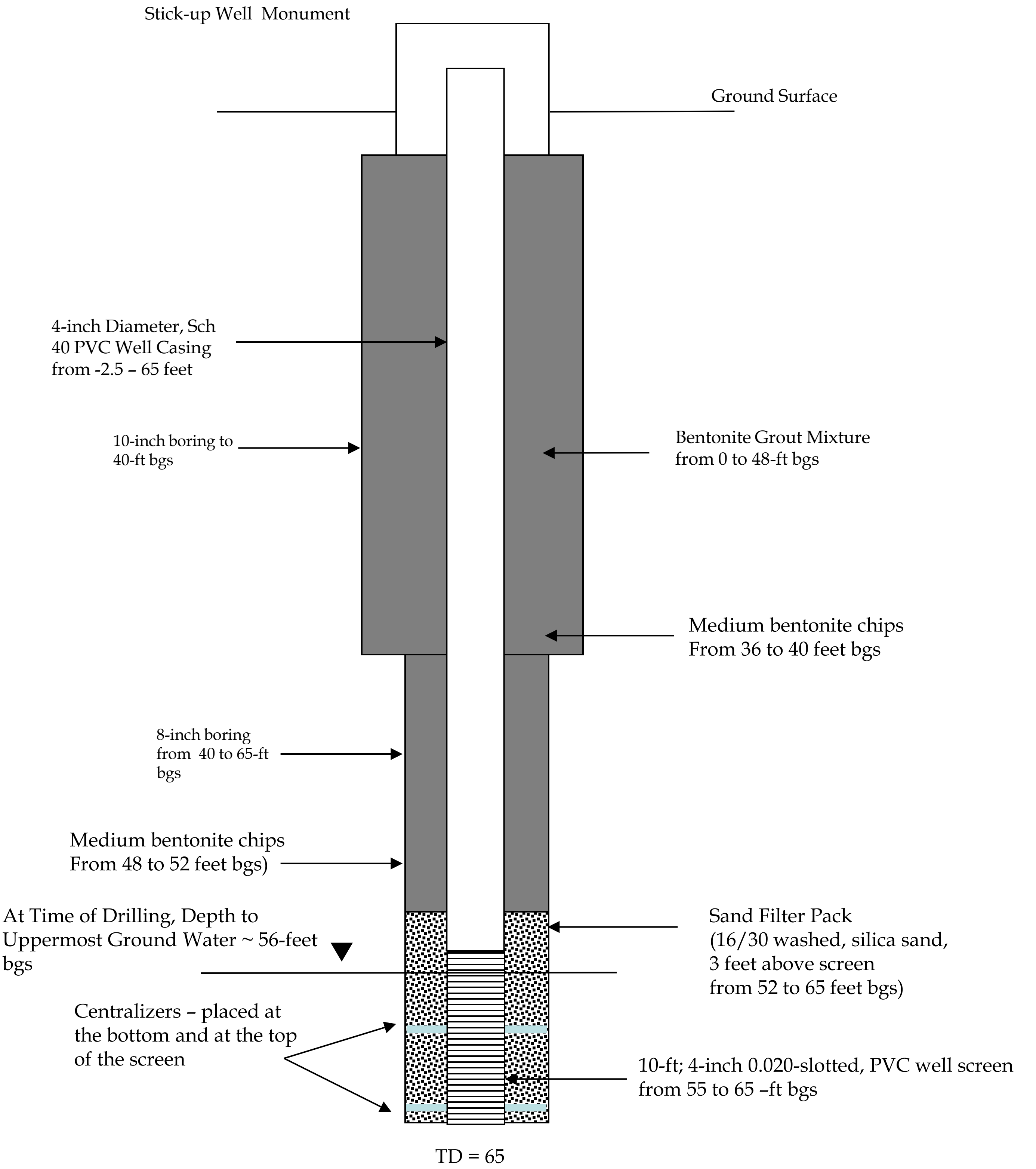


Stantec

IPSC– CB LANDFILL AREA
DELTA, UTAH

Well CLU-2 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15	Last Revision Date

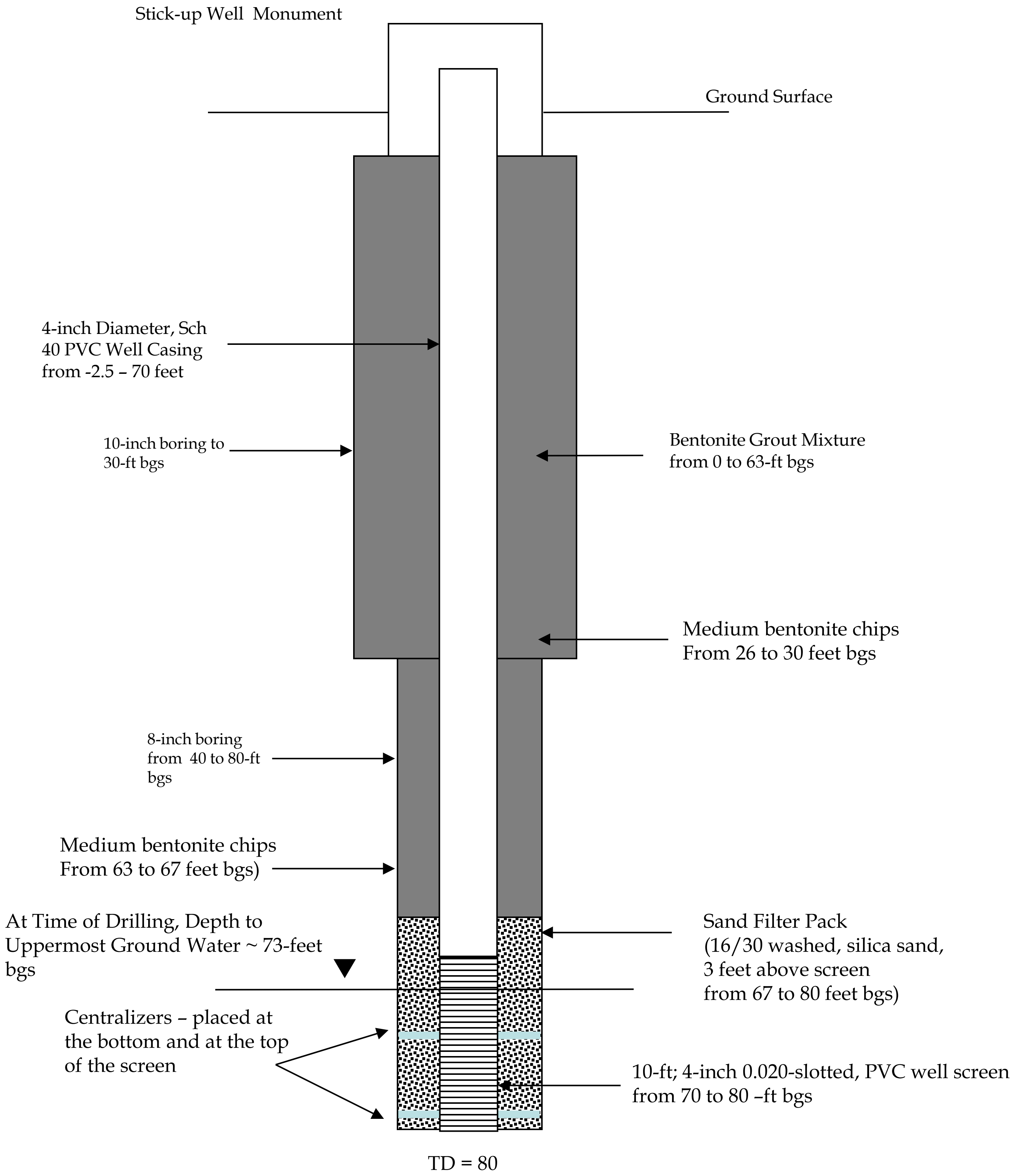


ISPC– LANDFILL AREA

DELTA, UTAH

Figure 1 – CLW-1 Schematic

Design by	Drawn by	Scale	Date Drawn Last Revision Date



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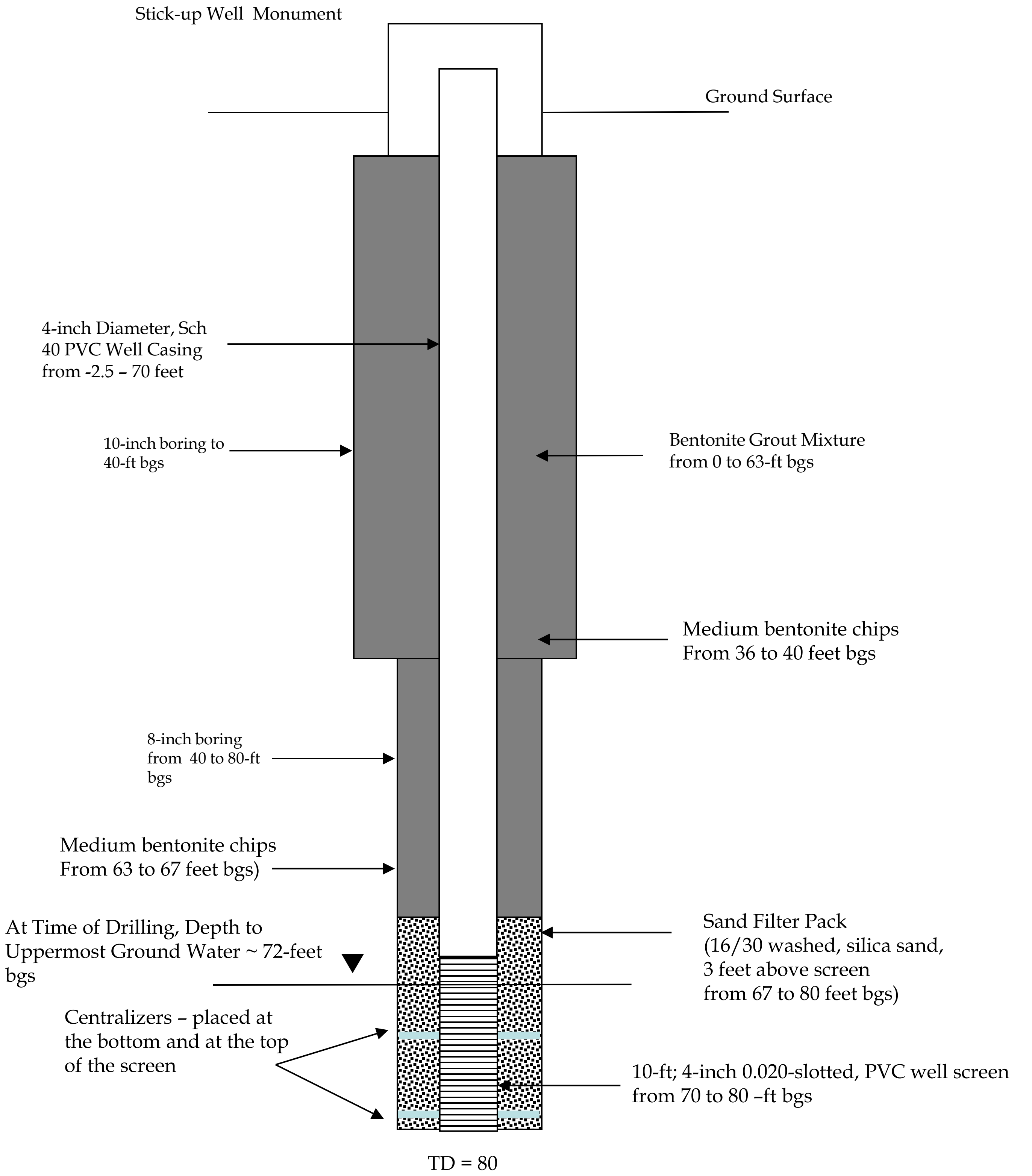
ISPC– LANDFILL AREA
DELTA, UTAH

Figure 1 – CLW-2 Schematic

Design by	Drawn by	Scale	Date Drawn	Last Revision Date



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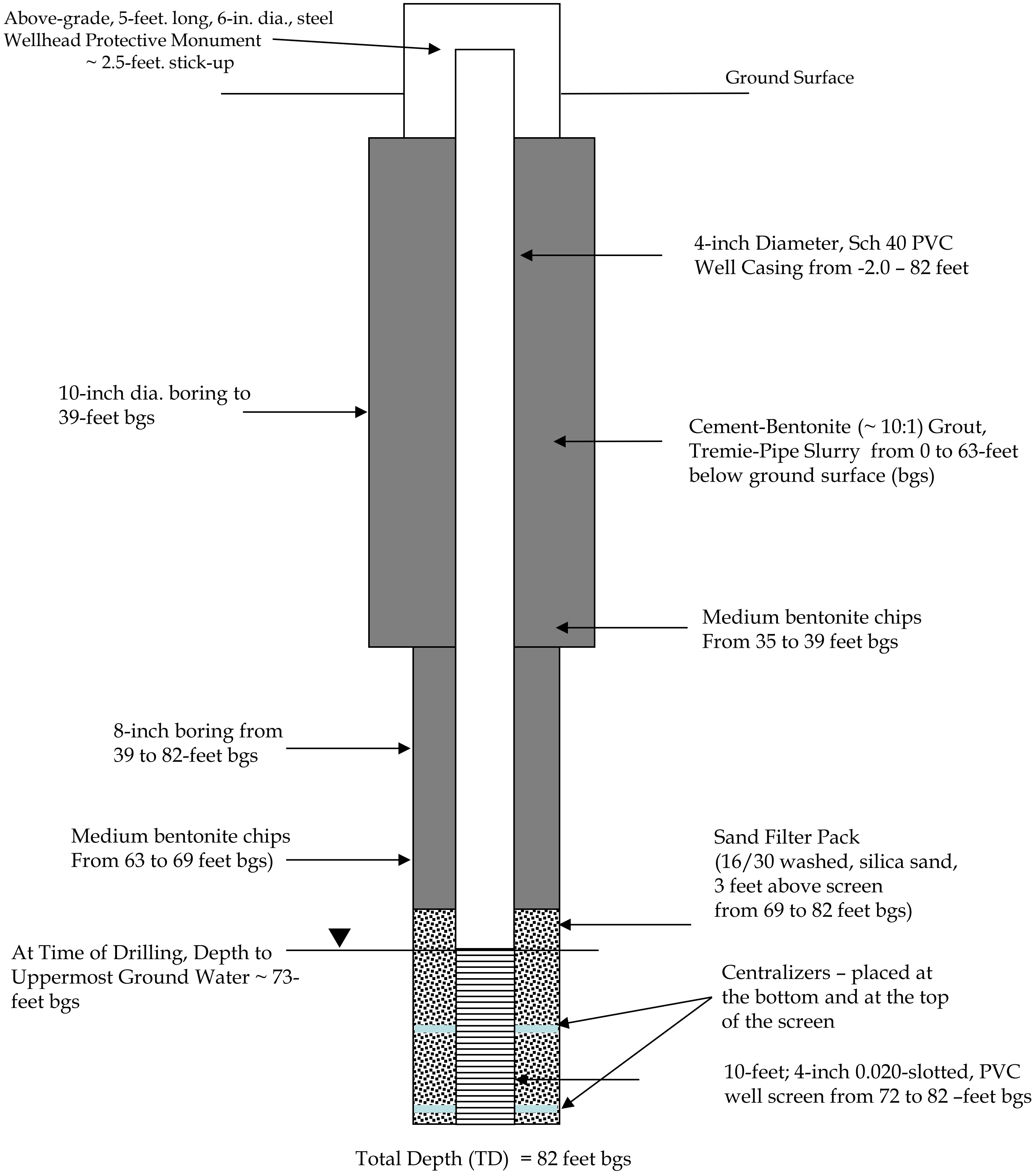
ISPC– LANDFILL AREA
DELTA, UTAH

Figure 1 – CLW-3 Schematic

Design by	Drawn by	Scale	Date Drawn
			Last Revision Date



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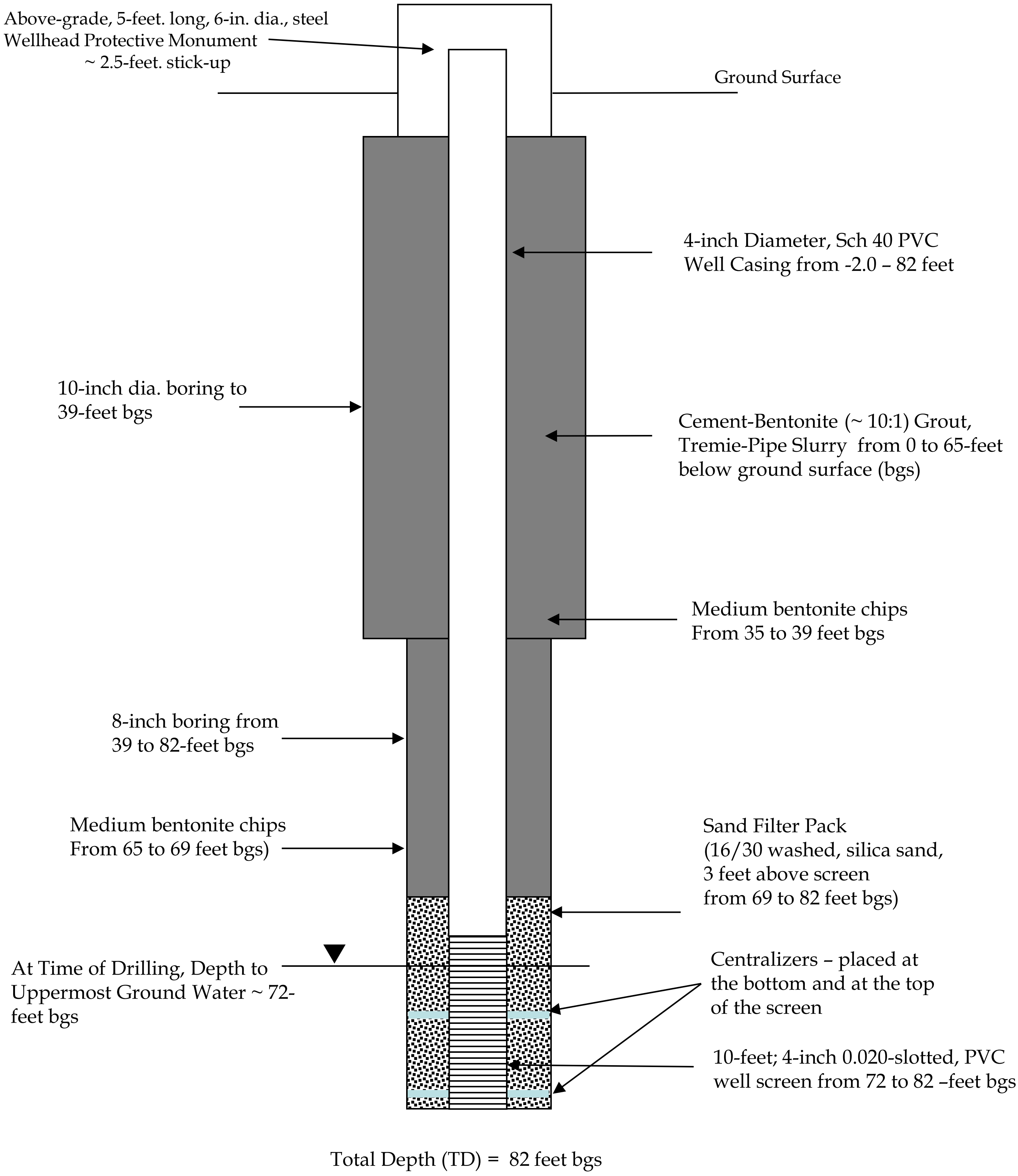
ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-4 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15 / Last Revision Date



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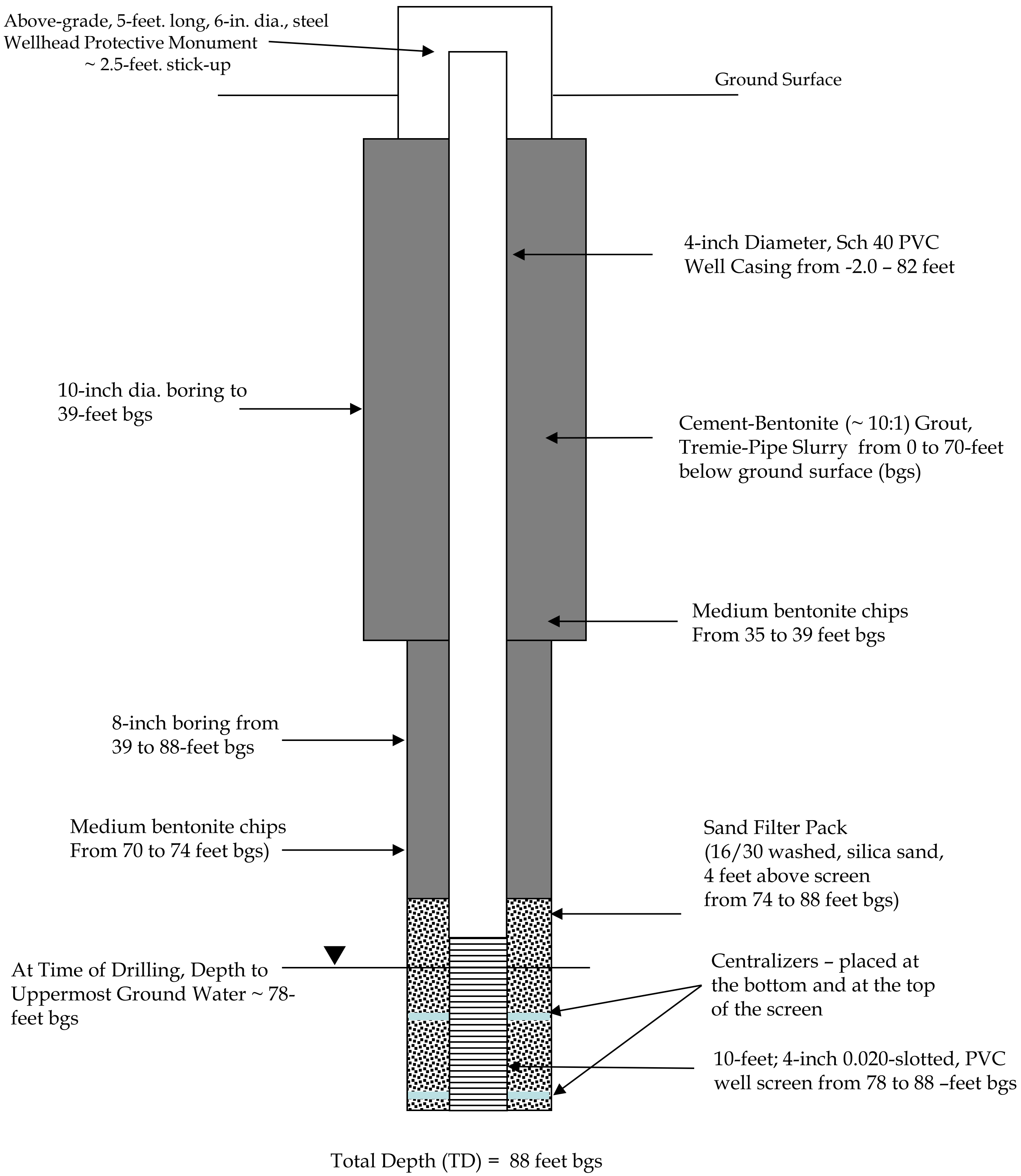
ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-5 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date



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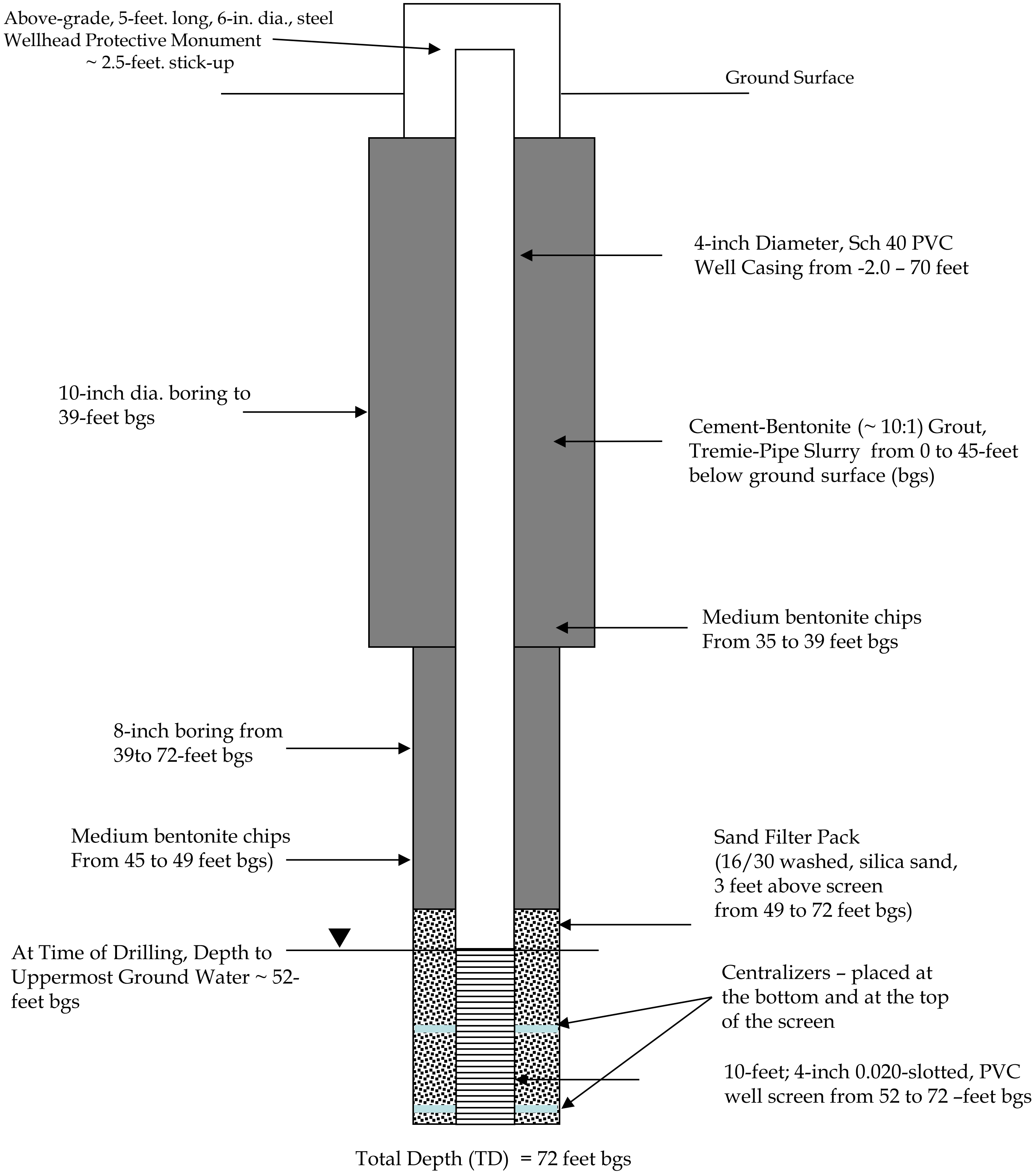
ISPC– CB LANDFILL AREA DELTA, UTAH			
CLW-6 Schematic			
			Date Drawn 9/1/15
Design by	Drawn by TH	Scale	Last Revision Date



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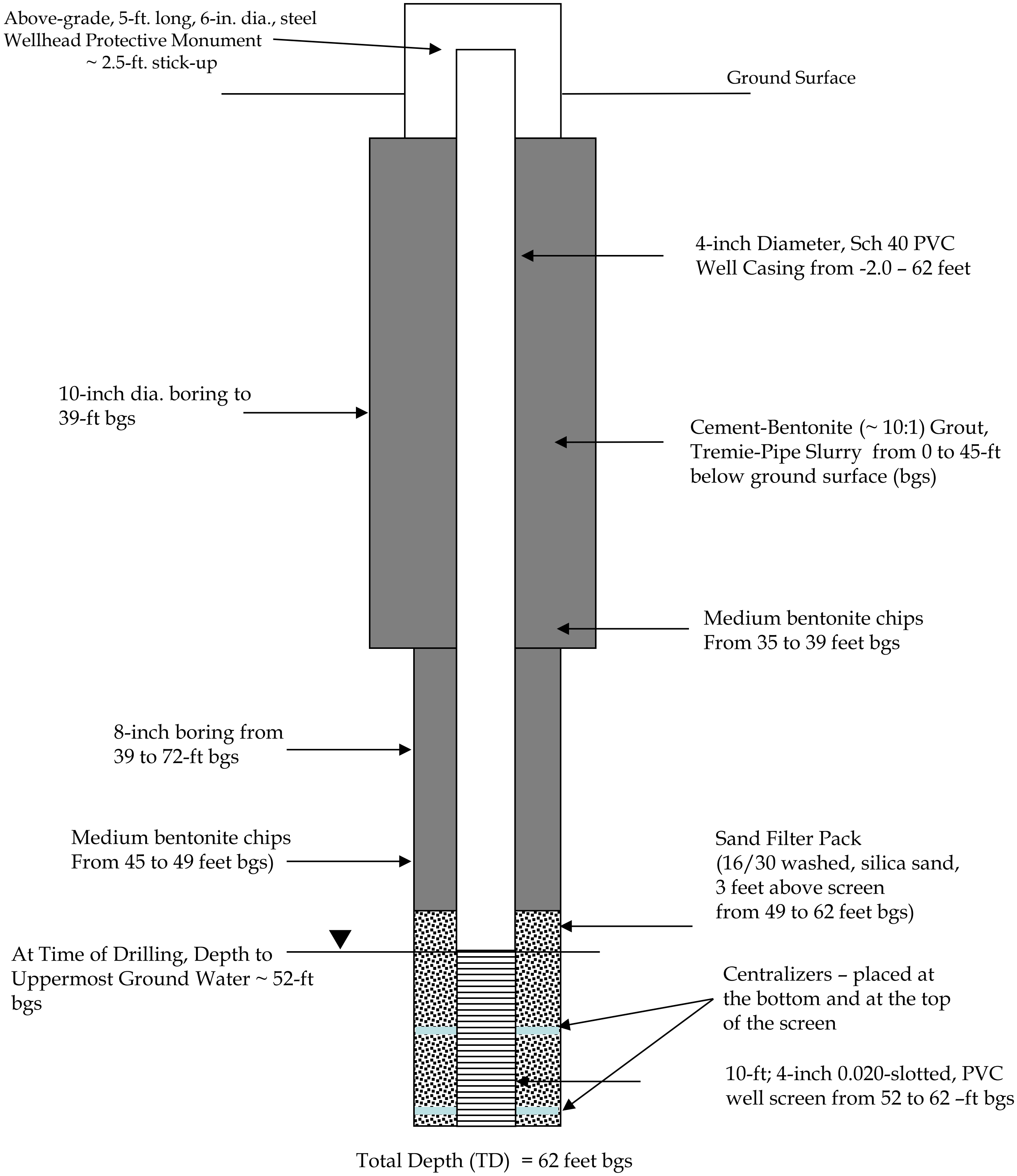
ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-7 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date



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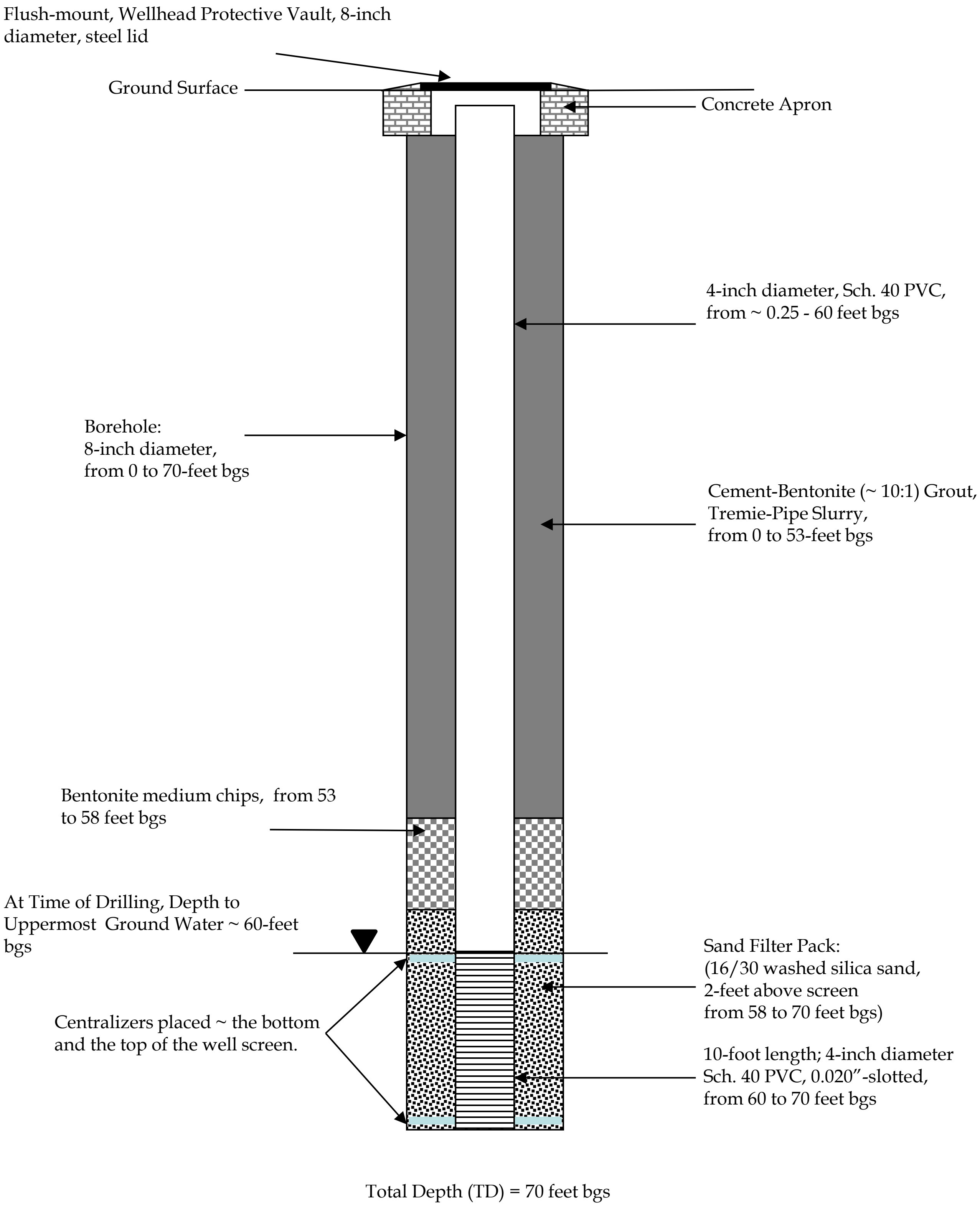
ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-8 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15 / Last Revision Date



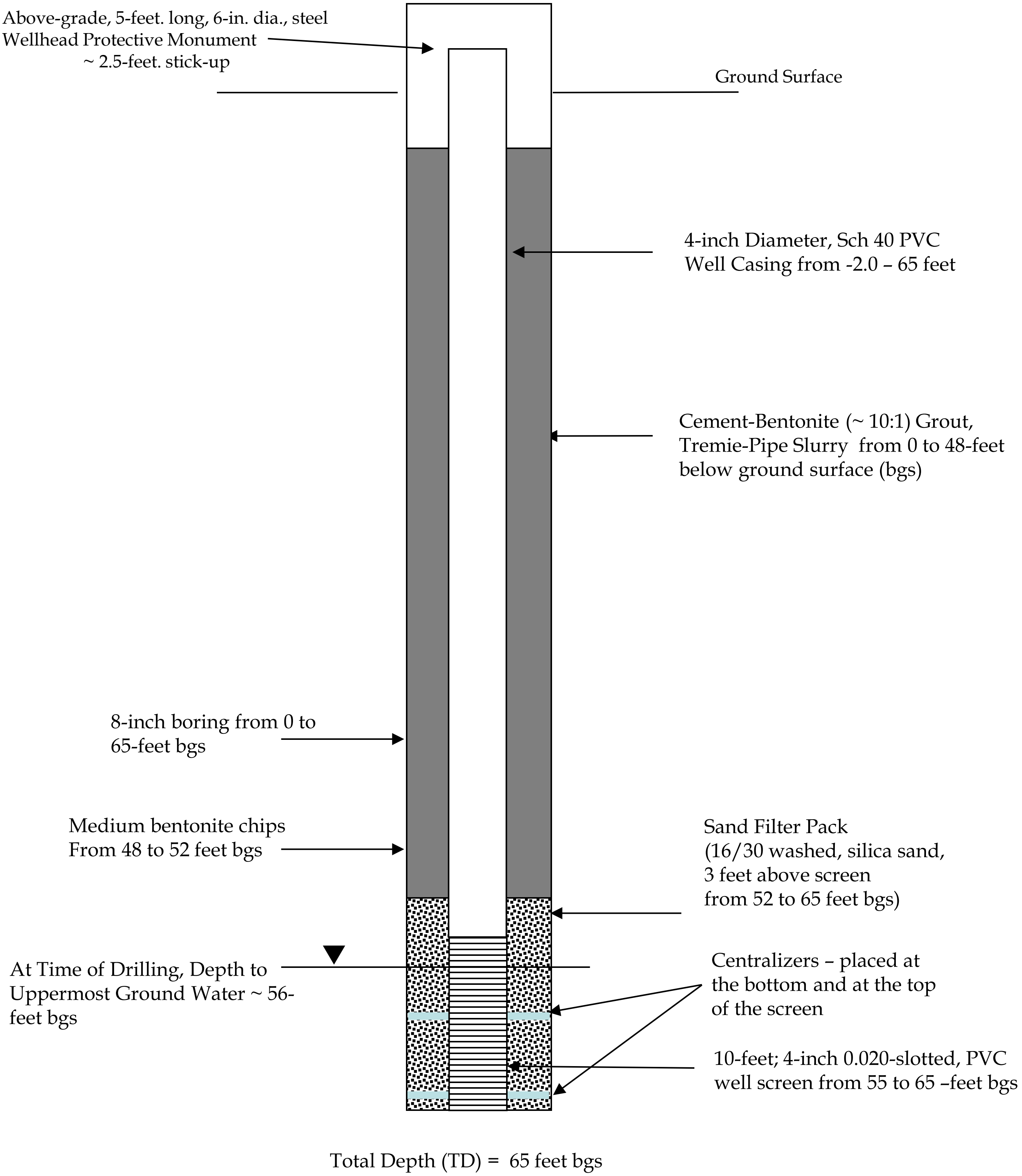
Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA

DELTA, UTAH

Well BAC-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/31/15
			Last Revision Date



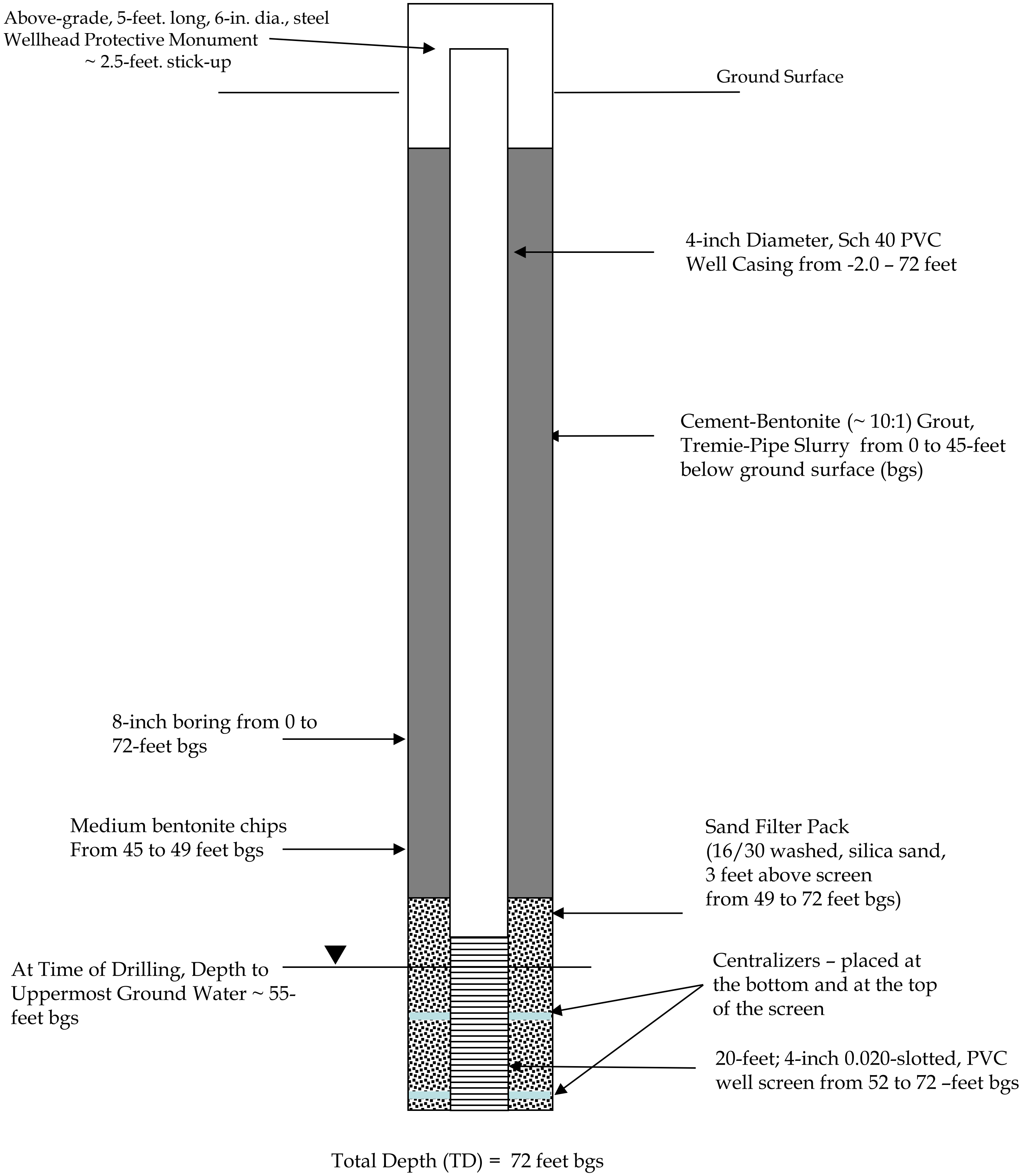
Stantec

ISPC– BOTTOM ASH AREA

DELTA, UTAH

BAC-2 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

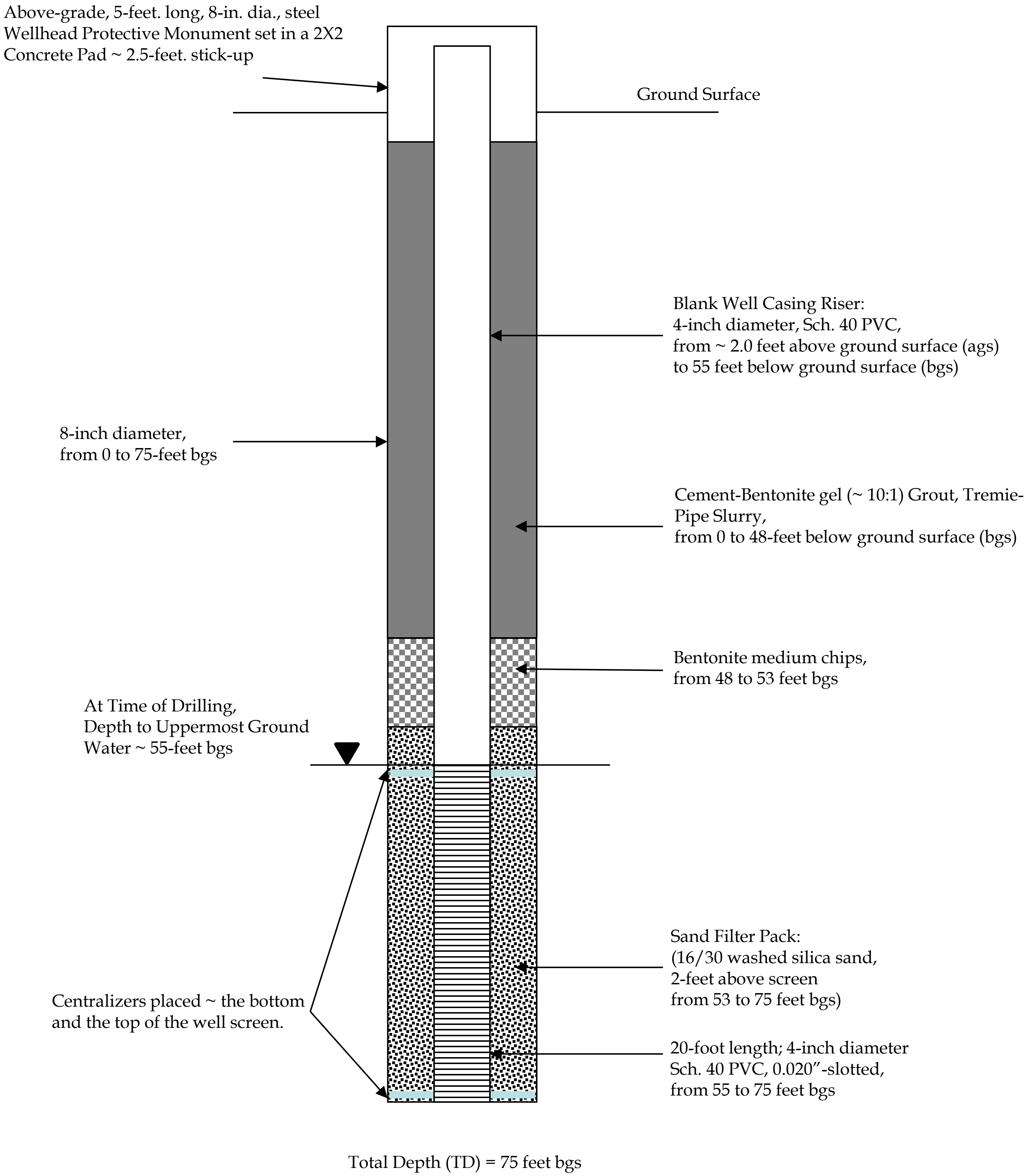


Stantec

ISPC– BOTTOM ASH AREA
DELTA, UTAH

BAC-3 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

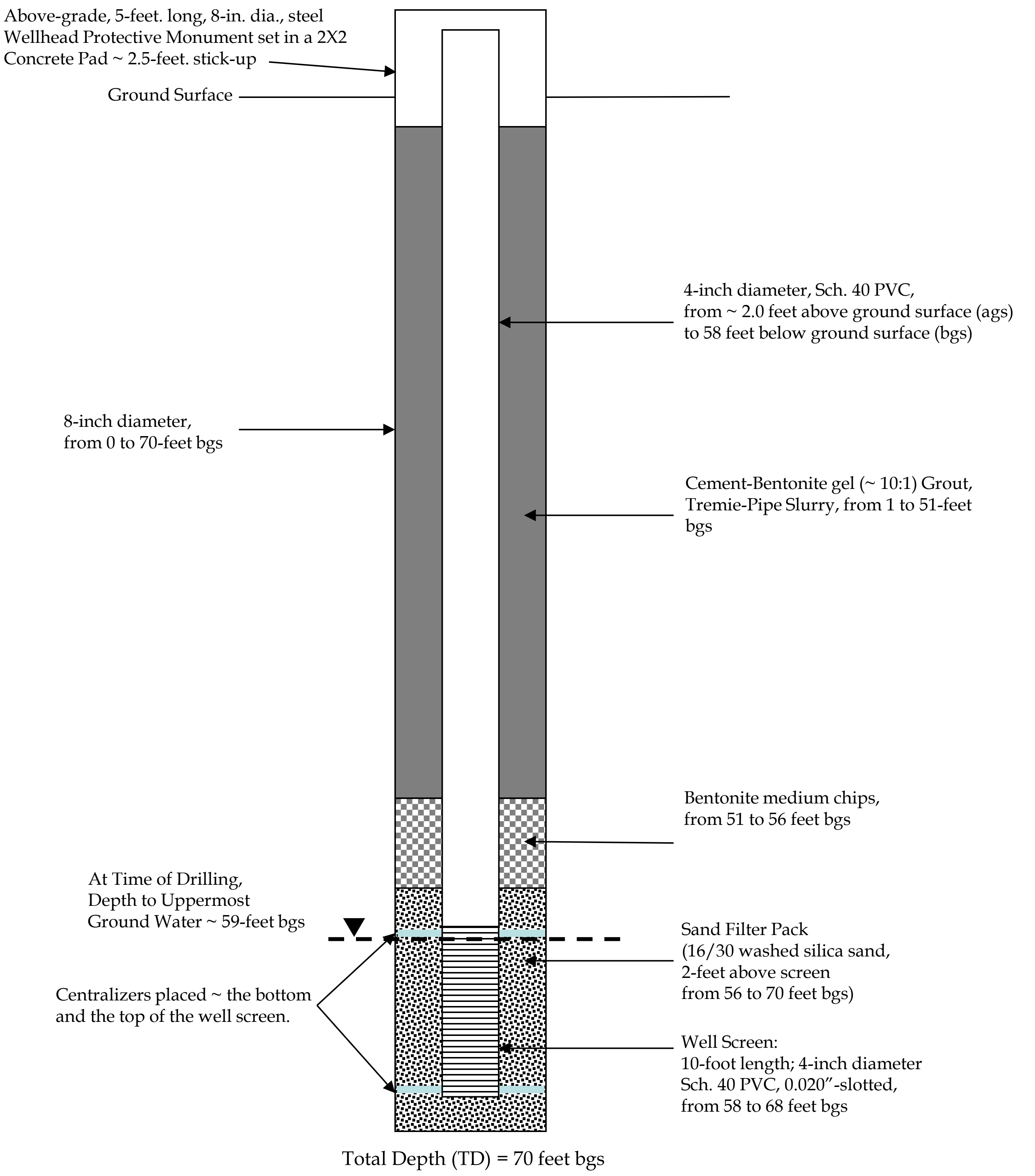


Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BAC-4 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/10/15
			Last Revision Date

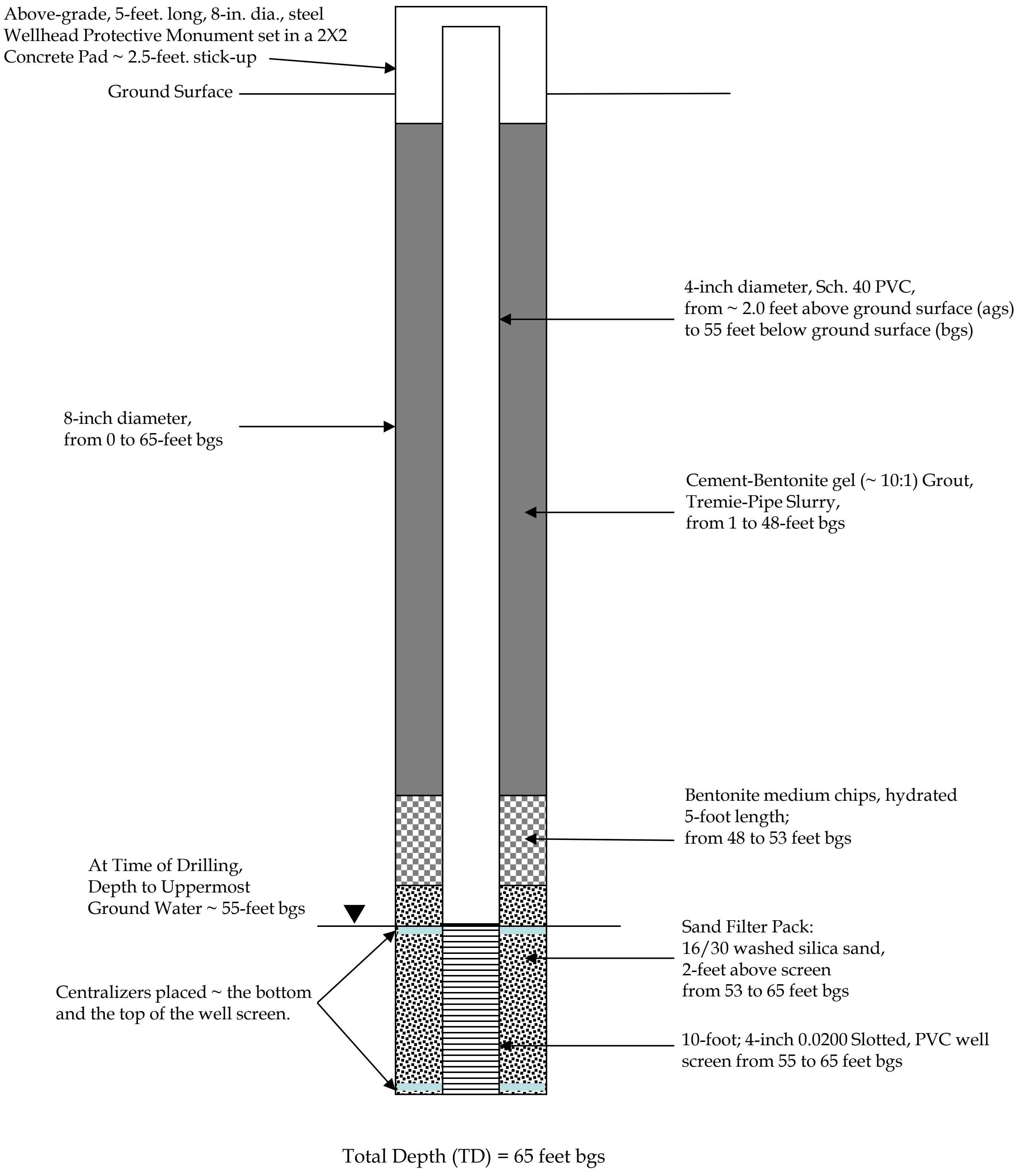


Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

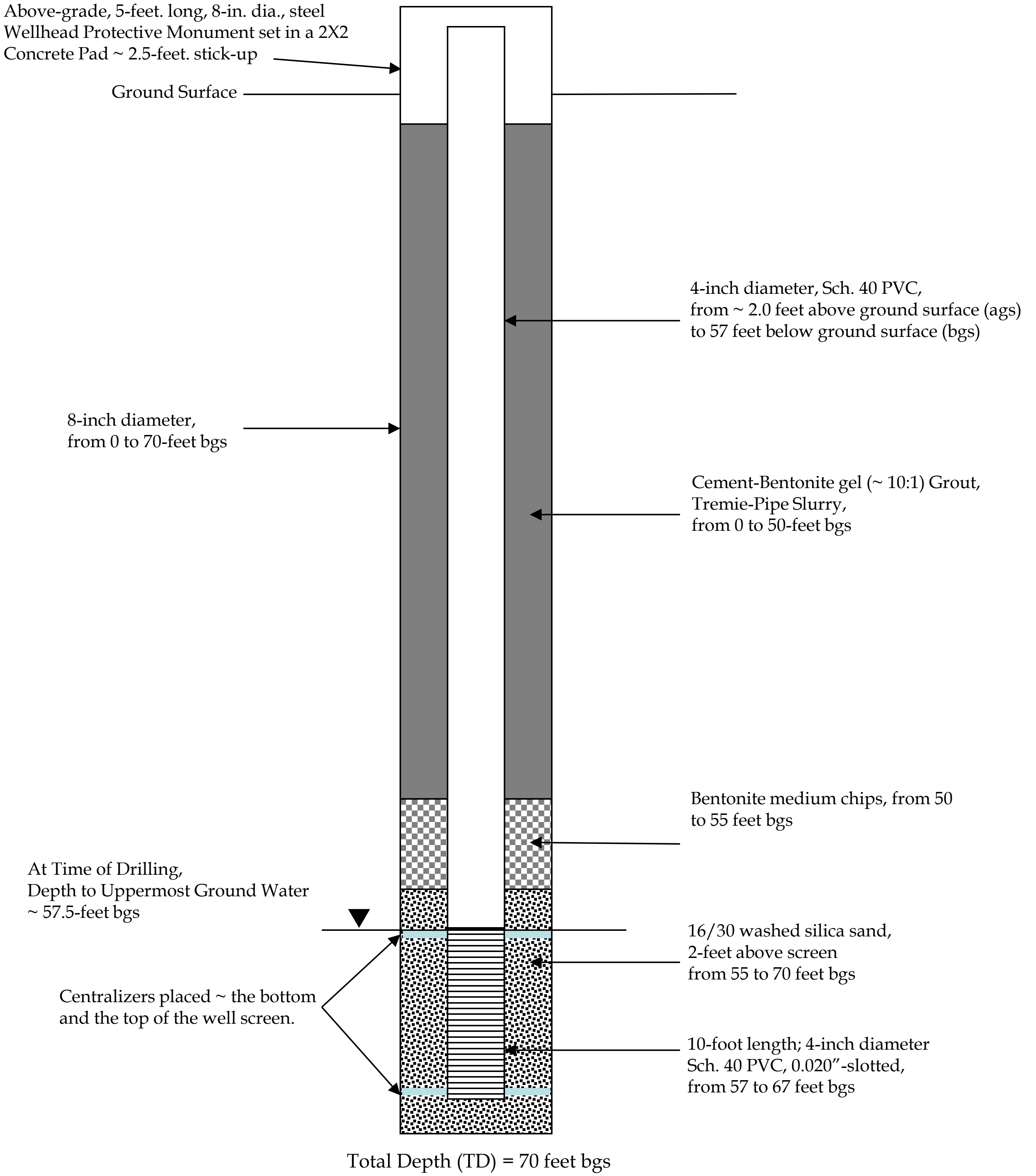
Well BAC-5 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/09/15
			Last Revision Date



Stantec

IPSC – BOTTOM ASH BASIN AREA DELTA, UTAH			
Well BAC-6 Schematic			
			Date Drawn 8/08/15
Design by	Drawn by MS	Scale	Last Revision Date

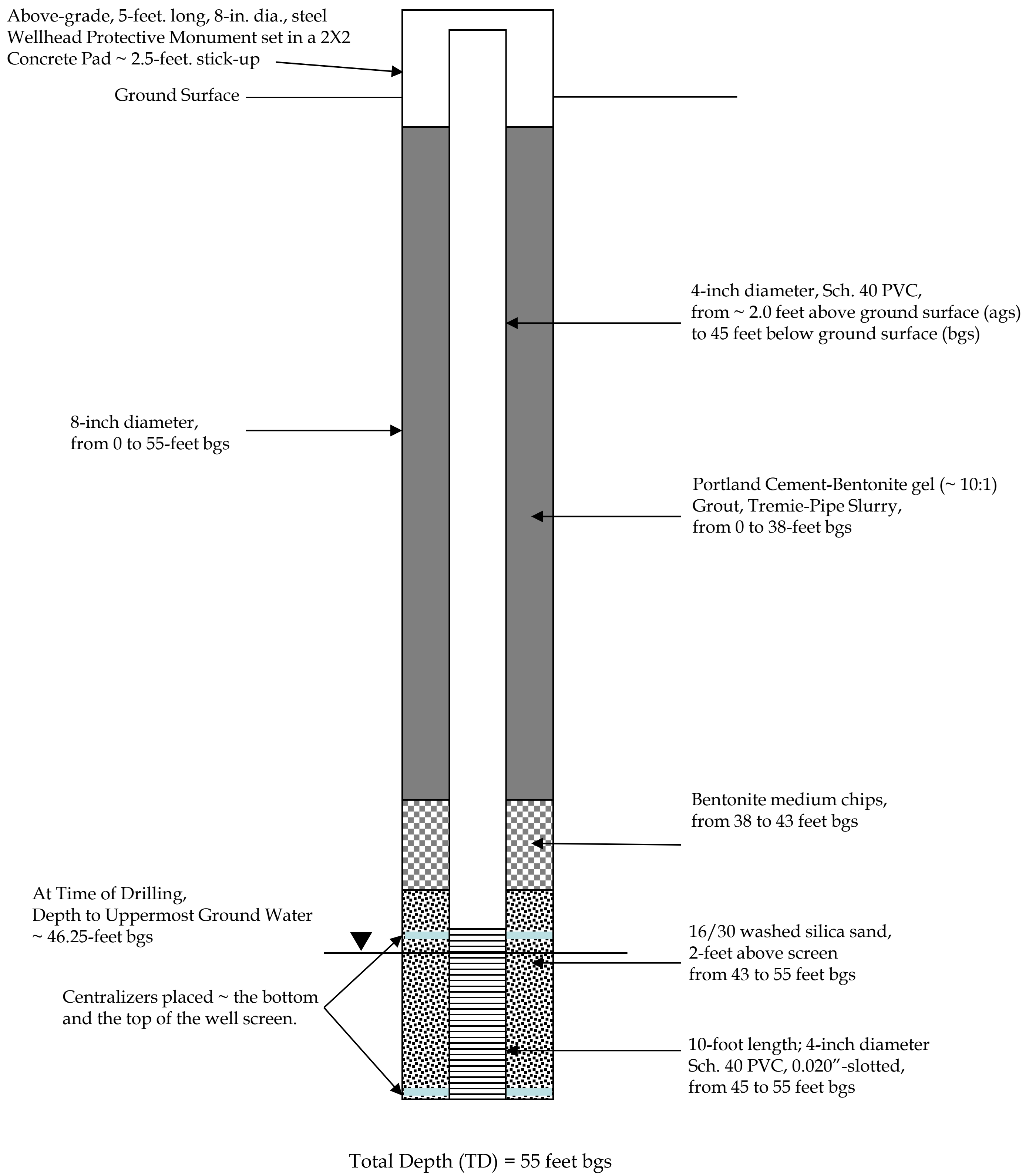


Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BAC-7 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/07/15
			Last Revision Date

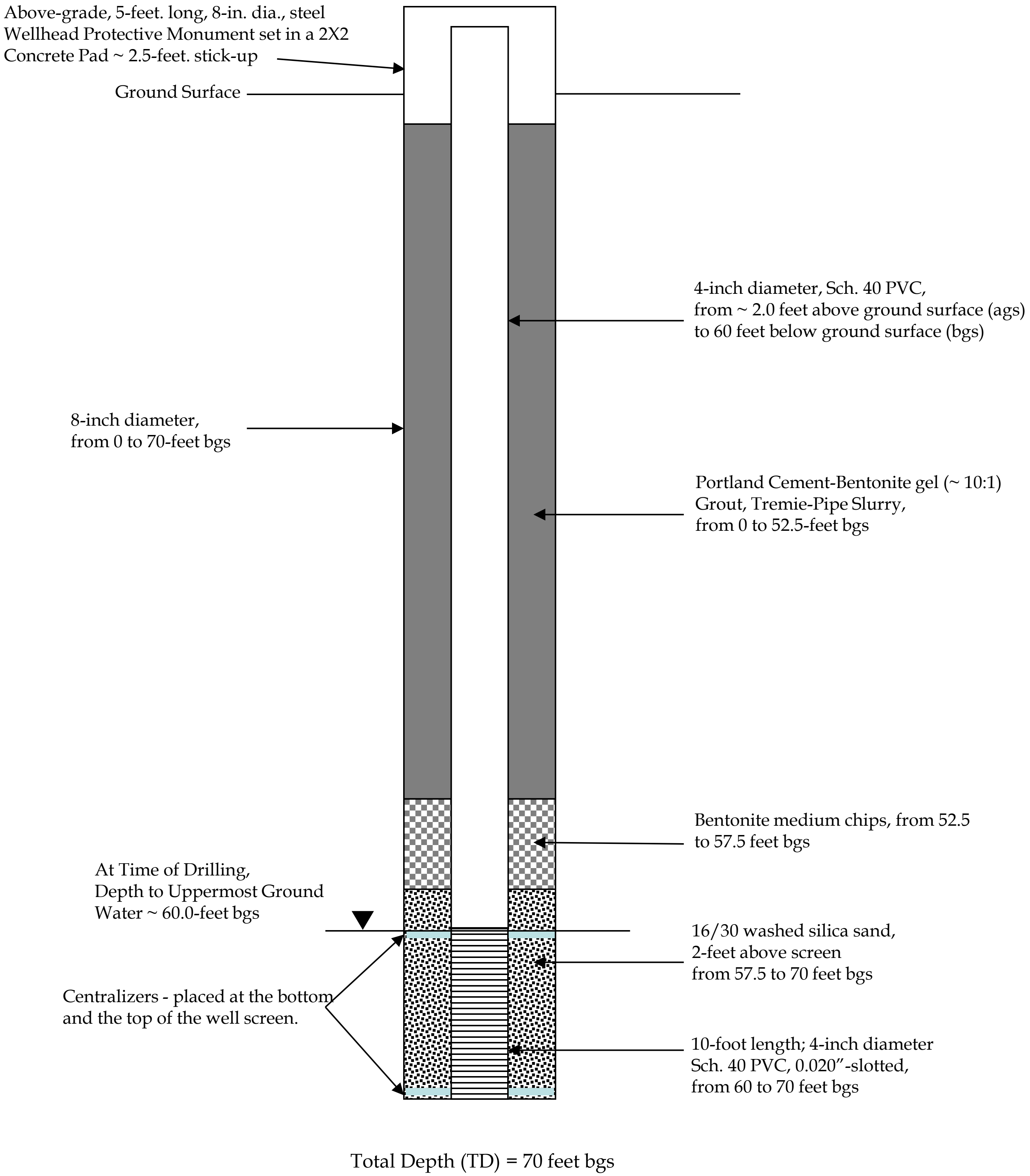


Stantec

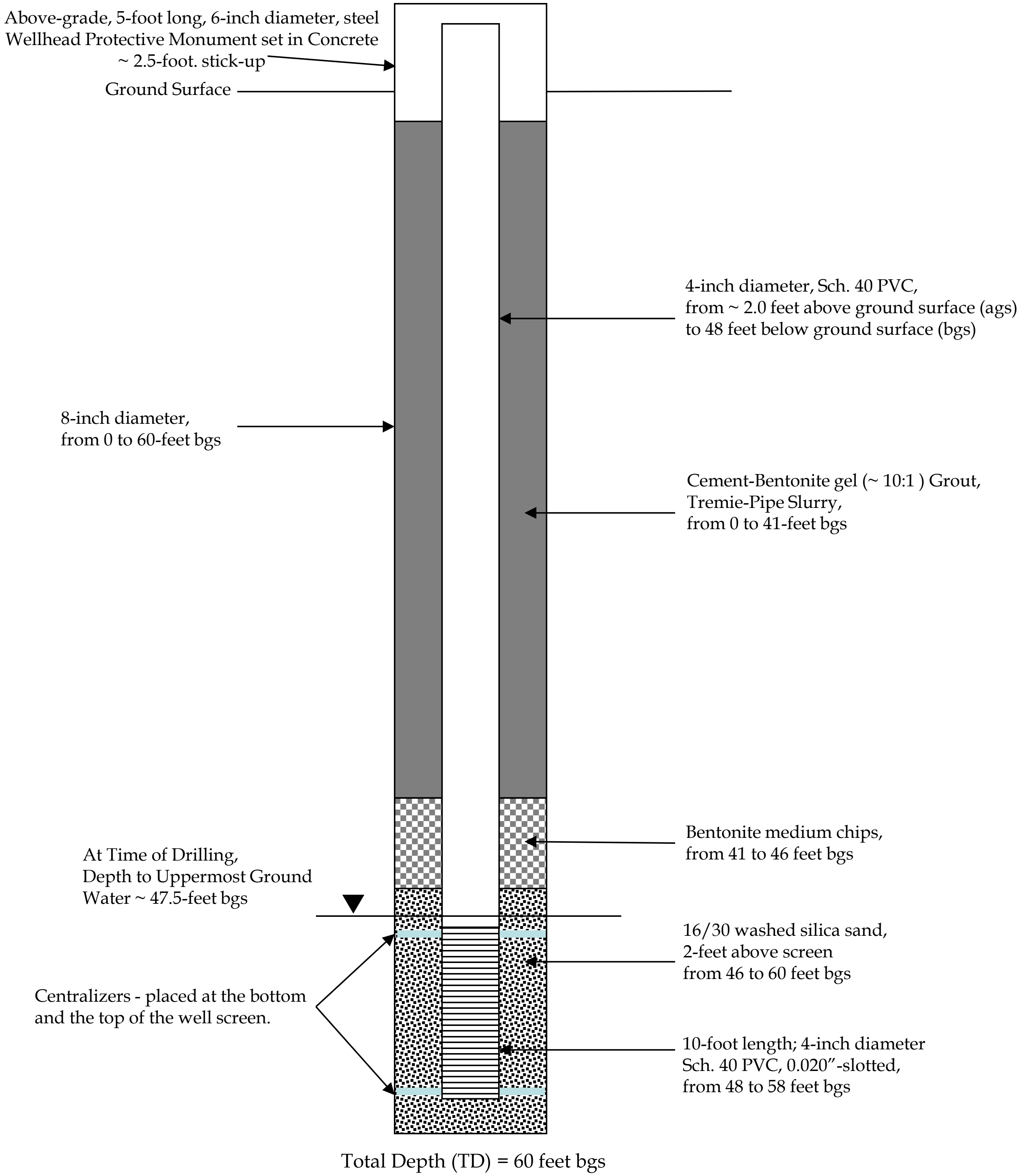
IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BA-U-1 Schematic

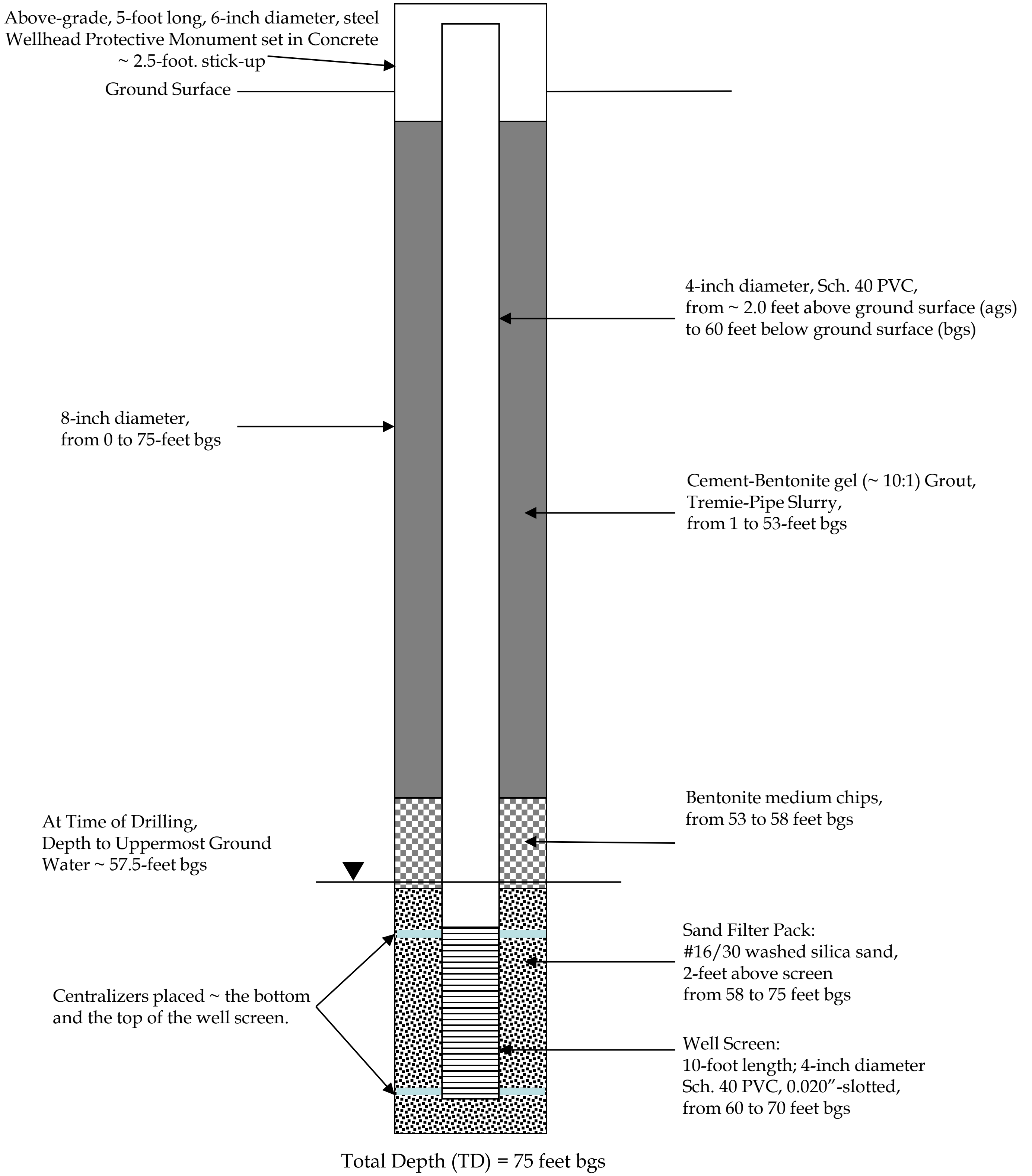
Date Drawn	7/24/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	



Stantec	IPSC – BOTTOM ASH BASIN AREA DELTA, UTAH			
	Well BA-U-2 Schematic			
				Date Drawn 7/25/15
	Design by	Drawn by MS	Scale	Last Revision Date



Stantec	IPSC – WASTEWATER HOLDING BASIN AREA DELTA, UTAH		
	Well WWC-1 Schematic		
			Date Drawn 7/26/15
	Design by	Drawn by MS	Scale	Last Revision Date



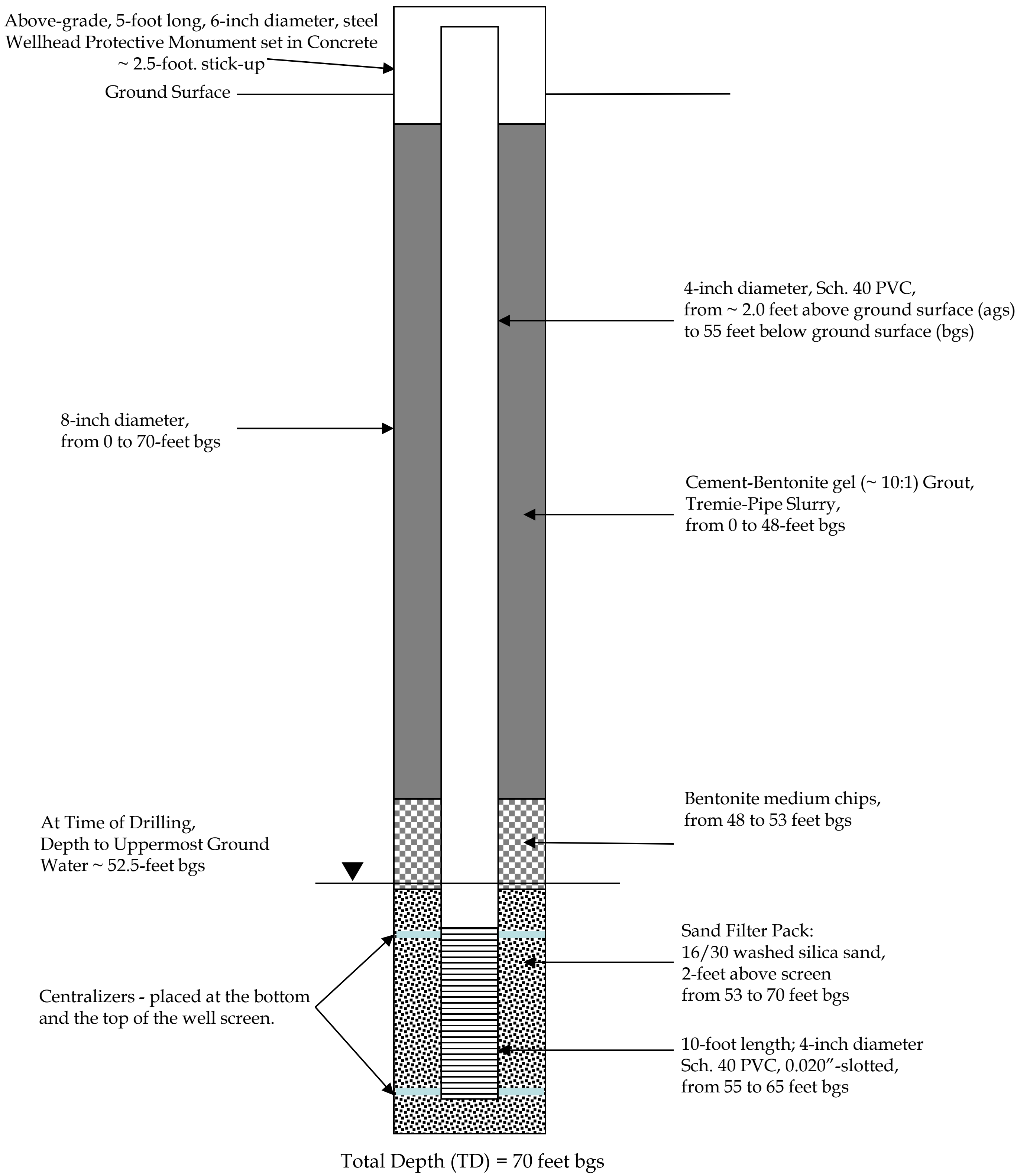
Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-2 Schematic

Date Drawn 7/27/15
Last Revision Date

Design by | Drawn by MS | Scale

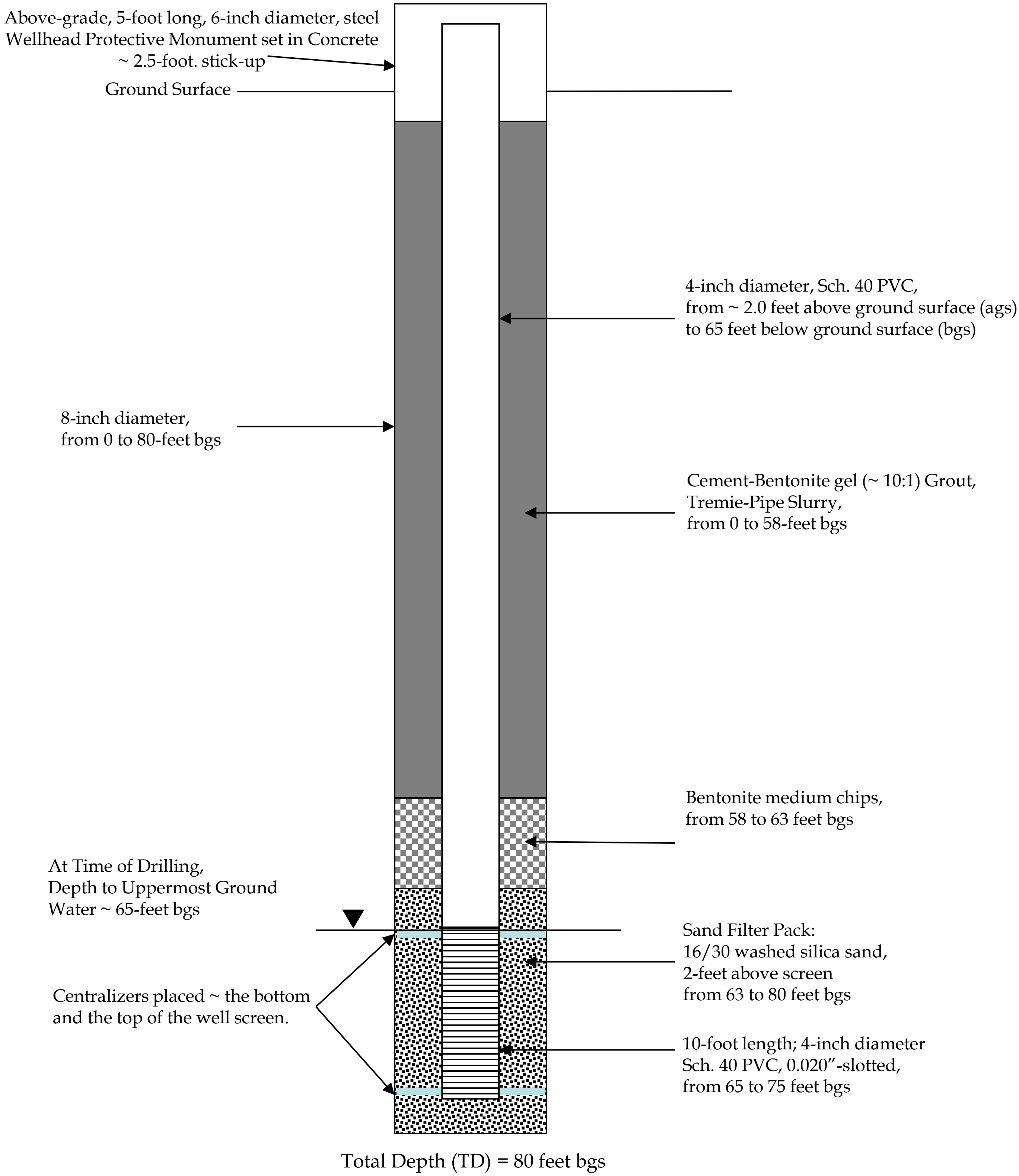


Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-3 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/30/15
			Last Revision Date



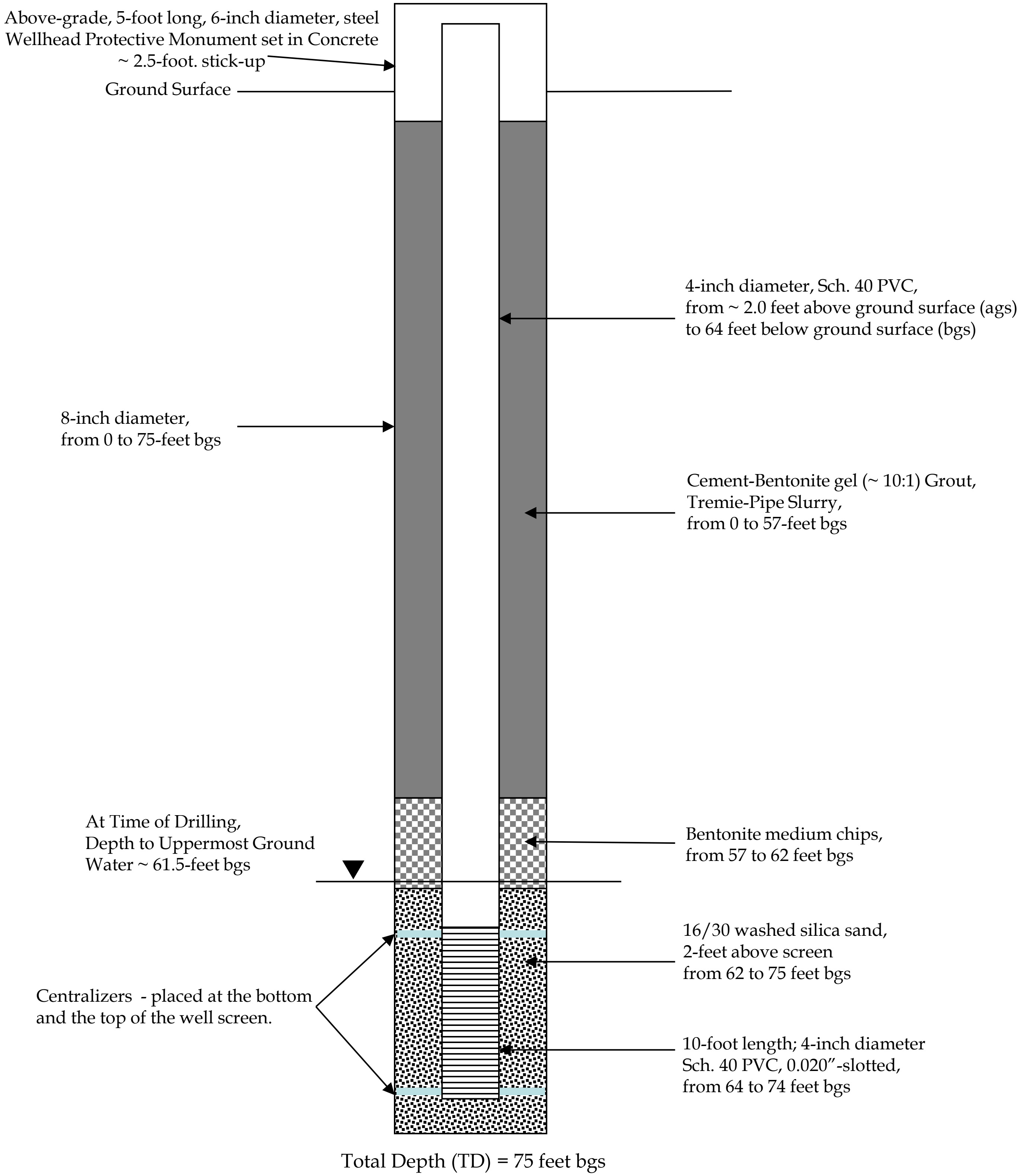
Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WWC-4 Schematic

			Date Drawn 7/29/15
Design by	Drawn by MS	Scale	Last Revision Date



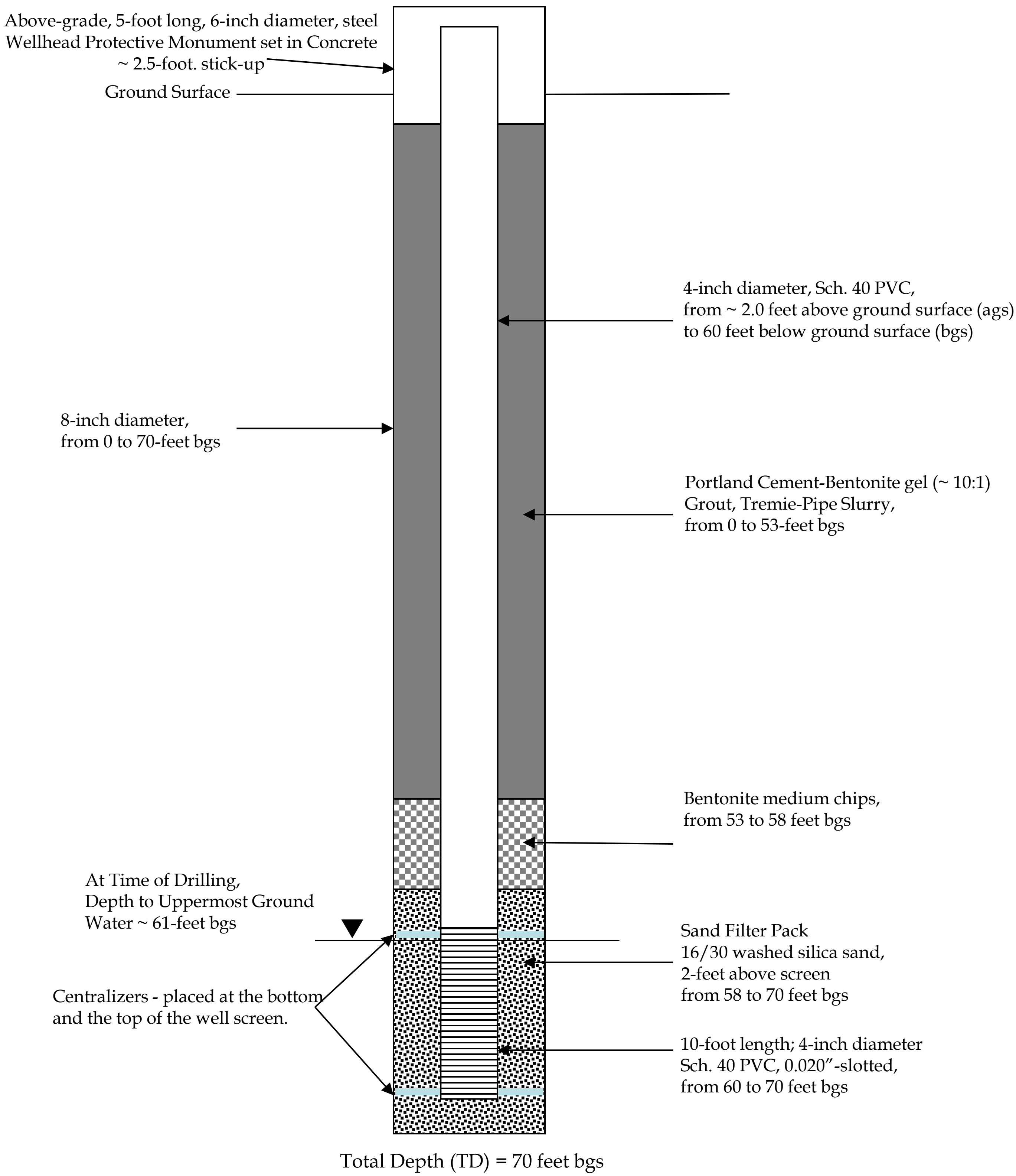
Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WWC-5 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/28/15
			Last Revision Date

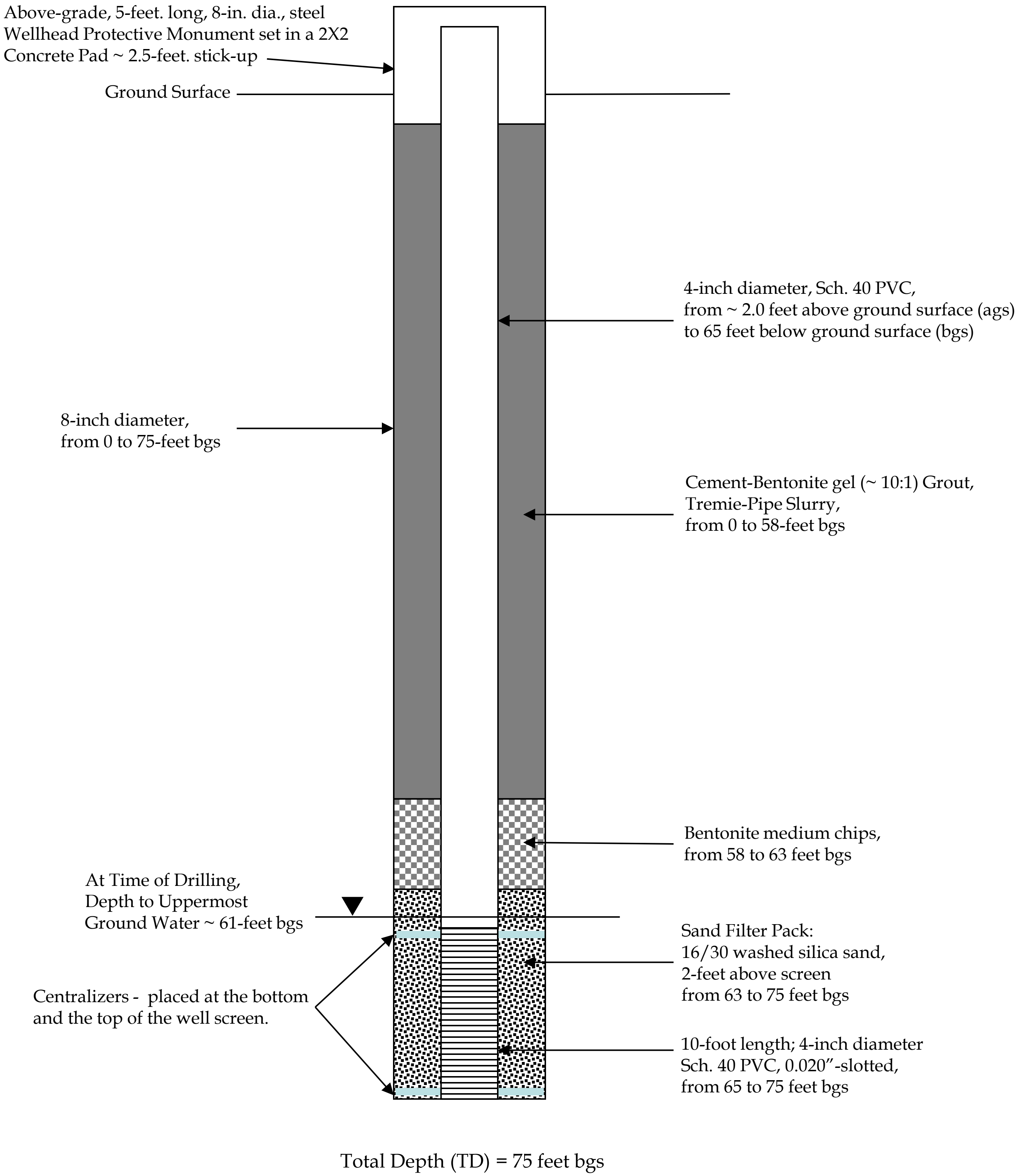


Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WW-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/11/15
			Last Revision Date



Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WW-U-2 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/11/15
			Last Revision Date

Boring Logs

IPSC

Delta, Utah

CLW-1

Interval (feet)	Drilling Method	Sample Description
		5/11/2015
0-3	10" Sonic	Brown fine grained Sand with gravel, dry
3-6	10" Sonic	Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-8	10" Sonic	Light Brown fine grained Sand
8-11.5	10" Sonic	Grayish white fine grained Sand, gravels present, rounded, dry
11.5-13.5	10" Sonic	Tan SILT with clay matrix, slightly moist
13.5-17	10" Sonic	Grayish Tan CLAY with small amount of silt present, slightly moist
17-23	10" Sonic	Grayish Tan SILT with fine grain sand present, trace amounts of clay, slightly moist
23-27	10" Sonic	Tannish Gray CLAY, denser, dry
27-32	10" Sonic	Tan CLAY, slightly moist
32-35	10" Sonic	Tan CLAY, denser material, slightly moist
		5/12/2015
35-48	10" Sonic to 40 feet	Tannish gray CLAY, moist
48-51	8" Sonic	Tannish gray CLAY, moist, softer
51-52	8" Sonic	Orangish, Brown, black fine grained Sand, moist
52-54	8" Sonic	Orangish, Brown , Red CLAY, slightly moist
54-56	8" Sonic	Orangish Brown CLAY with a fine grained sand matrix, slightly moist
56-62	8" Sonic	Light Brown fine grained Sand, saturated
62-63	8" Sonic	Light Brown CLAY, slightly moist
63-63.5	8" Sonic	Fine to medium grained Sand, slightly moist
63.5-64	8" Sonic	Light Brown CLAY, dry to slightly moist
64-65	8" Sonic	Light Brown fine grained Sand with clay matrix, moist

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-2

Interval (feet)	Drilling Method	Sample Description
		5/14/2015
0-8	10" Sonic	Brown fine grained Sand, clay present with gravel, dry
8-10	10" Sonic	Light to Dark Brown medium to course grained SAND, gravel present, dry
10-17	10" Sonic	Light Brown to Brown clayey SILT, slightly moist
17-25	10" Sonic	Light Brown Silty CLAY, moist
25-46	10" Sonic to 30 feet	Brown CLAY, slightly moist, from 40 to 45 feet transitioned to a Tan to Light Gray color
46-46.5	8" Sonic	Very moist to saturated zone, very soft clay , very sticky
46.5-50	8" Sonic	Light Gray CLAY, moist
50-51	8" Sonic	Tan to Light Gray with Orange zones, CLAY, slightly moist
51-51.5	8" Sonic	Very moist zone, CLAY
62	8" Sonic	Transitioning to a Orangish Red CLAY, Slightly moist
66-66.5	8" Sonic	Moist zone, transitioning from an Orangish Red to a Brown CLAY
66.5-73	8" Sonic	Reddish brown fine grained Sand with a clay matrix, very moist
73-80	8" Sonic	Brown fine gained Sand, trace amounts of clay, saturated.

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-3

Interval (feet)	Drilling Method	Drill Time	Sample Description
			5/13/2015
0-3	10" Sonic		Brown fine grained Sand , clay present with gravel, dry
3-6	10" Sonic		Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-11	10" Sonic		Grayish White fine grained Sand, gravels present, rounded, dry
11-13	10" Sonic		Brownish Orange SILT, with fine grained sand present, soft
13-16	10" Sonic		Tannish Gray SILT with a clay present, very moist, sticky
16-21	10" Sonic		Tannish Gray SILT with a clay matrix, very moist, sticky
21-24	10" Sonic		Light Gray CLAY, with silt present, very moist
24-33	10" Sonic		Light Gray to Orange CLAY, with silt present, slightly moist
32-40	10" Sonic to 40 feet		Tan CLAY, denser material, slightly moist
40-66	8" Sonic		Tan to Light Brown CLAY, slightly moist to Dry
63	8" Sonic		Transiting into a Darker Gray CLAY, Moist
66-72	8" Sonic		Very moist to saturated, clay very plastic, firm and sticky
72-73	8" Sonic		Dark Gray fine to medium grained Sand, saturated
73-74	8" Sonic		Dark Gray CLAY, sticky firm, very moist
74-80	8" Sonic		Dark Gray fine to medium grained Sand, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-4

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-2	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
2-5	10" Sonic	Light Brown fine grained Sands, dry
5-11	10" Sonic	Light Brown to gray fine grained SAND, dry to slightly moist
11-13	10" Sonic	Light Brown silty CLAY, slightly moist, good plasticity
13-14	10" Sonic	Light Brown fine grained SAND, with clays present, poor plasticity, dry
14-16	10" Sonic	Light Brown clayey SILT, dry
16-18	10" Sonic	Light Brown to Brown silty CLAY, slightly moist, good plasticity
18-21	10" Sonic	Light Brown to Gray silty CLAY, slightly moist to moist, good plasticity
21-24	10" Sonic	Brownish Gray CLAY, moist, high plascity
34-32	10" Sonic	Browninsh Gray CLAY, moist to very moist, high plasticity
32-53	10" Sonic to 39 feet	Brownish Gray CLAY, dencer, slightly moist,
		44 - thin layer of brownish orange fine grained sand
		47 - transitioning into a gray clay
		49 - thin layer of brownish orange fine grained sand
53-55	8" Sonic	Brownish Gray CLAY, dense, very plastic, slightly moist
55-73	8" Sonic	Brown CLAY, very plastic, slightly moist
73-82	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-5

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-4	10" Sonic	Gravels with medium to fine grand sands, moist
4-7.5	10" Sonic	Light Brown sitly CLAY, slightly moist, good plasticity
7.5-10	10" Sonic	Light Brown fine to medium grained SAND, dry
10-12	10" Sonic	Light Brown to Gray fine to medium grained SAND, gravels present, slightly moist
12-13	10" Sonic	Light Brown clayey SILT, slightly moist,
13-15	10" Sonic	Brown fine to medium grained SAND, wht clays and silts, slightly moist
		7/27/2015
15-22	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
22-32	10" Sonic	Light Brown CLAY, moistgood plasticity
32-38	10" Sonic	Brown CLAY, slightly moist, high plasticity
38-40	10" Sonic to 39 feet	Light Gray CLAY, slightly moist, hight plasticity
40-44	8" Sonic	Light Brown to Brown CLAY, slightly moist, high plasticity
44-52	8" Sonic	Light Gray CLAY, hight plasticity, slighly moist
52-53	8" Sonic	Brown CLAY, high plasticity, slightly moist
53-55	8" Sonic	Gray CLAY, high plasticity, slightly moist
55-72	8" Sonic	Gray CLAY, high plasticity, moist
72-74	8" Sonic	Gray fine grained SAND, with clay matrix, moist to saturated
74-75	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
75-78	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated
78-80	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
80-82	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-6

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown silty fine grained SAND, dry
5-7	10" Sonic	Light Brown fine grained sandy SILT, dry
7-12	10" Sonic	Light Brown fine to medium grained SAND, dry
12-15	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
15-21	10" Sonic	Light Brown to Brown clayey SILT, slightly moist, poor plasticity
21-22	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
21-23		Light Brown to Brown clayey SILT, slightly moist, poor plasticity
23-32	10" Sonic	Light Brown CLAY, moist, sticky, high plasticity
32-38	10" Sonic	Light Brown to Gray CLAY, moist, high plasticity
38-47	10" Sonic	Light Gray to Gray CLAY, slightly moist, high plasticity
47-55	10" Sonic to 39 feet	Transitioned to a Brownish gray CLAY, high plasticity, slight moist
55-72	8" Sonic	Brown CLAY, high plasticity, slightly moist
		58 - 58.5 very moist to saturated, 59 - slightly moist
72-78	8" Sonic	Gray CLAY, very moist, high plasticity
78-82	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
82-84	8" Sonic	Gray CLAY, high plasticity, very moist
84-85	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
85-88	8" Sonic	Gray CLAY, high plasticity, very moist

TD = 88; PVC 4-inch screen from 78 to 88; PVC 4-inch riser from -2.5 to 78

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-7

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-8	10" Sonic	Light Brown fine grained Sands with silts and gravel, angular, Dry
8-12	10" Sonic	Light Brown fine grained Sands with silts and clay, No gravel, Dry
12-15	10" Sonic	Tan SILT with a clay matrix, Dry
15-17	10" Sonic	Light Brown to Gray CLAY, medium plasticity, silty present, Dry
17-22	10" Sonic	Light Brown Clayey SILT, slightly moist
22-24	10" Sonic	Light Brown to Grayish silty CLAY, Dry
24-32	10" Sonic	Light Brown to Grayish CLAY, Brown silts and fine grained sands present, , Dry
32-40	10" Sonic to 39 feet	Light Brown CLAY, slightly moist, became denser at 35 feet
40-43	8" Sonic	Light Brown to Grayish CLAY, very dense, slightly moist
43-48	8" Sonic	Gray CLAY, slightly moist, some layers of a brown fine grained sand present every 3 to 4 inches alone the core
48-50	8" Sonic	Gray CLAY, slightly moist, some Iron Oxide present
50-51.5	8" Sonic	Brown fine to medium grained SANDS, saturated
51.5-58	8" Sonic	Brown CLAY, moist to slightly moist
58-58.5	8" Sonic	Brown fine grained SANDS, with a clay matrix, saturated
58.5-61	8" Sonic	Brown CLAY, moist to slightly moist
61-68	8" Sonic	Brown fine to medium grained SANDS, saturated
68-70	8" Sonic	Brown CLAY, moist to slightly moist
70-72	8" Sonic	Brown fine to medium grained SANDS, saturated

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-8

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown fine grained Sands, slightly moist
5-7	10" Sonic	Tannish white fine grained Sand, with smooth, rounded pebbles, slightly moist
7-10	10" Sonic	Tannish white silty, fine grained Sand, slightly moist
10-13	10" Sonic	Tan SILT with a clay matrix, slightly most, slightly plastic
13-15	10" Sonic	Tan Clayey SILT, dry, plastic
15-18	10" Sonic	Light Brown to tan silty CLAY, slightly moist, good plasticity
18-24	10" Sonic	Light Brown CLAY with silts present, slightly moist, good plasticity
24-32	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
32-37	10" Sonic	Brown CLAY, dence, dry to slihgtly moist, very plastic
37-52	10" Sonic to 39 feet	Transitioned fomrthe Brown CLAY to a Gray CLAY, with interbeds of brown fine gran sand layers, highly plastic, slihglty moist
52-62	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 62; PVC 4-inch screen from 52 to 62; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CL-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/22/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	SAND with silt:
2-2.5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
2.5-5	8" Sonic	SM	Silty SAND:
5-6	8" Sonic	CL	CLAY:
6-7.5	8" Sonic	SM/ML	Silty SAND/Sandy SILT with clay:
7.5-10	8" Sonic	CH	CLAY:
10-11	8" Sonic		CLAY:
11-12.5	8" Sonic		CLAY:
12.5-13.5	8" Sonic		CLAY:
13.5-15	8" Sonic	ML	Sandy SILT:
15-16.5	8" Sonic	SP/SM	SAND with silt:
16.5-17.5	8" Sonic	SM	Silty SAND:
17.5-20	8" Sonic	SP	SAND:
20-21	8" Sonic		SAND:
21-22	8" Sonic	ML	Sandy SILT:
22-23	8" Sonic	SP	SAND:
23-24	8" Sonic	ML	Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26	8" Sonic	ML	Sandy SILT:
26-28	8" Sonic		Sandy SILT:
28-30	8" Sonic		SILT with clay:
30-32	8" Sonic		Sandy SILT:
32-34	8" Sonic	SP	SAND:
34-35	8" Sonic	ML	Sandy SILT with clay:
35-40	8" Sonic	CL	CLAY:
40-42	8" Sonic	ML	SILT with clay:
42-45	8" Sonic	CH	CLAY:
45-55	8" Sonic		CLAY:
55-65	8" Sonic		CLAY:
7/23/2015			
65-66.5	8" Sonic	CH	Sandy CLAY:
66.5-67.5	8" Sonic	SP/SM	SAND with silt:
67.5-72.5	8" Sonic		SAND with silt:
72.5-73.5	8" Sonic	SP	SAND:
73.5-75	8" Sonic	SC	Clayey SAND:
75-76.5	8" Sonic	SW	SAND:
76.5-79	8" Sonic	SP	SAND:
79-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 68 to 78; PVC 4-inch riser from -2.5 to 68

Drilling Method: Guspech GS24-300RS 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

CLU-2

Interval (feet)	Drilling Method	Sample Description
		7/22/2015
0-6	8" Sonic	Light Brown fine grained SAND with silt, dry
6-7.5	8" Sonic	Light Brown to Tan CLAY with silt, slightly moist
7.5-13	8" Sonic	Light Brown fine grained SAND with silt, dry
13-16	8" Sonic	Brown fine grained SAND with clayey matrix, slightly moist, some plasticity
16-24	8" Sonic	Light Brown fine grained SAND, dry
24-35	8" Sonic	Light Brown clayey SILT, dry
35-44	8" Sonic	Light Brown Silty CLAY, dry, good plasticity
44-48	8" Sonic	Gray Clayey SILT, dry, slightly plastic
48-49	8" Sonic	Brownish Orange CLAY, with a silty matrix, dry, good plasticity
49-60	8" Sonic	Brownish Orange CLAY, slightly moist
	8" Sonic	53-55 soil becomes slightly moist and Iron Oxide present
	8" Sonic	57-61 soil is dry
61-67	8" Sonic	Brownish Gray CLAY, at 61 feet very moist, very plastic
67-70	8" Sonic	Gray CLAY, moist, very plastic
70-75	8" Sonic	Gray fine to medium grained SAND, saturated, nonplastic
75-77	8" Sonic	Greenish Gray to Brown Clay fine grained SAND with a CLAY matrix, saturated
77-80	8" Sonic	Brownish Gray, fine to medium grained SAND, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs
ISPC
Delta, Utah

BAC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/31/2015			
0-0.75	8" Sonic	Concrete	Surface - concrete soil mixture
0.75-2.5	8" Sonic	SM	Silty SAND:
2.5-3.25	8" Sonic		Silty SAND:
3.25-5	8" Sonic	SP/SM	SAND with silt:
5-12.5	8" Sonic		SAND with silt:
12.5-13.5	8" Sonic		SAND with silt:
13.5-14.5	8" Sonic	ML	Sandy SILT:
14.5-15	8" Sonic		Sandy SILT:
15-17.5	8" Sonic	SP	SAND:
17.5-19	8" Sonic	SP/SW	SAND:
19-20	8" Sonic	SP/SM	SAND with silt:
20-21.5	8" Sonic	SP	SAND:
21.5-22.5	8" Sonic	ML	Sandy SILT:
22.5-24	8" Sonic		Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26.75	8" Sonic	SM	Silty SAND:
26.75-27.5	8" Sonic	SP	SAND:
27.5-28.5	8" Sonic		SAND:
28.5-30	8" Sonic	SM	Silty SAND:
30-31.5	8" Sonic	SP	SAND:
31.5-32.25	8" Sonic	SM	Silty SAND:
32.25-33.75	8" Sonic	SP/SM	SAND with silt:
33.75-35	8" Sonic	SM	Silty SAND:
35-36	8" Sonic	SP/SM	SAND with silt:
36-37.5	8" Sonic	SM	Silty SAND:
37.5-38	8" Sonic	SP/SM	SAND with silt:
38-38.5	8" Sonic	SM	Silty SAND:
38.5-40	8" Sonic	ML	Sandy SILT:
40-42.5	8" Sonic	SC	Clayey SAND:
42.5-43.5	8" Sonic	CL	Sandy CLAY:
43.5-44.5	8" Sonic		Sandy CLAY:
44.5-45	8" Sonic		Sandy CLAY:
45-46	8" Sonic		Sandy CLAY:
46-47	8" Sonic		Sandy CLAY:
47-47.75	8" Sonic	SW	SAND:
47.75-48.5	8" Sonic	CH	Sandy CLAY:
48.5-50	8" Sonic		Sandy CLAY:
50-51.5	8" Sonic		CLAY:
51.5-53.5	8" Sonic		Sandy CLAY:
53.5-56	8" Sonic		CLAY:
56-57.5	8" Sonic		Sandy CLAY:
57.5-58	8" Sonic	SC	Clayey SAND:
58-59.5	8" Sonic	CH	CLAY:
59.5-60	8" Sonic	SC	Clayey SAND:
60-64.5	8" Sonic	SM	Silty SAND with clay:
64.5-65.5	8" Sonic	SC	Clayey SAND:
65.5-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic	SW	SAND:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from 0 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

BAC-2

Interval (feet)	Drilling Method	Sample Description
		7/29/2015
0-6	8" Sonic	Light Brown fine grained Sand, gravels, dry
6-12	8" Sonic	Light Brown fine grained SAND, moist
12-18	8" Sonic	Light Brown fine to medium grained sand, dry
18-23	8" Sonic	Light Brown fine to medium grained sand, with a clay matrix, dry
23-24	8" Sonic	Light Brown fine to medium grained sand, very moist, trace amount of clay
24-26	8" Sonic	Brown fine to medium grained sand, slightly moist
26-30	8" Sonic	Brown fine to medium grained sand, with gravels present, slightly moist
30-33	8" Sonic	Light Brown fine grained sand, slightly moist
33-34	8" Sonic	Light Brown CLAY, very moist, high plasticity
34-36	8" Sonic	Light Brown fine grained sand, with a clay matrix, moist
36-38	8" Sonic	Light Brown Silty CLAY, moderately plastic, slightly moist
38-40	8" Sonic	Brownish Red silty CLAY, good plasticity, slightly moist
40-41	8" Sonic	Brown fine grained SAND, saturated
41-42	8" Sonic	Brown SILT with a clay matrix, slightly moist
42-52	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist
52-55	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist, very dense
55-56	8" Sonic	Brown fine grained SAND with a clay matrix very moist to saturated
56-57	8" Sonic	Reddish brown CLAY, high plasticity, slightly moist to moist
57-65	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

BAC-3

Interval (feet)	Drilling Method	Sample Description
		7/28/2015
0-8.5	8" Sonic	Light Brown fine grained Sand, dry
8.5-11	8" Sonic	Light Brown fine to medium grained SAND, moist
11-14	8" Sonic	Light Brown fine grained sand, with a clay matrix, dry
14-17	8" Sonic	Gravels with fine to medium grained SAND, slightly moist
17-20	8" Sonic	Brown fine grained sand, slightly moist
20-22	8" Sonic	Brown fine to medium grained sand, with a clay matrix, slightly moist
22-26	8" Sonic	Brown fine to medium grained sand, with a clay matrix, moist
26-30	8" Sonic	Brown fine grained sand, moist
30-43	8" Sonic	Light Brown CLAY, slightly moist to moist, high plasticity
		30-33 Silty CLAY, poor plasticity
		33-35 Silty CLAY, moderately plastic
		35-43 very little silt present, high plasticity
43-45	8" Sonic	Transitioned to a Reddish Brown CLAY, dry, high plasticity
45-50	8" Sonic	Transitioned to a Brown CLAY, dry, high plasticity
50-55	8" Sonic	Light Brown CLAY, moist, high plasticity
55-58	8" Sonic	Light Brown fine grained SAND, with a clay matrix, slightly moist to moist
58-72	8" Sonic	Light Brown CLAY, with a sandy matrix medium to poor plasticity, moist

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Log

ISPC

Delta, Utah

BAC-4

Interval (feet)	Drilling Method	USCS	Sample Description
8/10/2015			
0-0.5	8' Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8' Sonic	SP/SM	SAND with silt:
2.5-5	8' Sonic	SP	SAND:
5-9	8' Sonic		SAND:
9-10	8' Sonic	SP/SM	SAND with silt:
10-15	8' Sonic	SP	SAND:
15-17.5	8' Sonic	SP/SM	SAND with silt:
17.5-19	8' Sonic		SAND with silt:
19-2	8' Sonic	SC	Clayey SAND:
20-21	8' Sonic		Clayey SAND:
21-22	8' Sonic	CL	Sandy CLAY:
22-22.5	8' Sonic	ML	Sandy SILT:
22.5-25	8' Sonic	CL	Sandy CLAY:
25-32.5	8' Sonic	CH	CLAY:
32.5-33.75	8' Sonic	SP	SAND:
33.75-35	8' Sonic	SM	Silty SAND:
35-36.5	8' Sonic	SP/SM	SAND with silt:
36.5-37.5	8' Sonic		SAND with silt:
37.5-38	8' Sonic	SM	Silty SAND:
38-38.75	8' Sonic	CH	Sandy CLAY:
38.75-39	8' Sonic	SP/SM	SAND with silt:
39-40	8' Sonic	CH	Sandy CLAY:
40-42.5	8' Sonic	ML	Sandy SILT with clay:
42.5-43.5	8' Sonic	SM	Silty SAND and clay:
43.5-45	8' Sonic	CH	CLAY:
45-47.5	8' Sonic		CLAY:
47.5-48.5	8' Sonic		CLAY:
48.5-50	8' Sonic	ML	Clayey SILT with sand:
50-51.25	8' Sonic		Clayey SILT:
51.25-52.5	8' Sonic	CH	CLAY:
52.5-55	8' Sonic	SC	Clayey SAND:
55-56.5	8' Sonic	SM	Silty SAND:
56.5-57	8' Sonic	ML	Clayey SILT with sand:
57-57.5	8' Sonic	CH	CLAY:
57.5-58.5	8' Sonic		CLAY:
58.5-59.5	8' Sonic	ML	Clayey SILT with sand:
59.5-61	8' Sonic		Clayey SILT with sand:
61-64	8' Sonic		Clayey SILT with sand:
64-65	8' Sonic		Clayey SILT with sand:
65-65.5	8' Sonic	SM	Silty SAND:
65.5-67	8' Sonic	CL	Silty CLAY:
67-67.5	8' Sonic	ML	Clayey SILT:
67.5-69	8' Sonic	CH	CLAY:
69-69.5	8' Sonic		CLAY:
69.5-70	8' Sonic		CLAY:
70-72.5	8' Sonic	ML	Sandy SILT with clay:
72.5-74	8' Sonic	CH	Silty CLAY:
74-75	8' Sonic	SM	Silty SAND:

TD = 75'; PVC 4-inch screen from 55 to 75; PVC 4-inch riser from -2.5 to 55

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BAC-5

Interval (feet)	Drilling Method	USCS	Sample Description
8/9/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-3	8" Sonic	SP	SAND:
3-6.5	8" Sonic	SP	SAND:
6.5-10	8" Sonic	SP	SAND:
10-12.5	8" Sonic	SP	SAND:
12.5-15	8" Sonic	SP/SM	SAND with silt:
15-19	8" Sonic	SM	Silty SAND:
19-19.5	8" Sonic	SC	Clayey SAND:
19.5-20	8" Sonic	SP/SM	SAND with silt:
20-22.5	8" Sonic	CL	Sandy CLAY:
22.5-23.75	8" Sonic	CL	Sandy CLAY:
23.75-25	8" Sonic	CL	Sandy CLAY:
25-27.5	8" Sonic	CL	Sandy CLAY:
27.5-30	8" Sonic	CL	CLAY:
30-32.5	8" Sonic	CL/CH	CLAY:
32.5-33.5	8" Sonic	SP	SAND:
33.5-35	8" Sonic	SP	SAND:
35-36	8" Sonic	SC	Clayey SAND:
36-37.5	8" Sonic	ML	Sandy SILT:
37.5-38.5	8" Sonic	ML	Sandy SILT:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic	SM	Silty SAND:
42.5-44.25	8" Sonic	SM	Silty SAND with clay:
44.25-45	8" Sonic	CH	CLAY:
45-46.5	8" Sonic	CH	CLAY:
46.5-47.5	8" Sonic	CH	CLAY:
47.5-49	8" Sonic	CH	CLAY:
49-50.75	8" Sonic	SM	Silty SAND:
50.75-52.5	8" Sonic	CH	CLAY:
52.5-53.5	8" Sonic	CH	CLAY:
53.5-55.5	8" Sonic	SP	SAND:
55.5-57.5	8" Sonic	CH	CLAY:
57.5-59	8" Sonic	CH	CLAY:
59-60	8" Sonic	SM	Silty SAND with clay:
60-62.5	8" Sonic	SP	SAND:
62.5-63	8" Sonic	SC	Clayey SAND:
63-65	8" Sonic	SP	SAND:
65-65.75	8" Sonic	SC	Clayey SAND:
65.75-66.5	8" Sonic	CH	CLAY:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-69	8" Sonic	CH	CLAY:
69-70	8" Sonic	CH	CLAY:

TD = 70'; PVC 4-inch screen from 58 to 68; PVC 4-inch riser from -2.5 to 58
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

BAC-6

Interval (feet)	Drilling Method	USCS	Sample Description
8/8/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-5	8" Sonic	SP	SAND:
5-6.5	8" Sonic	SP/SM	SAND with silt:
6.5-7.5	8" Sonic	SP	SAND:
7.5-10	8" Sonic		SAND:
10-13.5	8" Sonic		SAND:
13.5-15	8" Sonic	SM	Silty SAND:
15-16	8" Sonic	SP	SAND:
16-17.5	8" Sonic	SM	Silty SAND:
17.5-18.25	8" Sonic	SP/SM	SAND with silt:
18.25-18.75	8" Sonic	CL	Sandy CLAY:
18.75-20	8" Sonic	SC	Clayey SAND:
20-21.5	8" Sonic	CH	Sandy CLAY:
21.5-23	8" Sonic	SM	Silty SAND:
23-25	8" Sonic	CL	CLAY:
25-27.5	8" Sonic	CH	CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic		CLAY:
32.5-33.5	8" Sonic		CLAY:
33.5-35	8" Sonic	SW	SAND:
35-36	8" Sonic	SM	Silty SAND:
36-37.5	8" Sonic	SP/SM	SAND with silt:
37.5-38.5	8" Sonic	CH	CLAY:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-43.5	8" Sonic	CH	Sandy CLAY:
43.5-45	8" Sonic		CLAY:
45-45.5	8" Sonic	SC	Clayey SAND:
45.5-47.5	8" Sonic	CH	CLAY:
47.5-48	8" Sonic	SP	SAND:
48-49.5	8" Sonic	SM	Silty SAND with clay:
49.5-50	8" Sonic	CH	Sandy CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic		CLAY:
55-56	8" Sonic	SM	Silty SAND:
56-60	8" Sonic	SW	SAND:
60-61	8" Sonic		SAND:
61-62.5	8" Sonic	CH	Sandy CLAY:
62.5-63.5	8" Sonic		CLAY:
63.5-65	8" Sonic	SC	Clayey SAND:

TD = 65'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BAC-7

Interval (feet)	Drilling Method	USCS	Sample Description
8/7/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	Gravelly SAND:
2-2.5	8" Sonic	SP	Gravelly SAND:
2.5-5	8" Sonic		SAND:
5-7	8" Sonic		SAND:
7-8.5	8" Sonic		SAND:
8.5-9	8" Sonic	SP/SM	SAND with silt:
9-9.5	8" Sonic	SP	SAND:
9.5-11	8" Sonic	SP/SM	SAND with silt:
11-13	8" Sonic		SAND with silt:
13-17	8" Sonic	SM	Silty SAND:
17-18.5	8" Sonic		Silty SAND:
18.5-19	8" Sonic	ML	Sandy SILT:
19-20.25	8" Sonic	SP/SM	SAND with silt:
20.25-22	8" Sonic	CL	Sandy CLAY:
22-24	8" Sonic		Sandy CLAY:
24-25	8" Sonic	SC	Clayey SAND:
25-27.5	8" Sonic	CH	CLAY:
27.5-36.5	8" Sonic		CLAY:
36.5-40	8" Sonic	SP	SAND:
40-41.25	8" Sonic		SAND:
41.25-43.75	8" Sonic	SP/SM	SAND with silt:
43.75-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50	8" Sonic	SM	Silty SAND:
50-57.5	8" Sonic	CH	CLAY:
57.5-60	8" Sonic	SW	SAND:
60-62.5	8" Sonic		SAND:
62.5-64	8" Sonic	SP	SAND:
64-65	8" Sonic	CH	CLAY:
65-66.25	8" Sonic		Sandy CLAY:
66.25-67.5	8" Sonic		CLAY:
67.5-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 57 to 67; PVC 4-inch riser from -2.5 to 57
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

BA-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/24/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SC	Clayey SAND:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
5-6	8" Sonic	SP	SAND:
6-9.5	8" Sonic		SAND:
9.5-11	8" Sonic		SAND:
11-11.5	8" Sonic	SM	Silty SAND:
11.5-12	8" Sonic		Silty SAND:
12-13	8" Sonic	SP/SM	SAND with silt:
13-17	8" Sonic	SP	SAND:
17-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22.5	8" Sonic		SAND:
22.5-25	8" Sonic	SM	Silty SAND:
25-26	8" Sonic	SP	SAND:
26-27.5	8" Sonic	SP/SM	SAND with silt:
27.5-28.25	8" Sonic	SM	Silty SAND with clay:
28.25-29.25	8" Sonic	SP/SM	SAND with silt:
29.25-30	8" Sonic	CL	CLAY:
30-31.5	8" Sonic		Sandy CLAY:
31.5-33	8" Sonic	ML	Sandy SILT:
33-35	8" Sonic	SM	Silty SAND with clay:
35-36.25	8" Sonic	SP/SM	SAND with silt:
36.25-40	8" Sonic	CH	CLAY:
40-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic	SP/SM	SAND with silt:
47.5-50	8" Sonic	SM	Silty SAND with clay:
50-51	8" Sonic	SC	Clayey SAND:
51-51.75	8" Sonic	SW	SAND:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53	8" Sonic	CH	Sandy CLAY:
53-54	8" Sonic		Sandy CLAY:
54-55	8" Sonic		CLAY:

TD = 55'; PVC 4-inch screen from 45 to 55; PVC 4-inch riser from -2.5 to 45
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

BA-U-2

Interval (feet)	Drilling Method	USCS	Sample Description
7/25/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	ML	Sandy SILT:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4	8" Sonic		SAND with silt:
4-5	8" Sonic	ML	SILT with sand and clay:
5-6	8" Sonic	SP/SM	SAND with silt:
6-7	8" Sonic	SP	SAND:
7-9	8" Sonic	SW	Gravelly SAND:
9-9.75	8" Sonic		Gravelly SAND:
9.75-10.25	8" Sonic	SP	Gravelly SAND:
10.25-11	8" Sonic	SP/SM	SAND with silt:
11-12.5	8" Sonic	CL	CLAY:
12.5-13	8" Sonic	SP	SAND:
13-15.5	8" Sonic		SAND:
15.5-18	8" Sonic		SAND:
18-22.5	8" Sonic		SAND:
22.5-23	8" Sonic		SAND:
23-23.5	8" Sonic	SM	Silty SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-30	8" Sonic	SM	Silty SAND:
30-32.5	8" Sonic	SC	Clayey SAND:
32.5-35	8" Sonic	SM	Silty SAND with clay:
35-37.5	8" Sonic		Silty SAND:
37.5-40	8" Sonic	CL	Sandy CLAY:
40-42	8" Sonic	SC	Clayey SAND:
42-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		Sandy CLAY:
47.5-51.75	8" Sonic		CLAY:
51.75-53	8" Sonic	SM	Silty SAND:
53-54	8" Sonic		Silty SAND:
54-55	8" Sonic	SC/SM	Clayey SAND with silt:
55-56.5	8" Sonic	CH	CLAY:
56.5-57.5	8" Sonic		CLAY:
57.5-60	8" Sonic	SC	Clayey SAND:
60-60.75	8" Sonic	SM	Silty SAND with clay:
60.75-61.5	8" Sonic	SC	Clayey SAND:
61.5-62.5	8" Sonic	SP	SAND:
62.5-63.5	8" Sonic		SAND:
63.5-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic		SAND:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

WWC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/26/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP	SAND:
2.5-5	8" Sonic		SAND:
5-6.75	8" Sonic	SM	Silty SAND:
6.75-7.5	8" Sonic	ML	Sandy SILT:
7.5-10	8" Sonic		Sandy SILT:
10-12	8" Sonic		Sandy SILT:
12-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	CL	Silty CLAY:
15-17.5	8" Sonic		Silty CLAY:
17.5-18.5	8" Sonic		Silty CLAY:
18.5-19	8" Sonic		Sandy CLAY:
19-20	8" Sonic		Silty CLAY:
20-22	8" Sonic	CH	CLAY:
22-24.5	8" Sonic		Sandy CLAY:
24.5-25.5	8" Sonic		Sandy CLAY:
25.5-27	8" Sonic		Sandy CLAY:
27-31	8" Sonic		CLAY:
31-31.5	8" Sonic		CLAY:
31.5-33	8" Sonic		CLAY:
33-34.5	8" Sonic		Sandy CLAY:
34.5-35	8" Sonic		Sandy CLAY:
35-37.5	8" Sonic	SM	Silty SAND:
37.5-40	8" Sonic		Silty SAND:
40-41.5	8" Sonic	SP	SAND:
41.5-42.5	8" Sonic		SAND:
42.5-44	8" Sonic		SAND:
44-45	8" Sonic		SAND:
45-46.5	8" Sonic	CH	CLAY:
46.5-47.5	8" Sonic		Sandy CLAY:
47.5-50.5	8" Sonic	SC/SM	SAND with silt and clay:
50.5-52.5	8" Sonic	SW	SAND:
52.5-53.5	8" Sonic		SAND:
53.5-55	8" Sonic	SM	Silty SAND:
55-57	8" Sonic		Silty SAND:
57-57.5	8" Sonic	CH	CLAY:
57.5-60			CLAY:

TD = 60'; PVC 4-inch screen from 48 to 58; PVC 4-inch riser from -2.5 to 48
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

WWC-2

Interval (feet)	Driling Method	USCS	Sample Description
7/27/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SM	Silty SAND:
2.5-5	8" Sonic	SP	SAND:
5-7	8" Sonic		SAND:
7-9.5	8" Sonic	SW	Gravelly SAND:
9.5-10	8" Sonic	SW/SP	SAND:
10-12	8" Sonic	SP	SAND:
12-12.5	8" Sonic	SP/SW	Gravelly SAND:
12.5-14.5	8" Sonic	SW	Gravelly SAND:
14.5-15	8" Sonic	SP	SAND with gravel:
15-16	8" Sonic		SAND:
16-17.5	8" Sonic	CL	Sandy CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20	8" Sonic		Clayey SAND:
20-21	8" Sonic		Clayey SAND:
21-22	8" Sonic	CH	CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND with clay:
25-26.5	8" Sonic	SM/SC	Silty SAND and clay:
26.5-27.5	8" Sonic	SC	Clayey SAND with silt:
27.5-31.5	8" Sonic	CH	CLAY:
31.5-34	8" Sonic		Silty CLAY:
34-35.5	8" Sonic	SP	SAND:
35.5-37	8" Sonic	ML	Sandy SILT with clay:
37-38.5	8" Sonic	CL	Silty CLAY:
38.5-40	8" Sonic	SM	Silty SAND:
40-42	8" Sonic	CH	CLAY:
42-42.5	8" Sonic		Silty CLAY:
42.5-45	8" Sonic	SC	Clayey SAND:
45-46.25	8" Sonic	CH	CLAY:
46.25-46.75	8" Sonic	SW/SM	SAND with silt:
46.75-47	8" Sonic	ML	Sandy SILT:
47-47.5	8" Sonic	SM	Silty SAND:
47.5-50	8" Sonic	CH	CLAY:
50-51.5	8" Sonic	SM	Silty SAND:
51.5-52	8" Sonic	CH	Sandy CLAY:
52-52.5	8" Sonic	SM	CLAY:
52.5-53.5	8" Sonic	CH	Sandy CLAY:
53.5-55	8" Sonic	SM	Silty SAND:
55-56.25	8" Sonic	ML	Sandy SILT:
56.25-57.5	8" Sonic		SILT:
57.5-60	8" Sonic	SP/SM	SAND with silt:
60-61.5	8" Sonic	SM	Silty SAND:
61.5-62.5	8" Sonic	CH	CLAY:
62.5-63.75	8" Sonic	SP/SM	SAND with silt:
63.75-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND:
67.5-70	8" Sonic		Gravelly SAND:
70-70.5	8" Sonic	SC/SM	Silty SAND and clay:
70.5-72.5	8" Sonic	CH	CLAY:
72.5-75	8" Sonic		CLAY:

TD = 75'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

WWC-3

Interval (feet)	Drilling Method	USCS	Sample Description
7/30/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1	8" Sonic	SP	Gravelly SAND:
1-2.5	8" Sonic	SM	Silty SAND:
2.5-3.5	8" Sonic		Silty SAND:
3.5-5	8" Sonic	SP/SM	SAND with silt:
5-6.5	8" Sonic	ML	Sandy SILT:
6.5-7.5	8" Sonic	CL	Sandy CLAY:
7.5-8	8" Sonic	SM	Silty SAND:
8-10	8" Sonic	SC	Clayey SAND:
10-11	8" Sonic	SM	Silty SAND:
11-12.5	8" Sonic		Silty SAND with clay:
12.5-13.5	8" Sonic		Silty SAND:
13.5-14	8" Sonic	SC	Clayey SAND:
14-15	8" Sonic	SM	Silty SAND:
15-15.5	8" Sonic	CH	CLAY:
15.5-16	8" Sonic		CLAY:
16-16.5	8" Sonic		Sandy CLAY:
16.5-17.5	8" Sonic		Sandy CLAY:
17.5-20	8" Sonic		CLAY:
20-21	8" Sonic		CLAY:
21-22	8" Sonic		CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND:
25-26.25	8" Sonic	SP/SM	SAND with silt:
26.25-27	8" Sonic	SP	SAND:
27-29	8" Sonic	SM	Silty SAND:
29-30	8" Sonic	CH	CLAY:
30-31	8" Sonic		CLAY:
31-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-36	8" Sonic	CH	CLAY:
36-37	8" Sonic		CLAY:
37-39.5	8" Sonic	SP/SM	SAND with silt:
39.5-40.5	8" Sonic	SP	SAND:
40.5-41.5	8" Sonic		SAND:
41.5-43	8" Sonic	CH	CLAY:
43-44	8" Sonic	SP/SM	SAND with silt:
44-45	8" Sonic	SM	Silty SAND:
45-47.5	8" Sonic	SP	SAND:
47.5-50	8" Sonic	CH	CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic	SP	SAND:
55-61	8" Sonic		SAND:
61-62.5	8" Sonic	SW	SAND:
62.5-65	8" Sonic		SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-69.5	8" Sonic	SW	SAND:
69.5-70	8" Sonic	CH	CLAY:

TD = 70'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWC-4

Interval (feet)	Drilling Method	USCS	Sample Description
7/29/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-5	8" Sonic		SAND with silt:
5-6.25	8" Sonic	ML	Sandy SILT:
6.25-7.25	8" Sonic	CL	CLAY:
7.25-8	8" Sonic	SC	Clayey SAND:
8-9	8" Sonic	SP/SC	SAND with clay:
9-10	8" Sonic	SP	SAND:
10-11	8" Sonic	ML	SILT:
11-12.5	8" Sonic	ML/CL	Clayey SILT:
12.5-14	8" Sonic	CL	CLAY:
14-15	8" Sonic		Sandy CLAY:
15-16	8" Sonic	SC	Clayey SAND:
16-18	8" Sonic		Clayey SAND:
18-19.5	8" Sonic	SM	Silty SAND:
19.5-20	8" Sonic	CH	CLAY:
20-21.25	8" Sonic		Sandy CLAY:
21.25-22.5	8" Sonic	SM	Silty SAND:
22.5-23.75	8" Sonic	CH	CLAY:
23.75-25	8" Sonic	SM	Silty SAND:
25-25.75	8" Sonic	SC	Clayey SAND:
25.75-27.5	8" Sonic	CL	Sandy CLAY:
27.5-29	8" Sonic	CH	CLAY:
29-30.5	8" Sonic		CLAY:
30.5-31.5	8" Sonic	SM	Silty SAND:
31.5-32.25	8" Sonic	CL	Sandy CLAY:
32.25-32.5	8" Sonic		Sandy CLAY:
32.5-33	8" Sonic	CH	CLAY:
33-36	8" Sonic	SP/SM	SAND with silt:
36-37	8" Sonic	SM	Silty SAND:
37-40	8" Sonic	SP	SAND:
40-42.5	8" Sonic		SAND:
42.5-45	8" Sonic		SAND:
45-46	8" Sonic	SP/SW	SAND:
46-46.5	8" Sonic	CH	CLAY:
45.5-47.5	8" Sonic		Sandy CLAY:
47.5-48.5	8" Sonic		CLAY:
48.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		CLAY:
50.5-52.5	8" Sonic	SM	Silty SAND:
52.5-54	8" Sonic	CH	CLAY:
54-55	8" Sonic	SP	SAND:
55-57	8" Sonic	CH	Sandy CLAY:
57-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic	SM	Silty SAND:
60-62	8" Sonic		Silty SAND:
62-62.5	8" Sonic	SC	Clayey SAND:
62.5-63	8" Sonic	CH	Sandy CLAY:
63-65	8" Sonic	SM	Silty SAND:
65-67.5	8" Sonic	SW	SAND:
67.5-69.5	8" Sonic	SP	SAND:
69.5-70	8" Sonic	SW	SAND:
70-72	8" Sonic		SAND:
72-72.5	8" Sonic	SP/SM	SAND with silt:
72.5-75	8" Sonic	SM	Silty SAND:
75-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

WWC-5

Interval (feet)	Drilling Method	USCS	Sample Description
7/28/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4.25	8" Sonic	SM	Silty SAND:
4.25-5	8" Sonic	SP	SAND:
5-7.5	8" Sonic	ML	Clayey SILT:
7.5-9	8" Sonic	CL	Silty CLAY:
9-10	8" Sonic		Sandy CLAY:
10-10.5	8" Sonic	SC	Clayey SAND:
10.5-11.25	8" Sonic	CL	CLAY:
11.25-12.5	8" Sonic	ML	Clayey SILT:
12.5-13.25	8" Sonic	SM	Silty SAND:
13.25-13.75	8" Sonic	SC	Clayey SAND:
13.75-15	8" Sonic	CL	CLAY:
15-16	8" Sonic		CLAY:
16-17.5	8" Sonic	CH	CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20.5	8" Sonic	CH	CLAY:
20.5-21.25	8" Sonic		Sandy CLAY:
21.25-22	8" Sonic		CLAY:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-24	8" Sonic	SM	Silty SAND:
24-25	8" Sonic	CH	CLAY:
25-26	8" Sonic	SM/CH	Silty SAND / CLAY:
26-27.5	8" Sonic	CH	CLAY:
27.5-28	8" Sonic		Sandy CLAY:
28-28.25	8" Sonic	SM	Silty SAND:
28.25-30	8" Sonic	CH	CLAY:
30-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-37.5	8" Sonic		SAND:
37.5-40	8" Sonic	SP/SM	SAND with silt:
40-42.5	8" Sonic	CH	CLAY:
42.5-42.75	8" Sonic	SM	Silty SAND:
42.75-44	8" Sonic	CH	Sandy CLAY:
44-44.5	8" Sonic	SM	Silty SAND:
44.5-45	8" Sonic		Silty SAND:
45-45.5	8" Sonic		Silty SAND:
45.5-46.75	8" Sonic		Silty SAND:
46.75-47.5	8" Sonic	CH	CLAY:
47.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		Sandy CLAY:
50.5-51.5	8" Sonic		CLAY:
51.5-52	8" Sonic	SM	Silty SAND:
52-53.25	8" Sonic	CH	CLAY:
53.25-53.5	8" Sonic		CLAY:
53.5-54	8" Sonic	SC	Clayey SAND:
54-55	8" Sonic	SM/SC	Silty SAND and clay:
55-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic		SAND:
60-60.75	8" Sonic		SAND:
60.75-61.5	8" Sonic	CH	CLAY:
61.5-62.5	8" Sonic	SP/SM	SAND with silt:
62.5-64	8" Sonic		SAND with silt:
64-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND with gravel:
67.5-70	8" Sonic		Gravelly SAND:
70-72.5	8" Sonic		SAND:
72.5-75	8" Sonic		SAND:

TD = 75'; PVC 4-inch screen from 64 to 74; PVC 4-inch riser from -2.5 to 64

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein

Boring Log

ISPC

Delta, Utah

WWU-1

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-4.75	8" Sonic	SP	SAND:
4.75-5	8" Sonic	SC	Clayey SAND:
5-7	8" Sonic	SP/SM	SAND with silt:
7-10.75	8" Sonic	SC	Clayey SAND:
10.75-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SC	Clayey SAND:
13-14	8" Sonic	SM	Silty SAND:
14-15	8" Sonic	SP	SAND:
15-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22	8" Sonic	SP/SM	SAND with silt:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-25	8" Sonic	CL	Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-28	8" Sonic	SC	Clayey SAND:
28-30	8" Sonic	SW	Gravelly SAND:
30-32.5	8" Sonic	SP/SM	SAND with silt:
32.5-35	8" Sonic	SM	Silty SAND:
35-37.5	8" Sonic	SP	SAND:
37.5-40	8" Sonic		SAND:
40-42.5	8" Sonic	SW/SM	SAND with silt:
42.5-43.25	8" Sonic	SM	Silty SAND:
43.25-44.25	8" Sonic		Silty SAND:
44.25-45	8" Sonic	SP/SW	SAND:
45-47.5	8" Sonic	SW	SAND:
47.5-50	8" Sonic	SP	SAND:
50-50.5	8" Sonic		SAND:
50.5-51.75	8" Sonic	ML	Sandy SILT:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53.25	8" Sonic	SC	Clayey SAND:
53.25-55	8" Sonic		Clayey SAND:
55-56.5	8" Sonic		Clayey SAND:
56.5-57.5	8" Sonic		Clayey SAND:
57.5-60	8" Sonic		Clayey SAND:
60-61	8" Sonic	ML	Clayey SILT with sand:
61-62.5	8" Sonic	SM	Silty SAND:
62.5-63.75	8" Sonic	CL	Sandy CLAY:
63.75-64.75	8" Sonic	SM	Silty SAND:
64.75-65.5	8" Sonic	SP	SAND:
65.5-66.5	8" Sonic	ML	Clayey SILT with sand:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-70	8" Sonic	SM	Silty SAND with clay:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWU-2

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-2.5	8" Sonic	ML	Gravelly SILT with sand:
2.5-4	8" Sonic	SP	SAND:
4-5	8" Sonic		SAND:
5-5.5	8" Sonic		SAND:
5.5-7.5	8" Sonic		SAND:
7.5-9.5	8" Sonic	SP/SW	SAND:
9.5-10	8" Sonic	SP	SAND:
10-11	8" Sonic	SW	SAND:
11-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	ML	Sandy SILT:
15-15.5	8" Sonic	SP	SAND:
15.5-17	8" Sonic	SC	Clayey SAND with gravel:
17-17.5	8" Sonic	SW	Gravelly SAND with sand:
17.5-19	8" Sonic		SAND:
19-20	8" Sonic		SAND:
20-22.5	8" Sonic	GW	Sandy GRAVEL:
22.5-23.5	8" Sonic	SW	SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-32.5	8" Sonic		SAND with silt:
32.5-33.5	8" Sonic	SW/SC	Gravelly SAND with clay:
33.5-35	8" Sonic	SP/SM	SAND with silt:
35-37.5	8" Sonic		SAND with silt:
37.5-39	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
39-40	8" Sonic	SC	Clayey SAND:
40-45	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
45-45.5	8" Sonic	SM	Silty SAND with clay:
45.5-47.5	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
47.5-49.5	8" Sonic	CH/SC	Sandy CLAY/Clayey SAND:
49.5-50	8" Sonic	SP/SM	SAND with silt:
50-51.5	8" Sonic	SC	Clayey SAND:
51.5-52.5	8" Sonic	SP/SC	SAND with clay:
52.5-55	8" Sonic	SP	SAND:
55-56.5	8" Sonic	CH	Sandy CLAY:
56.5-57.5	8" Sonic	SC	Clayey SAND:
57.5-59	8" Sonic	ML	Clayey SILT with sand:
59-60	8" Sonic	CH	Sandy CLAY:
60-62.5	8" Sonic	SC	Clayey SAND:
62.5-64	8" Sonic	CH	Sandy CLAY:
64-65	8" Sonic	SM	Silty SAND:
65-66.5	8" Sonic	SP	SAND:
66.5-67.5	8" Sonic	SM	Silty SAND:
67.5-75	8" Sonic	SW	SAND:

TD = 75'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein

Appendix B Tabulation of UTL and GWPS Values, CCR Unit-Specific

Assessment Monitoring - Statistically Significant Levels above Groundwater Protection Standards Intermountain Power Service Corporation - Intermountain Generation Facility Delta, Utah																
Constituent	**Downgradient Well ID**	**N**	**Mean**	**SD**	**SE**	**Median**	**1st Quartile**	**3rd Quartile**	**Minimum**	**Maximum**	**% Non-Detects**	**UTL**	**MCL**	**GWPS**	**LCL**	**LCL Exceeds GWPS**
BOTTOM ASH BASIN																
lithium (mg/L)	BAC-3	11	1.369	0.6401	0.193	1.06	0.944	2.13	0.812	2.53	0.0%	0.7415	0.04	0.7415	0.812	YES
molybdenum (mg/L)	BAC-2	11	0.1595	0.01643	0.004953	0.156	0.143	0.167	0.14	0.194	0.0%	0.04038	0.1	0.1	0.1506	YES
COMBUSTION BY-PRODUCTS LANDFILL																
NO STATISTICALLY SIGNIFICANT LEVELS ABOVE GWPS																
WASTE WATER BASIN																
arsenic (mg/L)	WWC-1	11	0.01664	0.006735	0.002031	0.0181	0.0173	0.02	0.00331	0.0243	0.0%				0.01496	YES
arsenic (mg/L)	WWC-2	11	0.01455	0.0007488	0.0002258	0.0147	0.0141	0.0152	0.0129	0.0155	0.0%	0.01275	0.01	0.01275	0.01415	YES
arsenic (mg/L)	WWC-3	11	0.02086	0.003704	0.001117	0.0214	0.021	0.0226	0.0102	0.0247	0.0%				0.02045	YES

All units micrograms per liter (mg/L)
N: Number of Samples
SD: Standard Deviation
SE: Standard Error
UTL: Upper Tolerance Limit, calculated using samples collected from upgradient wells
Bottom Ash upgrandient wells: BA-U-1, BA-U-2 (n=22)
Waste Water upgradient wells: WW-U-1, WW-U-2, SI-U-1 (n=33)
GWPS: Ground water Protection Standard = the greater value of the UTL or MCL
LCL: Lower Confidence Limit of the Mean, If the LCL exceeds the GWPS it is evidence of a statistically significant level above background

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	UCL	LCL Exceeds GWPS2	UCL Exceeds GWPS
antimony (mg/L)	Background	33	0.00103	0.0001741	0.0000303	0.001	0.001	0.001	0.001	0.002	96.97	0.001	0.006	0.006				
antimony (mg/L)	WWC-1	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	33	0.006554	0.002831	0.0004929	0.00573	0.004425	0.00935	0.001	0.0109	3.03	0.01275	0.01	0.01275				
arsenic (mg/L)	WWC-1	11	0.01664	0.006735	0.002031	0.0181	0.0173	0.02	0.00331	0.0243	0				0.01496	0.0203	YES	YES
arsenic (mg/L)	WWC-2	11	0.01455	0.0007488	0.0002258	0.0147	0.0141	0.0152	0.0129	0.0155	0				0.01415	0.01496	YES	YES
arsenic (mg/L)	WWC-3	11	0.02086	0.003704	0.001117	0.0214	0.021	0.0226	0.0102	0.0247	0				0.02045	0.02262	YES	YES
arsenic (mg/L)	WWC-4	11	0.01206	0.002721	0.0008204	0.013	0.0116	0.0135	0.00498	0.0145	0				0.01147	0.01344	NO	YES
arsenic (mg/L)	WWC-5	11	0.008509	0.002536	0.0007647	0.00783	0.00717	0.0104	0.00371	0.0131	0				0.007123	0.009895	NO	NO
barium (mg/L)	Background	33	0.07908	0.02935	0.005109	0.0761	0.05565	0.09225	0.0446	0.178	0	0.1481	2	2				
barium (mg/L)	WWC-1	11	0.03876	0.01967	0.00593	0.0317	0.0268	0.0536	0.0209	0.077	0				0.02755	0.04481	NO	NO
barium (mg/L)	WWC-2	11	0.03947	0.007406	0.002233	0.0361	0.0339	0.0421	0.031	0.0543	0				0.03543	0.04352	NO	NO
barium (mg/L)	WWC-3	11	0.03304	0.01088	0.003279	0.0302	0.0278	0.0342	0.0242	0.0638	0				0.0242	0.0357	NO	NO
barium (mg/L)	WWC-4	11	0.0646	0.01769	0.005334	0.061	0.0507	0.0768	0.0463	0.101	0				0.05493	0.07427	NO	NO
barium (mg/L)	WWC-5	11	0.05179	0.02411	0.00727	0.0438	0.034	0.067	0.0302	0.103	0				0.03844	0.06223	NO	NO
beryllium (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	33	0.004887	0.0006476	0.0001127	0.005	0.005	0.005	0.00128	0.005	96.97	0.005	0.005	0.005				
cadmium (mg/L)	WWC-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-5	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
chromium (mg/L)	Background	33	0.00627	0.012	0.002088	0.00217	0.002	0.00481	0.000602	0.067	27.27	0.067	0.1	0.1				
chromium (mg/L)	WWC-1	11	0.00337	0.00355	0.00107	0.002	0.002	0.00348	0.002	0.0139	72.73				0.002	0.00369	NO	NO
chromium (mg/L)	WWC-2	11	0.004285	0.006663	0.002009	0.002	0.002	0.00335	0.002	0.0243	72.73				0.002	0.00348	NO	NO
chromium (mg/L)	WWC-3	11	0.002442	0.001151	0.0003471	0.002	0.002	0.002	0.002	0.00577	81.82				0.002	0.00309	NO	NO
chromium (mg/L)	WWC-4	11	0.002615	0.002041	0.0006155	0.002	0.002	0.002	0.002	0.00877	90.91				0.002	0.002	NO	NO
chromium (mg/L)	WWC-5	11	0.002665	0.002078	0.0006264	0.002	0.002	0.00202	0.002	0.00892	72.73				0.002	0.00238	NO	NO
cobalt (mg/L)	Background	33	0.004097	0.000557	0.00009697	0.004	0.004	0.004	0.004	0.0072	96.97	0.0072	0.006	0.0072				
cobalt (mg/L)	WWC-1	11	0.004522	0.001352	0.0004077	0.004	0.004	0.004	0.004	0.00842	81.82				0.004	0.00532	NO	NO
cobalt (mg/L)	WWC-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-5	11	0.004136	0.0004523	0.0001364	0.004	0.004	0.004	0.004	0.0055	90.91				0.004	0.004	NO	NO
fluoride (mg/L)	Background	33	0.4106	0.2331	0.04058	0.458	0.276	0.548	0	1.01	15.15	0.9086	4	4				
fluoride (mg/L)	WWC-1	11	0.1627	0.1651	0.04978	0.133	0	0.256	0	0.507	36.36				0.0767	0.2488	NO	NO
fluoride (mg/L)	WWC-2	11	0.4225	0.1728	0.0521	0.42	0.358	0.452	0.158	0.833	0				0.328	0.5169	NO	NO
fluoride (mg/L)	WWC-3	11	0.9894	0.09192	0.02772	1.01	0.897	1.06	0.845	1.13	0				0.9391	1.04	NO	NO
fluoride (mg/L)	WWC-4	11	0.4473	0.08237	0.02484	0.435	0.387	0.509	0.319	0.576	0				0.4023	0.4923	NO	NO
fluoride (mg/L)	WWC-5	11	0.3261	0.1374	0.04143	0.331	0.292	0.401	0	0.544	9.091				0.251	0.4012	NO	NO
lead (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lithium (mg/L)	Background	33	0.5821	0.3149	0.05482	0.479	0.4385	0.784	0.235	1.35	0	1.35	0.04	1.35				
lithium (mg/L)	WWC-1	11	1.325	0.7251	0.2186	0.964	0.819	2.18	0.755	2.69	0				0.755	2.41	NO	YES
lithium (mg/L)	WWC-2	11	0.1539	0.05544	0.01672	0.124	0.112	0.225	0.104	0.243	0				0.104	0.241	NO	NO
lithium (mg/L)	WWC-3	11	0.1649	0.04891	0.01475	0.139	0.127	0.23	0.123	0.243	0				0.123	0.241	NO	NO
lithium (mg/L)	WWC-4	11	0.5123	0.2318	0.0699	0.382	0.351	0.75	0.309	0.909	0				0.309	0.879	NO	NO
lithium (mg/L)	WWC-5	11	1.106	1.165	0.3513	0.555	0.497	1.4	0.472	4.41	0				0.472	1.41	NO	YES
mercury (mg/L)	Background	33	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	WWC-1	11	0.0002225	0.00006787	0.00002046	0.000198	0.000168	0.00031	0.00015	0.000328	18.18				0.0001872	0.0002579	NO	NO
mercury (mg/L)	WWC-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	33	0.008239	0.00735	0.001279	0.00619	0.00286	0.009505	0.00182	0.0342	0	0.02676	0.1	0.1				
molybdenum (mg/L)	WWC-1	11	0.008871	0.00245	0.0007387	0.00896	0.0068	0.00995	0.00596	0.0147	0				0.007532	0.01021	NO	NO
molybdenum (mg/L)	WWC-2	11	0.004055	0.001372	0.0004137	0.00372	0.00341	0.00402	0.00304	0.00809	0				0.00304	0.00405	NO	NO
molybdenum (mg/L)	WWC-3	11	0.008955	0.01226	0.003697	0.00537	0.00482	0.00574	0.00464	0.0459	0				0.00464	0.00593	NO	NO
molybdenum (mg/L)	WWC-4	11	0.002949	0.002736	0.0008249	0.00215	0.001	0.00467	0.001	0.0082	45.45				0.001	0.00783	NO	NO
molybdenum (mg/L)	WWC-5	11	0.008649	0.007883	0.002377	0.00523	0.00324	0.0119	0.00301	0.0265	0				0.004262	0.009735	NO	NO
radium226and228combined (pCi/L)	Background	30	1.633	0.7959	0.1453	1.54	1.045	2.19	0.27	3.3	0	3.4	5	5				
radium226and228combined (pCi/L)	WWC-1	10	1.56	0.551	0.1743	1.41	1.15	2.18	0.96	2.51	0				1.241	1.879	NO	NO
radium226and228combined (pCi/L)	WWC-2	10	0.86	0.5302	0.1677	0.715	0.515	1.23	0	1.89	10				0.5526	1.167	NO	NO
radium226and228combined (pCi/L)	WWC-3	10	0.801	1.124	0.3553	0.445	0.015	1.475	-0.14	3.43	10				0.02739	0.9845	NO	NO
radium226and228combined (pCi/L)	WWC-4	10	0.846	0.5889	0.1862	0.815	0.375	1.2	-0.02	1.97	10				0.5046	1.187	NO	NO
radium226and228combined (pCi/L)	WWC-5	10	1.511	0.4353	0.1377	1.555	1.12	1.77	0.92	2.42	0				1.259	1.763	NO	NO
selenium (mg/L)	Background	33	0.005938	0.003461	0.0006026	0.00617	0.002	0.007975	0.002	0.0122	33.33	0.0122	0.05	0.05				
selenium (mg/L)	WWC-1	11	0.01358	0.002457	0.0007407	0.0145	0.0139	0.015	0.00824	0.0153	0				0.00824	0.0152	NO	NO
selenium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	WWC-4	11	0.002142	0.0001713	0.00005166	0.00207	0.002	0.00238	0.002	0.00241	36.36				0.002	0.00239	NO	NO
selenium (mg/L)	WWC-5	11	0.003691	0.0007226	0.0002179	0.00395	0.00336	0.0041	0.002	0.00478	9.091				0.003296	0.004086	NO	NO

thallium (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTLs	MCL	GWPS	LC L	UCL	LCL Exceed GWPS	UCL Exceed GWPS
antimony (mg/L)	Background	22	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100	0.001	0.006	0.006				
antimony (mg/L)	CLW-1	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-6	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-7	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-8	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	22	0.03012	0.006689	0.001426	0.02775	0.0251	0.0333	0.0236	0.0507	0	0.047	0.01	0.047				
arsenic (mg/L)	CLW-1	11	0.02857	0.001619	0.0004882	0.0285	0.0266	0.0298	0.0264	0.0309	0				0.02769	0.02946	NO	NO
arsenic (mg/L)	CLW-2	11	0.02601	0.001529	0.0004609	0.0258	0.0246	0.0277	0.0243	0.0284	0				0.02517	0.02684	NO	NO
arsenic (mg/L)	CLW-3	11	0.03979	0.002278	0.000687	0.0402	0.0378	0.0412	0.0364	0.0437	0				0.03855	0.04104	NO	NO
arsenic (mg/L)	CLW-4	11	0.03304	0.005682	0.001713	0.0352	0.0308	0.0375	0.0196	0.0388	0				0.02993	0.03614	NO	NO
arsenic (mg/L)	CLW-5	11	0.02075	0.001594	0.0004806	0.021	0.0189	0.0216	0.0182	0.023	0				0.01987	0.02162	NO	NO
arsenic (mg/L)	CLW-6	11	0.01817	0.005867	0.001769	0.0164	0.0143	0.0246	0.0104	0.0287	0				0.01497	0.02138	NO	NO
arsenic (mg/L)	CLW-7	11	0.02379	0.00104	0.0003135	0.0239	0.0234	0.0244	0.0215	0.0257	0				0.02322	0.02436	NO	NO
arsenic (mg/L)	CLW-8	11	0.02325	0.00291	0.0008773	0.0239	0.0224	0.0254	0.0155	0.0258	0				0.0222	0.02476	NO	NO
barium (mg/L)	Background	22	0.09319	0.0127	0.002708	0.0915	0.087	0.0957	0.0758	0.129	0	0.129	2	2				
barium (mg/L)	CLW-1	11	0.06474	0.01389	0.004187	0.0615	0.0582	0.0648	0.053	0.105	0				0.053	0.0668	NO	NO
barium (mg/L)	CLW-2	11	0.08037	0.007668	0.002312	0.0811	0.072	0.0855	0.0711	0.0957	0				0.07618	0.08456	NO	NO
barium (mg/L)	CLW-3	11	0.09952	0.006035	0.00182	0.0995	0.0948	0.103	0.089	0.111	0				0.09622	0.1028	NO	NO
barium (mg/L)	CLW-4	11	0.09573	0.01558	0.004697	0.09	0.0801	0.109	0.0786	0.122	0				0.08721	0.1042	NO	NO
barium (mg/L)	CLW-5	11	0.07757	0.007172	0.002163	0.0801	0.0714	0.0851	0.0671	0.0869	0				0.07365	0.08149	NO	NO
barium (mg/L)	CLW-6	11	0.09176	0.003801	0.001146	0.0902	0.0885	0.0961	0.0873	0.0976	0				0.08969	0.09384	NO	NO
barium (mg/L)	CLW-7	11	0.05569	0.008609	0.002596	0.0539	0.0514	0.0581	0.0475	0.0794	0				0.0475	0.0593	NO	NO
barium (mg/L)	CLW-8	11	0.07477	0.01305	0.003936	0.0707	0.0643	0.0797	0.0609	0.107	0				0.06764	0.08191	NO	NO
beryllium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	22	0.004802	0.0009274	0.0001977	0.005	0.005	0.005	0.00065	0.005	95.45	0.005	0.005	0.005				
cadmium (mg/L)	CLW-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-5	10	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-6	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-7	10	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-8	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
chromium (mg/L)	Background	22	0.002286	0.001172	0.0002499	0.002	0.002	0.002	0.000529	0.00613	81.82	0.00613	0.1	0.1				
chromium (mg/L)	CLW-1	11	0.007546	0.008927	0.002692	0.002	0.002	0.0157	0.00102	0.0271	45.45				0.00102	0.0187	NO	NO
chromium (mg/L)	CLW-2	11	0.003625	0.003655	0.001102	0.002	0.002	0.00411	0.002	0.014	72.73				0.002	0.00576	NO	NO
chromium (mg/L)	CLW-3	11	0.001997	0.0006608	0.0001992	0.002	0.002	0.002	0.000505	0.00346	81.82				0.000505	0.002	NO	NO
chromium (mg/L)	CLW-4	11	0.00652	0.01496	0.004511	0.002	0.002	0.002	0.000762	0.0516	72.73				0.000762	0.00336	NO	NO
chromium (mg/L)	CLW-5	11	0.002622	0.002475	0.0007463	0.002	0.002	0.002	0.000712	0.00999	72.73				0.000712	0.00214	NO	NO
chromium (mg/L)	CLW-6	11	0.002869	0.00296	0.0008924	0.002	0.002	0.002	0.000612	0.0116	72.73				0.000612	0.00335	NO	NO
chromium (mg/L)	CLW-7	11	0.00338	0.00254	0.0007658	0.002	0.002	0.00421	0.002	0.00891	63.64				0.002	0.00772	NO	NO
chromium (mg/L)	CLW-8	11	0.00317	0.003032	0.0009141	0.002	0.002	0.00224	0.002	0.012	72.73				0.002	0.00463	NO	NO
cobalt (mg/L)	Background	22	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100	0.004	0.006	0.006				
cobalt (mg/L)	CLW-1	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-5	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-6	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-7	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-8	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
fluoride (mg/L)	Background	22	0.9517	0.1236	0.02635	0.976	0.8675	1.02	0.611	1.17	0	1.242	4	4				
fluoride (mg/L)	CLW-1	11	1.045	0.1158	0.03492	1.06	1.02	1.15	0.834	1.18	0				0.982	1.109	NO	NO
fluoride (mg/L)	CLW-2	11	1.132	0.1564	0.04715	1.18	1.13	1.21	0.695	1.29	0				1.094	1.209	NO	NO
fluoride (mg/L)	CLW-3	11	1.234	0.1135	0.03422	1.23	1.19	1.33	0.948	1.35	0				1.18	1.296	NO	NO
fluoride (mg/L)	CLW-4	11	1.442	0.1068	0.03219	1.44	1.35	1.53	1.27	1.6	0				1.383	1.5	NO	NO
fluoride (mg/L)	CLW-5	11	1.728	0.1058	0.0319	1.71	1.69	1.82	1.51	1.83	0				1.67	1.786	NO	NO
fluoride (mg/L)	CLW-6	11	1.592	0.1303	0.03928	1.61	1.46	1.73	1.38	1.73	0				1.521	1.663	NO	NO
fluoride (mg/L)	CLW-7	11	1.009	0.1205	0.03632	1.02	0.945	1.11	0.792	1.16	0				0.9427	1.074	NO	NO
fluoride (mg/L)	CLW-8	11	0.9985	0.1176	0.03545	1.03	0.933	1.08	0.782	1.13	0				0.9342	1.063	NO	NO
lead (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

lithium (mg/L)	Background	22	0.2651	0.07813	0.01666	0.2155	0.207	0.3485	0.19	0.401	0	0.401	0.04	0.401				
lithium (mg/L)	CLW-1	11	0.2355	0.07161	0.02159	0.192	0.184	0.316	0.173	0.361	0				0.173	0.318	NO	NO
lithium (mg/L)	CLW-2	11	0.2844	0.09059	0.02731	0.227	0.219	0.391	0.211	0.438	0				0.211	0.396	NO	NO
lithium (mg/L)	CLW-3	11	0.2722	0.08772	0.02645	0.217	0.214	0.368	0.197	0.435	0				0.197	0.375	NO	NO
lithium (mg/L)	CLW-4	11	0.2514	0.07328	0.02209	0.204	0.199	0.336	0.189	0.375	0				0.189	0.338	NO	NO
lithium (mg/L)	CLW-5	11	0.217	0.1204	0.03631	0.21	0.188	0.346	0.025	0.411	0				0.1511	0.2828	NO	NO
lithium (mg/L)	CLW-6	11	0.2383	0.09904	0.02986	0.203	0.193	0.333	0.05	0.4	9.091				0.1841	0.2924	NO	NO
lithium (mg/L)	CLW-7	11	0.2294	0.06576	0.01983	0.189	0.182	0.302	0.169	0.331	0				0.169	0.327	NO	NO
lithium (mg/L)	CLW-8	11	0.2343	0.06641	0.02002	0.192	0.188	0.308	0.176	0.35	0				0.176	0.32	NO	NO
mercury (mg/L)	Background	22	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	CLW-1	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-6	11	0.01677	0.05513	0.01662	0.00015	0.00015	0.00015	0.00015	0.183	90.91				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-7	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-8	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	22	0.004216	0.000791	0.0001686	0.00403	0.003815	0.004215	0.00359	0.00733	0	0.00733	0.1	0.1				
molybdenum (mg/L)	CLW-1	11	0.005008	0.001067	0.0003218	0.00454	0.00407	0.00589	0.00388	0.0068	0				0.004425	0.005591	NO	NO
molybdenum (mg/L)	CLW-2	11	0.004662	0.0004551	0.0001372	0.00461	0.00437	0.00472	0.00427	0.00593	0				0.00427	0.00481	NO	NO
molybdenum (mg/L)	CLW-3	11	0.004852	0.0001833	0.00005526	0.00483	0.00472	0.00498	0.00463	0.0052	0				0.004752	0.004952	NO	NO
molybdenum (mg/L)	CLW-4	11	0.006171	0.002332	0.0007033	0.00525	0.00459	0.00762	0.00414	0.0115	0				0.004892	0.007143	NO	NO
molybdenum (mg/L)	CLW-5	11	0.006953	0.00147	0.0004431	0.00679	0.0054	0.00841	0.00519	0.00922	0				0.00615	0.007756	NO	NO
molybdenum (mg/L)	CLW-6	11	0.008009	0.002976	0.0008972	0.00746	0.00711	0.0105	0.001	0.0117	9.091				0.006383	0.009635	NO	NO
molybdenum (mg/L)	CLW-7	11	0.01692	0.04282	0.01291	0.00396	0.00331	0.00425	0.00329	0.146	0				0.00329	0.00638	NO	NO
molybdenum (mg/L)	CLW-8	11	0.004575	0.0007728	0.000233	0.00435	0.00391	0.00503	0.00359	0.00626	0				0.004153	0.004998	NO	NO
radium226and228combined (pCi/L)	Background	20	1.207	0.7924	0.1772	1.11	0.71	1.66	0	3.7	5	3.106	5	5				
radium226and228combined (pCi/L)	CLW-1	10	1.24	0.6247	0.1975	1.25	0.54	1.885	0.34	2.16	0				0.8779	1.602	NO	NO
radium226and228combined (pCi/L)	CLW-2	10	1.333	0.6785	0.2146	1.195	0.965	1.48	0.65	3.12	0				0.9641	1.603	NO	NO
radium226and228combined (pCi/L)	CLW-3	10	0.998	0.5829	0.1843	1.18	0.465	1.56	0	1.7	10				0.6601	1.336	NO	NO
radium226and228combined (pCi/L)	CLW-4	10	1.063	0.6487	0.2051	1.03	0.49	1.605	0.22	2.24	0				0.687	1.439	NO	NO
radium226and228combined (pCi/L)	CLW-5	10	1.165	0.8818	0.2788	1.015	0.455	2.185	0	2.6	10				0.6538	1.676	NO	NO
radium226and228combined (pCi/L)	CLW-6	10	1.036	0.5369	0.1698	1.02	0.52	1.47	0.25	1.99	0				0.7248	1.347	NO	NO
radium226and228combined (pCi/L)	CLW-7	10	0.682	0.346	0.1094	0.625	0.465	0.93	0.14	1.4	0				0.4814	0.8826	NO	NO
radium226and228combined (pCi/L)	CLW-8	10	0.921	0.5334	0.1687	1.02	0.42	1.305	0.09	1.85	0				0.6118	1.23	NO	NO
selenium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.05	0.05				
selenium (mg/L)	CLW-1	11	0.001903	0.0003232	0.00009745	0.002	0.002	0.002	0.000928	0.002	90.91				0.000928	0.002	NO	NO
selenium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-6	11	0.002436	0.001447	0.0004364	0.002	0.002	0.002	0.002	0.0068	90.91				0.002	0.002	NO	NO
selenium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	UCL	LCL Exceeds GWPS	UCL Exceeds GWPS
antimony (mg/L)	Background	22	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100	0.001	0.006	0.006				
antimony (mg/L)	BAC-1	11	0.001212	0.0004318	0.0001302	0.001	0.001	0.00138	0.001	0.00237	72.73				0.001	0.00158	NO	NO
antimony (mg/L)	BAC-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-6	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-7	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	22	0.01936	0.01013	0.00216	0.02085	0.01585	0.02415	0.001	0.0362	9.091	0.04317	0.01	0.04317				
arsenic (mg/L)	BAC-1	11	0.01477	0.002596	0.0007828	0.0146	0.0129	0.0164	0.0103	0.0202	0				0.01335	0.01619	NO	NO
arsenic (mg/L)	BAC-2	11	0.04513	0.005039	0.001519	0.0444	0.0416	0.0469	0.0386	0.0565	0				0.04237	0.04788	NO	YES
arsenic (mg/L)	BAC-3	11	0.03214	0.01602	0.004831	0.0239	0.0192	0.0496	0.0158	0.0588	0				0.02259	0.03865	NO	NO
arsenic (mg/L)	BAC-4	11	0.03271	0.00833	0.002512	0.0352	0.0322	0.0362	0.00882	0.0407	0				0.03142	0.03659	NO	NO
arsenic (mg/L)	BAC-5	11	0.03282	0.003337	0.001006	0.0325	0.0297	0.0357	0.0275	0.0392	0				0.03099	0.03464	NO	NO
arsenic (mg/L)	BAC-6	11	0.01851	0.005069	0.001528	0.0214	0.0134	0.0229	0.0115	0.0248	0				0.01574	0.02128	NO	NO
arsenic (mg/L)	BAC-7	11	0.02408	0.00717	0.002162	0.0234	0.0191	0.0241	0.0154	0.0434	0				0.02023	0.02683	NO	NO
barium (mg/L)	Background	22	0.1102	0.03251	0.006932	0.1055	0.08195	0.139	0.0636	0.175	0	0.1866	2	2				
barium (mg/L)	BAC-1	11	0.1682	0.2106	0.06349	0.0643	0.049	0.279	0.0391	0.702	0				0.0391	0.39	NO	NO
barium (mg/L)	BAC-2	11	0.02595	0.008703	0.002624	0.0228	0.021	0.0248	0.0202	0.0472	0				0.0202	0.0385	NO	NO
barium (mg/L)	BAC-3	11	0.04248	0.0155	0.004672	0.0376	0.0317	0.048	0.0306	0.0827	0				0.03428	0.04787	NO	NO
barium (mg/L)	BAC-4	11	0.06728	0.01782	0.005373	0.0705	0.0666	0.0772	0.0171	0.0821	0				0.06453	0.07578	NO	NO
barium (mg/L)	BAC-5	11	0.08295	0.008322	0.002509	0.0877	0.0736	0.0893	0.0706	0.0928	0				0.07841	0.0875	NO	NO
barium (mg/L)	BAC-6	11	0.04864	0.02748	0.008286	0.0287	0.0245	0.0781	0.0227	0.0859	0				0.0227	0.0833	NO	NO
barium (mg/L)	BAC-7	11	0.02886	0.0109	0.003288	0.026	0.0214	0.0315	0.0195	0.0577	0				0.0231	0.03327	NO	NO
beryllium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	22	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100	0.005	0.005	0.005				
cadmium (mg/L)	BAC-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-5	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-6	11	0.004607	0.001303	0.000393	0.005	0.005	0.005	0.000677	0.005	90.91				0.000677	0.005	NO	NO
cadmium (mg/L)	BAC-7	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
chromium (mg/L)	Background	22	0.002836	0.002757	0.0005879	0.002	0.002	0.00208	0.000506	0.0125	68.18	0.0125	0.1	0.1				
chromium (mg/L)	BAC-1	11	0.0195	0.03328	0.01003	0.00612	0.00451	0.0184	0.0028	0.114	0				0.0028	0.0412	NO	NO
chromium (mg/L)	BAC-2	11	0.008191	0.003057	0.0009216	0.00777	0.00547	0.0111	0.00483	0.0145	0				0.00652	0.009861	NO	NO
chromium (mg/L)	BAC-3	11	0.01152	0.01677	0.005055	0.00676	0.00447	0.00968	0.00362	0.0615	0				0.00362	0.0114	NO	NO
chromium (mg/L)	BAC-4	11	0.003085	0.002737	0.0008253	0.002	0.002	0.0022	0.002	0.011	63.64				0.002	0.00461	NO	NO
chromium (mg/L)	BAC-5	11	0.003285	0.00425	0.001281	0.002	0.002	0.002	0.002	0.0161	81.82				0.002	0.00204	NO	NO
chromium (mg/L)	BAC-6	11	0.00525	0.0103	0.003106	0.002	0.002	0.00257	0.002	0.0363	63.64				0.002	0.00283	NO	NO
chromium (mg/L)	BAC-7	11	0.004414	0.007316	0.002206	0.002	0.002	0.00217	0.002	0.0264	72.73				0.002	0.00398	NO	NO
cobalt (mg/L)	Background	22	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100	0.004	0.006	0.006				
cobalt (mg/L)	BAC-1	11	0.004242	0.000627	0.000189	0.004	0.004	0.004	0.004	0.00605	81.82				0.004	0.00461	NO	NO
cobalt (mg/L)	BAC-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-5	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-6	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-7	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
fluoride (mg/L)	Background	22	1.081	0.3373	0.07191	0.959	0.843	1.39	0.727	1.75	0	1.75	4	4				
fluoride (mg/L)	BAC-1	11	0.3694	0.2444	0.07368	0.401	0.266	0.507	0	0.854	18.18				0.242	0.4967	NO	NO
fluoride (mg/L)	BAC-2	11	0.8338	0.4598	0.1386	0.986	0.684	1.11	0	1.33	18.18				0.5942	1.073	NO	NO
fluoride (mg/L)	BAC-3	11	0.9784	0.8142	0.2455	0.794	0	1.62	0	2.51	27.27				0.5541	1.403	NO	NO
fluoride (mg/L)	BAC-4	11	1.236	0.1279	0.03857	1.26	1.13	1.35	1.01	1.38	0				1.166	1.306	NO	NO
fluoride (mg/L)	BAC-5	11	1.144	0.1387	0.04181	1.11	1.04	1.26	0.916	1.34	0				1.068	1.219	NO	NO
fluoride (mg/L)	BAC-6	11	0.8664	0.1652	0.04981	0.847	0.754	1.01	0.582	1.15	0				0.7761	0.9566	NO	NO
fluoride (mg/L)	BAC-7	11	1.093	0.3078	0.09282	1.09	0.936	1.31	0.388	1.51	0				0.9252	1.262	NO	NO
lead (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-2	11	0.002019	0.00006332	0.00001909	0.002	0.002	0.002	0.002	0.00221	90.91				0.002	0.002	NO	NO
lead (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

lead (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lithium (mg/L)	Background	22	0.322	0.1536	0.03275	0.288	0.2125	0.3525	0.191	0.773	0	0.7415	0.04	0.7415				
lithium (mg/L)	BAC-1	11	0.7318	0.4543	0.137	0.581	0.402	1.3	0.305	1.52	0				0.4639	0.8974	NO	YES
lithium (mg/L)	BAC-2	11	0.7655	0.408	0.123	0.524	0.44	1.22	0.414	1.38	0				0.414	1.32	NO	YES
lithium (mg/L)	BAC-3	11	1.369	0.6401	0.193	1.06	0.944	2.13	0.812	2.53	0				0.812	2.37	YES	YES
lithium (mg/L)	BAC-4	11	0.3416	0.1315	0.03966	0.262	0.243	0.508	0.228	0.532	0				0.228	0.509	NO	NO
lithium (mg/L)	BAC-5	11	0.3574	0.1144	0.03449	0.294	0.277	0.479	0.219	0.538	0				0.2914	0.4126	NO	NO
lithium (mg/L)	BAC-6	11	0.3775	0.1536	0.04631	0.28	0.265	0.542	0.25	0.599	0				0.25	0.597	NO	NO
lithium (mg/L)	BAC-7	11	0.4395	0.193	0.0582	0.327	0.285	0.674	0.269	0.699	0				0.269	0.681	NO	NO
mercury (mg/L)	Background	22	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	BAC-1	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-6	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-7	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	22	0.01015	0.01031	0.002198	0.00717	0.00297	0.01355	0.00215	0.0408	0	0.04038	0.1	0.1				
molybdenum (mg/L)	BAC-1	11	0.05256	0.03347	0.01009	0.0467	0.0288	0.0607	0.0232	0.143	0				0.03483	0.06541	NO	NO
molybdenum (mg/L)	BAC-2	11	0.1595	0.01643	0.004953	0.156	0.143	0.167	0.14	0.194	0				0.1506	0.1685	YES	YES
molybdenum (mg/L)	BAC-3	11	0.03511	0.008635	0.002604	0.0337	0.0275	0.0396	0.026	0.0525	0				0.03039	0.03983	NO	NO
molybdenum (mg/L)	BAC-4	11	0.01258	0.002503	0.0007548	0.012	0.0104	0.0143	0.00992	0.017	0				0.01122	0.01395	NO	NO
molybdenum (mg/L)	BAC-5	11	0.008795	0.00228	0.0006875	0.0077	0.00728	0.00926	0.00666	0.0134	0				0.00666	0.0128	NO	NO
molybdenum (mg/L)	BAC-6	11	0.07072	0.02813	0.008481	0.0858	0.0359	0.0921	0.0213	0.0968	0				0.07083	0.08867	NO	NO
molybdenum (mg/L)	BAC-7	11	0.07822	0.00959	0.002892	0.075	0.0702	0.0888	0.0681	0.0944	0				0.0681	0.0942	NO	NO
radium226and228combined (pCi/L)	Background	20	1.231	0.6188	0.1384	1.245	0.84	1.675	0.28	2.42	0	2.713	5	5				
radium226and228combined (pCi/L)	BAC-1	10	1.643	0.7154	0.2262	1.555	0.99	2.435	0.61	2.6	0				1.228	2.058	NO	NO
radium226and228combined (pCi/L)	BAC-2	10	1.067	0.8147	0.2576	0.905	0.405	1.595	0.22	2.9	0				0.5947	1.539	NO	NO
radium226and228combined (pCi/L)	BAC-3	10	1.311	0.5293	0.1674	1.335	0.88	1.78	0.38	2.09	0				1.004	1.618	NO	NO
radium226and228combined (pCi/L)	BAC-4	10	0.85	0.7078	0.2238	0.84	0.31	1	0	2.6	10				0.3394	1.157	NO	NO
radium226and228combined (pCi/L)	BAC-5	10	1.052	0.8877	0.2807	0.665	0.335	1.78	0.19	2.96	0				0.5374	1.567	NO	NO
radium226and228combined (pCi/L)	BAC-6	10	1.22	1.109	0.3508	1.01	0.675	1.5	-0.09	4.07	0				-0.09	1.79	NO	NO
radium226and228combined (pCi/L)	BAC-7	10	1.231	1.035	0.3274	0.95	0.435	1.975	0	3.38	10				0.6308	1.831	NO	NO
selenium (mg/L)	Background	22	0.002272	0.0007933	0.0001691	0.002	0.002	0.002105	0.000691	0.00426	68.18	0.00426	0.05	0.05				
selenium (mg/L)	BAC-1	11	0.01246	0.004803	0.001448	0.0131	0.00818	0.0168	0.00643	0.0204	0				0.009831	0.01508	NO	NO
selenium (mg/L)	BAC-2	11	0.01469	0.001404	0.0004233	0.0144	0.0136	0.0157	0.0128	0.0173	0				0.01392	0.01546	NO	NO
selenium (mg/L)	BAC-3	11	0.02131	0.002908	0.0008769	0.0211	0.019	0.0228	0.0184	0.0287	0				0.01973	0.02278	NO	NO
selenium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	BAC-6	11	0.002646	0.0009703	0.0002925	0.002	0.002	0.00369	0.002	0.0045	54.55				0.002	0.00414	NO	NO
selenium (mg/L)	BAC-7	11	0.004189	0.001492	0.0004499	0.00446	0.00276	0.00541	0.00257	0.007	0				0.003374	0.005005	NO	NO
thallium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

ATTACHMENT 2 - January 2019 Annual Groundwater Monitoring and Corrective Action Summary Report

January 2019 Annual Ground Water Monitoring and Corrective Action Summary Report

Intermountain Generating Facility
Delta, Utah

Prepared for:
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Delta, Utah 84624

Prepared by:
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Project No.: 203709098

January 28, 2019

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Abbreviations

ASTM	American Standard for Testing and Materials
CCR	Coal Combustion Residuals
CB Landfill	Combustion By-Products Landfill
ft	Foot or feet
GWPS	Ground Water Protection Standard
IGF	Intermountain Generating Facility
IPSC	Intermountain Power Service Corporation
LCL	Lower Confidence Limit
MCL	Maximum Contaminant Level
mg/l	milligrams per liter
msl	mean sea level
PVC	Polyvinyl chloride
QA/QC	Quality Assurance and Quality Control
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan
SOPs	Standard Operating Procedures
Stantec	Stantec Consulting Services Inc.
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TDS	Total Dissolved Solids
UDEQ	Utah Department of Environmental Quality
UTL	Upper Tolerance Limit
US EPA	United States Environmental Protection Agency
USGS	United States Geological Survey

1.0 INTRODUCTION

On behalf of Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this report to summarize IPSC's 2018 ground water monitoring program pursuant to the United States Environmental Protection Agency's ("US EPA") Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")) at IPSC's Intermountain Generating Facility ("IGF") located approximately 10 miles north of Delta, Millard County, Utah. The monitoring program addresses elements prescribed by CCR Rule Parts §257.90 (R315-319-90) Applicability; §257.91 (R315-319-91) Ground Water Monitoring Systems; §257.93 (R315-319-93) Ground Water Sampling and Analysis Requirements; §257.94 (R315-319-94) Detection Monitoring Program; §257.95 (R315-319-95) Assessment Monitoring Program; and §257.96 (R315-319-96) Assessment of Corrective Measures.

This report is formatted in general accordance with reporting requisites prescribed within §257.90(e) (R315-319-90(e)). The report provides a summary of investigative activities implemented at the site by IPSC subsequent to IPSC's January 2018 *Annual Summary Report*. Activities conducted during 2018 entailed implementation of an Assessment Monitoring Program prescribed by §257.95 (315-319-95), including evaluation of ongoing, semi-annual, ground water monitoring data; establishment of Ground Water Protection Standards for Appendix IV constituents; and assessment of corrective measures, if and where needed.

1.1 BACKGROUND, DETECTION MONITORING PROGRAM 2015-2017 ACTIVITIES

As detailed within IPSC's November 2015 *CCR Unit Monitoring Well Design and Installation Summary Report*, IPSC installed a series of ground water monitoring wells to monitor uppermost ground water quality in up-gradient (e.g., 'background water quality') and down-gradient directions in relation to each of IPSC's three (3) CCR-regulated units, specifically including (reference Figures 1 and 2 for regional and site-specific, location maps):

- Combustion By-Products Landfill (CB Landfill);
- Bottom Ash Basin; and
- Waste Water Basin.

During late-October 2015, IPSC initiated its CCR Unit-specific monitoring, sampling, and analysis program for background and down-gradient monitoring wells, in accordance with IPSC's November 2015 *Ground Water Sampling and Analysis Plan*. As prescribed by §257.94(b) (R315-319-94(b)) for existing CCR-regulated landfills and surface impoundments, IPSC analyzed all ground water samples for Appendix III and Appendix IV constituents. As of October 17, 2017, IPSC completed eight (8) independent sampling events from each background and down-gradient monitoring well.

In accordance with §257.90(e) (315-319-90(e)), IPSC's January 2018 *Annual Ground Water Monitoring Summary Report* presented the results of IPSC's eight ground water monitoring and sampling events that comprised IPSC's Detection Monitoring Program. All monitoring and sampling procedures were implemented in accordance with IPSC's November 2015 *CCR Unit Monitoring Well Design and Installation Summary Report* and corollary *Ground Water Sampling and Analysis Plan* report. All three predecessor reports are stand-alone documents that are incorporated by reference herein.

2.0 ASSESSMENT MONITORING PROGRAM, 2018 ACTIVITIES

2.1 ASSESSMENT MONITORING RESULTS, MARCH AND JUNE 2018

As reported in IPSC's January 2018 *Annual Summary Report*, statistical analyses indicated potential statistically significant increases over background concentrations of certain Appendix III constituents associated with each of the three CCR Units. Therefore, IPSC implemented an Assessment Monitoring Program at each of the three CCR Units in accordance with measures and timeframes prescribed by §257.95 (315-319-95).

Background and down-gradient CCR unit-specific, ground water monitoring wells were purged and sampled as part of the Assessment Monitoring Program during March and June 2018. All purging, sampling, laboratory analysis, and Quality Assurance/Quality Control (QA/QC) protocols were administered as specified within IPSC's November 2015 Ground Water Sampling and Analysis Plan.

Table 1 presents a summary of all ground water monitoring well construction details and completion dates. Appendix A includes copies of drilling logs and well schematic diagrams. Tabulated analytical results and water level measurement data associated with the monitoring events are presented in Table 2 herein.

Figures 3 and 4 depict estimated regional ground water flow patterns based on March and June 2018 water level measurements at the CCR unit-specific monitoring wells. Regional and localized ground water flow patterns were similar to those observed during the 2015-2017 Detection Monitoring Program. The predominant ground water flow direction is from the east/northeast toward the west/southwest, with more prevalent southwesterly component of flow in the vicinity of the Bottom Ash Basin and the Waste Water Basin areas.

Stantec's review of natural topographic elevations presented on the 1971 United States Geological Survey (USGS) *Rain Lake, Utah Quadrangle* topographic map indicates that the natural topography grades generally toward the west across the generalized vicinity of the CB Landfill (T15S, R7W, Section 11), while the natural grade becomes more southwesterly in the vicinity of the Bottom Ash Basin (T15S, R7W, Section 14) and the Waste Water Basin (T15S, R7W, Sections 14 and 23) and lands located south and southwest of the surface impoundments [i.e., on-site lands located north of the Brush Wellman Highway (i.e., State Route 174)].

2.1.1 Water Quality Analytical Results and Statistical Evaluation

On behalf of IPSC, Detection and Assessment Monitoring Program ground water quality results were utilized by Stantec to establish Ground Water Protection Standards ("GWPSs") for each Appendix IV constituent and each CCR-regulated unit, in accordance with CCR Rule §257.95(d)(2) and §257.95(h) (R315-319-95(d)(2) and R315-319-95(h)) and the following general guidance sources:

- US EPA "Unified Guidance" document (*Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, Unified Guidance*, March 2009, *EPA 530/R-09-007*);
- the Interstate Technology and Regulatory Council's ("ITRC") 2013, *Groundwater Statistics for Monitoring and Compliance, Statistical Tools for the Project Lifecycle*, Online Guidance; and
- Ofungwu, J. (2014) *Statistical Applications for Environmental Analysis and Risk Assessment*. Hoboken, New Jersey: John Wiley and Sons, Inc.

The Unified Guidance recommends the use of Upper Tolerance Limits ("UTLs") for Assessment Monitoring. Tolerance limits consist of two values expected to contain a pre-specified proportion of the underlying data population with a specified level of confidence. For example, a 95% tolerance interval with a 95% confidence level, there is 95% confidence that, on average, 95% of the data population is contained within the interval. The upper, one-sided UTL is used commonly in environmental monitoring and is constructed using background data (Ofungwu 2014).

In the context of the CCR Rules, data from all background wells is used to estimate a 95% UTL with 95% coverage for each Appendix IV constituent at each CCR-regulated unit. This represents a 95% upper confidence limit on the 95th percentile. In Assessment Monitoring, the UTL may be used to represent the GWPS if: 1) the constituent does not have an established Maximum Contaminant Level ("MCL"); or 2) the background UTL exceeds the established MCL.

Three Appendix IV constituents do not have a US EPA-promulgated MCL: Cobalt, Lithium, and Molybdenum. However, the US EPA amended the original CCR rule in July 2018 and established the following alternate regulatory limits for these compounds: Cobalt (0.006 milligrams per liter, mg/L), Lithium (0.04 mg/L), and Molybdenum (0.1 mg/L).

As specified by CCR Rule §257.95(d)(2) and §257.95(h) (R315-319-95(d)(2) and R315-319-95(h)), each constituent-specific GWPS shall be either the MCL for that constituent (or above-referenced, CCR Rule-established alternate regulatory limits for Cobalt, Lithium, and Molybdenum) or the UTL in instances where the UTL exceeds the established MCL. Appendix B presents a tabulation of UTL and GWPS data for each CCR unit and each monitoring well.

During Assessment Monitoring, the site is assumed to be free of impacts, unless proven otherwise through statistical testing. The statistical null hypothesis (Ho) represents a mean downgradient concentration less than or equal to the GWPS, while the alternate hypothesis (Ha) represents a mean downgradient concentration greater than the GWPS (ITRC, 2013). To test this hypothesis, the Lower Confidence Limits (LCL) around the mean downgradient Appendix IV concentrations are estimated using data collected during the Detection Monitoring and Assessment Monitoring programs. The LCL for each constituent/well pair are then compared to their respective GWPS. If the LCL exceeds the GWPS, then downgradient concentrations are at a statistically significant level (SSL) above the GWPS, which *may* trigger corrective action at the Site.

It should be noted that individual sample results of Appendix IV constituents above the GWPS during Assessment Monitoring are not necessarily a demonstration of statistically significant exceedances of the GWPS. The LCL must exceed the GWPS to conclude a statistically significant increase. However, if individual constituent concentrations exceed GWPSs, then Assessment Monitoring is to continue at that specific CCR unit. Appendix B presents a tabulation of UTL, GWPS, and Confidence Limit data for each CCR unit and each monitoring well.

In summary, the quantitative analytical results associated with monitoring under the CCR Rule indicated the following Appendix IV constituent-specific LCL exceedances above corollary GWPS concentrations at ground water monitoring wells located at each CCR-regulated unit (all concentrations in mg/L):

CCR Unit	Well	Appendix IV Constituent	LCL Concentration	GWPS Concentration
CB Landfill		NONE	------	-----
Bottom Ash Basin	BAC-2	Molybdenum	0.1506	0.1
	BAC-3	Lithium	0.812	0.7415
Waste Water Basin	WWC-1	Arsenic	0.01496	0.01275
	WWC-2	Arsenic	0.01415	0.01275
	WWC-3	Arsenic	0.02045	0.01275

2.1.2 Regional Ground Water Quality

The site is located within the Basin and Range Physiographic Province and the Sevier Desert on a more localized scale. It is well-documented throughout arid Utah that localized, historical Lake Bonneville basin-fill sediments (that underlie the site) and associated uppermost ground water located in close proximity to igneous/volcanic and metamorphic formations contain high concentrations of abundant, naturally-occurring Arsenic (typically attributable to chemical and physical weathering of arsenopyrite). Likewise, Basin and Range Physiographic Province sediments, surface water, and ground water can also exhibit elevated concentrations of natural Lithium – especially in areas that are characterized by hydrologically-closed basins and thermal ground water.

Arsenic and Lithium concentrations within uppermost ground water can vary considerably, over short, lateral distances in many instances. Indeed, ground water quality data associated with the site exhibits considerable variation in Arsenic and Lithium concentrations across relatively-short, lateral distances, including up-gradient monitoring wells.

Stantec's familiarity with the regional geology surrounding the site, as well as review of United States Geological Survey (USGS) geologic maps associated with areas surrounding, and in a presumed up-gradient direction (northeast of) in relation to the site, indicate vast acreages encompassing square miles of volcanic and metamorphic mountainous areas with interspersed Lake Bonneville-related sediments, which could provide source material for soluble Arsenic and Lithium to impact localized, uppermost ground water quality. Baker Hot Springs and the mountainous Butte Fumarole formation are located a few miles northwest of the site, for instance. Reportedly, there are third-party companies investigating the possibility of Lithium mining/brine processing within nearby areas such as the Sevier Lake watershed and Tule Valley, areas located several miles southwest and west of the site.

2.2 APPENDIX IV CONSTITUENT CHARACTERIZATION OF NATURE AND EXTENT, OCTOBER 2018

Upon review of Appendix IV constituent analytical results, and in accordance with §257.95(g)(1)(iii), during late-March 2018 IPSC contracted Stantec and Cascade Drilling, Environmental Drilling Services of Salt Lake City, Utah (a Utah-certified, water well driller), to install supplemental, monitoring wells at the facility property boundaries located in presumed, down-gradient directions in relation to the three CCR units. The wells were drilled, soil sampled, installed, developed, and surveyed in relation to all other monitoring wells in similar fashion as the original CCR Unit boundary monitoring wells.

One (1) ground water monitoring well was installed at the property boundary located in a presumed, down-gradient direction in relation to the CB Landfill (well CL-U-9), while two (2) ground water monitoring wells were installed in a presumed, down-gradient direction in relation to the Waste Water Basin (wells WWC-6 and WWC-7). Additionally, new monitoring well CL-U-3 was installed in a presumed up-gradient direction in relation to the CB Landfill to provide additional up-gradient/background information, supplemental to the other up-gradient monitoring wells CL-U-1 and CL-U-2.

Reference Figure 5 for the locations of these property boundary, ground water monitoring wells, a potentiometric map that is based on October 2018 water level measurement data. Water levels were not measured at monitoring wells CL-U-3 and CL-W-9 during October 2018. Copies of Drilling Logs and schematic well diagrams and/or well construction details are presented in Appendix A herein. As may be noted by review of the drill logs, subsurface lithologic characteristics were similar to those encountered during the installation of the original monitoring wells. Well screen intervals were placed to permit monitoring of the uppermost aquifer at each location.

Also identified on Figure 5 are other ground water monitoring wells, independent of those used as part of CCR Rule compliance, that IPSC has been monitoring while complying with UDEQ regulatory requirements specified by the facility's DWQ Ground Water Discharge Permit No. UGW270004. The most recent permit renewal was issued by the UDEQ to IPSC's Intermountain Generating Facility, effective May 24, 2016. The Ground Water Discharge Permit does not require monitoring of all the CCR Rule-specified analytes such as Appendix IV constituents.

In an effort to investigate Appendix IV constituent concentrations in uppermost ground water located in apparent down-gradient directions in relation to the Bottom Ash Basin and Waste Water Basin as part of CCR Rule compliance, IPSC began monitoring/sampling some of the ground water monitoring wells associated with IPSC's Ground Water Discharge Permit monitoring program, specifically wells: RW-3, RW-4, RW-5, RW-6, RW-7, and RW-9, identified on Figure 5. Monitoring wells RW-4 and RW-7 are located in close proximity to, and in presumed, down-gradient directions in relation to the Waste Water Basin, while the RW-3, -5, -6, and -9 wells are located in presumed, down-gradient directions in relation to the Bottom Ash Basin. Well RW-6 is located down-gradient of the Bottom Ash Basin and in close proximity to the property boundary, as prescribed by §257.95(g)(1)(iii) (R315-319-95(g)).

The RW wells were drilled, soil sampled, installed, developed, and surveyed in relation to all other monitoring wells in similar fashion as the original CCR Unit boundary, monitoring wells, as approved by the UDEQ as part of IPSC's compliance with its Ground water Discharge Permit. The installations of the RW wells were observed and logged by JBR Environmental Consultants, an environmental engineering firm acquired by Stantec in 2014. Mr. John Russell was a long-time employee with JBR Environmental Consultants and continues supporting IPSC with Stantec currently. Copies of Drilling Logs associated with the RW wells are presented in Appendix A herein. As may be noted by review of the drill logs, subsurface lithologic characteristics were similar to those encountered during the during and installation of the original monitoring wells. Well screen intervals were placed to permit monitoring of the uppermost aquifer at each location.

During October 2018, IPSC monitored/sampled all of the historical CCR Rule monitoring wells, as wells as down-gradient monitoring wells WWC-6, WWC-7, and the RW wells. All ground water monitoring wells were purged and sampled in accordance with measures detailed in IPSC's November 2015 *Ground Water Sampling and Analysis Plan*. There were no exceedances of GWPSs at CB Landfill boundary, monitoring wells. As noted on Figure 6, the only Appendix IV exceedances of respective GWPSs were Bottom Ash Basin monitoring wells BAC-2 (Molybdenum) and BAC-3 (Lithium) and Waste Water Basin monitoring wells WWC-1, WWC-2, and WWC-3 (Arsenic).

Although down-gradient property boundary, monitoring wells WWC-6, WWC-7, and RW-6 did not contain elevated Appendix IV constituent concentrations during the lone October 2018 sampling event, it must be noted that in order to establish appropriate trend-analysis and comparison to Appendix IV constituent GWPSs, additional sampling events and water quality data at these specific wells are necessary; i.e., a one-time sampling event, such as in October 2018, is insufficient for appropriate statistical analysis. Additional future sampling events will help generate supplemental data that will be evaluated statistically and provide for more definitive investigation of water quality located down-gradient of the Bottom Ash Basin and the Waste Water Basin.

IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report, which was submitted to the UDEQ in January 2019, outlines IPSC's proposed approach for ongoing ground water quality monitoring and corrective action compliance. IPSC anticipates installing additional ground water monitoring wells during 2019 to help define more precisely Appendix IV concentrations in ground water located down-gradient of the Bottom Ash Basin and the Waste Water Basin. IPSC will also continue semi-annual ground water monitoring, sampling, and statistical analysis in accordance with §257.95(d)(1) (R315-319-95(d)(1)).

2.3 SUMMARY HYDRAULIC CHARACTERISTICS

As detailed within IPSC's November 2015 *CCR Unit Monitoring Well Design and Installation Summary Report*, and as also identified during subsequent, supplemental monitoring well installations, the lithologic characteristics comprising the uppermost aquifer beneath the site vary significantly between monitoring well locations. Typically, the 20-foot well screen interval of each monitoring well intersects the following example, subsurface, lithologic materials: clays; silty clays; sandy clays; silts within a clay-rich matrix; sands within a clay-rich matrix; silts; and fine- to medium-grained sands with intervening clay layers of a few inches to a few feet in thickness.

Hydraulic characteristics will vary significantly, both vertically and horizontally, due to the heterogenous nature of the variable, subsurface lithologies comprising the uppermost aquifer. For instance, the effective porosity (e.g., specific yield), hydraulic conductivity, transmissivity, and linear ground water flow velocity of the uppermost aquifer beneath the site will vary considerably, depending on site-specific location.

As detailed in IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report, historical ground water flow characteristics were used to identify proposed supplemental monitoring and recovery well locations, anticipated to be positioned in down-gradient locations in relation to the Bottom Ash Basin and the Waste Water Basin. The locations of the proposed wells are based in part on historical data generated during IPSC's compliance with its Ground Water Discharge Permit program, which included ground water modeling based on pump-testing of three wells located in close proximity to, and down-gradient of, the Bottom Ash Basin. Each of the well screen intervals of the three pump-tested wells are located within the uppermost aquifer, as will the well screens of all proposed monitoring wells.

Stantec constructed and calibrated a three-dimensional, numerical model to simulate ground water flow and fate and transport of TDS in ground water beneath the Site, based on pump-testing of existing, ground water recovery wells. The model was developed generally in accordance with ASTM International's (American Standard for Testing and Materials) *Standard Guide for Application of Groundwater Model to a Site-Specific Problem* and the current version of United States Geological Survey (USGS) *Modular Three-Dimensional Finite Difference Groundwater Flow Model* (MODFLOW-2005).

Stantec extrapolated that the down-gradient leading edge of the TDS plume located down-gradient of the Bottom Ash Basin appears to be migrating naturally toward the southwest at an approximate rate of 150 to 180 feet per year. However, this is a generalized plume migration rate estimate, considering the relatively large, lateral distances between water quality monitoring well locations and the highly-varied, lithologic characteristics of the uppermost aquifer underlying the site. The TDS plume remains within IPSC property boundaries and currently poses no significant risk to human health or the environment.

In light of the clay-rich nature of the uppermost aquifer beneath the site, Stantec anticipates that Appendix IV constituents, such as Arsenic, Molybdenum, and Lithium, would not be expected to migrate at the same velocity as natural ground water or TDS. Such constituents would be expected to be retarded to varying degrees and move at a much slower pace within the aquifer, as a result of natural attenuation processes, such as adsorption, cationic exchange, dispersion, dilution, and biological degradation, etc.

3.0 PROPOSED 2019 GROUND WATER MONITORING AND CORRECTIVE ACTIONS

IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report, which was approved by the UDEQ in January 2019, details IPSC's proposed approach for ongoing ground water quality monitoring and corrective action compliance. IPSC anticipates installing additional ground water monitoring wells during 2019 to help define more precisely Appendix IV concentrations in ground water located down-gradient of the Bottom Ash Basin and the Waste Water Basin. Additional ground water recovery wells will also be installed, pump-tested, and monitored to help provide control of the down-gradient leading edge of TDS, as well as any Appendix IV constituent plume that might also warrant control. Reference Figure 7 herein for locations of proposed wells located down-gradient of the Bottom Ash Basin and the Waste Water Basin.

Proposed wells will be installed and constructed in similar fashion as existing wells were designed and constructed to satisfy the requirements of CCR Rule Title 40, Part §257.91 (R315-319-91). Existing and proposed wells will be monitored and sampled in accordance with protocol outlined within IPSC's November 2015 *Ground Water Sampling and Analysis Plan*. IPSC will continue semi-annual, ground water monitoring, sampling, and statistical analysis in accordance with §257.95(d)(1) (R315-319-95(d)(1)). The following report sections provide a summary of IPSC's proposed ground water monitoring and corrective action program.

3.1 ONGOING GROUND WATER RECOVERY AT EXISTING RECOVERY WELLS WR-101, WR-102, AND WR-103

IPSC intends to continue operation of existing ground water recovery wells WR-101, WR-102, and WR-103 identified on Figure 7. The three wells are recovering ground water that contains elevated concentrations of TDS, located in relatively close proximity to the apparent historical TDS release areas associated with the Bottom Ash Basin. Wells WR-102 and WR-103 are located generally along the apparent TDS plume centerline, as explained in detail in IPSC's 2016 *Updated Corrective Action Plan*. Continued removal of TDS-enriched ground water from each of these three wells is helping reduce the total mass of TDS within the uppermost aquifer beneath the site in a generalized down-gradient/southwesterly direction in relation to the Bottom Ash Basin.

3.2 SUMMARY OF PROPOSED ACTIONS

IPSC and Stantec have reviewed analytical data and are proposing supplemental ground water recovery and investigative Tasks designed to:

1) Expand the current network of recovery wells intended to control the down-gradient, leading edge of the TDS plume associated with historical releases from the Bottom Ash Basin.

   Additional recovery wells will be installed at approximate 100-ft. lateral spacings, generally northeast of existing well RW-6, which currently contains TDS concentrations representative of background TDS concentrations. The proposed wells will be installed to intercept ground water near the down-gradient leading edge of the TDS plume, along a generalized northwest-southeast oriented line of wells (i.e., perpendicular to the predominant, southwesterly ground water flow direction), as discussed in detail in IPSC's 2016 *Updated Corrective Action Plan*. The line of wells will be positioned approximately 600 feet due northeast of well RW-6. Each proposed recovery well will be constructed of 6-inch diameter, Schedule 40 polyvinyl chloride (PVC) piping, approximately 80-feet deep with well screen intervals of approximately 25 feet. The wells will be located in close proximity to the apparent, centerline of the TDS plume.

   Additionally, 6-inch diameter, 76-ft. deep, well RW-5 (20-ft. well screen interval) is anticipated to be a suitable recovery well in light of its total depth, well screen interval, and static water level measurements (~ 46-ft. below grade) to date. Once supplemental recovery wells are installed northeast of well RW-6, IPSC intends to conduct a series of pump-tests to investigate well yields and radial cones of influence/capture associated with the newly-installed wells and existing well RW-5. The respective well yields will be analyzed using the ground water model to extrapolate potential lateral extent of capture for each well and help extrapolate yields and possible capture zones for supplemental ground water recovery wells.

2) Delineate ground water quality more thoroughly in apparent down-gradient directions in relation to recently-discovered, apparent release areas (west and south sides) at the Waste Water Basin by installing additional monitoring wells located: south of WWC-1; east of WWC-6; and between wells WWC-6 and WWC-7.

   Well installations would be sequenced such that initial wells will be installed on-site, followed-by off-site wells located farther south/southwest, depending on water quality and ground water flow characteristics identified during the sequenced phases of investigation. Select wells will be pump-tested to help investigate local hydrogeologic characteristics, in similar fashion as proposed above and conducted at the site in the past.

   Well RW-4 (4-inch diameter, 36-ft. deep; well screen: 26-36 feet; static water level approximates 20.5-ft. below top of casing), which is located in close proximity to and down-gradient from, the northwestern-most corner of the Waste Water Basin, would also be pump-tested in similar fashion as other wells. The respective well yield will be analyzed using the ground water model to extrapolate potential lateral extent of capture for each well and help extrapolate yields and possible capture zones for supplemental ground water recovery wells.

3) Following the sequential TDS plume investigation proposed in above Task #2, IPSC intends to initiate ground water recovery to control the migration of the TDS plume down-gradient of the Waste Water Basin. Select ground water recovery wells will be installed based on Task #2 findings. The intent of the recovery well program will be to control the down-gradient leading edge of the TDS plume associated with the Waste Water Basin.

4) For the foreseeable future, the following wells will be monitored as part of CCR Rule compliance. It is recommended that the following list be amended, as site conditions and future monitoring results warrant (reference Figure 7):

   - Monitoring of CB Landfill: wells CLU-1; CLU-2; CLW-1 through CLW-9; and WDB-19.

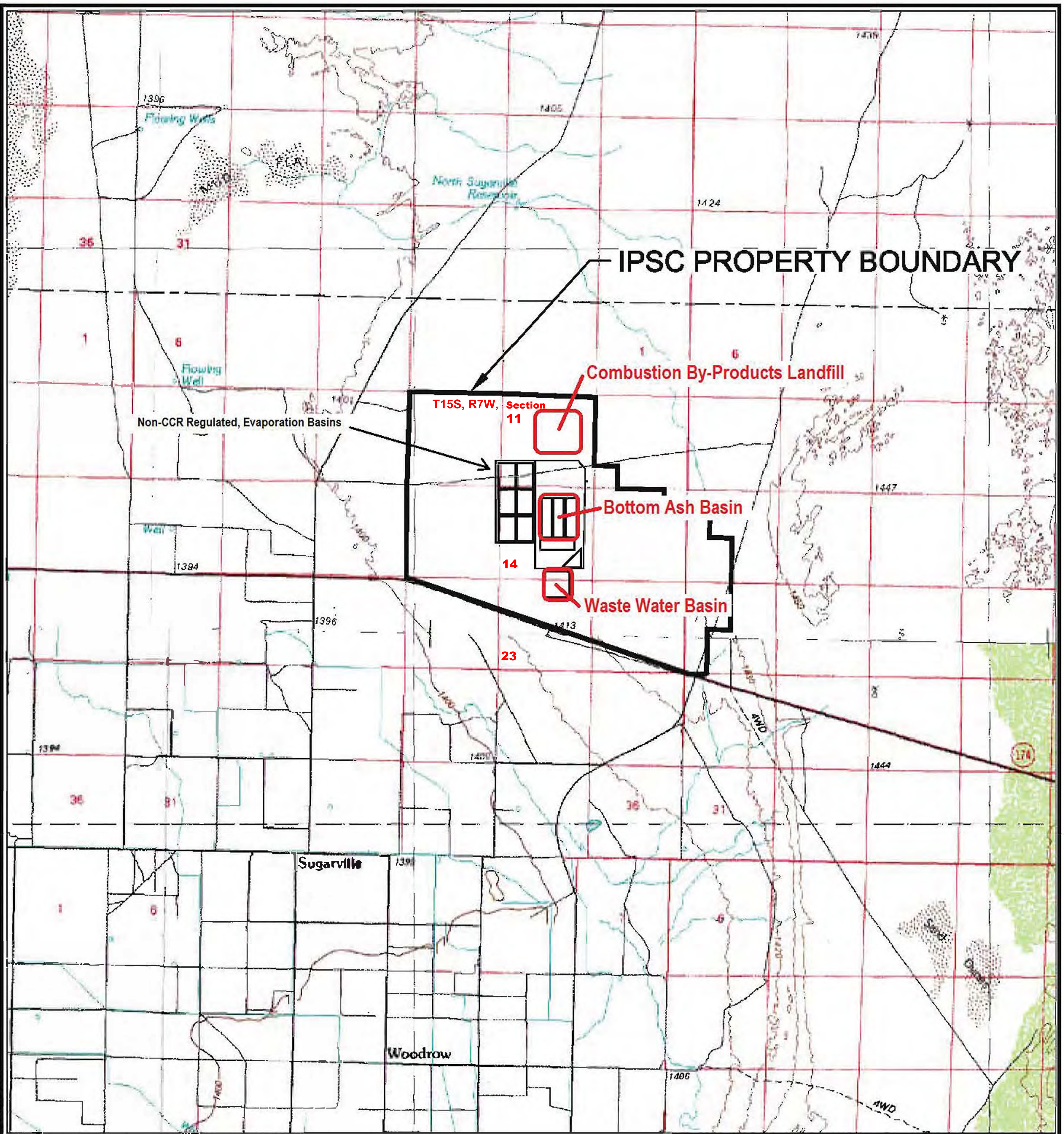
   - Monitoring of Bottom Ash Basin: wells BAU-1; BAU-2; BAC-1 through BAC-7; RW-1; RW-3; RW-5, RW-8; WDB-5; EMW-4U; and EMW-5U.

   - Monitoring of Waste Water Basin: WWU-1; WWU-2; WWC-1 through WWC-7; RW-4; and RW-7.

Upon implementation of the enhanced ground water recovery and monitoring program proposed in this report, IPSC will evaluate the degree to which ground water recovery and natural attenuation processes control the down-gradient leading edges of TDS plumes located down-gradient of the Bottom Ash Basin and the Waste Water Basin. IPSC also intends to evaluate potential alternative means for ongoing enhancement of remediating TDS mass from the uppermost aquifer beneath the site. IPSC will continue to conduct and report to the UDEQ its routine, semi-annual, ground water monitoring and remediation program in formal Summary Reports.

January 28, 2019

Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

drawings\ipsc-04\Fig2 Site Topographic Map.dwg

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

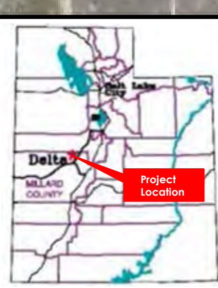
DATE DRAWN	1-26-17
DESIGN BY	JR
DRAWN BY	CP
CH'D BY	
SCALE	1"=1000'
REVISION	

January 28, 2019

Figure 2. CCR Units Location Map

Legend

CCR Unit



INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

Stantec

DRAWN BY JR	DATE DRAWN 9/30/2016
SCALE 1 in. approx. 1700 ft.	
PROJECT 203709098.409	

January 28, 2019

Figures 3 through 5. Potentiometric Maps for Assessment Monitoring Program, Ground Water Monitoring Events

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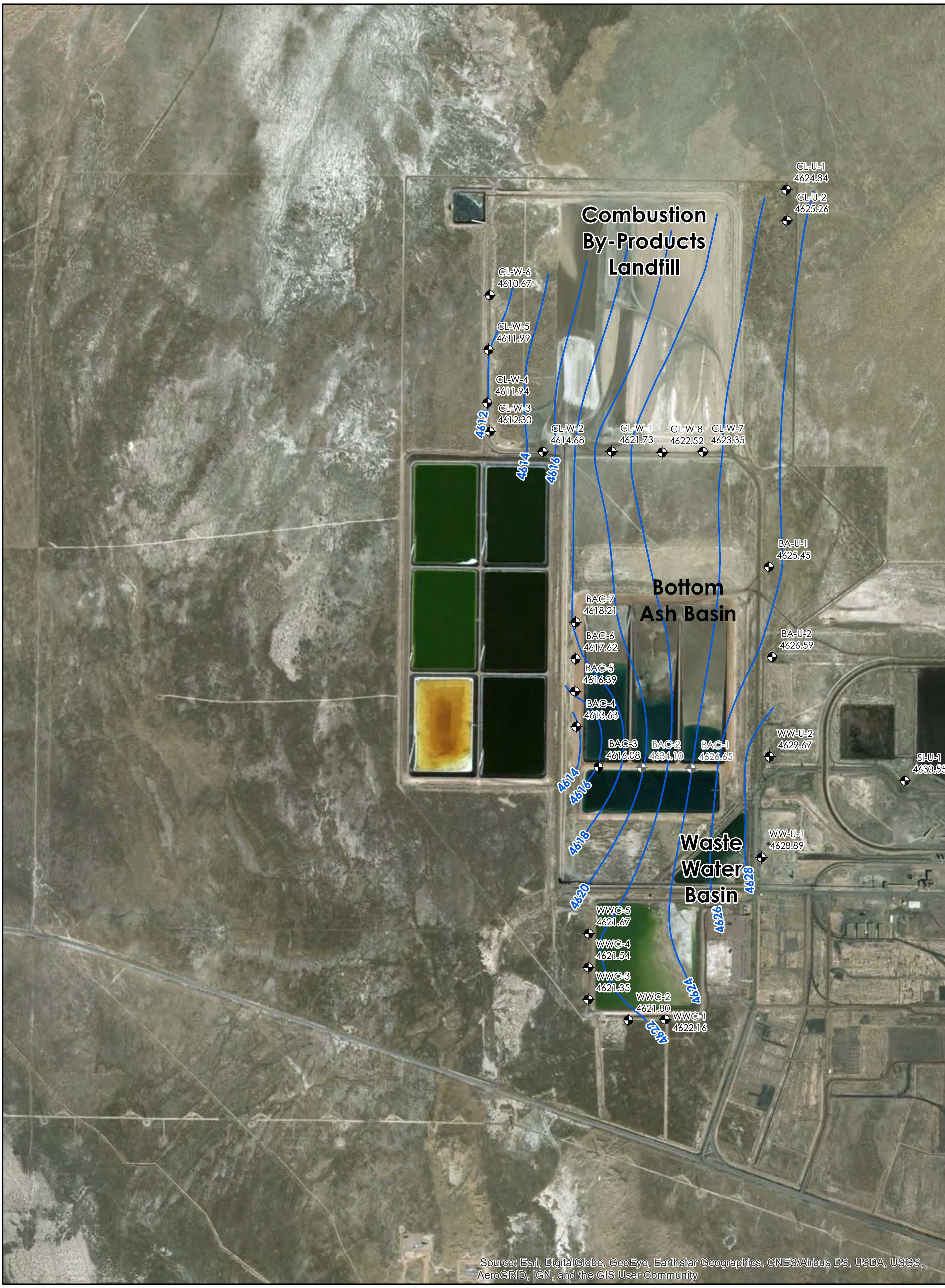

LEGEND:

- MONITORING WELL
- GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED MARCH 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

N

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		FIRST QUARTER 2018 POTENTIOMETRIC SURFACE MAP		FIGURE: 3
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 08/13/18

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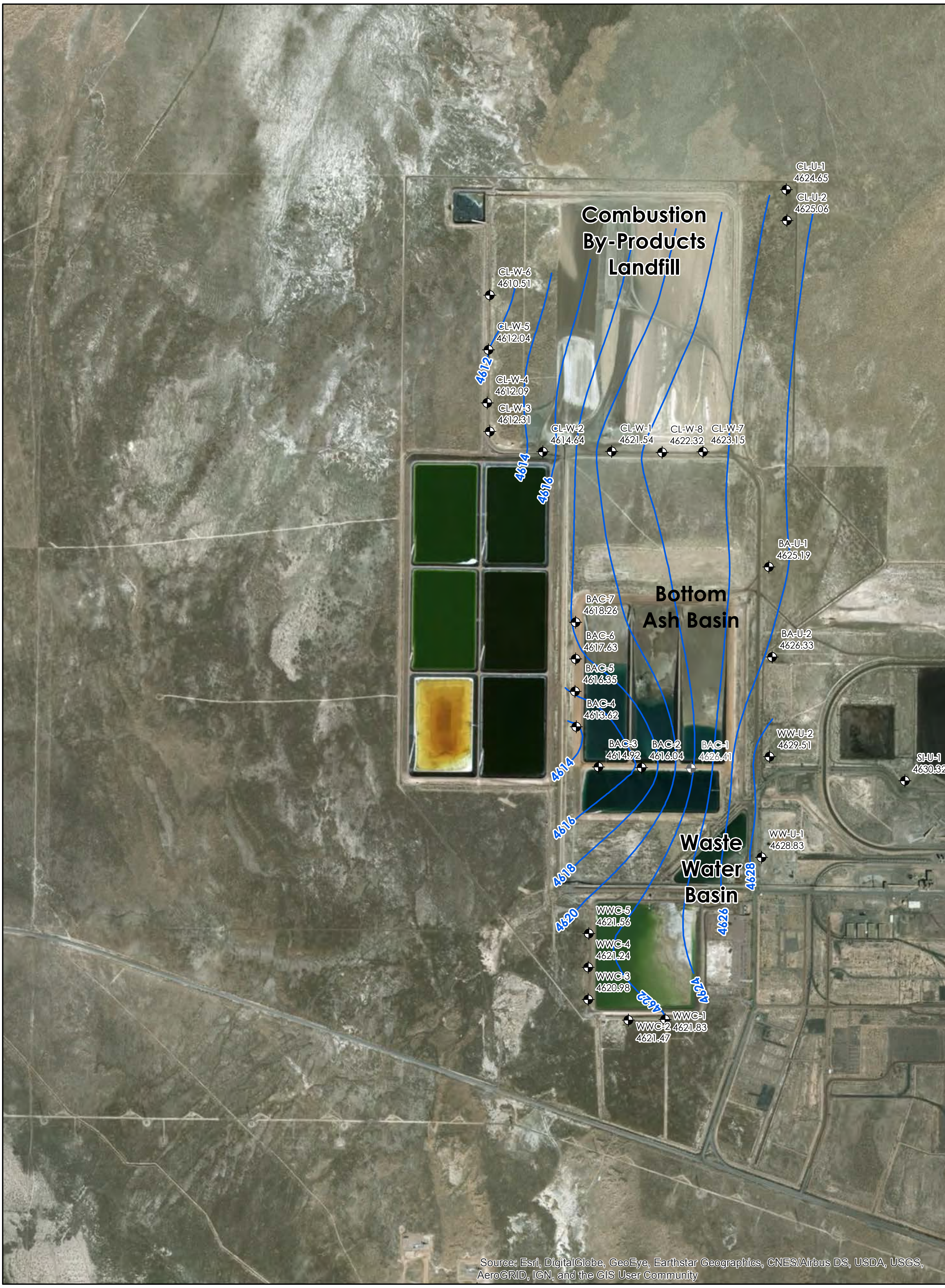

LEGEND:

- MONITORING WELL
- GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED JUNE 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

SECOND QUARTER 2018
POTENTIOMETRIC SURFACE MAP

FIGURE: 4

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL		08/13/18

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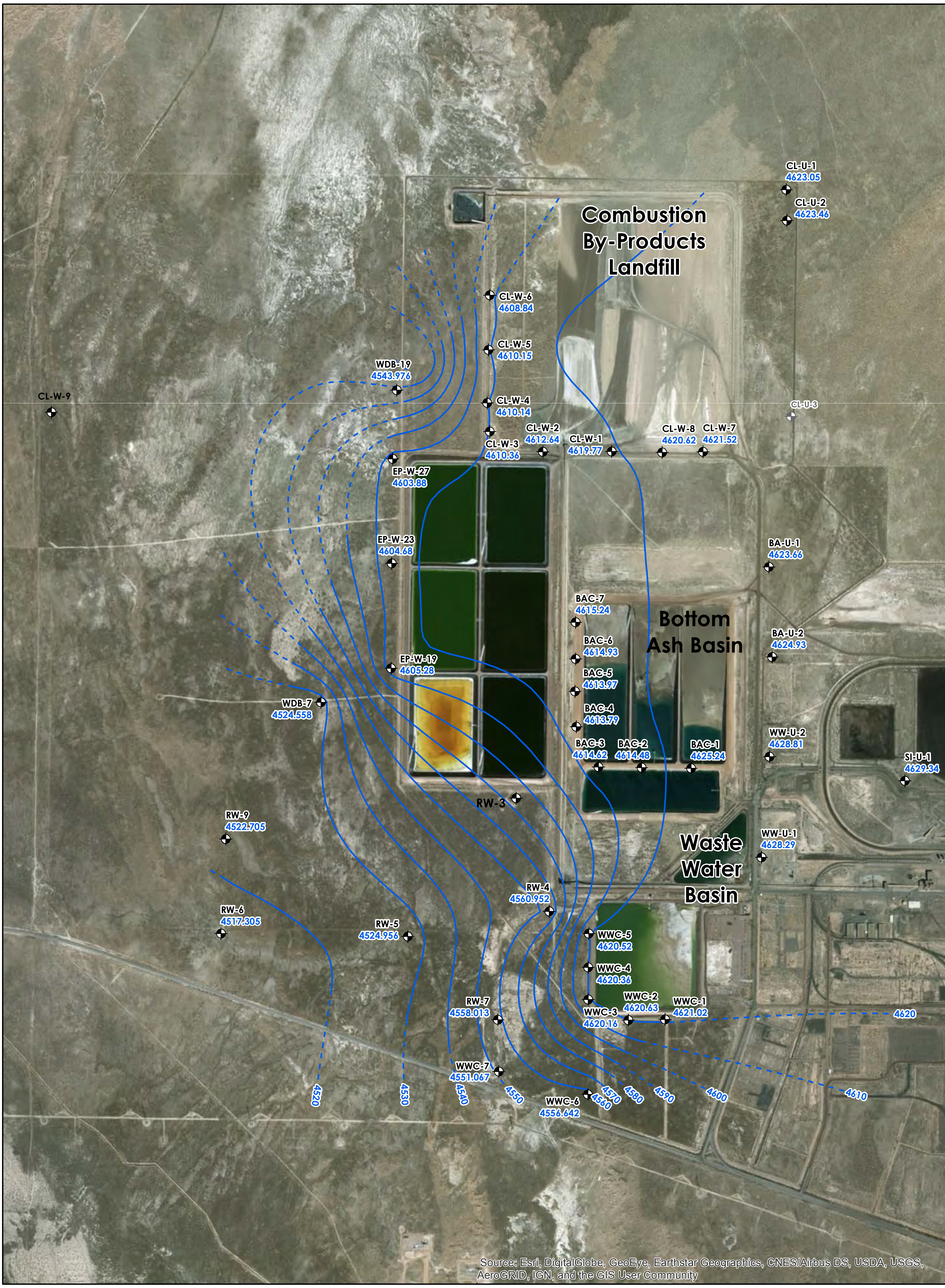


LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED OCTOBER 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

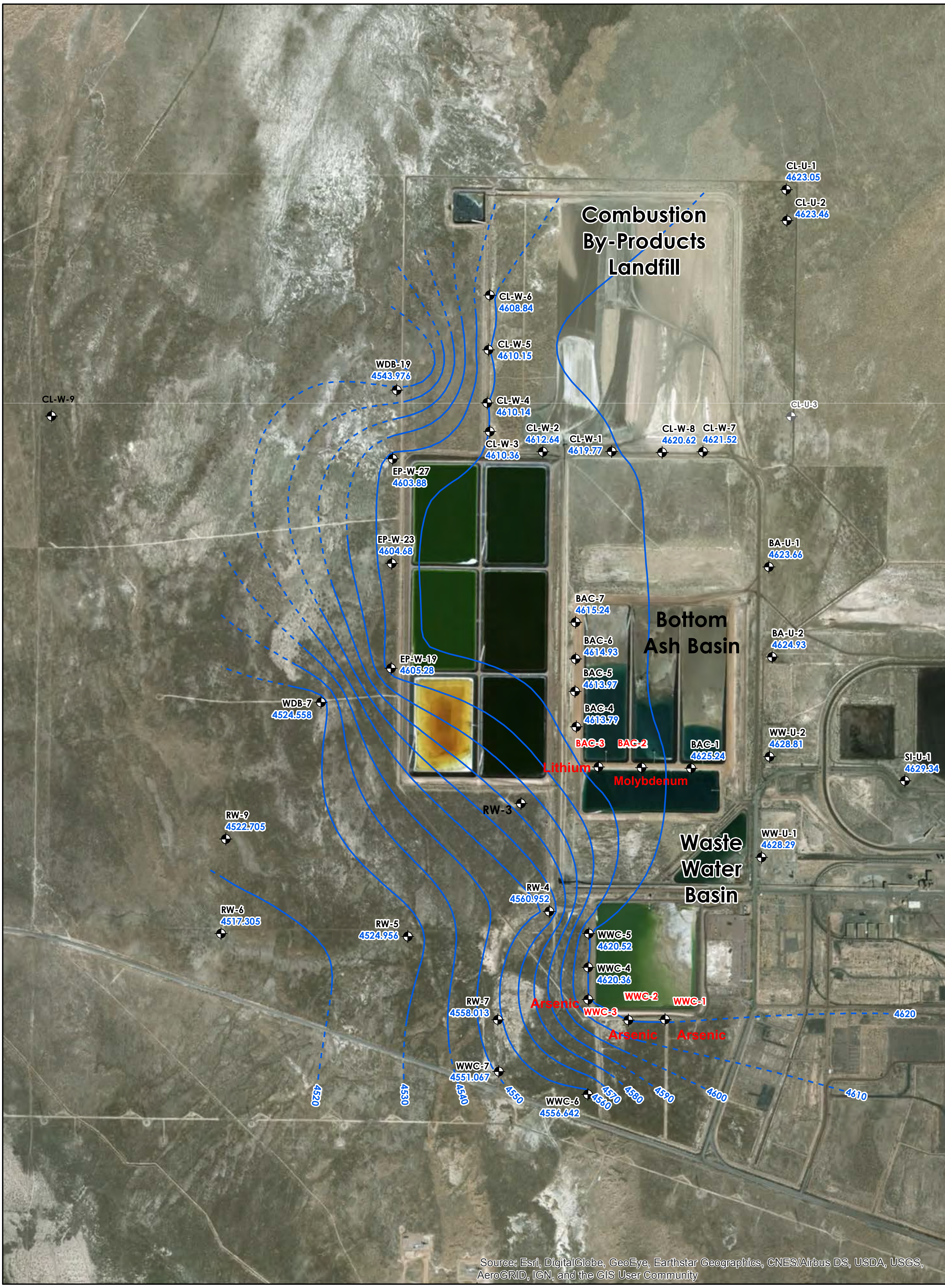
OCTOBER 2018
POTENTIOMETRIC SURFACE MAP

FIGURE: 5

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL		11/12/18

January 28, 2019

Figure 6. Appendix IV Constituent Exceedances



LEGEND:

MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING) Red Constituents Exceed GWPS.

GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED OCTOBER 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

Appendix IV Constituent Exceedances
superimposed on
OCTOBER 2018 POTENTIOMETRIC SURFACE MAP

FIGURE: 6

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL		11/12/18

Figure 7. PROPOSED SUPPLEMENTAL MONITORING WELLS

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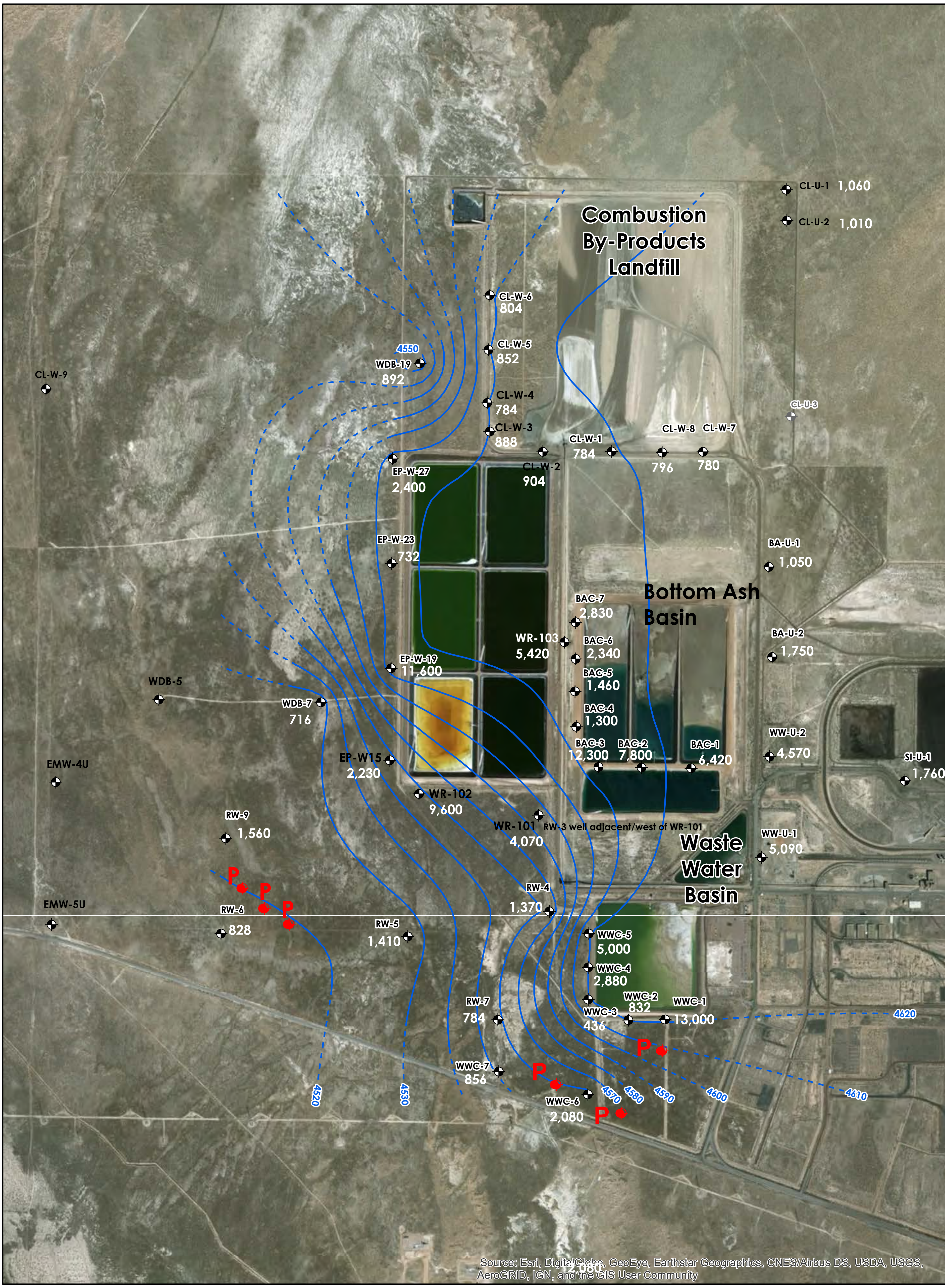


LEGEND:

- MONITORING WELL TDS Concentration (milligrams per Liter; i.e., ppm)
- GROUND WATER CONTOUR
- P PROPOSED, SUPPLEMENTAL MONITORING WELL

NOTE:

1) BASE MAP INCLUDES OCTOBER 2018 POTENTIOMETRIC MAP AND OCTOBER 2018 TDS RESULTS.
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL.
3) Existing 6-in. dia. wells RW-4 and RW-5 will be pump-tested to investigate if either or both might be used as recovery wells.
4) If and where needed, additional 6-in. dia., monitoring and recovery wells will be installed - depending on pump-test results associated with installation/testing of proposed, supplemental monitoring wells.
5) Existing recovery wells WR-101, WR-102, and WR-103 will continue to recover ground water near historical source areas.

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		PROPOSED SUPPLEMENTAL MONITORING WELLS Superimposed atop Oct. 2018 Potentiometric & TDS Concentration Map		FIGURE: 7
JOB NUMBER: 203709098	DRAWN BY: JR	CHECKED BY: ALL	APPROVED BY:	DATE: 1/15/19

January 28, 2019

Table 1 Ground Water Monitoring Well Construction Details

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4555.98
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4606.01
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WC-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WC-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46
WWC-6	3/24/2018	4-inch PVC	87	67-77	4576.26
WWC-7	3/22/2018	4-inch PVC	87	77-87	4570.78
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59

BGS = Below Ground Surface
MSL = Mean Sea Level

Table 2 CCR Rule Compliance, Analytical Results and Water Levels, 2015-2018

CCR Well Levels

Well	Depth	Date
WW-U-1	33.23	12/7/2015
WW-U-2	23.42	12/7/2015
SI-U-1	32.47	12/7/2015
CL-U-1	32.02	12/7/2015
CL-U-2	37.55	12/7/2015
CL-W-1	31.05	12/7/2015
CL-W-2	33.14	12/7/2015
CL-W-3	31.54	12/7/2015
CL-W-4	30.56	12/7/2015
CL-W-5	29.76	12/7/2015
CL-W-6	28.71	12/7/2015
CL-W-7	35.23	12/7/2015
CL-W-8	32.37	12/7/2015
BA-U-1	39.21	12/7/2015
BA-U-2	33.26	12/7/2015
BAC-1	39.32	12/7/2015
BAC-2	51.38	12/7/2015
BAC-3	51.02	12/7/2015
BAC-4	35.35	12/7/2015
BAC-5	32.62	12/7/2015
BAC-6	29.76	12/7/2015
BAC-7	31.26	12/7/2015
WWC-1	21.16	12/7/2015
WWC-2	22.16	12/7/2015
WWC-3	16.42	12/7/2015
WWC-4	17.85	12/7/2015
WWC-5	18.78	12/7/2015

CCR Well Levels

Well	Depth	Date
WW-U-1	33.08	3/3/2016
WW-U-2	23.52	3/3/2016
SI-U-1	32.45	3/3/2016
CL-U-1	31.53	3/3/2016
CL-U-2	37.09	3/3/2016
CL-W-1	31.56	3/3/2016
CL-W-2	32.59	3/3/2016
CL-W-3	30.91	3/3/2016
CL-W-4	30.02	3/3/2016
CL-W-5	28.17	3/3/2016
CL-W-6	28.13	3/3/2016
CL-W-7	34.75	3/3/2016
CL-W-8	31.89	3/3/2016
BA-U-1	38.82	3/3/2016
BA-U-2	33.05	3/3/2016
BAC-1	39.85	3/3/2016
BAC-2	51.31	3/3/2016
BAC-3	51.29	3/3/2016
BAC-4	34.97	3/3/2016
BAC-5	32.07	3/3/2016
BAC-6	29.27	3/3/2016
BAC-7	29.78	3/3/2016
WWC-1	20.92	3/3/2016
WWC-2	21.79	3/3/2016
WWC-3	16.12	3/3/2016
WWC-4	17.56	3/3/2016
WWC-5	18.5	3/3/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	34.2	6/24/2016
WW-U-2	24.21	6/24/2016
SI-U-1	32.93	6/24/2016
CL-U-1	31.88	6/24/2016
CL-U-2	37.41	6/24/2016
CL-W-1	30.67	6/24/2016
CL-W-2	32.49	6/24/2016
CL-W-3	30.78	6/24/2016
CL-W-4	29.86	6/24/2016
CL-W-5	27.97	6/24/2016
CL-W-6	27.9	6/24/2016
CL-W-7	34.98	6/24/2016
CL-W-8	32.07	6/24/2016
BA-U-1	39.13	6/24/2016
BA-U-2	33.49	6/24/2016
BAC-1	40.42	6/24/2016
BAC-2	51.38	6/24/2016
BAC-3	51.35	6/24/2016
BAC-4	34.85	6/24/2016
BAC-5	31.79	6/24/2016
BAC-6	28.86	6/24/2016
BAC-7	30.26	6/24/2016
WWC-1	21.47	6/24/2016
WWC-2	22.33	6/24/2016
WWC-3	16.63	6/24/2016
WWC-4	18.07	6/24/2016
WWC-5	19.03	6/24/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	34.42	8/30/2016
WW-U-2	24.57	8/30/2016
SI-U-1	33.49	8/30/2016
CL-U-1	32.74	8/30/2016
CL-U-2	38.31	8/30/2016
CL-W-1	31.52	8/30/2016
CL-W-2	33.5	8/30/2016
CL-W-3	31.81	8/30/2016
CL-W-4	30.89	8/30/2016
CL-W-5	28.99	8/30/2016
CL-W-6	28.95	8/30/2016
CL-W-7	35.84	8/30/2016
CL-W-8	32.93	8/30/2016
BA-U-1	39.95	8/30/2016
BA-U-2	34.24	8/30/2016
BAC-1	40.97	8/30/2016
BAC-2	52.1	8/30/2016
BAC-3	51.94	8/30/2016
BAC-4	35.68	8/30/2016
BAC-5	32.67	8/30/2016
BAC-6	29.64	8/30/2016
BAC-7	31.09	8/30/2016
WWC-1	22.4	8/30/2016
WWC-2	22.87	8/30/2016
WWC-3	17.17	8/30/2016
WWC-4	18.61	8/30/2016
WWC-5	19.6	8/30/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	34.74	11/9/2016
WW-U-2	24.81	11/9/2016
SI-U-1	33.74	11/9/2016
CL-U-1	33.04	11/9/2016
CL-U-2	38.59	11/9/2016
CL-W-1	31.89	11/9/2016
CL-W-2	34.00	11/9/2016
CL-W-3	32.34	11/9/2016
CL-W-4	31.43	11/9/2016
CL-W-5	29.58	11/9/2016
CL-W-6	29.55	11/9/2016
CL-W-7	36.20	11/9/2016
CL-W-8	33.28	11/9/2016
BA-U-1	40.27	11/9/2016
BA-U-2	34.59	11/9/2016
BAC-1	41.51	11/9/2016
BAC-2	52.61	11/9/2016
BAC-3	52.10	11/9/2016
BAC-4	35.98	11/9/2016
BAC-5	32.90	11/9/2016
BAC-6	29.81	11/9/2016
BAC-7	30.92	11/9/2016
WWC-1	22.27	11/9/2016
WWC-2	23.22	11/9/2016
WWC-3	17.43	11/9/2016
WWC-4	18.88	11/9/2016
WWC-5	19.85	11/9/2016

CCR Well Levels

Well	Depth	Date
WW-U-1	33.88	3/30/2017
WW-U-2	22.19	3/30/2017
SI-U-1	32.89	3/30/2017
CL-U-1	31.99	3/30/2017
CL-U-2	37.56	3/30/2017
CL-W-1	32.84	3/30/2017
CL-W-2	32.72	3/30/2017
CL-W-3	31.08	3/30/2017
CL-W-4	30.25	3/30/2017
CL-W-5	28.41	3/30/2017
CL-W-6	28.40	3/30/2017
CL-W-7	35.15	3/30/2017
CL-W-8	32.04	3/30/2017
BA-U-1	39.29	3/30/2017
BA-U-2	33.67	3/30/2017
BAC-1	40.89	3/30/2017
BAC-2	51.32	3/30/2017
BAC-3	51.94	3/30/2017
BAC-4	34.73	3/30/2017
BAC-5	31.71	3/30/2017
BAC-6	28.74	3/30/2017
BAC-7	30.03	3/30/2017
WWC-1	18.91	3/30/2017
WWC-2	22.21	3/30/2017
WWC-3	16.53	3/30/2017
WWC-4	17.97	3/30/2017
WWC-5	17.94	3/30/2017

CCR Well Levels

Well	Depth	Date
WW-U-1	34.70	6/21/2017
WW-U-2	24.75	6/21/2017
SI-U-1	33.46	6/21/2017
CL-U-1	32.13	6/21/2017
CL-U-2	37.72	6/21/2017
CL-W-1	30.74	6/21/2017
CL-W-2	32.35	6/21/2017
CL-W-3	30.72	6/21/2017
CL-W-4	29.90	6/21/2017
CL-W-5	28.06	6/21/2017
CL-W-6	28.01	6/21/2017
CL-W-7	35.16	6/21/2017
CL-W-8	32.21	6/21/2017
BA-U-1	39.41	6/21/2017
BA-U-2	33.90	6/21/2017
BAC-1	41.29	6/21/2017
BAC-2	50.94	6/21/2017
BAC-3	51.14	6/21/2017
BAC-4	34.08	6/21/2017
BAC-5	30.98	6/21/2017
BAC-6	28.03	6/21/2017
BAC-7	29.30	6/21/2017
WWC-1	21.95	6/21/2017
WWC-2	22.74	6/21/2017
WWC-3	17.04	6/21/2017
WWC-4	18.48	6/21/2017
WWC-5	19.44	6/21/2017

CCR Well Levels

Well	Depth	Date
WW-U-1	35.43	10/4/2017
WW-U-2	25.49	10/5/2017
SI-U-1	34.28	10/6/2017
CL-U-1	33.25	10/7/2017
CL-U-2	38.81	10/8/2017
CL-W-1	31.80	10/9/2017
CL-W-2	33.60	10/10/2017
CL-W-3	31.93	10/11/2017
CL-W-4	31.09	10/12/2017
CL-W-5	29.26	10/13/2017
CL-W-6	29.26	10/14/2017
CL-W-7	36.23	10/15/2017
CL-W-8	33.28	10/16/2017
BA-U-1	40.42	10/17/2017
BA-U-2	34.85	10/18/2017
BAC-1	41.78	10/19/2017
BAC-2	52.03	10/20/2017
BAC-3	52.31	10/21/2017
BAC-4	35.29	10/22/2017
BAC-5	32.19	10/23/2017
BAC-6	29.24	10/24/2017
BAC-7	30.48	10/25/2017
WWC-1	22.69	10/26/2017
WWC-2	23.51	10/27/2017
WWC-3	17.80	10/28/2017
WWC-4	19.27	10/29/2017
WWC-5	20.26	10/30/2017

CCR Well Levels

Well	Depth	Date
WW-U-1	36.14	3/26/2018
WW-U-2	25.79	3/26/2018
SI-U-1	34.04	3/26/2018
CL-U-1	32.64	3/26/2018
CL-U-2	38.22	3/26/2018
CL-W-1	31.73	3/26/2018
CL-W-2	33.49	3/26/2018
CL-W-3	31.73	3/26/2018
CL-W-4	30.94	3/26/2018
CL-W-5	29.00	3/26/2018
CL-W-6	28.96	3/26/2018
CL-W-7	35.99	3/26/2018
CL-W-8	33.11	3/26/2018
BA-U-1	40.28	3/26/2018
BA-U-2	34.74	3/26/2018
BAC-1	42.05	3/26/2018
BAC-2	34.62	3/26/2018
BAC-3	52.76	3/26/2018
BAC-4	35.82	3/26/2018
BAC-5	33.28	3/26/2018
BAC-6	30.53	3/26/2018
BAC-7	31.88	3/26/2018
WWC-1	22.56	3/26/2018
WWC-2	23.31	3/26/2018
WWC-3	17.55	3/26/2018
WWC-4	19.04	3/26/2018
WWC-5	20.08	3/26/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.20	6/13/2018
WW-U-2	25.95	6/13/2018
SI-U-1	34.27	6/13/2018
CL-U-1	32.83	6/13/2018
CL-U-2	38.42	6/13/2018
CL-W-1	31.92	6/13/2018
CL-W-2	33.53	6/13/2018
CL-W-3	31.72	6/13/2018
CL-W-4	30.79	6/13/2018
CL-W-5	28.95	6/13/2018
CL-W-6	29.12	6/13/2018
CL-W-7	36.19	6/13/2018
CL-W-8	33.31	6/13/2018
BA-U-1	40.54	6/13/2018
BA-U-2	35.00	6/13/2018
BAC-1	42.29	6/13/2018
BAC-2	52.68	6/13/2018
BAC-3	53.92	6/13/2018
BAC-4	35.83	6/13/2018
BAC-5	33.32	6/13/2018
BAC-6	30.52	6/13/2018
BAC-7	31.83	6/13/2018
WWC-1	22.89	6/13/2018
WWC-2	23.64	6/13/2018
WWC-3	17.92	6/13/2018
WWC-4	19.34	6/13/2018
WWC-5	20.19	6/13/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.74	10/24/2018
WW-U-2	26.65	10/24/2018
SI-U-1	35.25	10/24/2018
CL-U-1	34.43	10/24/2018
CL-U-2	40.02	10/24/2018
CL-W-1	33.69	10/24/2018
CL-W-2	35.53	10/24/2018
CL-W-3	33.67	10/24/2018
CL-W-4	32.74	10/24/2018
CL-W-5	30.84	10/24/2018
CL-W-6	30.79	10/24/2018
CL-W-7	37.82	10/24/2018
CL-W-8	35.01	10/24/2018
BA-U-1	42.07	10/24/2018
BA-U-2	36.40	10/24/2018
BAC-1	43.46	10/24/2018
BAC-2	54.24	10/24/2018
BAC-3	54.22	10/24/2018
BAC-4	35.66	10/24/2018
BAC-5	35.70	10/24/2018
BAC-6	33.22	10/24/2018
BAC-7	34.85	10/24/2018
WWC-1	23.70	10/24/2018
WWC-2	24.48	10/24/2018
WWC-3	18.74	10/24/2018
WWC-4	20.22	10/24/2018
WWC-5	21.23	10/24/2018

Assessment Well Levels

Well	Depth	Date
RW-4	20.49	10/24/2018
RW-5	46.01	10/24/2018
RW-7	14.55	10/24/2018
WDB-19	28.97	10/24/2018
WWC-6	19.62	10/24/2018
WWC-7	19.71	10/24/2018

Round 1 Detection Monitoring - December 2-10, 2015

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	68.9	418	0.813	7.82	131	1040	0	0.0378	0.126	0	0	0.00537	0	0	0.346	0	0.00459	0	0	0.52	0.5	1.02
CL-U-2	0	73.8	404	0.611	7.73	132	1020	0	0.0317	0.129	0	0	0.00613	0	0	0.325	0	0.00406	0	0	0.55	1.2	1.75
CLW-1	0	55.7	322	0.844	7.95	76.5	832	0	0.0264	0.105	0	0	0.00814	0	0	0.3	0	0.00574	0	0	0.56	1.6	2.16
CLW-2	0	53.9	432	0.695	7.75	108	976	0	0.0283	0.0957	0	0	0.00576	0	0	0.36	0	0.00472	0	0	0.51	1.1	1.61
CLW-3	0	45	367	0.948	7.86	123	928	0	0.0375	0.111	0	0	0.00346	0	0	0.337	0	0.00492	0	0	0.4	1.3	1.7
CLW-4	0	44.5	320	1.37	7.87	73.3	828	0	0.0308	0.122	0	0	0.00336	0	0	0.319	0	0.00584	0	0	0.34	1.9	2.24
CLW-5	0	38.4	345	1.51	7.81	88.3	872	0	0.0188	0.0864	0		0	0	0	0.0325	0	0.00841	0	0	0.37	1.6	1.97
CLW-6	0	33.6	325	1.38	7.71	74.5	820	0	0.0249	0.0879	0	0	0.00335	0	0	0.316	0	0.0104	0	0	0.37	0.63	1
CLW-7	0	47.3	339	0.792	7.81	66.4	812	0	0.0234	0.0593	0	0	0.00421	0	0	0.282	0	0.00331	0	0	0.14	0.52	0.66
CLW-8	0	43.6	324	0.797	7.8	70.5	772	0	0.0155	0.107	0	0	0.00463	0	0	0.285	0	0.00626	0	0	0.4	0.74	1.14
CLW-9																							
CL-U-3																							

Round 1

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	13.46	7.74	-42	1720	443	2.12	-
CL-U-2	14.72	6.92	-38	1750	604	2.6	-
CLW-1	14.84	7.69	-45	1490	383	2.28	0.952
CLW-2	9.95	7.86	-144	1810	99.6	1.76	1.16
CLW-3	11.24	7.95	-158	1740	128	1.9	1.11
CLW-4	14.9	7.95	-165	1540	25.1	1.67	0.98
CLW-5	15.12	7.96	-134	1620	46.4	1.6	1.04
CLW-6	15.3	8	-193	1550	30.8	0.98	0.998
CLW-7	16.38	7.54	8	1430	90.9	7.01	0.917
CLW-8	15.01	7.58	0	1530	11.3	2.09	0.976
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	51.4	430	1.21	8.06	121	984	0	0.0163	0.133	0	0	0.00305	0	0	0.313	0	0.0408	0	0	0.66	0.7	1.36
BA-U-2	0	53	343	0.727	8.9	48.9	82.4	0	0.0154	0.148	0	0	0.00971	0	0	0.297	0	0.0121	0	0	0.32	2.1	2.42
BAC-1	7.49	274	3280	0.299	7.37	3060	8860	0.00237	0.0146	0.1	0	0	0.00503	0.00605	0	1.52	0	0.143	0.0204	0	0.71	1.6	2.31
BAC-2	10.7	267	2000	0.741	7.29	3620	7820	0	0.0386	0.0472	0	0	0.0116	0	0	1.38	0	0.151	0.0164	0	0.48	0.94	1.42
BAC-3	6.09	387	2900	0.648	7.6	3840	9800	0	0.0191	0.0827	0	0	0.0615	0	0	2.13	0	0.0367	0.019	0	0.99	1.1	2.09
BAC-4	0	53	473	1.35	7.96	181	1150	0	0.0407	0.0821	0	0	0.0022	0	0	0.476	0	0.0104	0	0	0.19	0.5	0.69
BAC-5	0	51.1	483	1.11	7.83	129	1010	0	0.0357	0.0928	0	0	0.0161	0	0	0.479	0	0.00926	0	0	0.29	0.96	1.25
BAC-6	4.36	142	516	0.754	7.68	1080	2410	0	0.0134	0.0622	0	0	0.0363	0	0	0.599	0	0.0968	0	0	0.39	1.4	1.79
BAC-7	4.65	148	665	1.01	7.77	1360	2910	0	0.0191	0.0577	0	0	0.0264	0	0	0.681	0	0.0699	0.00276	0	0.46	0.92	1.38

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	14.56	7.93	-67	1590	106	2.51	-
BA-U-2	13.58	8.33	-85	1510	96.4	2.9	-
BAC-1	11.8	7.32	111	15100	54.8	1.84	9.35
BAC-2	15.7	7.12	79	11800	100	1.82	7.33
BAC-3	16.24	7.51	75	15000	34.2	1.36	9.28
BAC-4	14.36	7.93	12	2230	12.5	2.07	1.43
BAC-5	13.96	7.88	-18	2020	113	0.97	1.29
BAC-6	12.49	7.69	-157	3610	96.1	1.2	2.31
BAC-7	14.17	7.76	-96	4430	789	1.12	2.84

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0.594	171	667	0	7.4	918	2300	0	0.00266	0.112	0	0	0.0099	0	0	0.49	0	0.00554	0	0	0.56	1.7	2.26
WW-U-1	1.05	374	2180	0	7.06	1470	5430	0	0.00453	0.178	0	0	0.0032	0	0	0.983	0	0.00619	0.00549	0	1	2.3	3.3
WW-U-2	1.6	358	2430	0	7.23	1370	5540	0	0.00309	0.123	0	0	0.00582	0.0072	0	0.934	0	0.0237	0.00543	0	0.84	2.1	2.94
WWC-1	9.62	561	4840	0	7.19	3150	11800	0	0.0181	0.0536	0	0	0.0139	0	0	2.69	0.00031	0.00701	0.0152	0	0.31	0.83	1.14
WWC-2	0	66.5	381	0.158	7.91	147	940	0	0.0155	0.0511	0	0	0.00348	0	0	0.241	0	0.00383	0	0	0.12	1.1	1.22
WWC-3	0	34.5	284	1.01	8.11	82.2	688	0	0.0102	0.0638	0	0	0.00577	0	0	0.243	0	0.0459	0	0	0.32	0.55	0.87
WWC-4	1.09	247	1270	0.387	7.61	800	3250	0	0.0116	0.09	0	0	0.00877	0	0	0.909	0	0.00467	0.00207	0	0.5	0.45	0.95
WWC-5	2.4	345	1810	0.331	7.47	1610	5020	0	0.00783	0.103	0	0	0.00892	0.0055	0	4.41	0	0.0265	0	0	0.51	1.1	1.61
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	10.79	7.27	-14	3720	74	6.93	-
WW-U-1	13.11	7.01	2	7920	32.9	3.2	-
WW-U-2	12.59	7.23	-11	7920	93.4	5.09	-
WWC-1	14.94	7.06	15	1850	110	1.28	11.5
WWC-2	17.36	7.88	-44	1680	79.9	1.08	1.07
WWC-3	13.92	8.1	-249	1430	121	1.29	0.918
WWC-4	14.73	7.4	-20	5230	61.1	1.52	3.3
WWC-5	15.35	7.3	-122	7740	348	0.97	4.88
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 2 Detection Monitoring - February 23-March 8, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	47.7	391	0.839	8.52	123	908	0	0.0415	0.0953	0	0	0	0	0	0.401	0	0.00733	0	0	0.27	1.6	1.87
CL-U-2	0	59.9	372	0.873	7.75	119	940	0	0.0243	0.0934	0	0	0	0	0	0.387	0	0.00414	0	0	0.28	1	1.28
CLW-1	0	35.1	301	0.834	7.89	71.6	808	0	0.0266	0.0648	0	0	0.00235	0	0	0.361	0	0.00506	0	0	0.36	1.5	1.86
CLW-2	0	45.9	378	1.18	7.66	90.5	936	0	0.0243	0.0882	0	0	0	0	0	0.438	0	0.00481	0	0	0.51	0.53	1.04
CLW-3	0	40.5	336	1.35	7.92	96	884	0	0.0437	0.103	0	0	0	0	0	0.435	0	0.0049	0	0	0.47	1.1	1.57
CLW-4	0	32.1	282	1.53	7.87	80.9	776	0	0.0271	0.109	0	0	0	0	0	0.375	0	0.00762	0	0	0.37	0.7	1.07
CLW-5	0	35.4	318	1.82	7.91	85.7	824	0	0.0214	0.0869	0	0	0	0	0	0.411	0	0.00922	0	0	0.27	0.32	0.59
CLW-6	0	32.1	306	1.72	7.97	75.4	816	0	0.0246	0.095	0	0	0	0	0	0.4	0	0.0117	0	0	0.02	0.96	0.98
CLW-7	0	42.8	290	0.825	7.65	67.6	832	0	0.0239	0.0794	0	0	0	0	0	0.327	0	0.146	0	0	0.14	0.29	0.43
CLW-8	0	41.5	293	0.782	7.8	70.3	808	0	0.022	0.0839	0	0	0.00224	0	0	0.35	0	0.00499	0	0	0.32	0.32	0.64
CLW-9																							
CL-U-3																							

Round 2

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	14.18	8.74	-209	1750	4.3	2.15	1.12
CL-U-2	14.41	7.75	-89	1820	4.6	1.85	1.17
CLW-1	15.84	7.95	-60	1560	3.8	1.4	0.996
CLW-2	17.53	7.81	-137	1840	2	9.35	1.17
CLW-3	14.99	7.87	-203	1710	0	3.96	1.09
CLW-4	17.08	7.81	-211	1490	11.5	1.82	0.955
CLW-5	17.06	7.82	-168	1650	10.9	8.45	1.06
CLW-6	15.83	7.91	-194	1600	6.2	0.95	1.02
CLW-7	16.53	7.75	9	1560	3.5	2.67	0.996
CLW-8	15.86	7.81	-25	1560	8	1.92	0.996
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	28.7	258	1.67	8.55	64.2	852	0	0.023	0.0969	0	0	0	0	0	0.376	0	0.0359	0	0	0.33	1.3	1.63
BA-U-2	0	67.4	529	0.938	8.02	55.7	1230	0	0.0199	0.175	0	0	0	0	0	0.514	0	0.00298	0	0	0.2	1	1.2
BAC-1	2.85	155	1730	0	7.86	1390	5240	0	0.0174	0.39	0	0	0.00536	0	0	0.63	0	0.0607	0.0131	0	0.96	1.6	2.56
BAC-2	9.83	196	1600	0	7.35	2900	7640	0	0.0411	0.0385	0	0	0.00742	0	0.00221	1.22	0	0.167	0.0128	0	0.4	2.5	2.9
BAC-3	6.55	406	3240	0	7.62	3960	10400	0	0.0192	0.0553	0	0	0.00676	0	0	1.12	0	0.0337	0.0184	0	0.44	0.68	1.12
BAC-4	0	57.4	488	1.36	7.87	191	1290	0	0.0371	0.0806	0	0	0	0	0	0.532	0	0.0106	0	0	0.48	0.5	0.98
BAC-5	0	41.3	433	1.34	7.95	111	1010	0	0.0392	0.0736	0	0	0	0	0	0.476	0	0.00758	0	0	0.25	-0.03	0.22
BAC-6	2.67	98.4	491	0.734	7.72	636	1880	0	0.0144	0.0736	0	0	0	0	0	0.597	0	0.0569	0	0	0.61	0.6	1.21
BAC-7	4.43	132	623	1.07	7.89	1230	2980	0	0.0225	0.0372	0	0	0	0	0	0.699	0	0.0681	0.00274	0	0.16	0.51	0.67

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	13.53	8.63	5	1550	11.3	2.59	0.995
BA-U-2	15.78	7.94	-167	2240	19.7	1.06	1.44
BAC-1	17.51	8.16	39	6.5	10.7	3	4.11
BAC-2	16.74	7.2	322	9.96	3.2	2.59	6.26
BAC-3	14.4	7.36	29	1590	3.8	3.35	9.84
BAC-4	15.9	7.81	-55	2370	3.9	2.08	1.51
BAC-5	16.34	7.92	-23	1980	4	2.89	1.27
BAC-6	18.19	7.67	-8	2.94	0	1.73	1.88
BAC-7	14.22	7.9	-9	4560	3.9	2.46	2.92

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	168	752	0.557	7.65	665	2320	0	0.00781	0.0846	0	0	0.00346	0	0	0.634	0	0.00671	0	0	0.43	-0.16	0.27
WW-U-1	1.03	346	2430	0	7.23	1440	5330	0	0.00446	0.123	0	0	0	0	0	1.33	0	0.00669	0.00432	0	1	2.2	3.2
WW-U-2	1.59	362	2410	0	7.34	1370	5780	0	0.00846	0.0761	0	0	0.00735	0	0	1.35	0	0.0126	0.0108	0	0.51	1.2	1.71
WWC-1	6.01	458	4530	0.256	7.24	2710	10800	0	0.00331	0.072	0	0	0.00369	0.00842	0	1.08	0	0.0103	0.00919	0	0.91	1.6	2.51
WWC-2	0	61.3	352	0.208	7.97	131	932	0	0.0147	0.0421	0	0	0.00335	0	0	0.162	0	0.00391	0	0	0.18	1	1.18
WWC-3	0	29.2	203	0.845	8.2	78.5	660	0	0.021	0.0357	0	0	0	0	0	0.172	0	0.00593	0	0	0.16	0.52	0.68
WWC-4	0.826	185	1100	0.39	7.31	716	3100	0	0.00923	0.101	0	0	0	0	0	0.75	0	0.00783	0	0	0.6	0.84	1.44
WWC-5	1.59	320	1640	0.319	7.22	1210	4790	0	0.00371	0.0882	0	0	0	0	0	1.41	0	0.0205	0.00345	0	0.52	1.9	2.42
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	12.99	7.49	11	3790	7.4	1.37	2.42
WW-U-1	15.75	7.21	-117	8030	19.6	4.07	5.06
WW-U-2	14.5	7.34	-22	9240	12.9	2.4	5.82
WWC-1	15.29	7.11	-108	1400	11.8	7.82	8.62
WWC-2	14.19	7.75	-86	1720	9.1	2.37	1.1
WWC-3	15.63	8.1	-183	1190	2	1.36	0.759
WWC-4	15.58	7.37	-8	5004	4.7	1.61	3.18
WWC-5	15	7.22	19	7510	6.4	2	4.75
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 3 Detection Monitoring - June 6-15, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	51.2	414	1.01	7.83	122	1080	0	0.0507	0.0887	0	0	0	0	0	0.378	0	0.00491	0	0	0.11	0.72	0.83
CL-U-2	0	53.7	390	1.14	7.75	121	976	0	0.0245	0.0933	0	0	0	0	0	0.346	0	0.00391	0	0	0.26	1.5	1.76
CLW-1	0	34.6	312	1.13	7.9	70.1	716	0	0.0285	0.0621	0	0	0	0	0	0.318	0	0.00438	0	0	0.28	0.89	1.17
CLW-2	0	43.9	402	1.21	7.84	87.9	976	0	0.0264	0.0819	0	0	0	0	0	0.396	0	0.00427	0	0	0.25	1.1	1.35
CLW-3	0	36.2	346	1.3	7.86	104	876	0	0.0402	0.0992	0	0	0	0	0	0.375	0	0.00463	0	0	0.35	1.2	1.55
CLW-4	0	30.6	294	1.58	7.79	77.9	748	0	0.0196	0.119	0	0	0	0	0	0.338	0	0.0092	0	0	0.45	0.72	1.17
CLW-5	0	33	336	1.81	7.86	84.9	848	0	0.0182	0.0851	0	0	0	0	0	0.352	0	0.00868	0	0	0.27	0.65	0.92
CLW-6	0	29.8	313	1.73	7.9	73.2	756	0	0.0181	0.0901	0	0	0	0	0	0.333	0	0.0105	0	0	0.34	1.4	1.74
CLW-7	0	39.3	328	1.16	7.64	67.4	732	0	0.0246	0.0581	0	0	0.00891	0	0	0.331	0	0.00638	0	0	0.19	0.55	0.74
CLW-8	0	40.3	312	1.08	7.82	69.7	808	0	0.0225	0.0797	0	0	0	0	0	0.32	0	0.00435	0	0	0.27	0.32	0.59
CLW-9																							
CL-U-3																							

Round 3

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	18.94	8.04	-204	1910	22.6	1.2	1.22
CL-U-2	18.47	7.7	-136	1900	1	2.72	1.22
CLW-1	23.71	7.77	62	1550	0	1.34	0.99
CLW-2	22.15	7.66	-169	1840	0	1.31	1.17
CLW-3	20.8	7.71	-225	1720	0.8	1.8	1.1
CLW-4	19.51	7.8	-235	1480	0	4.39	0.95
CLW-5	21.24	7.77	-209	1570	11.5	4.22	1.01
CLW-6	18.81	7.87	-235	1600	0	1.7	1.02
CLW-7	16.73	7.62	66	1580	8.9	3.82	1.01
CLW-8	20.93	7.66	55	1510	0	12.58	0.966
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	195	1130	0.801	7.63	339	2520	0	0.0177	0.0935	0	0	0	0	0	0.773	0	0.00317	0.00426	0	0.3	1.6	1.9
BA-U-2	0	15.9	284	0.865	12	40.6	720	0	0	0.128	0	0	0.0032	0	0	0.315	0	0.016	0	0	0.22	1.5	1.72
BAC-1	4.73	191	2240	0.402	7.59	1840	6420	0	0.0164	0.081	0	0	0.0033	0	0	1.3	0	0.0669	0.0168	0	0.51	1.3	1.81
BAC-2	11.2	216	1650	0.986	7.17	3220	7520	0	0.0416	0.0248	0	0	0.00488	0	0	1.32	0	0.14	0.0142	0	0.17	1.6	1.77
BAC-3	6.82	445	3230	0.794	7.42	4490	10900	0	0.0158	0.048	0	0	0.00707	0	0	2.53	0	0.0269	0.0198	0	0.25	1.6	1.85
BAC-4	0	66.1	551	1.38	7.73	223	1280	0	0.0334	0.0772	0	0	0.00461	0	0	0.509	0	0.0122	0	0	0.16	0.68	0.84
BAC-5	0	50.4	541	1.26	7.79	122	1220	0	0.0337	0.0839	0	0	0	0	0	0.494	0	0.00738	0	0	0.11	1.7	1.81
BAC-6	1.7	89.5	521	1.04	7.72	448	1560	0	0.0122	0.0859	0	0	0	0	0	0.542	0	0.0359	0	0	0.27	0.76	1.03
BAC-7	4.51	132	685	1.31	7.69	1370	2870	0	0.0234	0.0315	0	0	0	0	0	0.674	0	0.0749	0.00319	0	0.17	2.4	2.57

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.51	7.48	-114	4730	4.9	1.73	3.03
BA-U-2	20.17	11.9	-206	1980	5.1	4.04	1.26
BAC-1	20.91	7.43	-5	10.3	33.2	3.43	6.41
BAC-2	19.81	7.01	33	11.6	2	0.69	7.18
BAC-3	18.81	7.19	16	16.6	2.6	1.26	10.3
BAC-4	18.21	7.71	83	2490	2.6	3.05	1.59
BAC-5	18.58	7.75	51	2260	0	1320	1.45
BAC-6	20.42	7.7	50	2740	0.4	21.84	1.75
BAC-7	21.43	7.63	-7	4510	8	15.04	2.89

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	129	901	0.564	7.6	318	1880	0	0.00989	0.0929	0	0	0.0156	0	0	0.499	0	0.00411	0	0	0.45	0.64	1.09
WW-U-1	1.18	296	2030	0.386	7.21	1300	5820	0	0.0052	0.115	0	0	0	0	0	1	0	0.00888	0.00637	0	0.64	0.92	1.56
WW-U-2	1.49	412	2300	0.534	7.33	1180	5400	0	0.00538	0.0746	0	0	0.0114	0	0	1.08	0	0.0126	0.0107	0	0.64	1.1	1.74
WWC-1	3.59	526	3950	0	7.12	1990	8820	0	0.00401	0.077	0	0	0	0.00532	0	2.18	0	0.00653	0.00824	0	0.47	2	2.47
WWC-2	0	59.1	369	0.833	7.79	145	956	0	0.0151	0.0408	0	0	0	0	0	0.225	0	0.00402	0	0	0.22	0.39	0.61
WWC-3	0	26.4	197	1.02	8.12	85.6	664	0	0.0213	0.0328	0	0	0	0	0	0.23	0	0.00574	0	0	0.13	3.3	3.43
WWC-4	0.627	138	902	0.576	7.57	406	2010	0	0.00498	0.0768	0	0	0	0	0	0.606	0	0.0082	0	0	0.27	1.7	1.97
WWC-5	1.65	406	1730	0.3	7.24	1140	5060	0	0.00608	0.067	0	0	0	0	0	1.4	0	0.0119	0.00363	0	0.42	0.85	1.27
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	18	7.54	-69	3350	0.3	8.11	2.14
WW-U-1	22.73	7.15	34	7560	0	4.74	4.76
WW-U-2	18.42	7.25	-66	8820	25.9	1.6	5.56
WWC-1	18.38	6.9	62	14.7	1.6	1.86	9.13
WWC-2	18.22	7.74	-101	1.74	1.9	5.2	1.12
WWC-3	16.62	7.99	-168	1.2	0	0.59	0.765
WWC-4	16.85	7.43	-8	3.63	1.2	0.85	2.32
WWC-5	17.35	7.01	15	7.44	1	0.78	4.69
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 4 Detection Monitoring - August 22-September 1, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	54.8	424	1.03	7.63	124	1030	0	0.0301	0.0911	0	0	0	0	0	0.375	0	0.00428	0	0	0.36	0.44	0.8
CL-U-2	0	57.7	406	1.17	7.69	113	948	0	0.0265	0.0961	0	0	0.00227	0	0	0.351	0	0.00508	0	0	0.31	1.1	1.41
CLW-1	0	35	315	1.18	7.89	65.4	832	0	0.0279	0.0594	0	0	0	0	0	0.316	0	0.00454	0	0	0.52	0.86	1.38
CLW-2	0	46.8	424	1.29	7.75	89.2	992	0	0.0284	0.0823	0	0	0	0	0	0.391	0	0.00462	0	0	0.31	0.62	0.93
CLW-3	0	38.7	349	1.33	7.75	109	896	0	0.0412	0.0995	0	0	0	0	0	0.368	0	0.00472	0	0	0.3	0.15	0.45
CLW-4	0	32.1	318	1.53	7.81	84.5	808	0	0.0316	0.104	0	0	0	0	0	0.336	0	0.00577	0	0	0.39	0.62	1.01
CLW-5	0	34.3	350	1.83	7.75	92.1	860	0	0.0189	0.0803	0	0	0	0	0	0.346	0	0.00798	0	0	0.24	0.27	0.51
CLW-6	0	31.5	331	1.73	7.84	77.1	812	0	0.0164	0.0966	0	0	0	0	0	0.342	0	0.011	0	0	0.2	1	1.2
CLW-7	0	42.1	336	1.1	7.71	70	760	0	0.024	0.0529	0	0	0	0	0	0.302	0	0.00396	0	0	0.17	0.33	0.5
CLW-8	0	40.1	327	1.08	7.73	75	720	0	0.0224	0.0761	0	0	0	0	0	0.308	0	0.00459	0	0	0.35	1	1.35
CLW-9																							
CL-U-3																							

Round 4

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.53	7.66	-180	1.84	4.1	1.72	1.18
CL-U-2	19.27	7.65	-151	1.81	0	9.25	1.16
CLW-1	18.96	7.85	34	1.55	0	5.66	0.992
CLW-2	19.41	7.7	-177	1.81	0	10.68	1.16
CLW-3	19.1	7.74	-225	1.66	0	10.74	1.07
CLW-4	21.52	7.8	-244	1.54	0	5.07	0.985
CLW-5	20.36	7.74	-195	1.67	45.2	9.17	1.07
CLW-6	18.53	7.79	-235	1.61	0	4.22	1.03
CLW-7	19.86	7.62	-71	1.57	0.01	12.06	1.01
CLW-8	20.81	7.7	-78	1.53	0	5.02	0.976
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	180	1170	0.888	7.62	327	2390	0	0.0191	0.0802	0	0	0	0	0	0.684	0	0.00386	0.00384	0	0.45	0.84	1.29
BA-U-2	0	10.4	317	0.975	11.8	39.9	748	0	0.00225	0.114	0	0	0.00216	0	0	0.337	0	0.0147	0	0	0.26	1.1	1.36
BAC-1	4.95	221	2520	0.401	7.52	2380	7210	0	0.0146	0.0643	0	0	0.0028	0	0	1.42	0	0.0603	0.0148	0	0.63	0.64	1.27
BAC-2	10.5	203	1640	1.03	7.22	3180	7620	0	0.0431	0.0237	0	0	0.0081	0	0	1.17	0	0.166	0.0136	0	0.33	0.23	0.56
BAC-3	6.77	399	3350	1.28	7.36	4630	11700	0	0.0213	0.0436	0	0	0.00386	0	0	2.37	0	0.0294	0.019	0	0.38	0.76	1.14
BAC-4	0	56.1	498	1.35	7.62	210	1460	0	0.0358	0.0757	0	0	0	0	0	0.508	0	0.0103	0	0	0.19	0.83	1.02
BAC-5	0	49.4	561	1.25	7.68	127	1200	0	0.0331	0.0879	0	0	0	0	0	0.538	0	0.0077	0	0	0.1	0.46	0.56
BAC-6	1.38	80.2	546	0.901	7.61	502	1540	0	0.0115	0.0781	0	0.000677	0.00283	0	0	0.54	0	0.034	0	0	0.31	0.24	0.55
BAC-7	3.96	126	612	1.28	7.68	1370	2770	0	0.0232	0.0274	0	0	0	0	0	0.669	0	0.0942	0.00257	0	0.37	-0.17	0.2

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	20.11	7.46	-160	4.24	0	3.38	2.72
BA-U-2	17.77	11.83	-224	2.11	9.1	8.94	1.35
BAC-1	22.39	7.33	10	11.8	8.7	2.54	7.3
BAC-2	21.36	7.04	0	10200	0	2.17	6.33
BAC-3	22.52	7.22	34	15.4	0	2.18	9.58
BAC-4	19.45	7.62	-94	2350	0	11.45	1.51
BAC-5	19.21	7.62	-96	2340	0	10.71	1.5
BAC-6	19.95	7.59	9	2650	0	24.99	1.7
BAC-7	19.38	7.56	-77	4270	0	2.75	2.73

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	131	922	0.564	7.57	281	1880	0	0.00926	0.0858	0	0	0.00217	0	0	0.467	0	0.00295	0	0	0.45	0.96	1.41
WW-U-1	1.25	304	2200	0.327	7.21	1280	5270	0	0.00439	0.0916	0	0	0.00337	0	0	1.01	0	0.00835	0.00689	0	0.54	2	2.54
WW-U-2	0.641	308	2140	0.614	7.42	854	4550	0	0.00258	0.117	0	0	0.00424	0	0	0.994	0	0.0342	0.00617	0	0.82	1.6	2.42
WWC-1	10.2	457	4680	0.213	7.11	3130	12100	0	0.02	0.0335	0	0	0	0	0	2.41	0.00019	0.00966	0.0145	0	0.33	0.86	1.19
WWC-2	0	57.9	389	0.508	7.86	151	960	0	0.0152	0.0406	0	0	0	0	0	0.243	0	0.0034	0	0	0.69	1.2	1.89
WWC-3	0	27.3	220	1.03	8.02	78	628	0	0.0217	0.0342	0	0	0	0	0	0.241	0	0.00559	0	0	0.2	-0.34	-0.14
WWC-4	1.17	225	1330	0.422	7.37	868	3230	0	0.0131	0.065	0	0	0	0	0	0.879	0	0.00237	0.00238	0	0.27	0.48	0.75
WWC-5	2.87	326	1920	0.366	7.18	1700	5440	0	0.00717	0.0439	0	0	0	0	0	1.33	0	0.00742	0.00312	0	0.41	0.51	0.92
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	21.31	7.57	-21	3.25	1.6	14.7	2.08
WW-U-1	20.96	7.12	34	8.06	10.9	3.52	5.08
WW-U-2	19.51	7.41	-63	7.34	4.7	8.24	4.62
WWC-1	20.69	6.94	-34	18400	0	0.54	11.4
WWC-2	17.91	7.64	-153	1720	2.6	3.57	1.1
WWC-3	17.39	7.97	-176	1200	0	0.54	0.766
WWC-4	17.14	7.22	-68	5320	0	2.25	3.35
WWC-5	17.85	7.01	-89	7790	0.9	0.59	4.91
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 5 Detection Monitoring - October 17-26, 2016

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.4	424	0.959	7.7	115	912	0	0.037	0.089	0	0	0	0	0	0.217	0	0.00404	0	0	0.25	0.18	0.43
CL-U-2	0	59.5	395	0.99	7.73	113	864	0	0.0269	0.101	0	0	0	0	0	0.206	0	0.00401	0	0	0.36	0.84	1.2
CLW-1	0	38.9	325	1.15	7.8	67.8	824	0	0.0295	0.0668	0	0	0	0	0	0.189	0	0.0043	0	0	0.27	0.19	0.46
CLW-2	0	49.2	422	1.13	7.82	85.3	984	0	0.0258	0.0855	0	0	0	0	0	0.223	0	0.00456	0	0	0.31	0.34	0.65
CLW-3	0	40.8	366	1.19	7.83	100	944	0	0.0412	0.104	0	0	0	0	0	0.214	0	0.00508	0	0	0.35	0.13	0.48
CLW-4	0	34.6	335	1.39	7.84	85.9	828	0	0.0385	0.0932	0	0	0	0	0	0.203	0	0.00414	0	0	0.59	-0.37	0.22
CLW-5	0	35.3	339	1.69	7.89	82.1	928	0	0.0206	0.0812	0	0	0	0	0	0.204	0	0.00723	0	0	0.31	0.84	1.15
CLW-6	0	33.9	325	1.46	7.85	77.9	972	0	0.0287	0.0908	0	0	0	0	0	0.203	0	0.00638	0	0	0.35	0.18	0.53
CLW-7	0	42.8	343	1.14	7.9	68.6	796	0	0.0235	0.0551	0	0	0.00234	0	0	0.182	0	0.00413	0	0	0.27	0.32	0.59
CLW-8	0	41.7	334	1.11	7.77	68.9	744	0	0.0258	0.0797	0	0	0	0	0	0.189	0	0.00428	0	0	0.37	-0.28	0.09
CLW-9																							
CL-U-3																							

Round 5

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.15	7.72	-195	1900	0.7	2.79	1.22
CL-U-2	16.89	7.67	-102	1820	0.4	0.82	1.17
CLW-1	16.85	7.77	-50	1520	2	1.57	0.974
CLW-2	17.05	7.76	-202	1900	0.4	3.82	1.21
CLW-3	15.28	7.75	-231	1720	1.8	1.29	1.1
CLW-4	14.67	7.78	-235	1620	7	1.4	1.04
CLW-5	17.4	7.71	-209	1690	8.1	1.41	1.08
CLW-6	15.85	7.83	-249	1620	1.1	1.72	1.04
CLW-7	17.42	7.7	-73	564	0	13.65	0.361
CLW-8	17.18	7.7	-100	1530	2.2	1.03	0.978
CLW-9							
CL-U-3							

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	16.7	327	1.65	9.08	60.2	832	0	0.0362	0.0679	0	0	0	0	0	0.215	0	0.0163	0	0	0.67	0.13	0.8
BA-U-2	0	38.1	357	1.02	8.56	51.9	824	0	0.0234	0.131	0	0	0	0	0	0.21	0	0.00449	0	0	0.57	0.42	0.99
BAC-1	3.42	131	1850	0.437	8.8	1610	7720	0	0.0103	0.049	0	0	0.00612	0	0	0.402	0	0.0498	0.00852	0	0.34	0.27	0.61
BAC-2	9.71	216	1620	1.11	7.34	2980	7040	0	0.0444	0.0228	0	0	0.00644	0	0	0.414	0	0.165	0.0131	0	0.25	-0.03	0.22
BAC-3	7.04	401	3160	0.76	7.39	4260	11400	0	0.0226	0.0404	0	0	0.00362	0	0	0.812	0	0.0275	0.0195	0	0.24	0.14	0.38
BAC-4	0	59.2	534	1.34	7.8	222	1230	0	0.0352	0.0723	0	0	0.00212	0	0	0.243	0	0.00992	0	0	0.09	0.4	0.49
BAC-5	0	40.5	479	1.33	7.85	110	1070	0	0.0359	0.0909	0	0	0	0	0	0.219	0	0.00715	0	0	0.2	-0.01	0.19
BAC-6	4.35	133	606	0.97	7.61	1080	2620	0	0.022	0.0287	0	0	0.00257	0	0	0.266	0	0.0858	0.00369	0	0.13	0.69	0.82
BAC-7	3.97	135	628	1.42	7.69	1340	2880	0	0.0241	0.026	0	0	0.00217	0	0	0.279	0	0.0944	0.00279	0	0.26	1.1	1.36

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.41	9.07	6	1660	3.2	1.88	1.06
BA-U-2	16.67	8.77	-318	1600	1.7	1.76	1.03
BAC-1	18.66	7.57	-144	8800	7.7	0.55	6.19
BAC-2	19.51	7.01	-2	10200	0.6	0.46	6.34
BAC-3	18.63	7.15	2	16700	20	4.99	10.4
BAC-4	16.35	7.72	-120	0.859	3	4.2	0.55
BAC-5	16.43	7.85	-64	726	1.4	12.41	0.464
BAC-6	16.07	7.62	-86	1370	11.4	1.77	0.879
BAC-7	16.64	7.59	-67	1560	4.6	12.42	0.998

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	132	863	0.514	7.52	286	1850	0	0.00895	0.0871	0	0	0	0	0	0.254	0	0.00276	0	0	0.32	0.11	0.43
WW-U-1	1.23	348	2190	0.346	7.18	1230	5370	0	0.0041	0.0771	0	0	0.00538	0	0	0.479	0	0.00891	0.00579	0	0.73	0.17	0.9
WW-U-2	1.47	383	2340	0.416	7.22	1120	5540	0	0.00573	0.0704	0	0	0.00396	0	0	0.512	0	0.0111	0.0116	0	0.78	0.46	1.24
WWC-1	9.83	513	4540	0.133	7.04	2960	12500	0	0.0197	0.0317	0	0	0.00348	0	0	0.819	0.000198	0.00936	0.0153	0	0.23	0.73	0.96
WWC-2	0	58.5	369	0.42	7.88	140	960	0	0.0129	0.0543	0	0	0.0243	0	0	0.112	0	0.00809	0	0	0.1	0.45	0.55
WWC-3	0	27.7	224	1.08	8.01	86.1	612	0	0.0218	0.0332	0	0	0	0	0	0.123	0	0.00543	0	0	0.07	0.1	0.17
WWC-4	1.19	227	1200	0.509	7.32	763	3200	0	0.0136	0.0629	0	0	0	0	0	0.351	0	0.00222	0.00216	0	0.08	0.75	0.83
WWC-5	3.02	343	1850	0.401	0.71	1570	5300	0	0.00778	0.0389	0	0	0.00238	0	0	0.497	0	0.00498	0.0041	0	0.43	1.1	1.53
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.62	7.47	-22	3370	1	9	2.16
WW-U-1	17.72	6.99	7	8330	3	1.89	5.25
WW-U-2	17.84	7.19	-10	8400	2.6	1.89	5.29
WWC-1	15.78	6.93	-22	18600	0	0.51	11.6
WWC-2	15.91	7.75	-210	1680	6	1.08	1.07
WWC-3	16.26	7.94	-166	1210	0	0.24	0.772
WWC-4	16.51	7.22	-41	5140	0.2	1.09	3.24
WWC-5	15.83	7.02	-87	7930	0.2	0.37	4.99
WWC-6							
WWC-7							

Round 6 Detection Monitoring - March 20-30, 2017

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.1	403	0.876	7.83	113	908	0	0.0322	0.0867	0	0	0	0	0	0.214	0	0.00365	0	0	0.62	0.22	0.62
CL-U-2	0	61.2	374	0.903	7.89	110	852	0	0.0272	0.0976	0	0	0	0	0	0.208	0	0.00386	0	0	0.4	0.39	0.4
CLW-1	0	38.4	295	1.05	7.83	62.4	768	0	0.0309	0.0631	0	0	0.0187	0	0	0.185	0	0.00654	0	0	0.41	0.78	1.2
CLW-2	0	49.7	377	1.07	7.85	92.9	936	0	0.0277	0.0811	0	0	0	0	0	0.219	0	0.00437	0	0	0.31	0.72	1
CLW-3	0	42.4	333	1.23	7.87	94.4	876	0	0.0423	0.103	0	0	0	0	0	0.214	0	0.00473	0	0	0.35	0.7	1.1
CLW-4	0	35.2	306	1.27	8.02	79.1	808	0	0.0388	0.0898	0	0	0	0	0	0.202	0	0.00439	0	0	0.39	0.12	0.39
CLW-5	0	36	320	1.71	7.88	79.9	748	0	0.0216	0.0801	0	0	0.00214	0	0	0.025	0	0.00666	0	0	0.4	0.38	0.4
CLW-6	0	33.4	302	1.48	7.91	66	752	0	0.0164	0.0976	0	0	0	0	0	0.193	0	0.00805	0	0	0.25	-0.35	0.25
CLW-7	0	46.4	312	1.02	7.68	61	824	0	0.0257	0.0545	0	0	0.00772	0	0	0.182	0	0.00425	0	0	0.14	0.18	0.14
CLW-8	0	42.8	301	1.03	7.71	63.8	772	0	0.0255	0.0707	0	0	0.012	0	0	0.189	0	0.00526	0	0	0.25	0.29	0.25
CLW-9																							
CL-U-3																							

Round 6

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.27	7.52	-194	957	4.2	2.53	0.613
CL-U-2	15.81	7.48	-139	929	0	10.45	0.598
CLW-1	14.45	7.6	-173	1540	0	5.98	0.984
CLW-2	16.63	7.58	-221	950	0	9.29	0.609
CLW-3	16.58	7.66	-235	840	0	10.64	0.539
CLW-4	16.67	7.68	-253	785	0	2.14	0.502
CLW-5	16.63	7.6	-222	834	0	2.29	0.534
CLW-6	15.51	7.65	-245	790	0	8.85	0.505
CLW-7	15.48	7.52	-150	1600	0	1.94	1.02
CLW-8	15.08	7.57	-159	1550	0	1.55	0.991
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	24.5	259	1.57	8.59	48.8	648	0	0.0359	0.0856	0	0	0	0	0	0.193	0	0.0124	0	0	0.28	0.15	0.28
BA-U-2	0	3.76	328	0.886	12.1	39.2	728	0	0.00254	0.122	0	0	0	0	0	0.221	0	0.00986	0	0	0.3	0.47	0.3
BAC-1	4.01	188	2170	0	7.47	1650	6320	0	0.0202	0.279	0	0	0.0412	0	0	0.429	0	0.0391	0.0152	0	1.1	1.5	2.6
BAC-2	10.5	193	1480	0.871	7.2	2780	7320	0	0.0469	0.022	0	0	0.0145	0	0	0.44	0	0.194	0.0144	0	0.34	0.22	0.56
BAC-3	7.57	408	3140	0	7.36	4290	13000	0	0.0239	0.0376	0	0	0.00447	0	0	0.974	0	0.026	0.0211	0	0.2	0.5	0.7
BAC-4	0	59	461	1.13	7.68	206	1260	0	0.0362	0.0705	0	0	0.011	0	0	0.237	0	0.012	0	0	0.13	0.18	0.13
BAC-5	0	59.5	576	0.994	7.73	190	1430	0	0.032	0.0893	0	0	0.00204	0	0	0.277	0	0.00666	0	0	0.21	0.24	0.45
BAC-6	4.44	128	594	0.763	7.6	1040	2500	0	0.0237	0.0269	0	0	0.00205	0	0	0.28	0	0.0873	0.0045	0	0.12	-0.21	-0.09
BAC-7	3.31	151	591	0.936	7.43	1140	3120	0	0.0237	0.0253	0	0	0	0	0	0.327	0	0.0702	0.007	0	0.21	0.7	0.91

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.08	8.22	55	783	1.8	6.02	0.501
BA-U-2	17.77	11.71	-250	2120	1.9	7.87	1.36
BAC-1	16.44	7.24	-131	9640	11.2	2.14	6.07
BAC-2	15.89	6.86	-53	10400	0.1	0.6	6.44
BAC-3	15.61	7.1	-44	18000	3.4	0.5	11.2
BAC-4	14.42	7.58	-165	2400	0	2.76	1.53
BAC-5	15.18	7.53	-155	2550	0.1	0.57	1.63
BAC-6	16.07	7.42	-115	4030	0	0.32	2.58
BAC-7	16.54	7.34	-124	4780	1.5	0.38	3.06

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	131	785	0.458	7.54	247	1760	0	0.00941	0.08	0	0	0	0	0	0.25	0	0.00227	0	0	0.33	0.24	0.33
WW-U-1	1.15	336	1880	0.2	7.26	1180	4890	0	0.00593	0.0568	0	0	0	0	0	0.477	0	0.00558	0.00583	0	0.53	0.89	1.42
WW-U-2	0.6	317	1860	0.438	7.38	734	4300	0	0.00355	0.095	0	0	0	0	0	0.479	0	0.021	0.00749	0	0.51	1.6	2.11
WWC-1	11.2	479	4510	0	6.98	2940	12200	0	0.0213	0.0288	0	0	0	0	0	0.932	0.000328	0.00995	0.0149	0	0.26	1.1	1.36
WWC-2	0	52	318	0.405	7.79	125	856	0	0.0149	0.0361	0	0	0	0	0	0.122	0	0.00357	0	0	0.17	0.61	0.78
WWC-3	0	25.7	195	0.852	8.13	76	680	0	0.0227	0.0302	0	0	0.00309	0	0	0.137	0	0.00537	0	0	0.24	-0.21	0.03
WWC-4	1.3	233	1250	0.319	7.38	819	3230	0	0.0135	0.061	0	0	0	0	0	0.382	0	0	0.00239	0	0.18	-0.2	-0.02
WWC-5	1.72	318	1520	0.292	7.13	1190	4560	0	0.01	0.0501	0	0	0	0	0	0.555	0	0.00523	0.00399	0	0.23	0.95	1.18
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.03	7.37	-45	3340	1.1	8.42	2.14
WW-U-1	18.15	6.96	-57	7980	11.5	1.02	5.02
WW-U-2	17.03	7.29	-15	7470	2.3	1.36	4.71
WWC-1	15.08	6.74	-32	19700	0.3	1.8	12.2
WWC-2	15.4	7.75	-134	1650	1	0.44	1.06
WWC-3	15.31	8.09	207	1230	1.2	0.22	0.784
WWC-4	15.85	7.18	-70	5390	0.5	3.15	3.39
WWC-5	16.2	6.84	-61	7180	0	0.62	4.52
WWC-6							
WWC-7							

Round 7 Detection Monitoring - June 5-21, 2017

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	53	480	0.996	7.74	132	1010	0	0.0344	0.0826	0	0.00065	0	0	0	0.202	0	0.00402	0	0	0.36	0.95	1.31
CL-U-2	0	55.1	444	1	7.8	134	952	0	0.0247	0.0938	0	0	0	0	0	0.19	0	0.00408	0	0	2.7	1	3.7
CLW-1	0	36.4	322	1.06	7.85	68.2	772	0	0.0289	0.0615	0	0	0	0	0	0.173	0	0.00389	0	0	0.2	0.14	0.34
CLW-2	0	44.7	436	1.19	7.83	102	964	0	0.0246	0.0754	0	0	0.00411	0	0	0.211	0	0.00461	0	0	0.24	1	1.24
CLW-3	0	37.3	380	1.23	7.85	106	856	0	0.0378	0.0951	0	0	0	0	0	0.197	0	0.00498	0	0	0.27	0.29	0.56
CLW-4	0	30.6	345	1.44	7.89	86.3	816	0	0.0352	0.0885	0	0	0	0	0	0.189	0	0.00481	0	0	0.29	0.3	0.59
CLW-5	0	32.4	358	1.82	7.86	91.6	860	0	0.0203	0.0732	0	0	0	0	0	0.188	0	0.00572	0	0	1.4	1.2	2.6
CLW-6	0	31	336	1.61	7.9	77.5	768	0	0.02	0.0893	0	0	0	0	0	0	0.183	0	0.0068	0	0.01	0.5	0.51
CLW-7	0	41.5	352	1.01	7.88	70.4	832	0	0.0241	0.0514	0	0	0	0	0	0.169	0	0.0033	0	0	0.14	0.75	0.89
CLW-8	0	38.4	339	1.02	7.81	73.1	812	0	0.0239	0.0681	0	0	0	0	0	0.176	0	0.00391	0	0	0.18	0.81	0.99
CLW-9																							
CL-U-3																							

Round 7

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.35	7.59	-206	1920	0	1.51	1.23
CL-U-2	15.98	7.5	-177	1860	0	1.62	1.19
CLW-1	18.47	7.79	-160	768	0	0.9	0.491
CLW-2	16.77	7.73	-210	945	0	1.52	0.605
CLW-3	17.35	7.78	-246	879	0	213	0.562
CLW-4	17.86	7.75	-252	1580	0	4.35	1.01
CLW-5	18.97	7.66	-232	1680	0	2.65	1.08
CLW-6	16.95	7.75	-258	1590	0	5.1	1.02
CLW-7	18.07	7.7	-131	805	0	2.21	0.516
CLW-8	17.59	7.74	-130	776	0	1.58	0.497
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	26.3	317	1.75	8.32	52.9	776	0	0.0323	0.0901	0	0	0	0	0	0.191	0	0.0109	0	0	0.15	0.73	0.88
BA-U-2	0	3.58	366	0.821	11.8	39.6	748	0	0	0.0899	0	0	0	0	0	0.215	0	0.0086	0	0	0.09	0.98	1.07
BAC-1	1.91	88.7	914	0.266	8.92	702	2920	0	0.0145	0.0563	0	0	0.00666	0	0	0.305	0	0.0317	0.00643	0	0.2	0.99	1.19
BAC-2	10.6	216	1730	0	7.21	3260	7720	0	0.042	0.0211	0	0	0.00799	0	0	0.586	0	0.177	0.0138	0	0.14	0.64	0.78
BAC-3	7.76	401	3510	0	7.29	4900	13200	0	0.0251	0.0316	0	0	0.00858	0	0	1.17	0	0.0292	0.0212	0	0.3	0.76	1.06
BAC-4	0	56.1	612	1.13	7.84	212	1220	0	0.0329	0.0666	0	0	0	0	0	0.228	0	0.0113	0	0	0.37	0.47	0.84
BAC-5	0	58.3	654	1.1	7.76	217	1180	0	0.0297	0.0881	0	0	0	0	0	0.259	0	0.00728	0	0	0.31	0.28	0.59
BAC-6	4.25	135	697	0.779	7.63	1110	2810	0	0.0229	0.0256	0	0	0	0	0	0.257	0	0.0921	0.00414	0	0.24	0.76	1
BAC-7	3.4	146	632	0.864	7.78	1290	3170	0	0.0154	0.0288	0	0	0.00398	0	0	0.36	0	0.0888	0.00457	0	2.5	0.88	3.38

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.46	8.13	-138	1500	0	2.32	0.963
BA-U-2	19.9	11.43	-301	1870	0	0.58	1.2
BAC-1	22.57	9.92	-118	5180	15.6	2.32	3.27
BAC-2	19.02	7.09	-80	10900	2.2	0.84	6.76
BAC-3	18.87	7.1	-69	17800	3.2	1.02	11
BAC-4	17.01	7.62	-158	2380	0	1.61	1.52
BAC-5	17.31	7.69	-131	2560	0	2.62	1.64
BAC-6	19.46	7.59	-128	3900	35.2	0.85	2.5
BAC-7	17.97	7.5	-147	4610	2.9	1.16	2.95

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	116	763	0.522	7.56	427	1800	0	0.0101	0.0599	0	0.00128	0.00274	0	0	0.235	0	0.00233	0	0	0.2	1.3	1.5
WW-U-1	1.18	312	2340	0.181	7.41	1450	4540	0	0.00568	0.0521	0	0	0.00212	0	0	0.441	0	0.00556	0.00625	0	1.2	1.5	2.7
WW-U-2	0.741	338	2590	0.287	7.36	1040	12500	0	0.00325	0.0803	0	0	0.067	0	0	0.512	0	0.0226	0.00846	0	0.52	1.6	2.12
WWC-1	9.88	413	4410	0	7.14	2770	11000	0	0.0173	0.0326	0	0	0	0	0	1.11	0.000175	0.0147	0.0147	0	0.39	1.5	1.89
WWC-2	0	49.5	326	0.447	7.85	134	832	0	0.0141	0.0339	0	0	0	0	0	0.138	0	0.00405	0	0	0.24	0.24	0.48
WWC-3	0	25.9	220	0.974	8.12	84.3	696	0	0.0214	0.0281	0	0	0	0	0	0.146	0	0.00504	0	0	0.1	0.45	0.55
WWC-4	1.33	229	1330	0.466	7.22	912	3060	0	0.013	0.0545	0	0	0	0	0	0.421	0	0	0.00241	0	0.22	0.74	0.96
WWC-5	2.25	287	1790	0	7.49	1420	4810	0	0.00753	0.0379	0	0	0.00202	0	0	0.567	0	0.00531	0.00336	0	0.2	1.5	1.7
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.96	7.27	-138	3170	0	0.57	2.03
WW-U-1	18.63	6.87	-32	8050	0	1	5.07
WW-U-2	18.21	7.22	-161	7610	0	0.91	4.79
WWC-1	16.96	6.95	-34	15200	0.1	0.67	9.48
WWC-2	16.11	7.72	-169	1500	1.3	0.94	0.96
WWC-3	16.94	7.99	-194	1210	0.7	0.63	0.773
WWC-4	16.15	7.16	-73	5.48	0.5	0.6	3.46
WWC-5	16.54	7.01	-42	7225	0.9	0.76	4.57
WWC-6							
WWC-7							

Round 8 Detection Monitoring - September 25-October 4, 2017

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	0	52.1	422	1.07	7.73	116	1130	0	0.0291	0.088	0	0	0	0	0	0.228	0	0.00398	0	0	0.25	1.6	1.85
CL-U-2	0	53.8	390	1.1	7.67	120	1060	0	0.0262	0.0941	0	0	0	0	0	0.212	0	0.00415	0	0	0.17	1.4	1.57
CLW-1	0	35.7	310	1.15	7.85	71.7	808	0	0.0308	0.0614	0	0	0	0	0	0.192	0	0.00407	0	0	0.21	1.7	1.91
CLW-2	0	43.5	407	1.23	7.76	97.3	1040	0	0.0257	0.0793	0	0	0	0	0	0.229	0	0.00467	0	0	0.12	3	3.12
CLW-3	0	36.2	347	1.34	7.8	100	884	0	0.0408	0.102	0	0	0	0	0	0.223	0	0.00474	0	0	0.16	1.1	1.26
CLW-4	0	30.5	313	1.6	7.81	85.1	856	0	0.0333	0.09	0	0	0.0516	0	0	0.199	0	0.0115	0	0	0.24	1.8	2.04
CLW-5	0	33.2	344	1.82	7.8	88.5	824	0	0.023	0.0727	0	0	0	0	0	0.211	0	0.0052	0	0	0.2	2.2	2.4
CLW-6	0	30.5	317	1.73	7.82	74.5	828	0	0.0143	0.0961	0	0	0	0	0	0.199	0	0.00721	0	0	0.29	1.7	1.99
CLW-7	0	45.5	319	1.11	7.7	64.5	868	0	0.0244	0.0539	0	0	0	0	0	0.189	0	0.00389	0	0	0.45	0.95	1.4
CLW-8	0	37.9	319	1.13	7.77	70.6	788	0	0.0252	0.0689	0	0	0	0	0	0.192	0	0.00431	0	0	0.25	1.6	1.85
CLW-9																							
CL-U-3																							

Round 8

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	16.07	7.45	-199	1930	0.4	0.56	1.24
CL-U-2	15.67	7.43	-176	1880	0.8	0.58	1.2
CLW-1	20.49	7.68	-172	1.48	0	0.41	0.949
CLW-2	16.63	7.63	-199	1880	0.7	0.64	1.2
CLW-3	16.82	7.59	-251	1750	1.5	2.9	1.12
CLW-4	17.63	7.56	-269	1620	1.6	1.56	1.03
CLW-5	17.21	7.71	-244	1690	3.7	1.12	1.09
CLW-6	15.97	7.75	-259	1.6	2.3	3.3	1.02
CLW-7	16.72	7.59	-147	1640	0	0.86	1.05
CLW-8	18.26	7.65	-145	1.53	1.1	1.89	0.975
CLW-9							
CL-U-3							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	0	169	1040	1.02	7.53	343	2310	0	0.0215	0.0745	0	0	0	0	0	0.368	0	0.00296	0.00375	0	0.07	1.3	1.37
BA-U-2	0	46.3	479	0.993	8.04	53.7	1140	0	0.0249	0.156	0	0	0	0	0	0.241	0	0.00294	0	0	0.24	1.5	1.74
BAC-1	4.86	229	2620	0.854	7.4	2150	8400	0	0.0148	0.702	0	0	0.114	0.00461	0	0.52	0	0.0467	0.0174	0	0.39	1.6	1.99
BAC-2	10.1	221	1690	1.33	7.62	2970	7940	0	0.0469	0.0202	0	0	0.00547	0	0	0.431	0	0.154	0.0149	0	0.11	0.14	0.25
BAC-3	8.76	353	3370	2.51	7.43	5340	12700	0	0.054	0.0306	0	0	0.0114	0	0	0.897	0	0.0525	0.0287	0	0.23	1.3	1.53
BAC-4	0	62.4	482	1.26	7.76	231	1280	0	0.0359	0.0703	0	0	0	0	0	0.262	0	0.0139	0	0	0.1	2.5	2.6
BAC-5	0	67.5	593	1.17	7.74	269	1450	0	0.0325	0.0877	0	0	0	0	0	0.294	0	0.00838	0	0	0.26	2.7	2.96
BAC-6	0.978	77.2	516	1.01	7.97	301	1510	0	0.0156	0.0833	0	0	0	0	0	0.265	0	0.0213	0	0	0.27	3.8	4.07
BAC-7	3.41	144	633	1.15	7.65	1220	2990	0	0.0191	0.0223	0	0	0	0	0	0.285	0	0.074	0.00446	0	0.15	0.84	0.99

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	16.04	7.21	-166	4300	1.7	0.78	2.75
BA-U-2	16.58	8.07	-272	2030	0	1.63	1.3
BAC-1	15.36	6.93	-28	7170	1	0.54	4.52
BAC-2	16.95	6.92	-20	11500	2	0.9	7.11
BAC-3	16.87	7.07	-102	18.7	43.3	0.94	11.6
BAC-4	16.67	7.68	-148	2470	1.1	0.62	1.58
BAC-5	16.66	7.71	-140	2740	0.8	1.12	1.75
BAC-6	17.02	7.83	-47	2610	0.9	2.54	1.67
BAC-7	15.97	7.45	-121	4500	3.3	2.56	2.88

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	0	110	820	0.618	7.55	263	1810	0.002	0.00969	0.0783	0	0	0	0	0	0.257	0	0.00251	0	0	0.44	0.56	1
WW-U-1	1.2	311	2130	0.539	7.23	1280	5260	0	0.0055	0.0545	0	0	0.003309	0	0	0.459	0	0.00792	0.00697	0	0.34	1.2	1.54
WW-U-2	1.66	314	2280	0.721	7.31	1220	5510	0	0.0104	0.0659	0	0	0.00415	0	0	0.485	0	0.00647	0.0122	0	0.24	1.3	1.54
WWC-1	9.55	492	4430	0.507	7.37	2990	11500	0	0.0177	0.0272	0	0	0	0	0	0.755	0.000262	0.0068	0.014	0	0.26	1.2	1.46
WWC-2	0	53.6	347	0.452	7.78	137	936	0	0.0142	0.0361	0	0	0	0	0	0.112	0	0.00341	0	0	0.04	1.2	1.24
WWC-3	0	25.3	207	1.13	8.14	84	704	0	0.0207	0.0242	0	0	0	0	0	0.127	0	0.00477	0	0	0.08	2	2.08
WWC-4	1.11	201	1100	0.57	7.38	744	3280	0	0.0135	0.0529	0	0	0	0	0	0.313	0	0	0.00214	0	0.38	0.4	0.78
WWC-5	1.48	327	1620	0.544	7.16	1240	4590	0	0.0104	0.0438	0	0	0	0	0	0.496	0	0.00395	0.00407	0	0.41	0.65	1.06
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	17.02	7.36	-123	3490	0	1.25	2.24
WW-U-1	16.41	6.96	-135	8820	0.7	1.56	5.56
WW-U-2	16.68	7.09	-34	9.23	0.6	3.75	5.82
WWC-1	16.21	6.78	48	18900	0.8	1.92	11.7
WWC-2	16.38	7.64	-110	1740	1	2.87	1.12
WWC-3	15.49	8.16	-207	1220	1.3	0.45	0.781
WWC-4	16.11	7.17	-77	4980	1.2	0.46	3.19
WWC-5	15.42	6.94	-31	7180	1.3	0.53	4.52
WWC-6							
WWC-7							

Round 9 Assessment Monitoring - March 26-30, 2018

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	0	62.6	402	0.971	7.66	94.9	1090	0	0.0283	0.0758	0	0	0.000529	0	0	0.209	0	0.00359	0	0	0.18	0.81	0.99
CL-U-2	0	64.1	352	0.895	7.65	92.7	980	0	0.0236	0.0873	0	0	0	0	0	0.194	0	0.00376	0	0	0.34	0.16	0.5
CLW-1	0	37.8	318	1.02	7.67	59.5	720	0	0.0265	0.053	0	0	0.0271	0	0	0.179	0	0.0068	0	0	0.09	0.53	0.62
CLW-2	0	51.4	421	1.13	7.8	79.4	1020	0	0.0258	0.0711	0	0	0	0	0	0.212	0	0.00439	0	0	0.24	0.94	1.18
CLW-3	0	42.8	334	1.23	7.86	82.3	956	0	0.0364	0.089	0	0	0.000505	0	0	0.2	0	0.00464	0	0	0.37	0.94	1.31
CLW-4	0	35.8	301	1.35	7.77	70.4	864	0	0.0352	0.0788	0	0	0.000762	0	0	0.189	0	0.00477	0	0	0.46	0.59	1.05
CLW-5	0	37.4	354	1.71	7.66	79.9	876	0	0.021	0.0671	0	0	0.000712	0	0	0.194	0	0.0054	0	0	0.15	0.96	1.11
CLW-6	0	34.2	292	1.62	7.74	60.4	916	0	0.0104	0.0885	0	0	0.000612	0	0	0.182	0	0.00729	0	0	0.56	0.48	1.04
CLW-7	0	47	316	0.972	7.59	51.3	792	0	0.0215	0.0475	0		0	0	0	0.183	0	0.00341	0	0	0.28	0.22	0.5
CLW-8	0	44.1	303	0.981	7.63	54.2	792	0	0.0231	0.0609	0	0	0	0	0	0.188	0	0.00376	0	0	0.25	0.8	1.05
CLW-9																							
CL-U-3																							

Round 9

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	14.91	7.28	-193	1940	0.6	0.54	1.24
CL-U-2	14.84	7.24	-174	1890	0.2	0.67	1.21
CLW-1	16.76	7.7	-186	1530	0.2	0.7	0.98
CLW-2	15.47	7.6	-204	1880	0.4	0.96	1.22
CLW-3	16.64	7.49	-236	1720	0	1.61	1.1
CLW-4	16.15	7.51	-259	1610	0	2.2	1.03
CLW-5	16.46	7.43	-239	1720	3	1	1.1
CLW-6	15.56	7.47	-250	1600	0.1	3.61	1.03
CLW-7	18.88	7.52	-123	1570	0	1.89	1
CLW-8	18.47	7.58	-129	1520	0	0.45	0.973
CLW-9							
CL-U-3							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	0	33.5	296	1.64	8.05	50.7	872	0	0.0276	0.0837	0	0	0.00126	0	0	0.199	0	0.00914	0.0022	0	0.07	0.31	0.38
BA-U-2	0	46.2	399	0.943	8.2	46.9	1080	0	0.0227	0.125	0	0	0	0	0	0.209	0	0.00311	0.000691	0	0.12	0.34	0.46
BAC-1	3.88	192	1890	0.507	7.63	1470	6120	0.00138	0.0127	0.0501	0	0	0.00451	0	0	0.581	0	0.028	0.00924	0	0.31	0.48	0.79
BAC-2	9.89	283	1940	1.32	7.72	3070	8590	0	0.0508	0.0238	0	0	0.00777	0	0	0.524	0	0.142	0.0173	0	0.29	0.89	1.18
BAC-3	7.91	417	3480	1.62	7.84	4460	13000	0	0.0441	0.0331	0	0	0.00468	0	0	1.05	0	0.0396	0.0228	0	0.28	1.25	1.53
BAC-4	0	67.4	489	1.14	7.74	221	1300	0	0.0316	0.0605	0	0	0	0	0	0.249	0	0.0143	0	0	0.1	0.81	0.91
BAC-5	0	74.8	524	1.07	7.68	234	1480	0	0.0275	0.0706	0	0	0	0	0	0.284	0	0.00915	0	0	0.24	0.5	0.74
BAC-6	4.58	145	595	1.15	7.48	1100	2600	0	0.0214	0.0227	0	0	0	0	0	0.28	0	0.0898	0.00249	0	0.08	0.72	0.8
BAC-7	4.51	137	1980	0.388	7.57	1100	2730	0	0.0235	0.0195	0	0	0	0	0	0.288	0	0.0752	0.0048	0	0.14	0.71	0.85

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	15.13	7.78	-33	1600	0.6	3.82	1.02
BA-U-2	16.14	8.65	-281	1750	0.2	0.25	1.12
BAC-1	16.99	7.23	-189	9190	8.1	0.52	5.79
BAC-2	15.94	6.82	-77	12000	1.2	0.51	7.44
BAC-3	15.37	7.03	-82	18900	5	3.65	11.7
BAC-4	15.79	7.47	-150	2500	0.5	0.7	1.6
BAC-5	18.41	7.47	-149	2570	0.5	3.97	1.63
BAC-6	19.15	7.32	-92	3810	0.5	0.55	2440
BAC-7	19.26	7.4	-101	4190	3	3.14	2.68

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	0	129	739	0.506	7.5	201	1840	0	0.00929	0.0741	0	0	0.00137	0	0	0.241	0	0.00227	0	0	0.04	0.73	0.77
WW-U-1	1.34	339	1900	0.406	7.05	1050	5280	0	0.005	0.0486	0	0	0.00193	0	0	0.436	0	0.00702	0.00653	0	0.45	0.91	1.36
WW-U-2	1.47	370	2010	0.532	7.16	925	5260	0	0.00642	0.0499	0	0	0.00144	0	0	0.475	0	0.00467	0.0115	0	0.34	0.94	1.28
WWC-1	11.9	638	4100	0.236	6.89	2640	12700	0	0.02	0.0209	0	0	0	0	0	0.805	0.000205	0.00596	0.015	0	0.25	1.21	1.46
WWC-2	0	57.2	308	0.41	7.62	111	784	0	0.014	0.031	0	0	0	0	0	0.104	0	0.00356	0	0	0.1	0.55	0.65
WWC-3	0	28.9	200	0.985	7.96	67.8	628	0	0.0214	0.0245	0	0	0	0	0	0.131	0	0.00464	0	0	0.07	0.27	0.34
WWC-4	1.19	200	1010	0.365	7.3	593	2790	0	0.0128	0.0463	0	0	0	0	0	0.355	0	0	0	0	0.22	0.58	0.8
WWC-5	2.86	321	1600	0.384	6.92	1450	5030	0	0.0096	0.0302	0	0	0	0	0	0.511	0	0.00301	0.00415	0	0.2	1.64	1.84
WWC-6																							
WWC-7																							

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	16.11	7.56	-31	3240	0	0.71	2.07
WW-U-1	16.35	7.11	-75	8010	0.7	0.4	5.03
WW-U-2	16.11	7.27	-10	8450	0.2	0.47	5.32
WWC-1	16.03	6.65	-17	19900	0	2.51	12.4
WWC-2	15.75	7.52	-124	1650	0.4	0.55	1.05
WWC-3	14.89	7.81	-190	1250	1.1	0.79	0.8
WWC-4	16.17	7.26	-64	4600	2.3	0.37	2.92
WWC-5	17.27	7.02	-36	7300	0	0.34	4.6
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 10 Assessment Monitoring - June 4-13, 2018

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	54.7	372	0.853	7.7	98	984	0	0.0272	0.0799	0	0	0	0	0	0.208	0	0.00361	0	0	0.18	0.67	0.85
CL-U-2	0	56.4	365	0.862	7.64	108	952	0	0.0242	0.09	0	0	0	0	0	0.195	0	0.0038	0	0	-0.02	0.67	0
CLW-1	0	35.2	298	1.02	7.93	57.8	748	0	0.0285	0.0568	0	0	0.00102	0	0	0.184	0	0.00388	0.000928	0	0.29	1.01	1.3
CLW-2	0	44.6	399	1.14	7.79	86.8	980	0	0.0247	0.072	0	0	0	0	0	0.222	0	0.00433	0	0	0.25	0.96	1.21
CLW-3	0	37.5	323	1.16	7.91	94.2	876	0	0.0382	0.0948	0	0	0	0	0	0.214	0	0.00483	0	0	0.18	0.55	0
CLW-4	0	31.8	289	1.35	7.91	76.4	836	0	0.0358	0.0801	0	0	0	0	0	0.204	0	0.00459	0	0	0.13	0.85	0.85
CLW-5	0	33.1	318	1.59	7.79	75.3	804	0	0.0215	0.0689	0	0	0	0	0	0.21	0	0.00519	0	0	0.11	0.76	0
CLW-6	0	29.9	292	1.45	7.88	66.3	796	0	0.0109	0.0902	0	0	0	0	0	0.199	0	0.00711	0	0	0.27	0.85	1.12
CLW-7	0	40.6	321	0.945	7.68	58.6	900	0	0.0234	0.0514	0	0	0	0	0	0.186	0	0.00329	0	0	0.16	0.97	0.97
CLW-8	0	38.8	314	0.933	7.73	63.5	768	0	0.0244	0.0632	0	0	0	0	0	0.188	0	0.00359	0	0	0.18	1.26	1.26
CLW-9																							
CL-U-3																							

Round 10

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.54	7.56	-196	1888	1.7	0.39	1.2
CL-U-2	17.81	7.55	-171	1830	0.7	2.53	1.17
CLW-1	19.97	7.67	-159	1480	2.1	4.08	9.45
CLW-2	17.54	7.63	-220	1830	4.5	0.63	1.18
CLW-3	17.95	7.73	-260	1680	5.5	1.57	1.07
CLW-4	17.85	7.73	-278	1570	2.8	1.64	1
CLW-5	17.16	7.72	-276	1660	8.2	1.29	1.07
CLW-6	17.86	7.83	-280	1570	8	2.56	1.01
CLW-7	17.32	7.6	-150	1610	15.7	3.84	1.03
CLW-8	17.1	7.61	-194	1550	2	0.73	0.985
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	140	799	0.818	7.54	254	1970	0	0.0199	0.0636	0	0	0.000506	0	0	0.337	0	0.00279	0.00324	0	0.39	1.94	2.33
BA-U-2	0	70.1	578	0.73	7.68	63.5	1330	0	0.0208	0.145	0	0	0	0	0	0.279	0	0.00215	0.00201	0	0.16	1.13	1.13
BAC-1	2.16	113	1190	0.315	7.92	971	3120	0.00158	0.0141	0.0393	0	0	0.00714	0	0	0.314	0	0.0288	0.00694	0	0.24	1.06	1.3
BAC-2	8.44	263	2210	0.684	7.1	3430	7720	0	0.0445	0.021	0	0	0.00483	0	0	0.463	0	0.143	0.0154	0	0.12	1.03	1.03
BAC-3	7.26	347	3870	1.52	7.42	5080	12700	0	0.0588	0.0327	0	0	0.00511	0	0	0.944	0	0.0467	0.0229	0	0.27	1.44	1.71
BAC-4	0	62.8	510	1.01	7.95	221	1290	0	0.0322	0.0672	0	0	0	0	0	0.247	0	0.0165	0	0	0.06	0.92	0
BAC-5	0	73.5	591	0.916	7.82	302	1180	0	0.0292	0.0763	0	0	0	0	0	0.288	0	0.0128	0	0	0.19	1.56	1.75
BAC-6	4.12	134	694	0.582	7.65	1120	2980	0	0.0217	0.0235	0	0	0	0	0	0.25	0	0.0938	0.00229	0	0.14	1.02	1.02
BAC-7	4.36	130	709	1.09	7.74	1280	2760	0	0.0275	0.0204	0	0	0	0	0	0.269	0	0.0757	0.00541	0	0.06	0.87	0

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	19.26	7.41	-163	3640	1	0.46	2.33
BA-U-2	18.16	7.63	-187	2370	2.1	1.31	1.51
BAC-1	17.87	8.86	-418	6480	53.2	2.95	4.04
BAC-2	16.94	6.98	-63	12400	2.3	4.29	7.68
BAC-3	17.19	7.16	-356	18300	15.2	0.87	11.4
BAC-4	17.11	7.64	-149	2500	1.5	0.75	1.6
BAC-5	17.63	7.61	-126	2850	1.2	0.65	1.83
BAC-6	17.58	7.51	-112	4210	0	0.51	2.63
BAC-7	17.32	7.6	-127	4440	0	0.56	2.84

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	123	873	0.499	7.62	209	2040	0	0.00839	0.0653	0	0	0.000602	0	0	0.254	0	0.00182	0	0	0.32	1.34	1.66
WW-U-1	1.19	289	1940	0.265	7.17	1140	5450	0	0.00477	0.0479	0	0	0.00124	0	0	0.443	0	0.00591	0.00663	0	0.23	1.49	1.72
WW-U-2	1.23	337	2130	1.01	7.3	985	5120	0	0.0102	0.0459	0	0	0.00137	0	0	0.508	0	0.00277	0.0112	0	0.05	0.93	0.93
WWC-1	8.22	504	4710	0.114	7.2	2730	11100	0	0.0173	0.0268	0	0	0	0	0	0.831	0.000168	0.00896	0.0139	0	0.25	1.16	1.16
WWC-2	0	50	340	0.358	7.91	119	852	0	0.0143	0.0338	0	0	0	0	0	0.11	0	0.00372	0	0	0.08	0.27	0
WWC-3	0	27.3	230	0.897	8.05	88.4	644	0	0.0226	0.0278	0	0	0	0	0	0.125	0	0.00527	0	0	-0.03	0.15	0
WWC-4	0.998	184	1080	0.435	7.43	620	2640	0	0.0129	0.0495	0	0	0	0	0	0.309	0	0.00215	0.00201	0	0.28	0.35	0
WWC-5	2.64	314	1820	0.219	7.26	1660	5200	0	0.0104	0.0327	0	0	0	0	0	0.472	0	0.00324	0.00395	0	0.1	1.58	1.58
WWC-6																							
WDB-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	18.38	7.39	-108	3510	1.7	0.79	2.25
WW-U-1	21.81	6.92	-77	8180	0.1	0.51	5.14
WW-U-2	18.76	7.09	-16	8130	7.6	1.06	5.12
WWC-1	16.92	6.94	-84	15600	1.5	4.48	9.65
WWC-2	17.4	7.75	-163	1570	1.2	0.4	1
WWC-3	17.01	7.89	-191	1220	2.6	0.42	0.782
WWC-4	18.39	7.27	-106	4320	2.4	1.17	2.77
WWC-5	15.81	6.98	-84	7740	0.8	0.58	4.88
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 11 (all results ppm) Assessment Monitoring - October 8-18, 2018

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	61.9	415	0.981	7.79	122	1060	0	0.029	0.0796	0	0	0	0	0	0.229	0	0.00383	0	0	0.09	0.32	0
CL-U-2	0	67.5	414	0.995	7.73	128	1010	0	0.0255	0.0919	0	0	0	0	0	0.212	0	0.00408	0	0	0.12	0.94	0.94
CLW-1	0	39.6	288	1.06	7.76	61.9	784	0	0.0298	0.0582	0	0	0.0157	0	0	0.194	0	0.00589	0	0	0.11	1.2	1.2
CLW-2	0	49.7	475	1.19	7.72	88.1	904	0	0.0244	0.0716	0	0	0.014	0	0	0.227	0	0.00593	0	0	0.17	0.39	0
CLW-3	0	42	325	1.27	7.79	95	888	0	0.0384	0.0941	0	0	0	0	0	0.217	0	0.0052	0	0	0.33	0.68	0
CLW-4	0	35.2	297	1.45	7.85	80.7	792	0	0.0375	0.0786	0	0	0	0	0	0.211	0	0.00525	0	0	1.89	0.65	1.89
CLW-5	0	36.9	320	1.7	7.72	85.3	852	0	0.0229	0.0714	0	0	0.00999	0	0	0.213	0	0.00679	0	0	1.87	0.17	1.87
CLW-6	0	33.8	292	1.6	7.82	73.3	804	0	0.0152	0.0873	0	0	0.0116	0	0	0.204	0	0.00746	0	0	0.18	0.41	0
CLW-7	0	46.5	399	1.02	7.65	73.2	780	0	0.0232	0.0491	0	0	0	0	0	0.19	0	0.00416	0	0	0.05	0.07	0
CLW-8	0	43	300	1.04	7.71	66.5	796	0	0.0254	0.0643	0	0	0	0	0	0.192	0	0.00503	0	0	0.19	1.2	1.2
CLW-9																							
CL-U-3																							

Round 11

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.4	7.85	-132	1800	40.9	0.61	1.15
CL-U-2	18.15	7.83	-97	1770	0	3.95	1.13
CLW-1	17.83	7.93	-114	1490	0	1.48	0.951
CLW-2	16.04	7.84	-184	1850	0.6	2.72	1.18
CLW-3	17.52	7.98	-178	1660	3.6	3.1	1.06
CLW-4	18.53	8.02	-192	1530	7.2	1.63	0.983
CLW-5	21	7.94	-175	1640	0	1.29	1.05
CLW-6	16.49	8.02	-210	1560	0	2.23	1
CLW-7	17.12	7.83	-81	1560	2.4	2.97	1
CLW-8	17.05	7.91	-130	1510	0	1.37	0.963
CLW-9							
CL-U-3							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	73.9	561	0.881	7.97	62.2	1050	0	0.0216	0.149	0	0	0	0	0	0.276	0	0.00237	0	0	0.44	0.74	1.18
BA-U-2	0	143	885	0.977	7.58	298	1750	0	0.0209	0.0728	0	0	0.0125	0	0	0.321	0	0.00574	0	0	0.22	0.62	0
BAC-1	4.87	225	1840	0.582	7.57	1760	6420	0	0.0129	0.0391	0	0	0.0184	0	0	0.629	0	0.0232	0.00818	0	0.45	0.88	0
BAC-2	9.98	255	1660	1.1	7.35	2730	7800	0	0.0565	0.0204	0	0	0.0111	0	0	0.472	0	0.156	0.0157	0	0.08	0.96	0.96
BAC-3	8.33	469	3280	1.63	7.31	4450	12300	0	0.0496	0.0317	0	0	0.00968	0	0	1.06	0	0.038	0.022	0	0.39	1.06	1.45
BAC-4	0.523	68.1	501	1.15	7.96	273	1300	0	0.00882	0.0171	0	0	0	0	0	0.267	0	0.017	0	0	-0.16	0.48	0
BAC-5	0	82.2	557	1.04	7.86	353	1460	0	0.0325	0.0714	0	0	0	0	0	0.323	0	0.0134	0	0	0.26	0.81	0
BAC-6	4.57	138	624	0.847	7.75	1080	2340	0	0.0248	0.0245	0	0	0	0	0	0.276	0	0.0842	0	0	0.17	1.02	0
BAC-7	4.24	143	649	1.51	7.75	1210	2830	0	0.0434	0.0214	0	0	0	0	0	0.303	0	0.075	0.00579	0	0.19	0.71	0

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.4	7.71	-41	3010	0	0.7	1.94
BA-U-2	18.72	8.31	-138	2010	0	0.56	1.28
BAC-1	16.12	7.43	-228	9840	77.8	0.85	6.2
BAC-2	16.79	7.15	-22	11200	2.5	1.3	6.93
BAC-3	16.79	7.31	42	18300	7	5.15	11.3
BAC-4	15.08	7.77	-69	2500	0.2	0.61	1.6
BAC-5	16.95	7.88	-43	2860	0	0.52	1.83
BAC-6	17.13	7.74	-35	3970	0	0.49	2.54
BAC-7	17	7.76	-71	4420	1.9	0.48	2.84

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	139	805	0.533	7.63	394	1760	0	0.0103	0.0575	0	0	0	0	0	0.265	0	0.00241	0	0	0.07	0.85	0.85
WW-U-1	1.36	357	2150	0.41	7.28	1360	5090	0	0	0.0449	0	0	0.0258	0	0	0.456	0	0.0101	0.00682	0	0.43	1.2	1.63
WW-U-2	1.23	380	2160	0.604	7.31	1090	4570	0	0.0109	0.0446	0	0	0	0	0	0.519	0	0.00338	0.0105	0	0.14	0.83	0.83
WWC-1	12	607	4430	0.331	7.25	3210	13000	0	0.0243	0.0223	0	0	0	0	0	0.964	0.000312	0.00835	0.0145	0	0.15	1.2	0
WWC-2	0	59.5	344	0.448	7.85	139	832	0	0.0152	0.0344	0	0	0	0	0	0.124	0	0.00304	0	0	0.17	0.03	0
WWC-3	0	29.7	209	1.06	7.92	84.2	436	0	0.0247	0.0289	0	0	0	0	0	0.139	0	0.00482	0	0	0	0.76	0
WWC-4	1.34	219	1030	0.481	7.46	692	2880	0	0.0145	0.0507	0	0	0	0	0	0.36	0	0	0	0	0.03	0.8	0
WWC-5	3.07	364	1720	0.431	7.38	1620	5000	0	0.0131	0.034	0	0	0	0	0	0.523	0	0.0031	0.00478	0	0.2	-0.56	0
WWC-6																							
WDB-7																							

Results below reporting limit are recorded as 0.

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.1	7.65	-6	3290	0	0.58	2.11
WW-U-1	16.29	7.25	-7	8350	0.6	0.87	5.27
WW-U-2	16.41	7.44	55	7730	0	1.5	4.87
WWC-1	16.6	7.11	40	19600	0	4.49	12.1
WWC-2	17.73	7.91	-84	1600	2.1	0.62	1.03
WWC-3	16.97	8.12	-179	1190	0.2	0.56	0.759
WWC-4	16.27	7.4	-32	4780	0.7	0.54	3.06
WWC-5	15.76	7.16	-11	7580	1	3.51	4.77
WWC-6	15.05	7.63	-148	3550	1.8	0.7	2.27
WWC-7	15.18	8.07	-195	1510	8.4	0.65	0.967

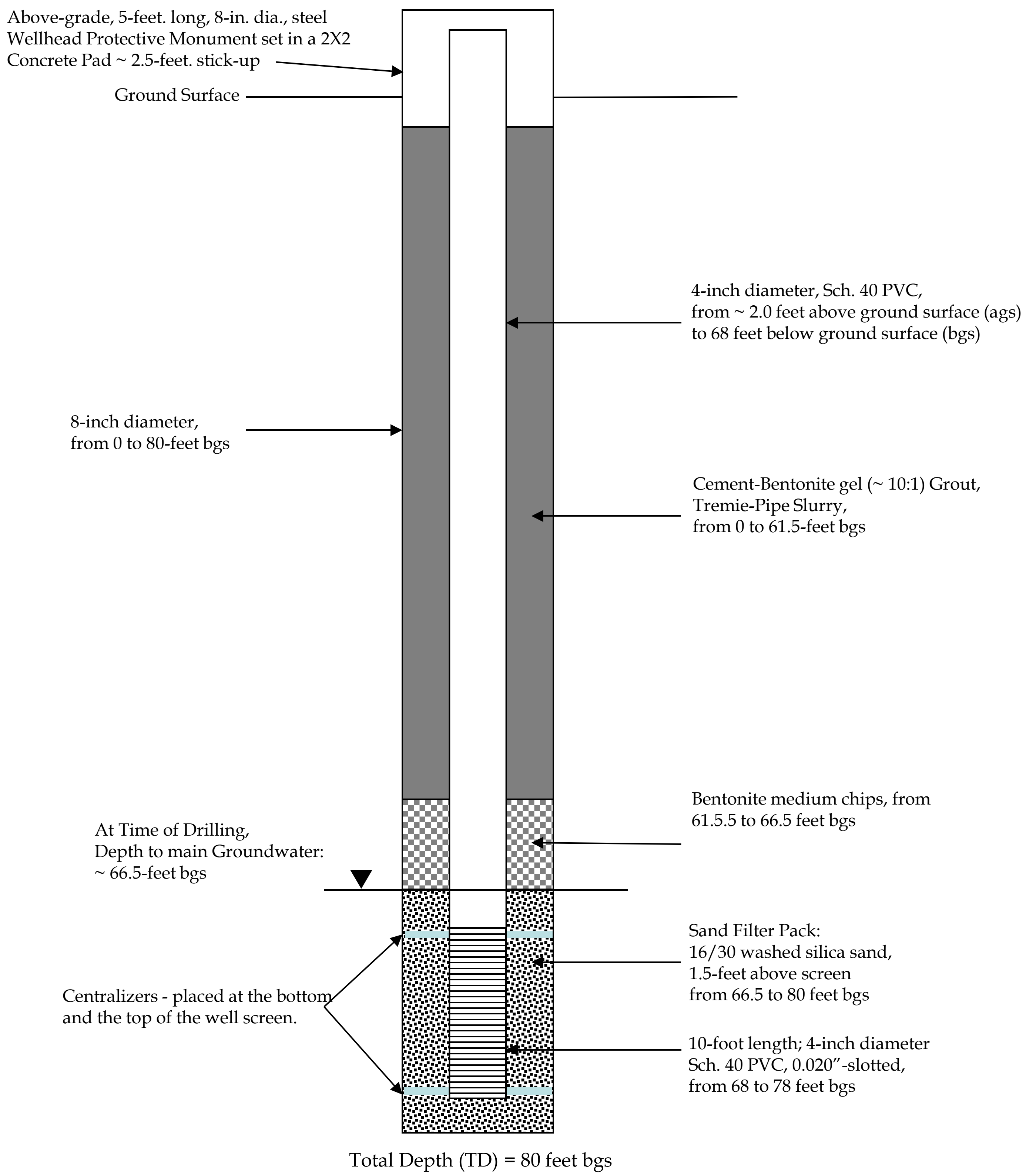
Engineering Assessment

Assessment Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
RW-4	0.659	65.4	150	0.556	7.84	109	508	0	0.0298	0.0857	0	0	0	0	0	0.245	0	0.00311	0	0			
RW-5	0	32.1	569	0.86	7.73	224	1410	0	0.0308	0.0253	0	0	0.00472	0	0	0	0	0.00486	0	0			
RW-7	0	46.9	308	0.576	7.8	128	784	0	0.0217	0.033	0	0	0.00366	0	0	0.146	0	0.00436	0	0			
WDB-19	0	35	339	1.46	7.9	784	892	0	0.0287	0.0501	0	0	0.016	0	0	0.209	0	0.00623	0	0	0.16		
WWC-6	0.509	142	802	0.244	7.57	370	1920	0	0.0142	0.0795	0	0	0.00296	0	0	0.207	0	0.00542	0	0			
WWC-7	0	63.7	298	0.415	7.76	146	728	0	0.0141	0.046	0	0	0.00407	0	0	0.112	0	0.00473	0	0			

Assessment Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
RW-5	15.56	7.92	72	2630	2.5	0.51	1.69
RW-4	15.98	8.2	-64	0.96	0.3	0.96	0.615
RW-7	14.72	7.83	-79	1550	7	0.72	0.99
WDB-19	15.61	7.94	-197	1580	0	0.9	1.01
EMW-9	15.05	7.63	-148	3550	1.8	0.7	2.27
EMW-4u	15.18	8.07	-195	1510	8.4	0.65	0.967

January 28, 2019

Appendix A Copies of Drilling Logs and Well Schematic Diagrams



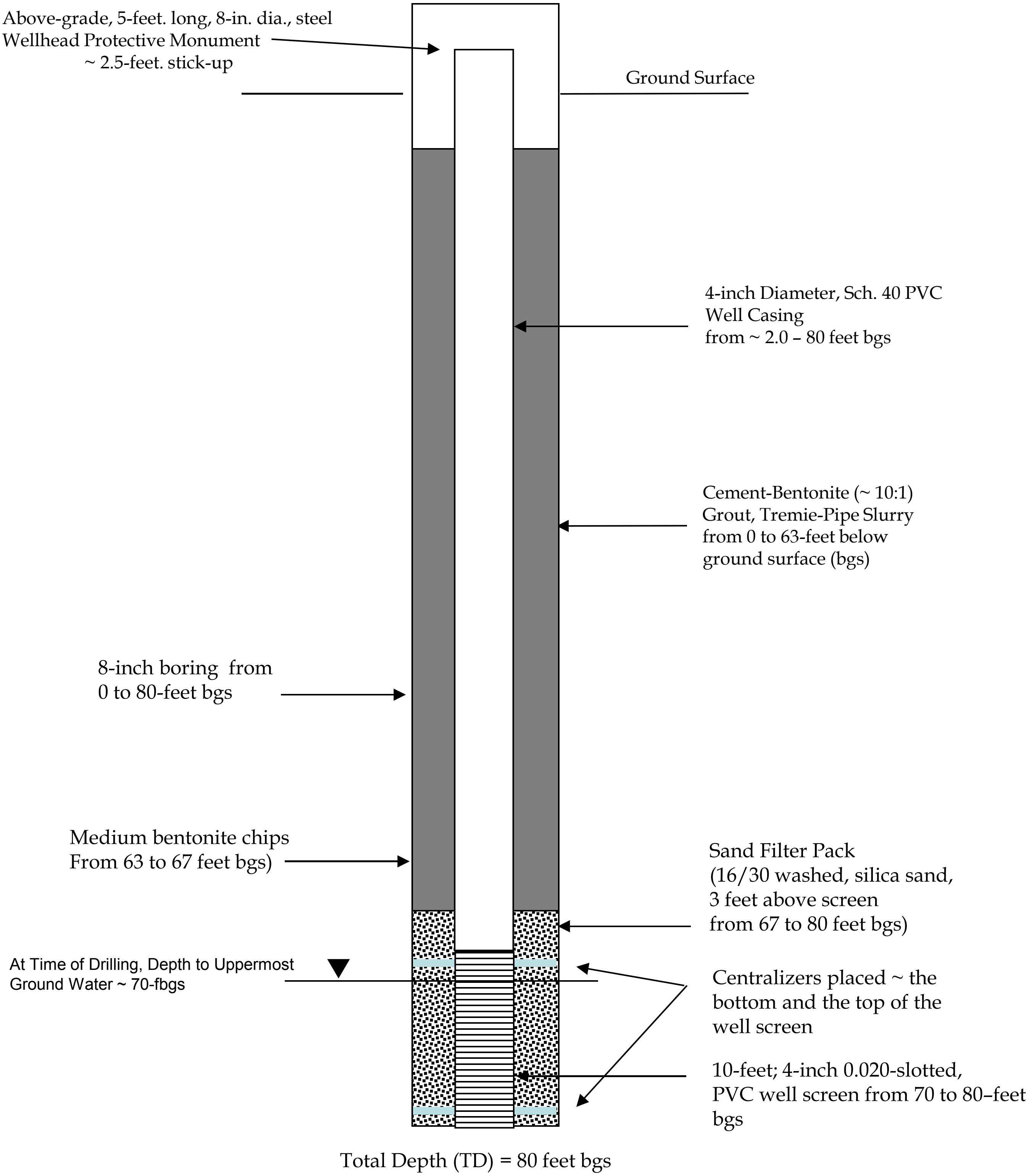
Stantec

IPSC – COMBUSTION BYPRODUCT LANDFILL AREA

DELTA, UTAH

Well CL-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/23/15
			Last Revision Date



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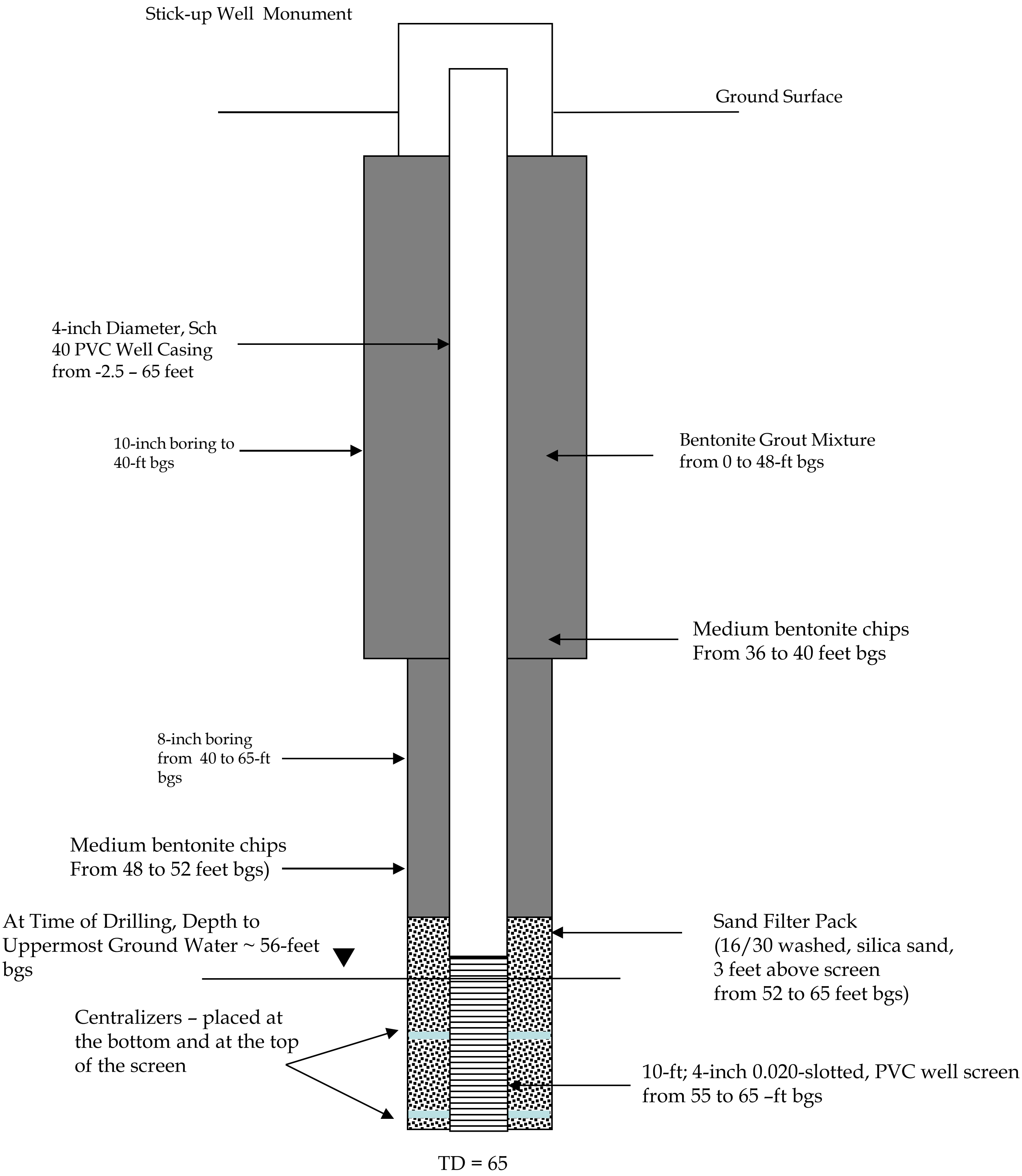
IPSC– CB LANDFILL AREA

DELTA, UTAH

Well CLU-2 Schematic

			Date Drawn 9/1/15
Design by	Drawn by TH	Scale	Last Revision Date



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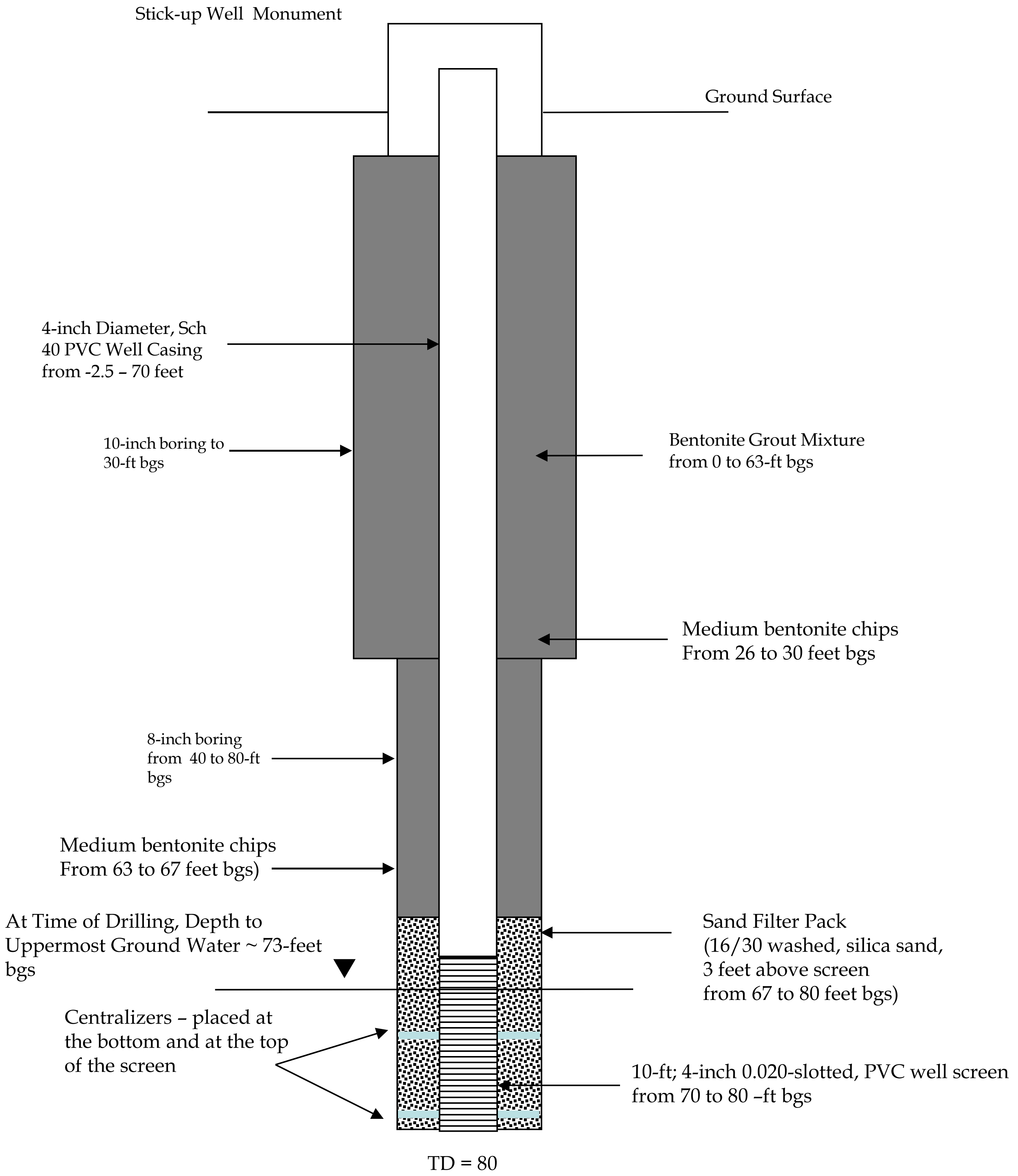
ISPC– LANDFILL AREA

DELTA, UTAH

Figure 1 – CLW-1 Schematic

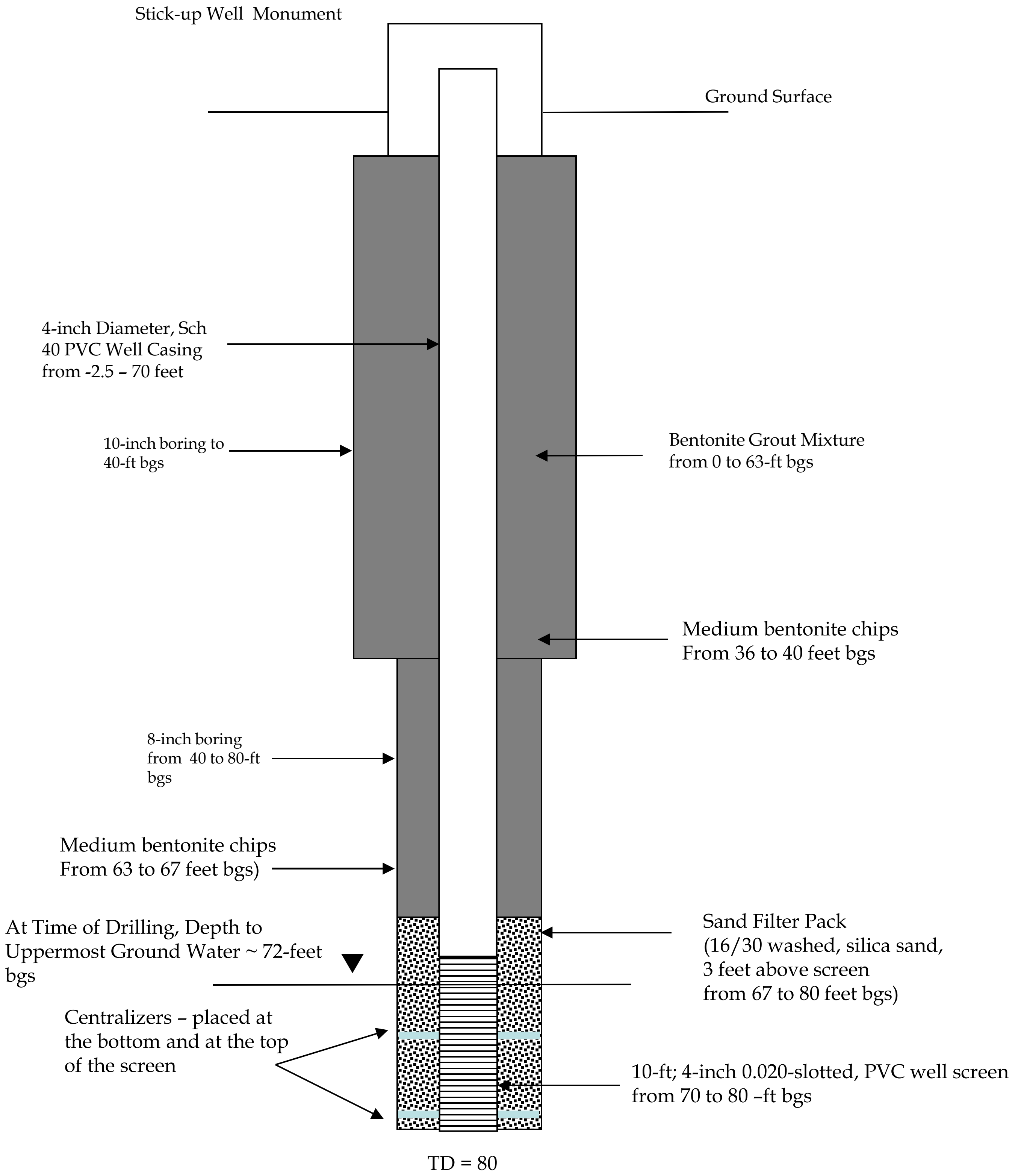
			Date Drawn
Design by	Drawn by	Scale	Last Revision Date



ISPC– LANDFILL AREA
DELTA, UTAH

Figure 1 – CLW-2 Schematic

Design by	Drawn by	Scale	Date Drawn
			Last Revision Date



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ISPC– LANDFILL AREA DELTA, UTAH		
Figure 1 – CLW-3 Schematic		
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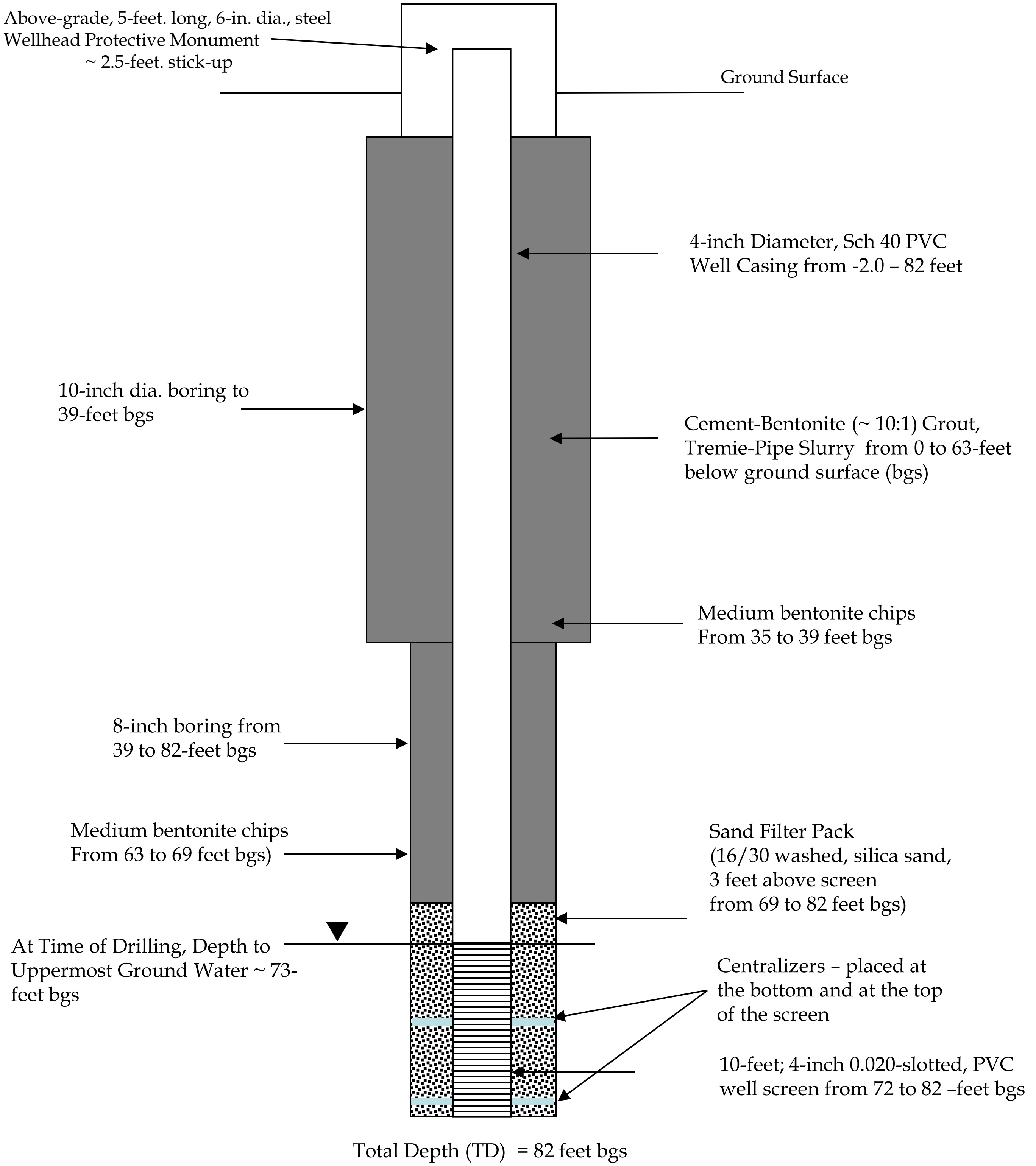
Design by	Drawn by	Scale
		Last Revision Date



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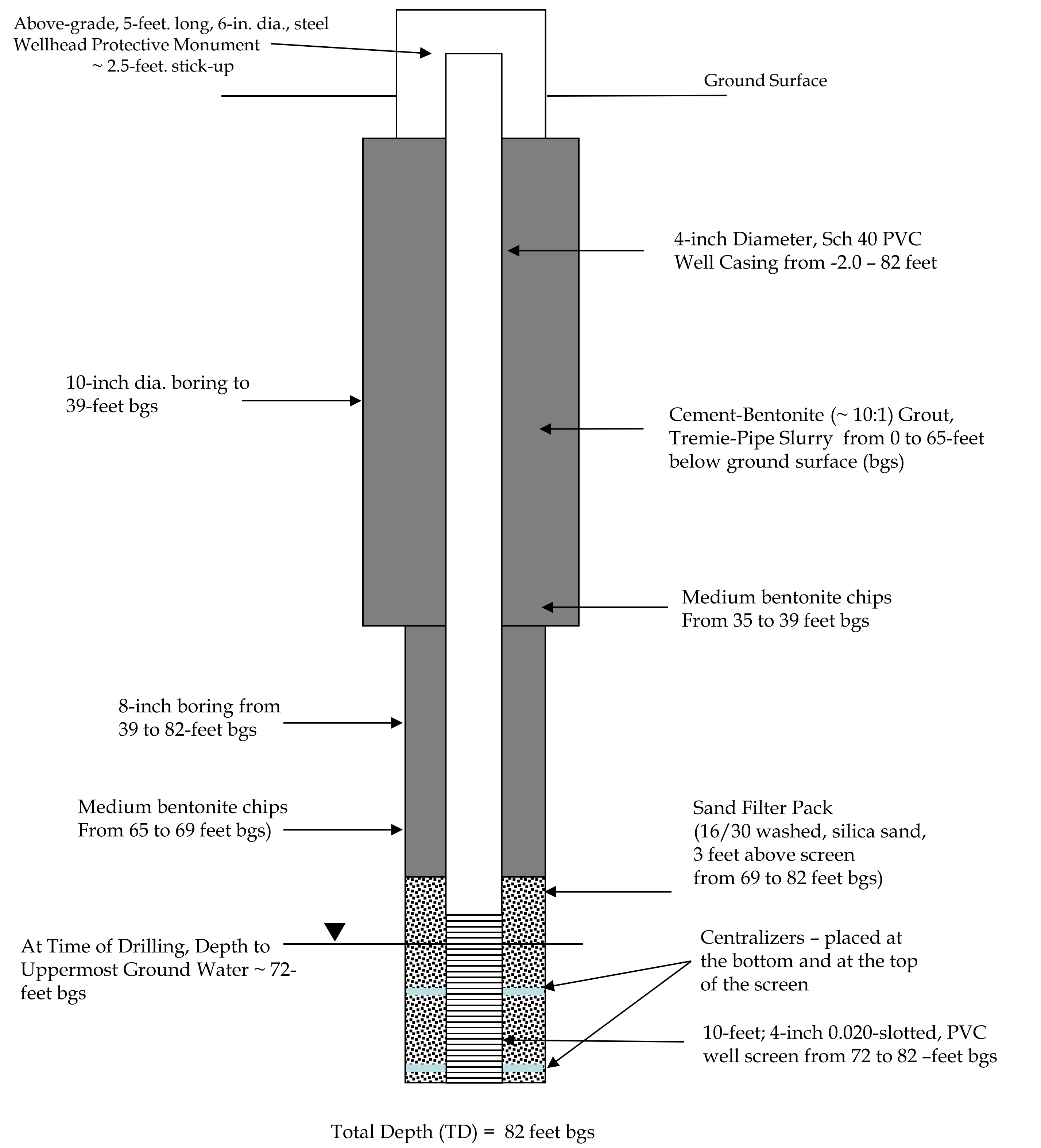
ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-4 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date



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ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-5 Schematic

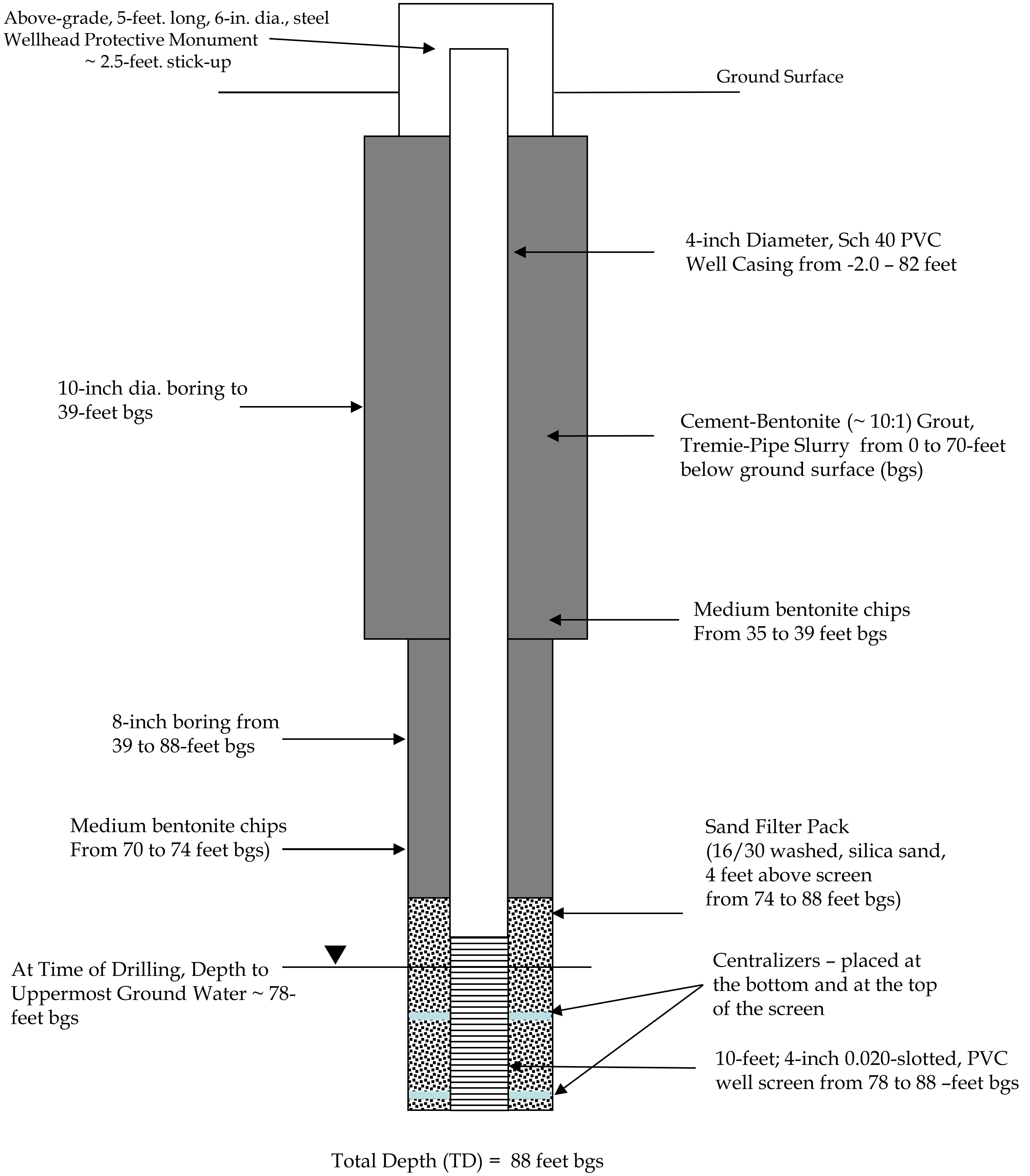
Date Drawn 9/1/15

Last Revision Date

Design by

Drawn by TH

Scale



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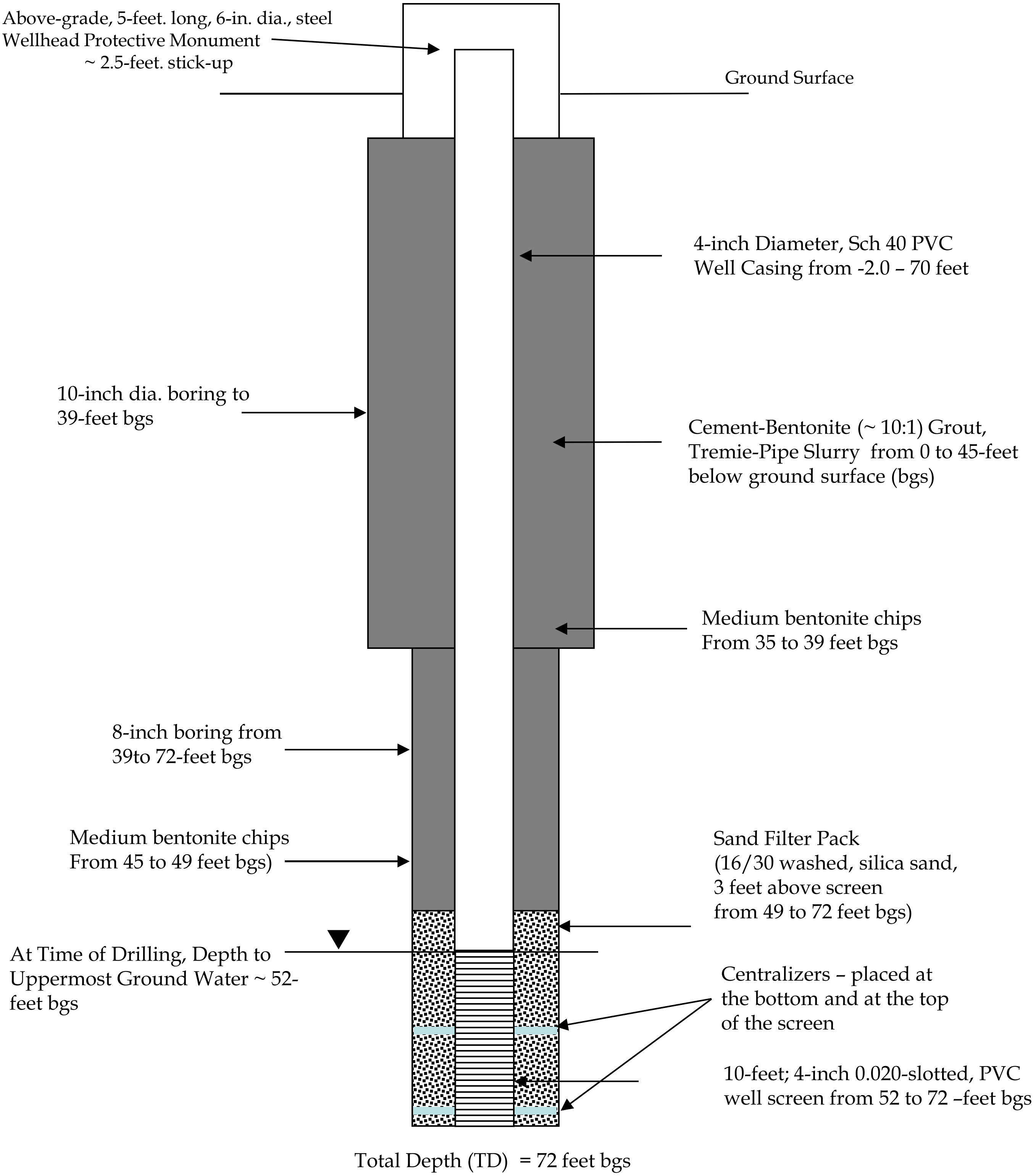
ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-6 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date



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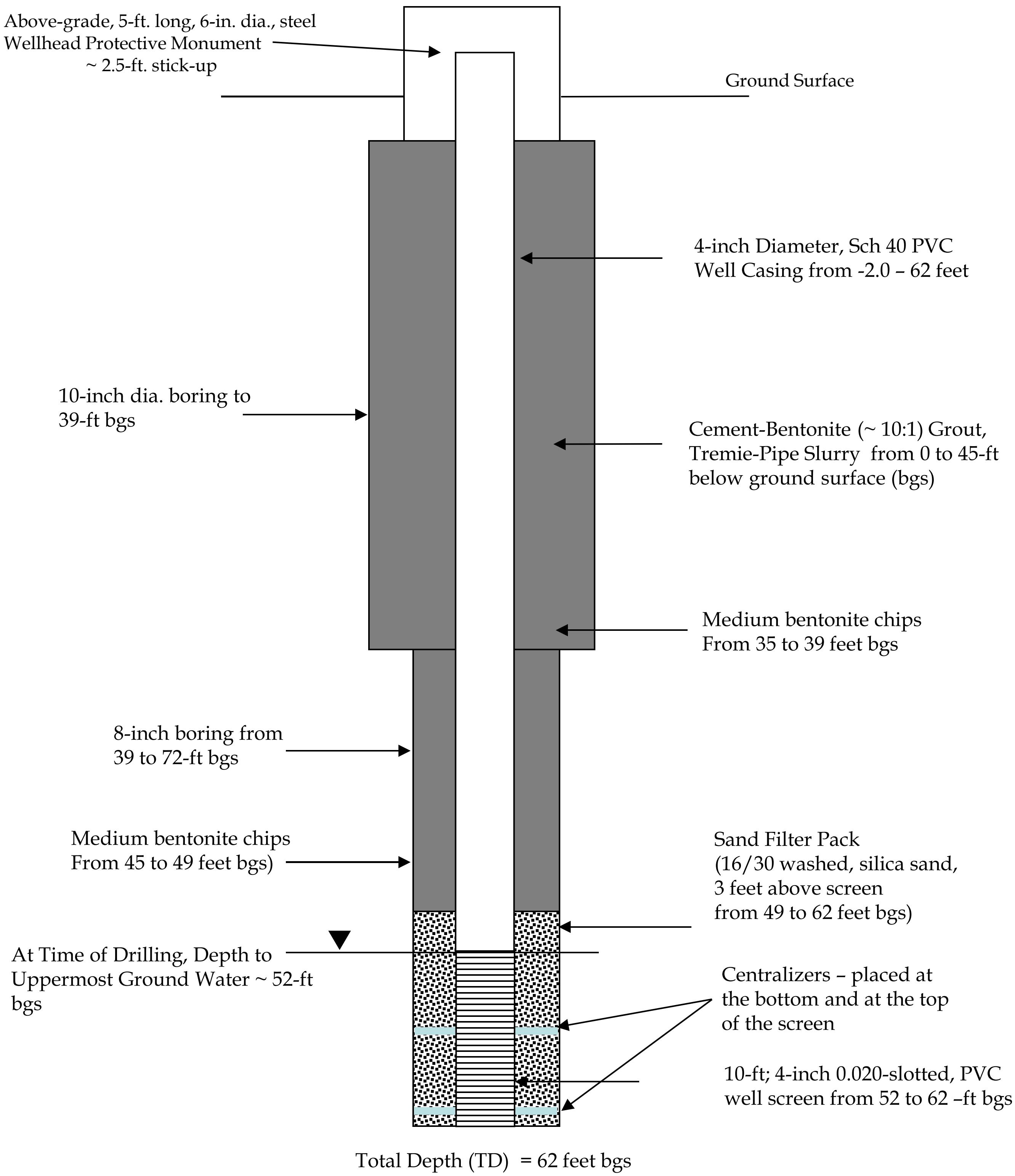
ISPC– CB LANDFILL AREA

DELTA, UTAH

CLW-7 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date



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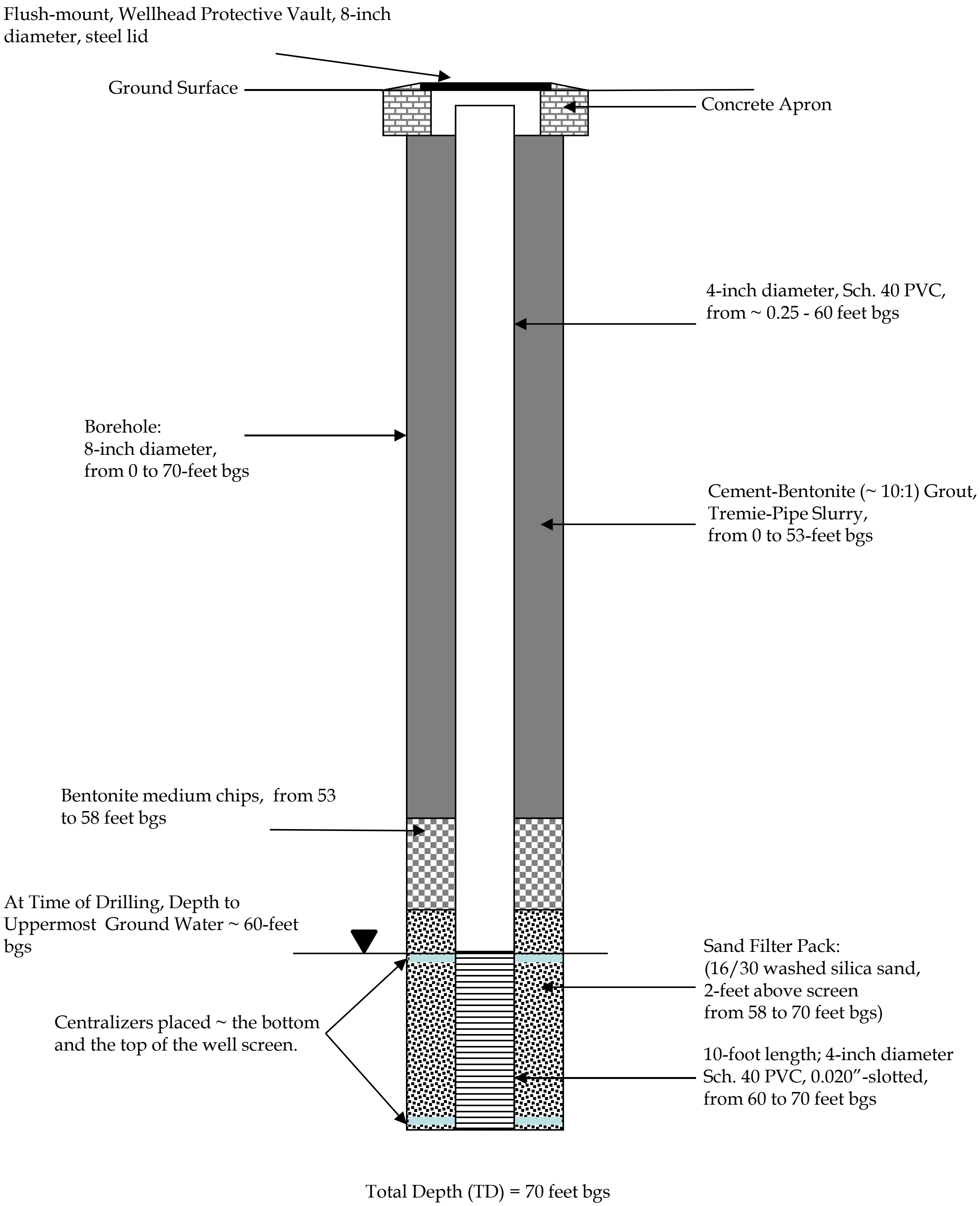
ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-8 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date



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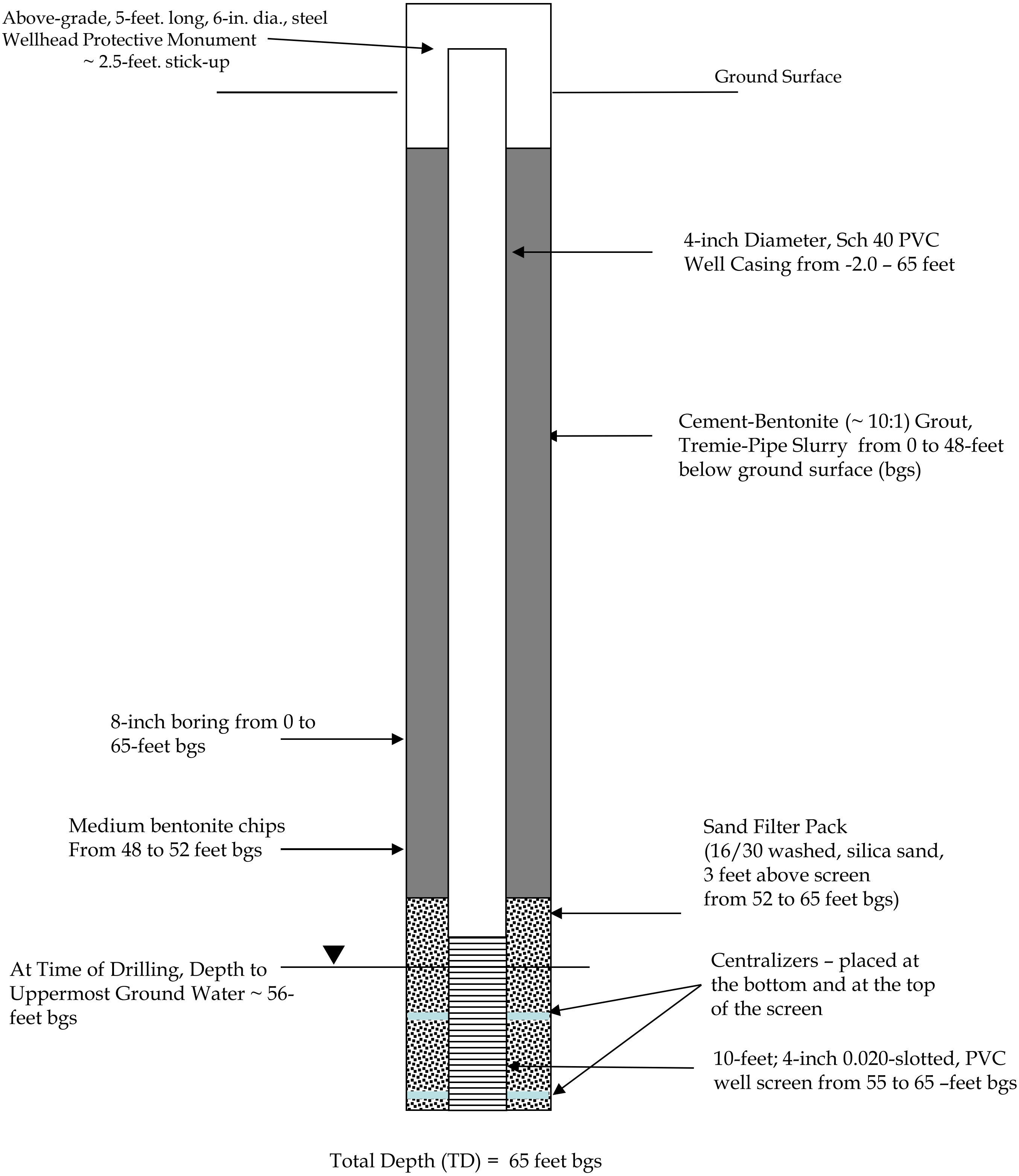
IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA

DELTA, UTAH

Well BAC-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/31/15
			Last Revision Date



Stantec	ISPC– BOTTOM ASH AREA DELTA, UTAH			
	BAC-2 Schematic			
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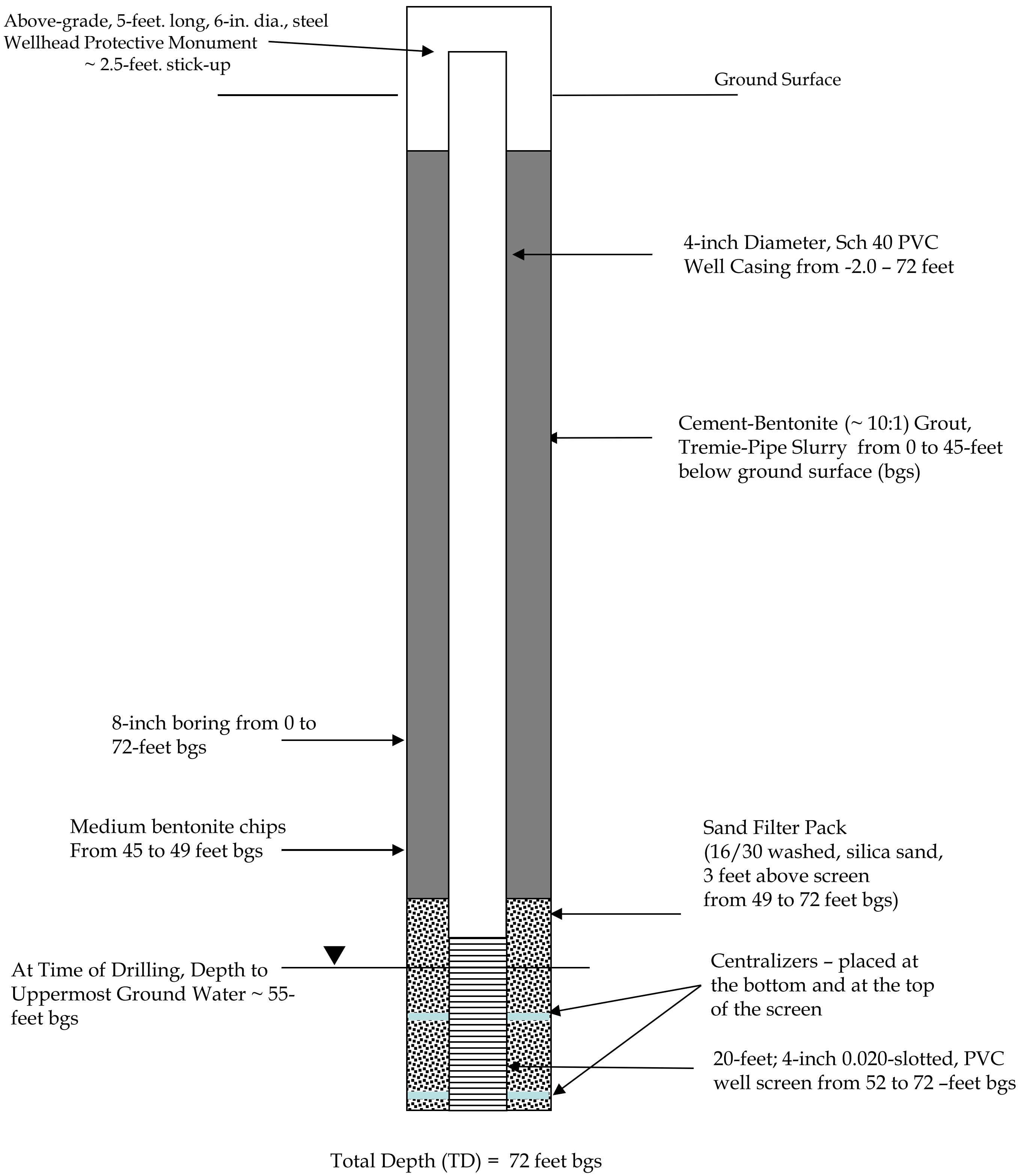
	Design by	Drawn by TH	Scale	Last Revision Date



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ISPC– BOTTOM ASH AREA DELTA, UTAH			
BAC-3 Schematic			
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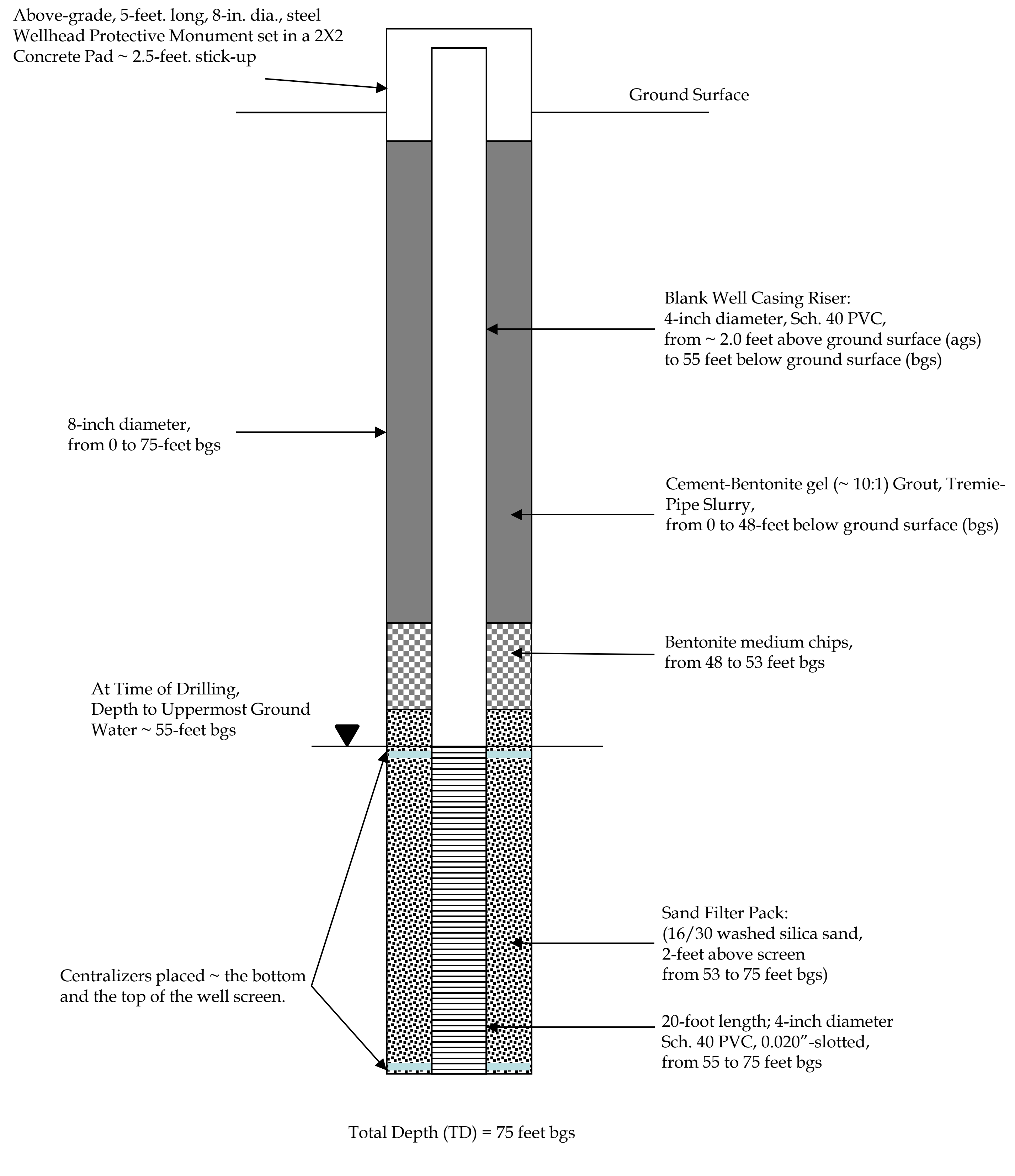
Design by	Drawn by TH	Scale	Last Revision Date



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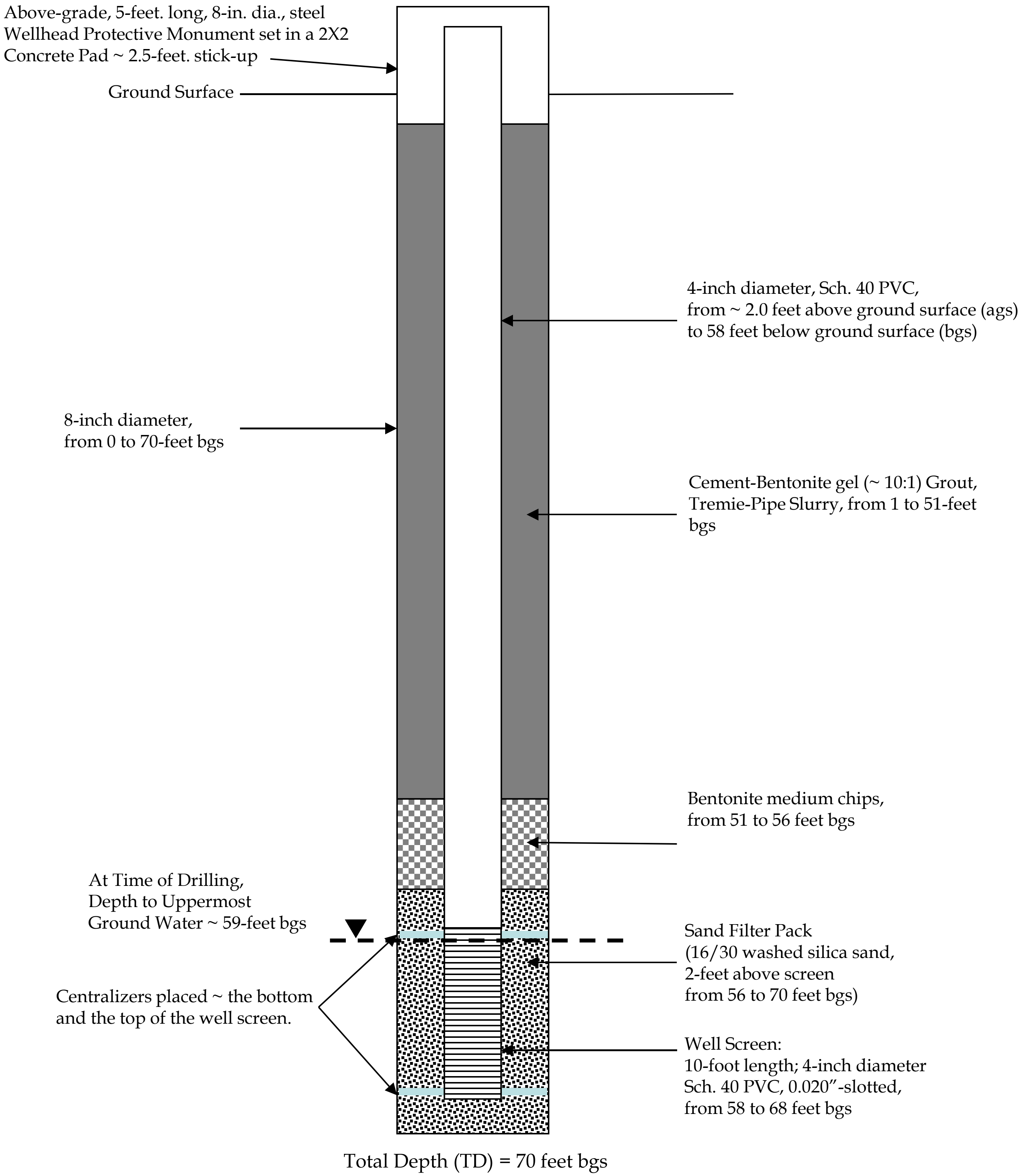
IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BAC-4 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/10/15
			Last Revision Date



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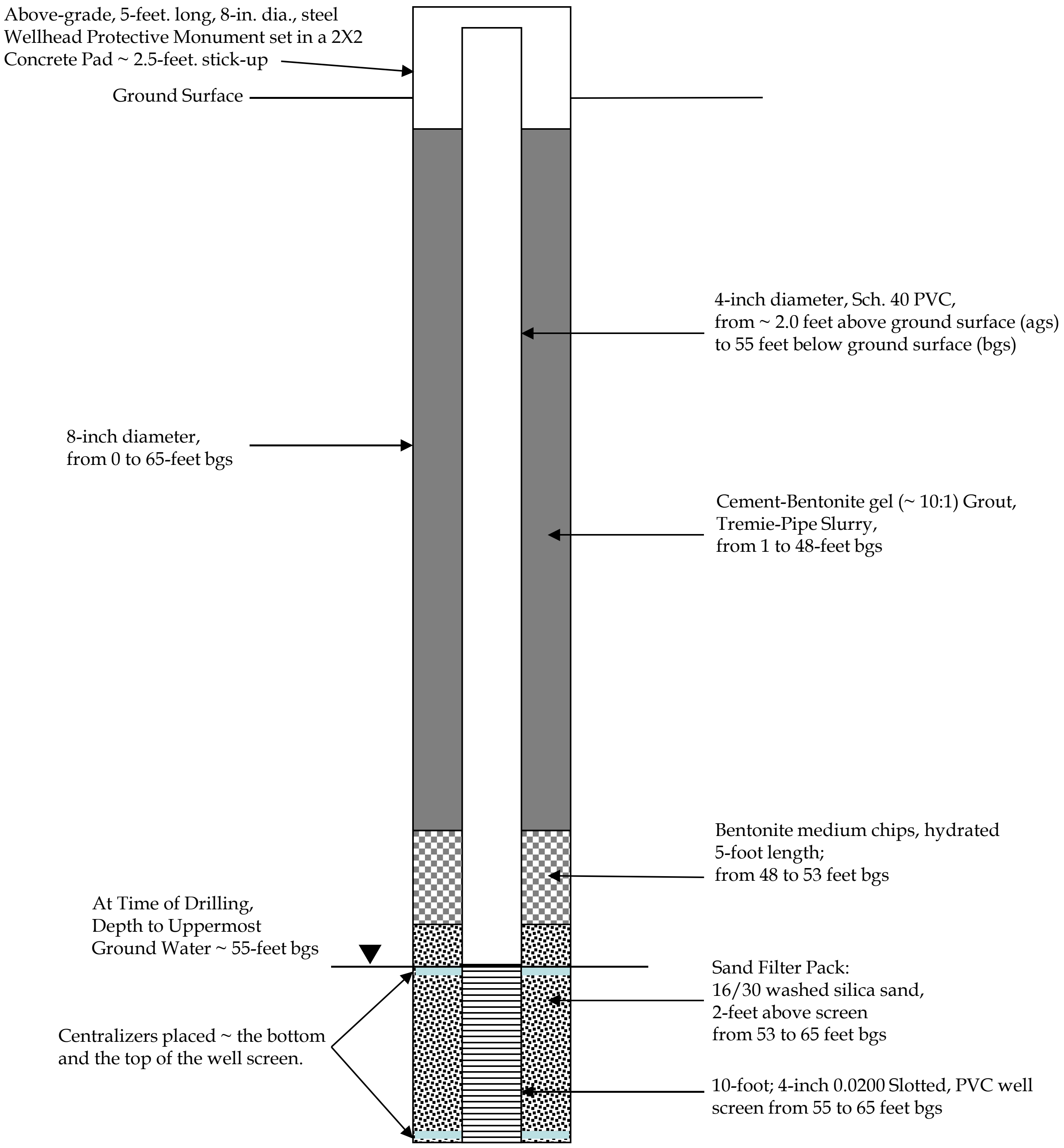
IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BAC-5 Schematic

Design by	Drawn by MS	Scale

Date Drawn 8/09/15

Last Revision Date



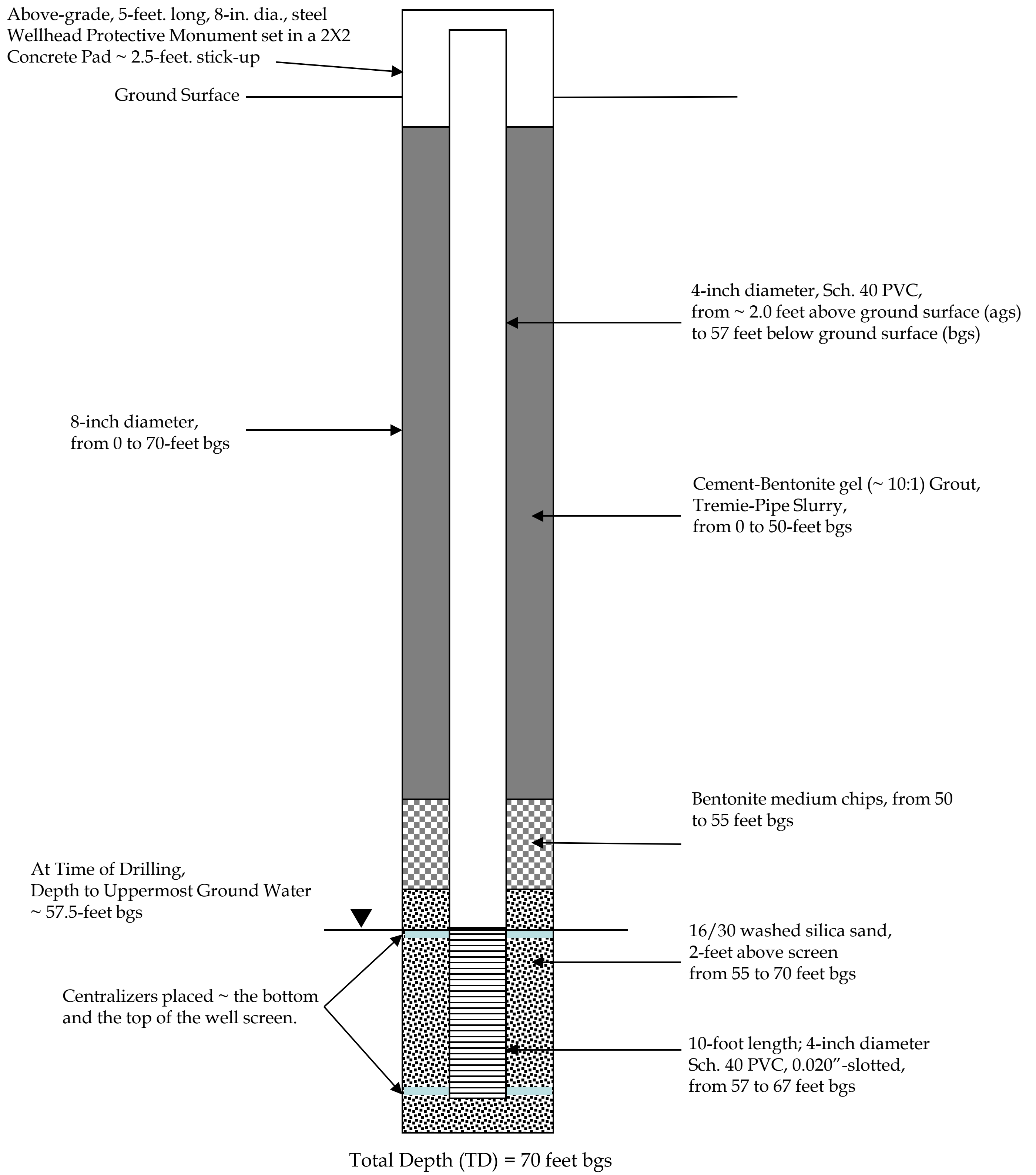
Total Depth (TD) = 65 feet bgs

Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BAC-6 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/08/15	Last Revision Date



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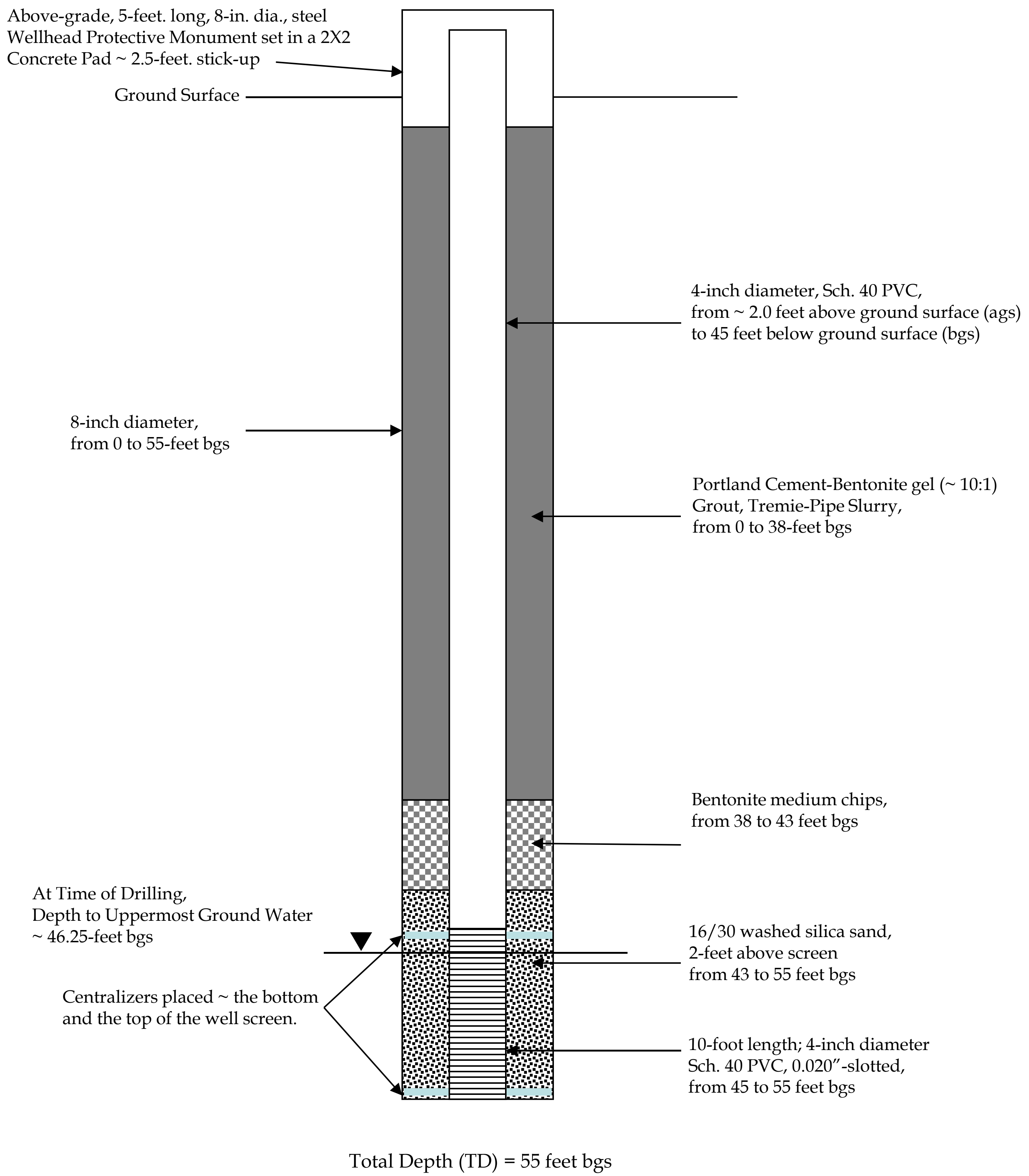
IPSC – BOTTOM ASH BASIN AREA

DELTA, UTAH

Well BAC-7 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/07/15
			Last Revision Date



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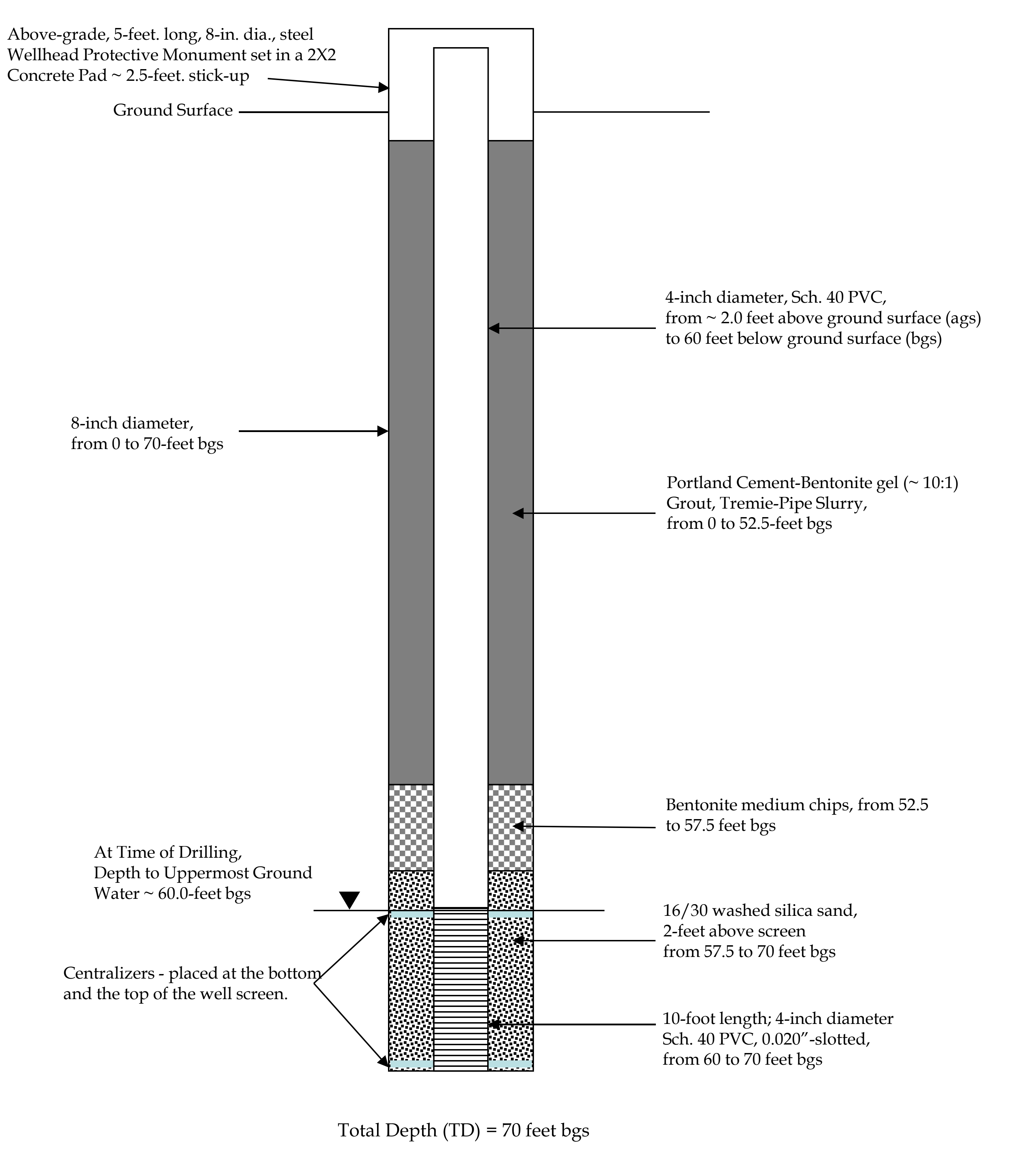
IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BA-U-1 Schematic

Date Drawn	7/24/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	



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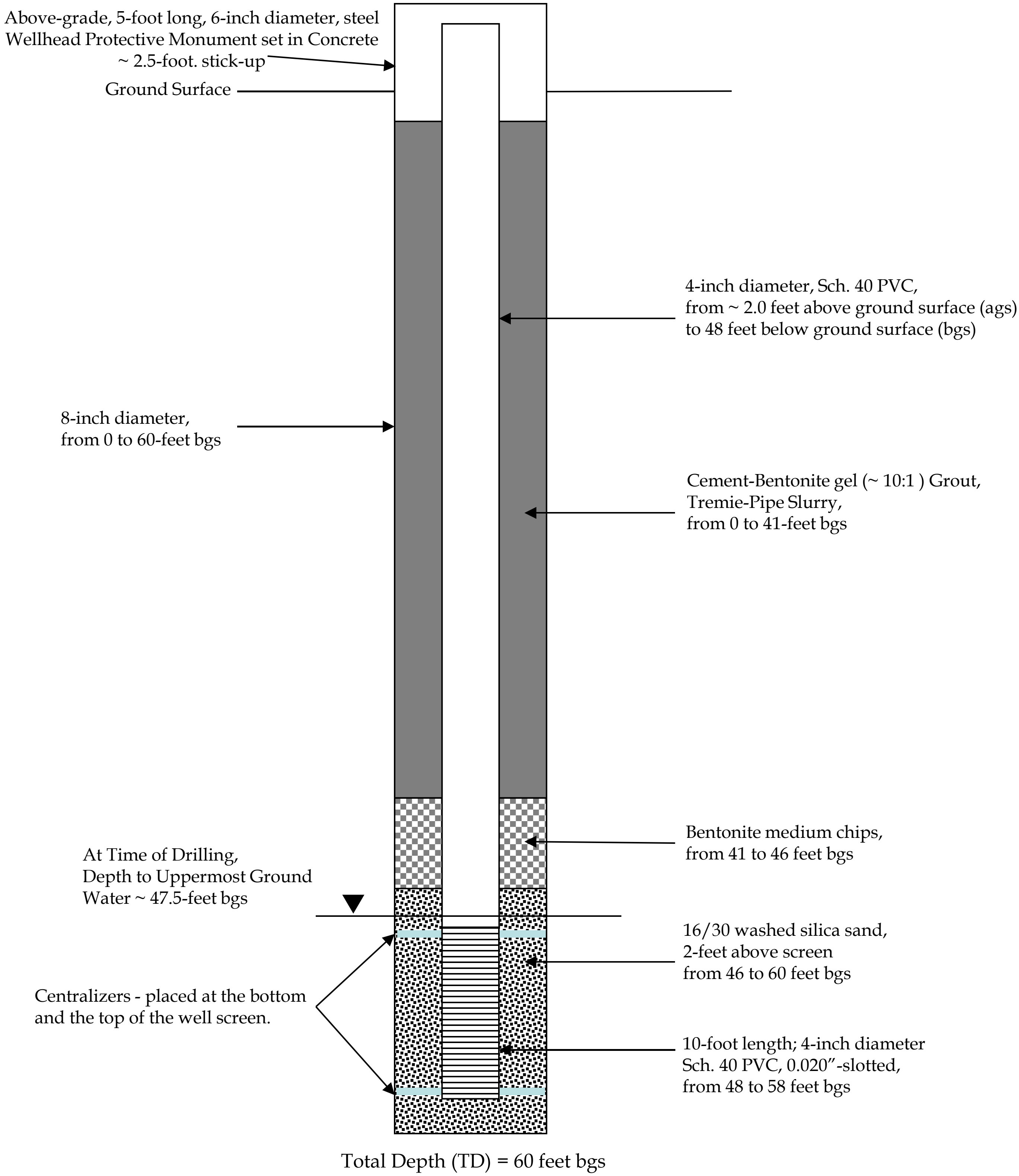
IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BA-U-2 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/25/15
			Last Revision Date



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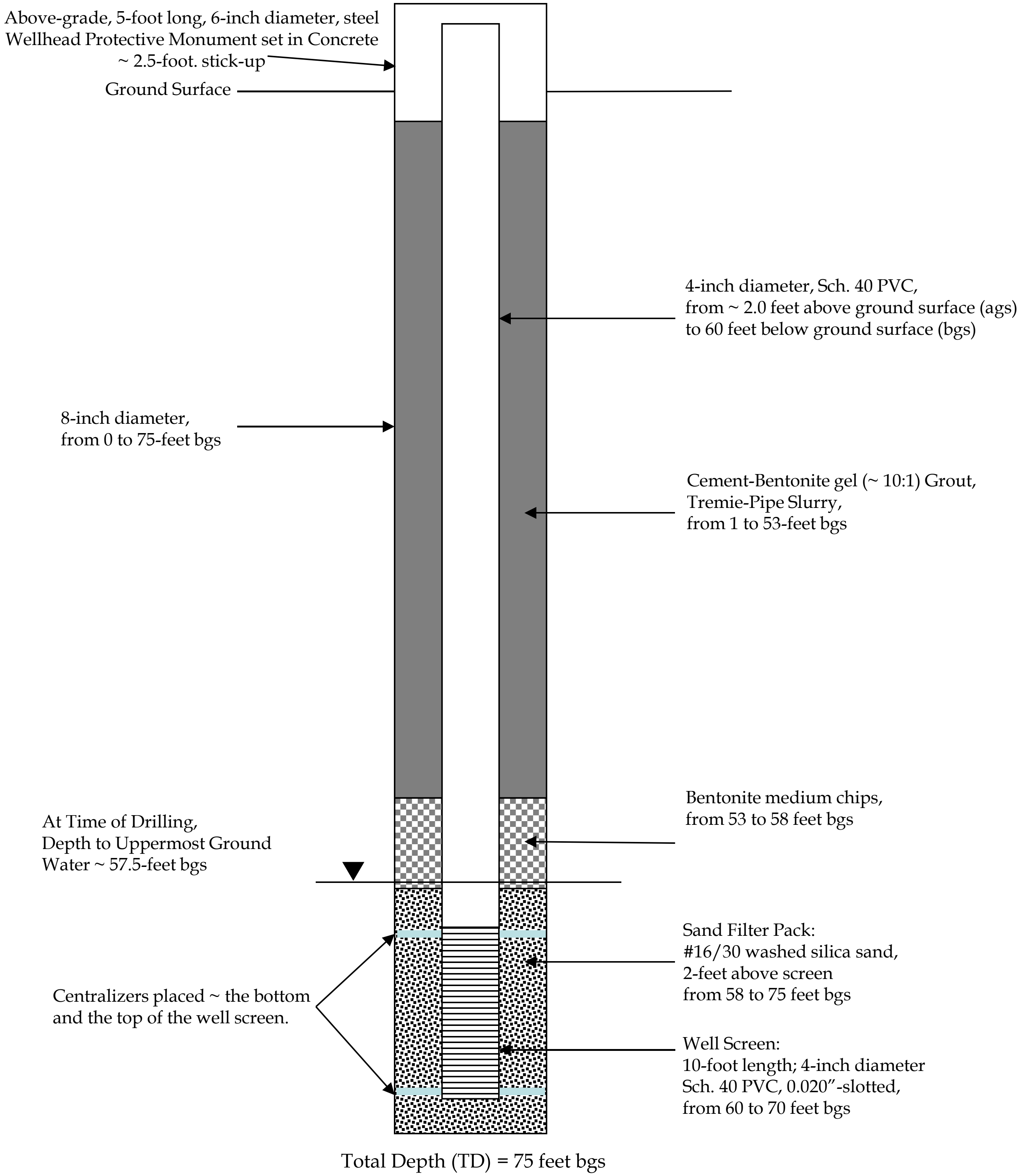
IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-1 Schematic

Date Drawn	7/26/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	



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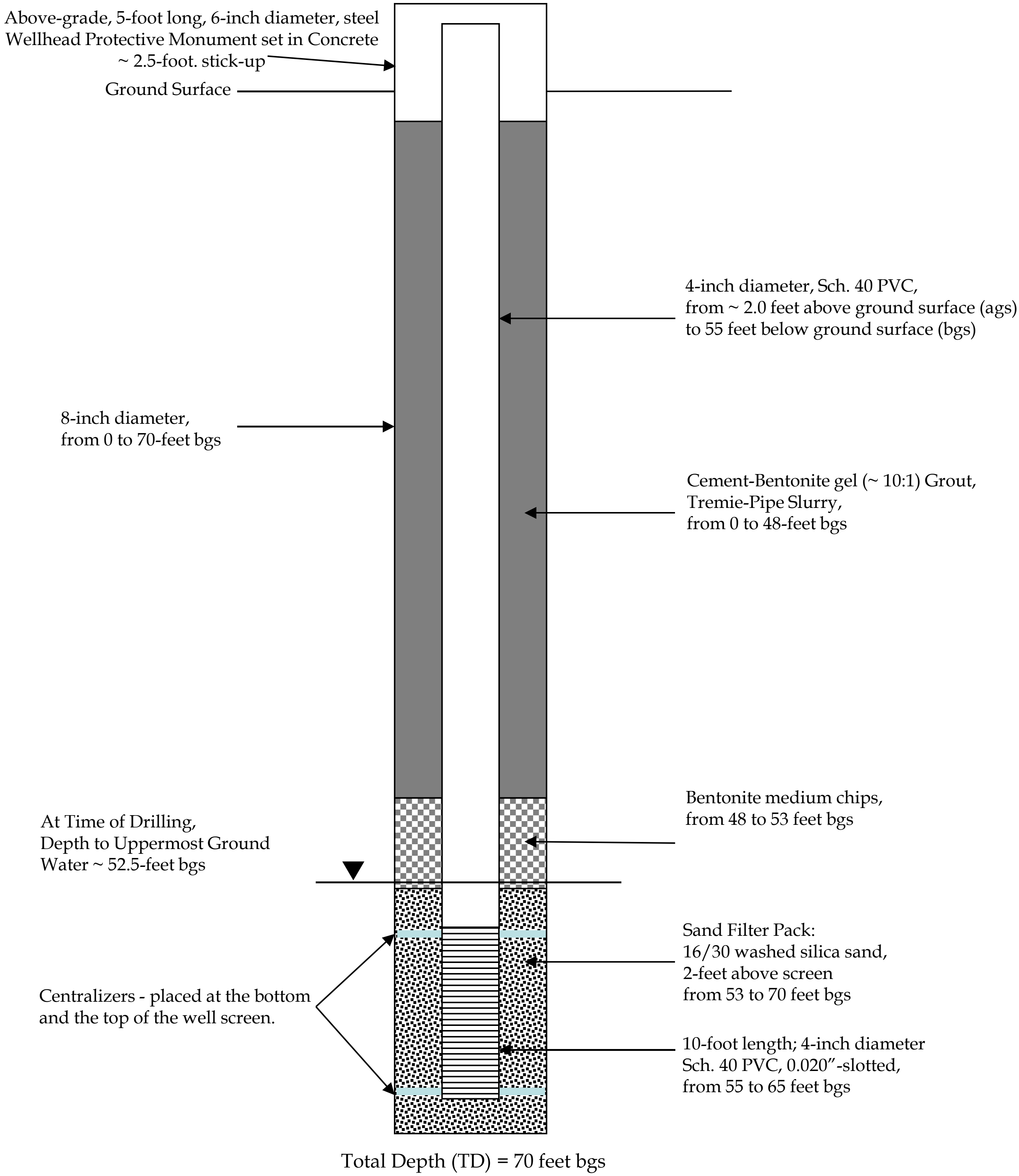
IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-2 Schematic

			Date Drawn 7/27/15
			Last Revision Date
Design by	Drawn by MS	Scale	

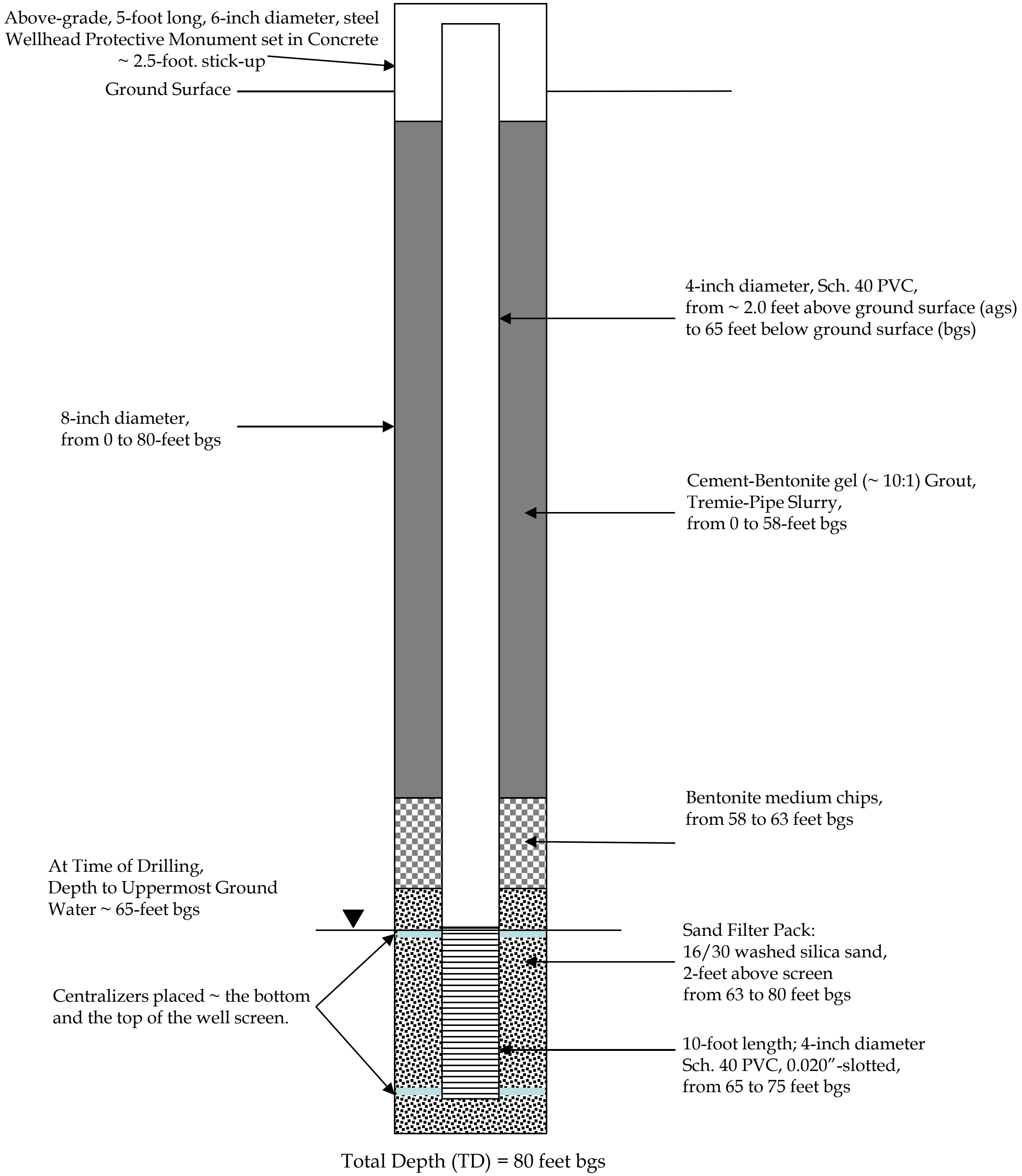


Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-3 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/30/15
			Last Revision Date

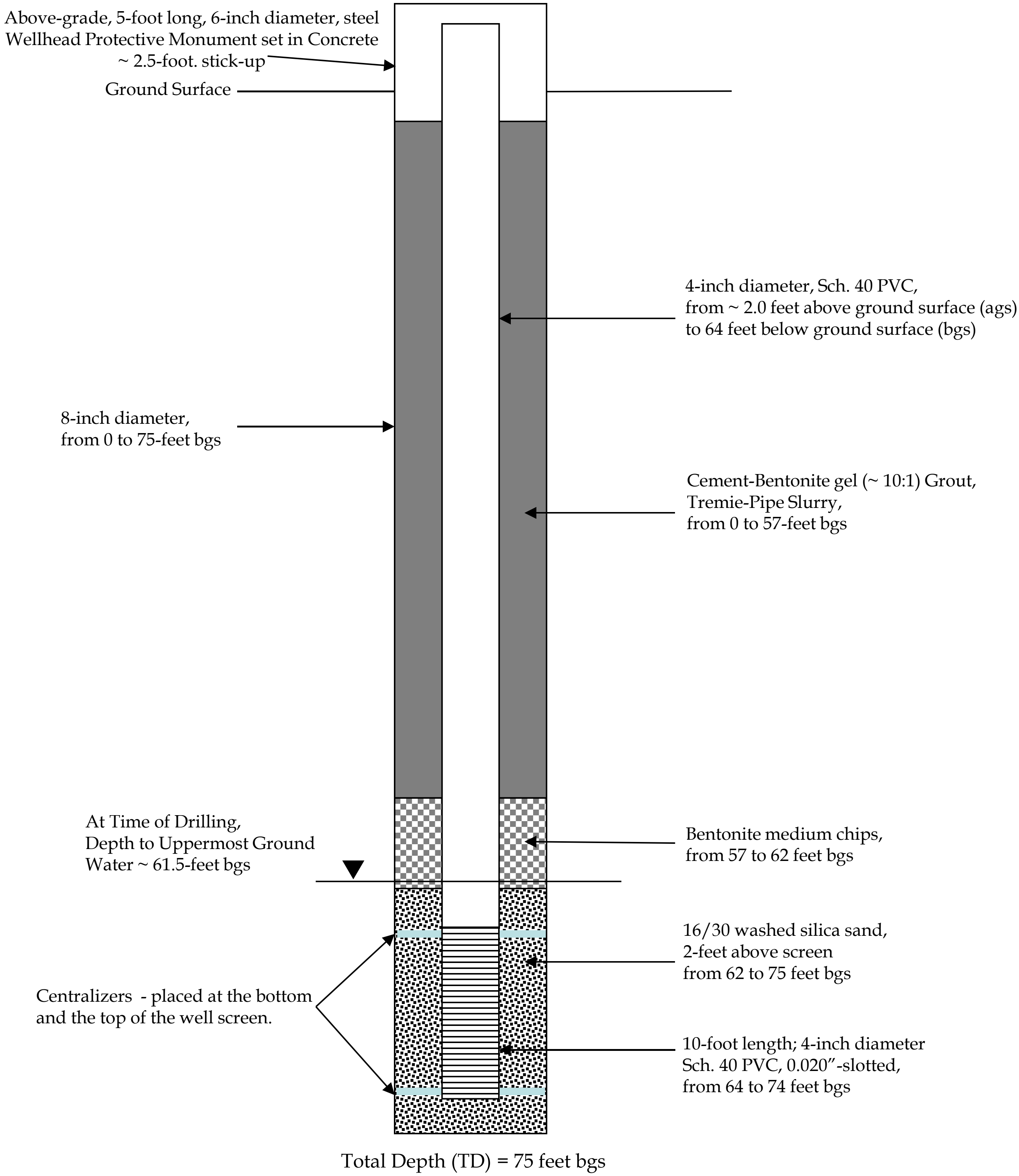


Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-4 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/29/15 Last Revision Date



Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WWC-5 Schematic

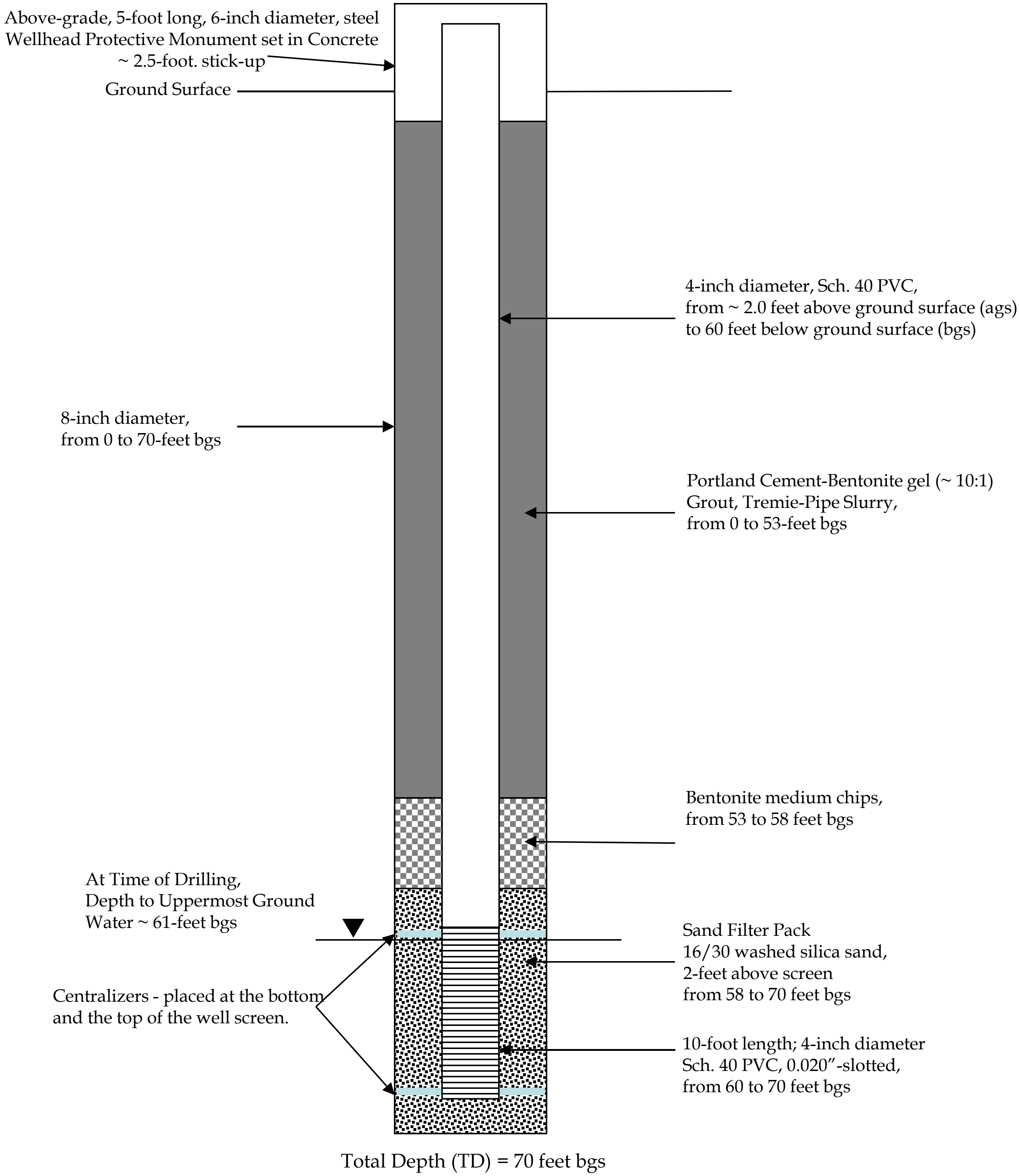
Date Drawn 7/28/15

Last Revision Date

Design by

Drawn by MS

Scale



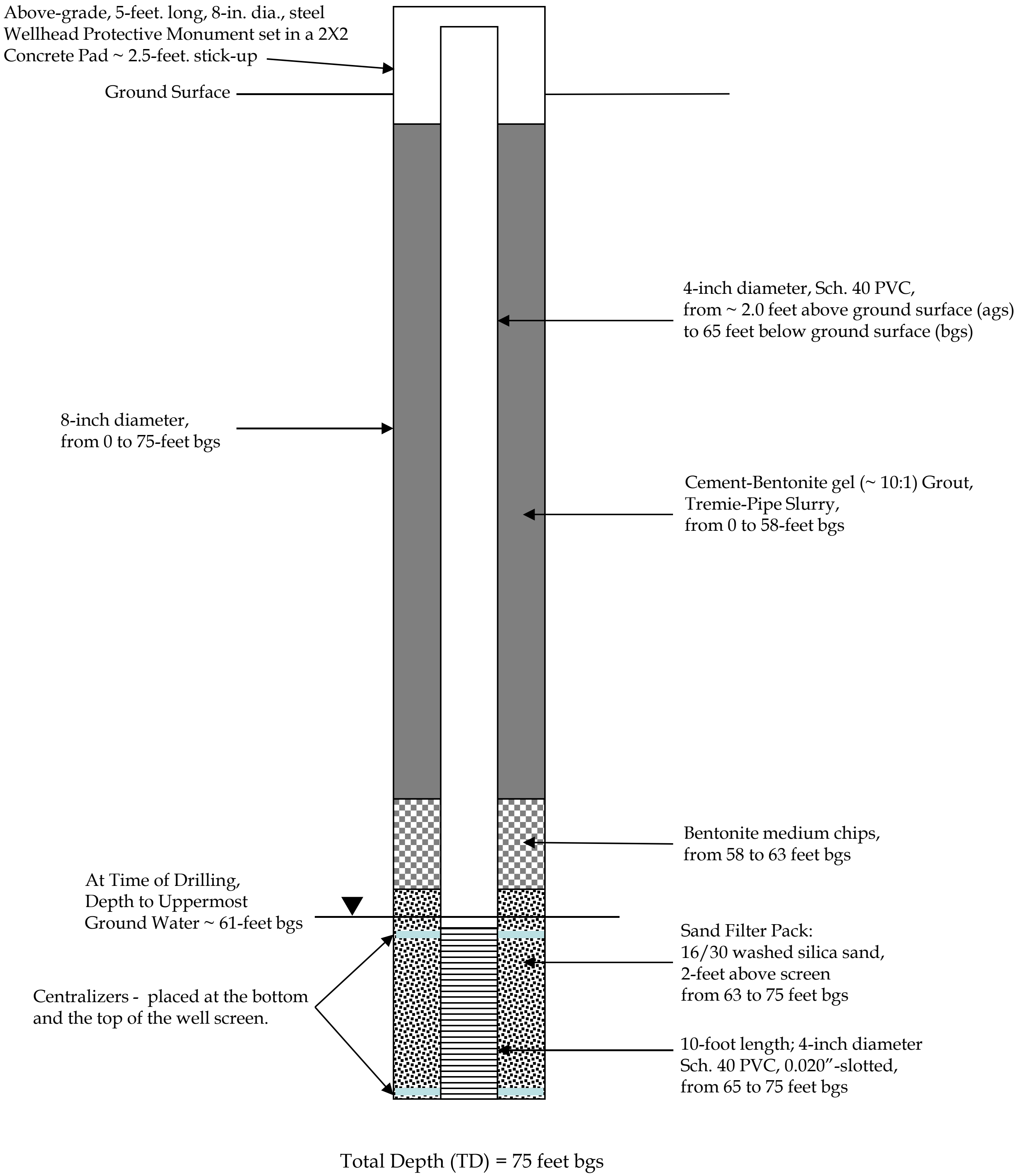
Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WW-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/11/15
			Last Revision Date



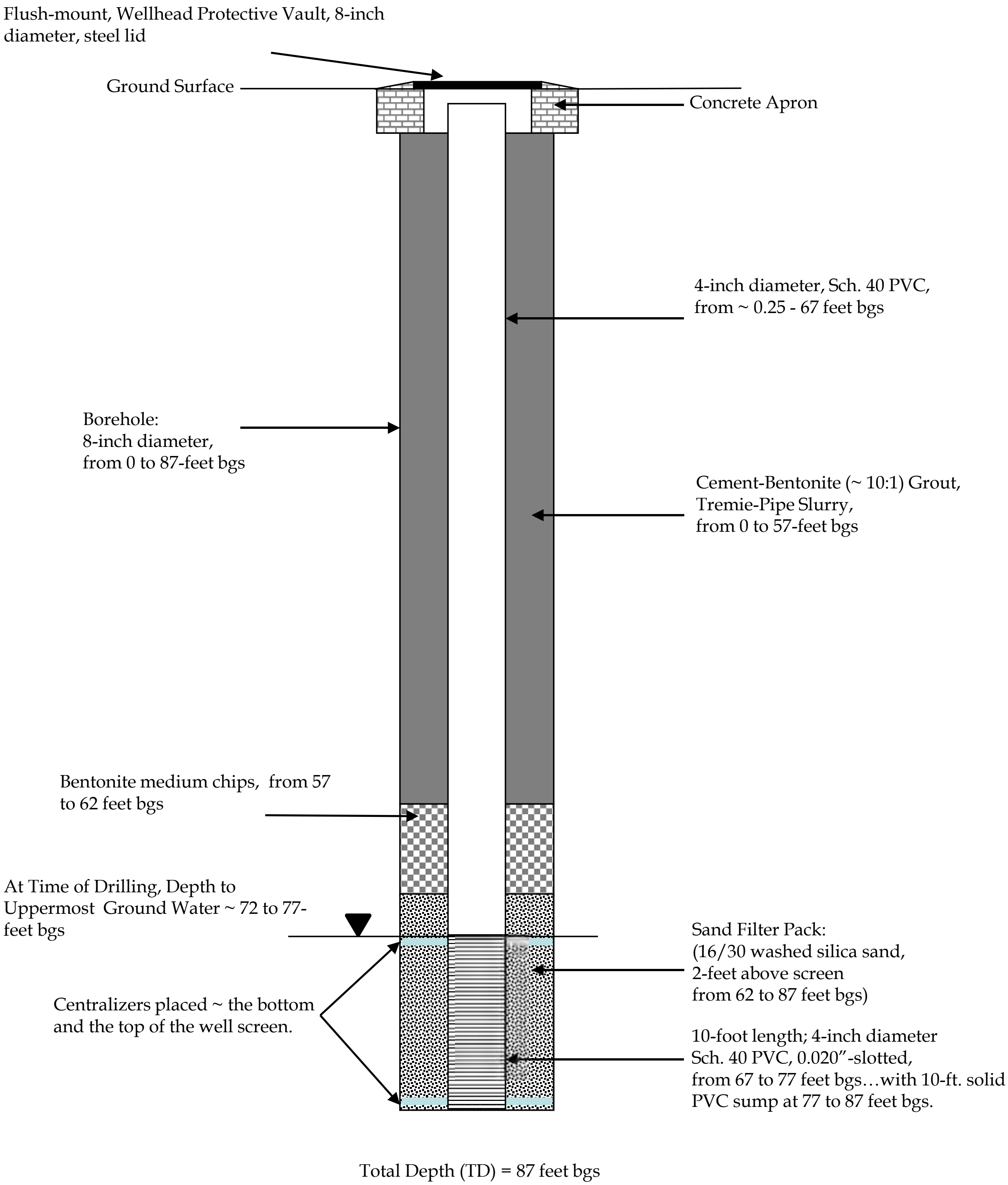
Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WW-U-2 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/11/15 Last Revision Date



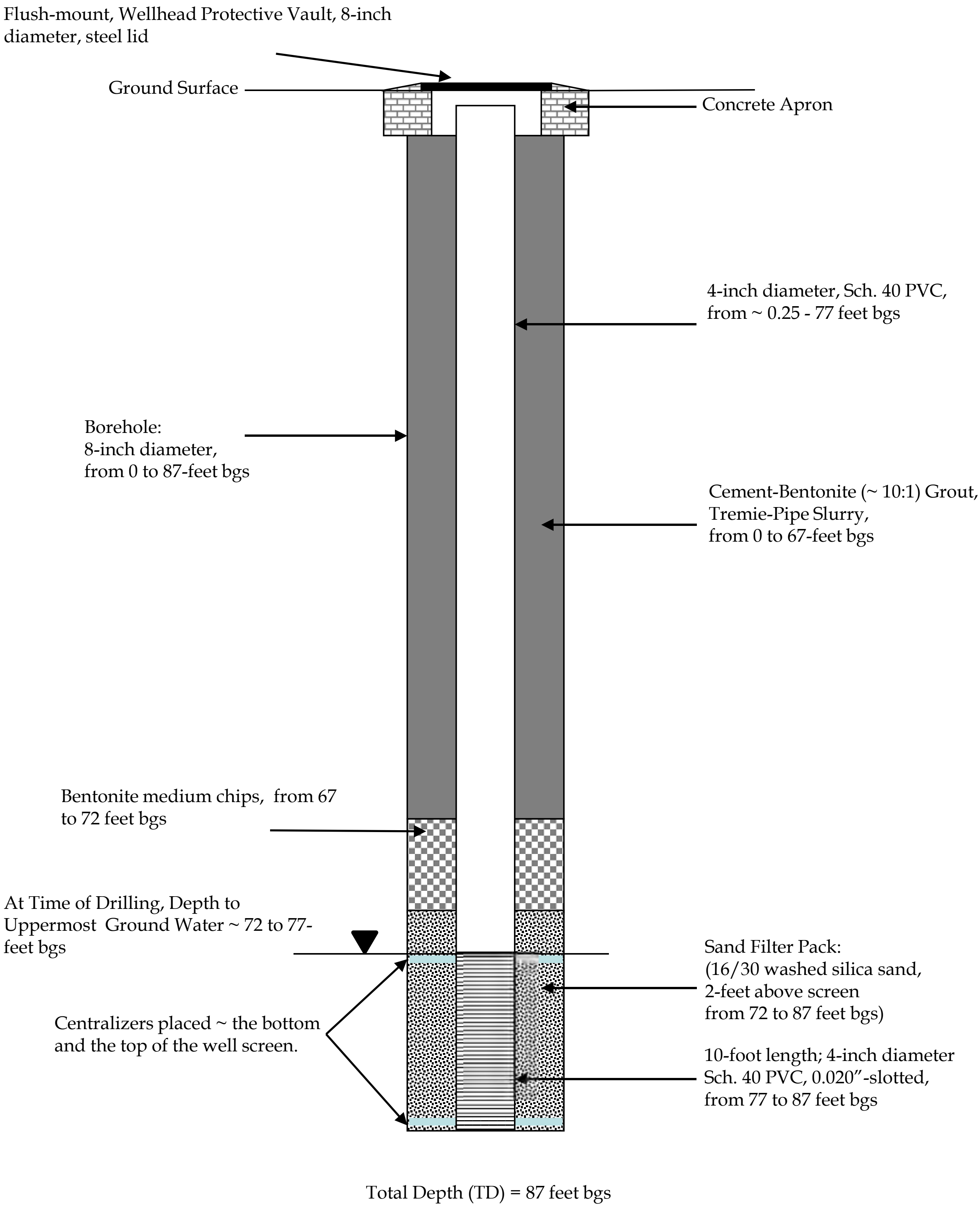
Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA

DELTA, UTAH

Well WWC-6 Schematic

Design by	Drawn by JR	Scale	Date Drawn 10/24/18
			Last Revision Date



Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA
DELTA, UTAH

Well WWC-7 Schematic

Design by	Drawn by JR	Scale	Date Drawn 10/24/18
			Last Revision Date

Boring Logs

IPSC

Delta, Utah

CLW-1

Interval (feet)	Drilling Method	Sample Description
		5/11/2015
0-3	10" Sonic	Brown fine grained Sand with gravel, dry
3-6	10" Sonic	Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-8	10" Sonic	Light Brown fine grained Sand
8-11.5	10" Sonic	Grayish white fine grained Sand, gravels present, rounded, dry
11.5-13.5	10" Sonic	Tan SILT with clay matrix, slightly moist
13.5-17	10" Sonic	Grayish Tan CLAY with small amount of silt present, slightly moist
17-23	10" Sonic	Grayish Tan SILT with fine grain sand present, trace amounts of clay, slightly moist
23-27	10" Sonic	Tannish Gray CLAY, denser, dry
27-32	10" Sonic	Tan CLAY, slightly moist
32-35	10" Sonic	Tan CLAY, denser material, slightly moist
		5/12/2015
35-48	10" Sonic to 40 feet	Tannish gray CLAY, moist
48-51	8" Sonic	Tannish gray CLAY, moist, softer
51-52	8" Sonic	Orangish, Brown, black fine grained Sand, moist
52-54	8" Sonic	Orangish, Brown , Red CLAY, slightly moist
54-56	8" Sonic	Orangish Brown CLAY with a fine grained sand matrix, slightly moist
56-62	8" Sonic	Light Brown fine grained Sand, saturated
62-63	8" Sonic	Light Brown CLAY, slightly moist
63-63.5	8" Sonic	Fine to medium grained Sand, slightly moist
63.5-64	8" Sonic	Light Brown CLAY, dry to slightly moist
64-65	8" Sonic	Light Brown fine grained Sand with clay matrix, moist

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-2

Interval (feet)	Drilling Method	Sample Description
		5/14/2015
0-8	10" Sonic	Brown fine grained Sand, clay present with gravel, dry
8-10	10" Sonic	Light to Dark Brown medium to course grained SAND, gravel present, dry
10-17	10" Sonic	Light Brown to Brown clayey SILT, slightly moist
17-25	10" Sonic	Light Brown Silty CLAY, moist
25-46	10" Sonic to 30 feet	Brown CLAY, slightly moist, from 40 to 45 feet transitioned to a Tan to Light Gray color
46-46.5	8" Sonic	Very moist to saturated zone, very soft clay , very sticky
46.5-50	8" Sonic	Light Gray CLAY, moist
50-51	8" Sonic	Tan to Light Gray with Orange zones, CLAY, slightly moist
51-51.5	8" Sonic	Very moist zone, CLAY
62	8" Sonic	Transitioning to a Orangish Red CLAY, Slightly moist
66-66.5	8" Sonic	Moist zone, transitioning from an Orangish Red to a Brown CLAY
66.5-73	8" Sonic	Reddish brown fine grained Sand with a clay matrix, very moist
73-80	8" Sonic	Brown fine gained Sand, trace amounts of clay, saturated.

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-3

Interval (feet)	Drilling Method	Drill Time	Sample Description
			5/13/2015
0-3	10" Sonic		Brown fine grained Sand , clay present with gravel, dry
3-6	10" Sonic		Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-11	10" Sonic		Grayish White fine grained Sand, gravels present, rounded, dry
11-13	10" Sonic		Brownish Orange SILT, with fine grained sand present, soft
13-16	10" Sonic		Tannish Gray SILT with a clay present, very moist, sticky
16-21	10" Sonic		Tannish Gray SILT with a clay matrix, very moist, sticky
21-24	10" Sonic		Light Gray CLAY, with silt present, very moist
24-33	10" Sonic		Light Gray to Orange CLAY, with silt present, slightly moist
32-40	10" Sonic to 40 feet		Tan CLAY, denser material, slightly moist
40-66	8" Sonic		Tan to Light Brown CLAY, slightly moist to Dry
63	8" Sonic		Transiting into a Darker Gray CLAY, Moist
66-72	8" Sonic		Very moist to saturated, clay very plastic, firm and sticky
72-73	8" Sonic		Dark Gray fine to medium grained Sand, saturated
73-74	8" Sonic		Dark Gray CLAY, sticky firm, very moist
74-80	8" Sonic		Dark Gray fine to medium grained Sand, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-4

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-2	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
2-5	10" Sonic	Light Brown fine grained Sands, dry
5-11	10" Sonic	Light Brown to gray fine grained SAND, dry to slightly moist
11-13	10" Sonic	Light Brown silty CLAY, slightly moist, good plasticity
13-14	10" Sonic	Light Brown fine grained SAND, with clays present, poor plasticity, dry
14-16	10" Sonic	Light Brown clayey SILT, dry
16-18	10" Sonic	Light Brown to Brown silty CLAY, slightly moist, good plasticity
18-21	10" Sonic	Light Brown to Gray silty CLAY, slightly moist to moist, good plasticity
21-24	10" Sonic	Brownish Gray CLAY, moist, high plascity
34-32	10" Sonic	Browninsh Gray CLAY, moist to very moist, high plasticity
32-53	10" Sonic to 39 feet	Brownish Gray CLAY, dencer, slightly moist,
		44 - thin layer of brownish orange fine grained sand
		47 - transitioning into a gray clay
		49 - thin layer of brownish orange fine grained sand
53-55	8" Sonic	Brownish Gray CLAY, dense, very plastic, slightly moist
55-73	8" Sonic	Brown CLAY, very plastic, slightly moist
73-82	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-5

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-4	10" Sonic	Gravels with medium to fine grand sands, moist
4-7.5	10" Sonic	Light Brown sitly CLAY, slightly moist, good plasticity
7.5-10	10" Sonic	Light Brown fine to medium grained SAND, dry
10-12	10" Sonic	Light Brown to Gray fine to medium grained SAND, gravels present, slightly moist
12-13	10" Sonic	Light Brown clayey SILT, slightly moist,
13-15	10" Sonic	Brown fine to medium grained SAND, wht clays and silts, slightly moist
		7/27/2015
15-22	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
22-32	10" Sonic	Light Brown CLAY, moistgood plasticity
32-38	10" Sonic	Brown CLAY, slightly moist, high plasticity
38-40	10" Sonic to 39 feet	Light Gray CLAY, slightly moist, hight plasticity
40-44	8" Sonic	Light Brown to Brown CLAY, slightly moist, high plasticity
44-52	8" Sonic	Light Gray CLAY, hight plasticity, slighly moist
52-53	8" Sonic	Brown CLAY, high plasticity, slightly moist
53-55	8" Sonic	Gray CLAY, high plasticity, slightly moist
55-72	8" Sonic	Gray CLAY, high plasticity, moist
72-74	8" Sonic	Gray fine grained SAND, with clay matrix, moist to saturated
74-75	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
75-78	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated
78-80	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
80-82	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-6

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown silty fine grained SAND, dry
5-7	10" Sonic	Light Brown fine grained sandy SILT, dry
7-12	10" Sonic	Light Brown fine to medium grained SAND, dry
12-15	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
15-21	10" Sonic	Light Brown to Brown clayey SILT, slightly moist, poor plasticity
21-22	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
21-23		Light Brown to Brown clayey SILT, slightly moist, poor plasticity
23-32	10" Sonic	Light Brown CLAY, moist, sticky, high plasticity
32-38	10" Sonic	Light Brown to Gray CLAY, moist, high plasticity
38-47	10" Sonic	Light Gray to Gray CLAY, slightly moist, high plasticity
47-55	10" Sonic to 39 feet	Transitioned to a Brownish gray CLAY, high plasticity, slight moist
55-72	8" Sonic	Brown CLAY, high plasticity, slightly moist
		58 - 58.5 very moist to saturated, 59 - slightly moist
72-78	8" Sonic	Gray CLAY, very moist, high plasticity
78-82	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
82-84	8" Sonic	Gray CLAY, high plasticity, very moist
84-85	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
85-88	8" Sonic	Gray CLAY, high plasticity, very moist

TD = 88; PVC 4-inch screen from 78 to 88; PVC 4-inch riser from -2.5 to 78

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-7

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-8	10" Sonic	Light Brown fine grained Sands with silts and gravel, angular, Dry
8-12	10" Sonic	Light Brown fine grained Sands with silts and clay, No gravel, Dry
12-15	10" Sonic	Tan SILT with a clay matrix, Dry
15-17	10" Sonic	Light Brown to Gray CLAY, medium plasticity, silty present, Dry
17-22	10" Sonic	Light Brown Clayey SILT, slightly moist
22-24	10" Sonic	Light Brown to Grayish silty CLAY, Dry
24-32	10" Sonic	Light Brown to Grayish CLAY, Brown silts and fine grained sands present, , Dry
32-40	10" Sonic to 39 feet	Light Brown CLAY, slightly moist, became denser at 35 feet
40-43	8" Sonic	Light Brown to Grayish CLAY, very dense, slightly moist
43-48	8" Sonic	Gray CLAY, slightly moist, some layers of a brown fine grained sand present every 3 to 4 inches alone the core
48-50	8" Sonic	Gray CLAY, slightly moist, some Iron Oxide present
50-51.5	8" Sonic	Brown fine to medium grained SANDS, saturated
51.5-58	8" Sonic	Brown CLAY, moist to slightly moist
58-58.5	8" Sonic	Brown fine grained SANDS, with a clay matrix, saturated
58.5-61	8" Sonic	Brown CLAY, moist to slightly moist
61-68	8" Sonic	Brown fine to medium grained SANDS, saturated
68-70	8" Sonic	Brown CLAY, moist to slightly moist
70-72	8" Sonic	Brown fine to medium grained SANDS, saturated

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CLW-8

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown fine grained Sands, slightly moist
5-7	10" Sonic	Tannish white fine grained Sand, with smooth, rounded pebbles, slightly moist
7-10	10" Sonic	Tannish white silty, fine grained Sand, slightly moist
10-13	10" Sonic	Tan SILT with a clay matrix, slightly most, slightly plastic
13-15	10" Sonic	Tan Clayey SILT, dry, plastic
15-18	10" Sonic	Light Brown to tan silty CLAY, slightly moist, good plasticity
18-24	10" Sonic	Light Brown CLAY with silts present, slightly moist, good plasticity
24-32	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
32-37	10" Sonic	Brown CLAY, dence, dry to slihgtly moist, very plastic
37-52	10" Sonic to 39 feet	Transitioned fomrthe Brown CLAY to a Gray CLAY, with interbeds of brown fine gran sand layers, highly plastic, slihglty moist
52-62	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 62; PVC 4-inch screen from 52 to 62; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

CL-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/22/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	SAND with silt:
2-2.5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
2.5-5	8" Sonic	SM	Silty SAND:
5-6	8" Sonic	CL	CLAY:
6-7.5	8" Sonic	SM/ML	Silty SAND/Sandy SILT with clay:
7.5-10	8" Sonic	CH	CLAY:
10-11	8" Sonic		CLAY:
11-12.5	8" Sonic		CLAY:
12.5-13.5	8" Sonic		CLAY:
13.5-15	8" Sonic	ML	Sandy SILT:
15-16.5	8" Sonic	SP/SM	SAND with silt:
16.5-17.5	8" Sonic	SM	Silty SAND:
17.5-20	8" Sonic	SP	SAND:
20-21	8" Sonic		SAND:
21-22	8" Sonic	ML	Sandy SILT:
22-23	8" Sonic	SP	SAND:
23-24	8" Sonic	ML	Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26	8" Sonic	ML	Sandy SILT:
26-28	8" Sonic		Sandy SILT:
28-30	8" Sonic		SILT with clay:
30-32	8" Sonic		Sandy SILT:
32-34	8" Sonic	SP	SAND:
34-35	8" Sonic	ML	Sandy SILT with clay:
35-40	8" Sonic	CL	CLAY:
40-42	8" Sonic	ML	SILT with clay:
42-45	8" Sonic	CH	CLAY:
45-55	8" Sonic		CLAY:
55-65	8" Sonic		CLAY:
7/23/2015			
65-66.5	8" Sonic	CH	Sandy CLAY:
66.5-67.5	8" Sonic	SP/SM	SAND with silt:
67.5-72.5	8" Sonic		SAND with silt:
72.5-73.5	8" Sonic	SP	SAND:
73.5-75	8" Sonic	SC	Clayey SAND:
75-76.5	8" Sonic	SW	SAND:
76.5-79	8" Sonic	SP	SAND:
79-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 68 to 78; PVC 4-inch riser from -2.5 to 68

Drilling Method: Guspech GS24-300RS 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

CLU-2

Interval (feet)	Drilling Method	Sample Description
		7/22/2015
0-6	8" Sonic	Light Brown fine grained SAND with silt, dry
6-7.5	8" Sonic	Light Brown to Tan CLAY with silt, slightly moist
7.5-13	8" Sonic	Light Brown fine grained SAND with silt, dry
13-16	8" Sonic	Brown fine grained SAND with clayey matrix, slightly moist, some plasticity
16-24	8" Sonic	Light Brown fine grained SAND, dry
24-35	8" Sonic	Light Brown clayey SILT, dry
35-44	8" Sonic	Light Brown Silty CLAY, dry, good plasticity
44-48	8" Sonic	Gray Clayey SILT, dry, slightly plastic
48-49	8" Sonic	Brownish Orange CLAY, with a silty matrix, dry, good plasticity
49-60	8" Sonic	Brownish Orange CLAY, slightly moist
	8" Sonic	53-55 soil becomes slightly moist and Iron Oxide present
	8" Sonic	57-61 soil is dry
61-67	8" Sonic	Brownish Gray CLAY, at 61 feet very moist, very plastic
67-70	8" Sonic	Gray CLAY, moist, very plastic
70-75	8" Sonic	Gray fine to medium grained SAND, saturated, nonplastic
75-77	8" Sonic	Greenish Gray to Brown Clay fine grained SAND with a CLAY matrix, saturated
77-80	8" Sonic	Brownish Gray, fine to medium grained SAND, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs
ISPC
Delta, Utah

BAC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/31/2015			
0-0.75	8" Sonic	Concrete	Surface - concrete soil mixture
0.75-2.5	8" Sonic	SM	Silty SAND:
2.5-3.25	8" Sonic		Silty SAND:
3.25-5	8" Sonic	SP/SM	SAND with silt:
5-12.5	8" Sonic		SAND with silt:
12.5-13.5	8" Sonic		SAND with silt:
13.5-14.5	8" Sonic	ML	Sandy SILT:
14.5-15	8" Sonic		Sandy SILT:
15-17.5	8" Sonic	SP	SAND:
17.5-19	8" Sonic	SP/SW	SAND:
19-20	8" Sonic	SP/SM	SAND with silt:
20-21.5	8" Sonic	SP	SAND:
21.5-22.5	8" Sonic	ML	Sandy SILT:
22.5-24	8" Sonic		Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26.75	8" Sonic	SM	Silty SAND:
26.75-27.5	8" Sonic	SP	SAND:
27.5-28.5	8" Sonic		SAND:
28.5-30	8" Sonic	SM	Silty SAND:
30-31.5	8" Sonic	SP	SAND:
31.5-32.25	8" Sonic	SM	Silty SAND:
32.25-33.75	8" Sonic	SP/SM	SAND with silt:
33.75-35	8" Sonic	SM	Silty SAND:
35-36	8" Sonic	SP/SM	SAND with silt:
36-37.5	8" Sonic	SM	Silty SAND:
37.5-38	8" Sonic	SP/SM	SAND with silt:
38-38.5	8" Sonic	SM	Silty SAND:
38.5-40	8" Sonic	ML	Sandy SILT:
40-42.5	8" Sonic	SC	Clayey SAND:
42.5-43.5	8" Sonic	CL	Sandy CLAY:
43.5-44.5	8" Sonic		Sandy CLAY:
44.5-45	8" Sonic		Sandy CLAY:
45-46	8" Sonic		Sandy CLAY:
46-47	8" Sonic		Sandy CLAY:
47-47.75	8" Sonic	SW	SAND:
47.75-48.5	8" Sonic	CH	Sandy CLAY:
48.5-50	8" Sonic		Sandy CLAY:
50-51.5	8" Sonic		CLAY:
51.5-53.5	8" Sonic		Sandy CLAY:
53.5-56	8" Sonic		CLAY:
56-57.5	8" Sonic		Sandy CLAY:
57.5-58	8" Sonic	SC	Clayey SAND:
58-59.5	8" Sonic	CH	CLAY:
59.5-60	8" Sonic	SC	Clayey SAND:
60-64.5	8" Sonic	SM	Silty SAND with clay:
64.5-65.5	8" Sonic	SC	Clayey SAND:
65.5-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic	SW	SAND:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from 0 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

BAC-2

Interval (feet)	Drilling Method	Sample Description
		7/29/2015
0-6	8" Sonic	Light Brown fine grained Sand, gravels, dry
6-12	8" Sonic	Light Brown fine grained SAND, moist
12-18	8" Sonic	Light Brown fine to medium grained sand, dry
18-23	8" Sonic	Light Brown fine to medium grained sand, with a clay matrix, dry
23-24	8" Sonic	Light Brown fine to medium grained sand, very moist, trace amount of clay
24-26	8" Sonic	Brown fine to medium grained sand, slightly moist
26-30	8" Sonic	Brown fine to medium grained sand, with gravels present, slightly moist
30-33	8" Sonic	Light Brown fine grained sand, slightly moist
33-34	8" Sonic	Light Brown CLAY, very moist, high plasticity
34-36	8" Sonic	Light Brown fine grained sand, with a clay matrix, moist
36-38	8" Sonic	Light Brown Silty CLAY, moderately plastic, slightly moist
38-40	8" Sonic	Brownish Red silty CLAY, good plasticity, slightly moist
40-41	8" Sonic	Brown fine grained SAND, saturated
41-42	8" Sonic	Brown SILT with a clay matrix, slightly moist
42-52	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist
52-55	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist, very dense
55-56	8" Sonic	Brown fine grained SAND with a clay matrix very moist to saturated
56-57	8" Sonic	Reddish brown CLAY, high plasticity, slightly moist to moist
57-65	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Logs

IPSC

Delta, Utah

BAC-3

Interval (feet)	Drilling Method	Sample Description
		7/28/2015
0-8.5	8" Sonic	Light Brown fine grained Sand, dry
8.5-11	8" Sonic	Light Brown fine to medium grained SAND, moist
11-14	8" Sonic	Light Brown fine grained sand, with a clay matrix, dry
14-17	8" Sonic	Gravels with fine to medium grained SAND, slightly moist
17-20	8" Sonic	Brown fine grained sand, slightly moist
20-22	8" Sonic	Brown fine to medium grained sand, with a clay matrix, slightly moist
22-26	8" Sonic	Brown fine to medium grained sand, with a clay matrix, moist
26-30	8" Sonic	Brown fine grained sand, moist
30-43	8" Sonic	Light Brown CLAY, slightly moist to moist, high plasticity
		30-33 Silty CLAY, poor plasticity
		33-35 Silty CLAY, moderately plastic
		35-43 very little silt present, high plasticity
43-45	8" Sonic	Transitioned to a Reddish Brown CLAY, dry, high plasticity
45-50	8" Sonic	Transitioned to a Brown CLAY, dry, high plasticity
50-55	8" Sonic	Light Brown CLAY, moist, high plasticity
55-58	8" Sonic	Light Brown fine grained SAND, with a clay matrix, slightly moist to moist
58-72	8" Sonic	Light Brown CLAY, with a sandy matrix medium to poor plasticity, moist

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick

Boring Log

ISPC

Delta, Utah

BAC-4

Interval (feet)	Drilling Method	USCS	Sample Description
8/10/2015			
0-0.5	8' Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8' Sonic	SP/SM	SAND with silt:
2.5-5	8' Sonic	SP	SAND:
5-9	8' Sonic		SAND:
9-10	8' Sonic	SP/SM	SAND with silt:
10-15	8' Sonic	SP	SAND:
15-17.5	8' Sonic	SP/SM	SAND with silt:
17.5-19	8' Sonic		SAND with silt:
19-2	8' Sonic	SC	Clayey SAND:
20-21	8' Sonic		Clayey SAND:
21-22	8' Sonic	CL	Sandy CLAY:
22-22.5	8' Sonic	ML	Sandy SILT:
22.5-25	8' Sonic	CL	Sandy CLAY:
25-32.5	8' Sonic	CH	CLAY:
32.5-33.75	8' Sonic	SP	SAND:
33.75-35	8' Sonic	SM	Silty SAND:
35-36.5	8' Sonic	SP/SM	SAND with silt:
36.5-37.5	8' Sonic		SAND with silt:
37.5-38	8' Sonic	SM	Silty SAND:
38-38.75	8' Sonic	CH	Sandy CLAY:
38.75-39	8' Sonic	SP/SM	SAND with silt:
39-40	8' Sonic	CH	Sandy CLAY:
40-42.5	8' Sonic	ML	Sandy SILT with clay:
42.5-43.5	8' Sonic	SM	Silty SAND and clay:
43.5-45	8' Sonic	CH	CLAY:
45-47.5	8' Sonic		CLAY:
47.5-48.5	8' Sonic		CLAY:
48.5-50	8' Sonic	ML	Clayey SILT with sand:
50-51.25	8' Sonic		Clayey SILT:
51.25-52.5	8' Sonic	CH	CLAY:
52.5-55	8' Sonic	SC	Clayey SAND:
55-56.5	8' Sonic	SM	Silty SAND:
56.5-57	8' Sonic	ML	Clayey SILT with sand:
57-57.5	8' Sonic	CH	CLAY:
57.5-58.5	8' Sonic		CLAY:
58.5-59.5	8' Sonic	ML	Clayey SILT with sand:
59.5-61	8' Sonic		Clayey SILT with sand:
61-64	8' Sonic		Clayey SILT with sand:
64-65	8' Sonic		Clayey SILT with sand:
65-65.5	8' Sonic	SM	Silty SAND:
65.5-67	8' Sonic	CL	Silty CLAY:
67-67.5	8' Sonic	ML	Clayey SILT:
67.5-69	8' Sonic	CH	CLAY:
69-69.5	8' Sonic		CLAY:
69.5-70	8' Sonic		CLAY:
70-72.5	8' Sonic	ML	Sandy SILT with clay:
72.5-74	8' Sonic	CH	Silty CLAY:
74-75	8' Sonic	SM	Silty SAND:

TD = 75'; PVC 4-inch screen from 55 to 75; PVC 4-inch riser from -2.5 to 55

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BAC-5

Interval (feet)	Drilling Method	USCS	Sample Description
8/9/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-3	8" Sonic	SP	SAND:
3-6.5	8" Sonic		SAND:
6.5-10	8" Sonic		SAND:
10-12.5	8" Sonic		SAND:
12.5-15	8" Sonic	SP/SM	SAND with silt:
15-19	8" Sonic	SM	Silty SAND:
19-19.5	8" Sonic	SC	Clayey SAND:
19.5-20	8" Sonic	SP/SM	SAND with silt:
20-22.5	8" Sonic	CL	Sandy CLAY:
22.5-23.75	8" Sonic		Sandy CLAY:
23.75-25	8" Sonic		Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic	CL/CH	CLAY:
32.5-33.5	8" Sonic	SP	SAND:
33.5-35	8" Sonic		SAND:
35-36	8" Sonic	SC	Clayey SAND:
36-37.5	8" Sonic	ML	Sandy SILT:
37.5-38.5	8" Sonic		Sandy SILT:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-44.25	8" Sonic		Silty SAND with clay:
44.25-45	8" Sonic	CH	CLAY:
45-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50.75	8" Sonic	SM	Silty SAND:
50.75-52.5	8" Sonic	CH	CLAY:
52.5-53.5	8" Sonic		CLAY:
53.5-55.5	8" Sonic	SP	SAND:
55.5-57.5	8" Sonic	CH	CLAY:
57.5-59	8" Sonic		CLAY:
59-60	8" Sonic	SM	Silty SAND with clay:
60-62.5	8" Sonic	SP	SAND:
62.5-63	8" Sonic	SC	Clayey SAND:
63-65	8" Sonic	SP	SAND:
65-65.75	8" Sonic	SC	Clayey SAND:
65.75-66.5	8" Sonic	CH	CLAY:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-69	8" Sonic	CH	CLAY:
69-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 58 to 68; PVC 4-inch riser from -2.5 to 58
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BAC-6

Interval (feet)	Drilling Method	USCS	Sample Description
8/8/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-5	8" Sonic	SP	SAND:
5-6.5	8" Sonic	SP/SM	SAND with silt:
6.5-7.5	8" Sonic	SP	SAND:
7.5-10	8" Sonic		SAND:
10-13.5	8" Sonic		SAND:
13.5-15	8" Sonic	SM	Silty SAND:
15-16	8" Sonic	SP	SAND:
16-17.5	8" Sonic	SM	Silty SAND:
17.5-18.25	8" Sonic	SP/SM	SAND with silt:
18.25-18.75	8" Sonic	CL	Sandy CLAY:
18.75-20	8" Sonic	SC	Clayey SAND:
20-21.5	8" Sonic	CH	Sandy CLAY:
21.5-23	8" Sonic	SM	Silty SAND:
23-25	8" Sonic	CL	CLAY:
25-27.5	8" Sonic	CH	CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic		CLAY:
32.5-33.5	8" Sonic		CLAY:
33.5-35	8" Sonic	SW	SAND:
35-36	8" Sonic	SM	Silty SAND:
36-37.5	8" Sonic	SP/SM	SAND with silt:
37.5-38.5	8" Sonic	CH	CLAY:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-43.5	8" Sonic	CH	Sandy CLAY:
43.5-45	8" Sonic		CLAY:
45-45.5	8" Sonic	SC	Clayey SAND:
45.5-47.5	8" Sonic	CH	CLAY:
47.5-48	8" Sonic	SP	SAND:
48-49.5	8" Sonic	SM	Silty SAND with clay:
49.5-50	8" Sonic	CH	Sandy CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic		CLAY:
55-56	8" Sonic	SM	Silty SAND:
56-60	8" Sonic	SW	SAND:
60-61	8" Sonic		SAND:
61-62.5	8" Sonic	CH	Sandy CLAY:
62.5-63.5	8" Sonic		CLAY:
63.5-65	8" Sonic	SC	Clayey SAND:

TD = 65'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

BAC-7

Interval (feet)	Drilling Method	USCS	Sample Description
8/7/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	Gravelly SAND:
2-2.5	8" Sonic	SP	Gravelly SAND:
2.5-5	8" Sonic		SAND:
5-7	8" Sonic		SAND:
7-8.5	8" Sonic		SAND:
8.5-9	8" Sonic	SP/SM	SAND with silt:
9-9.5	8" Sonic	SP	SAND:
9.5-11	8" Sonic	SP/SM	SAND with silt:
11-13	8" Sonic		SAND with silt:
13-17	8" Sonic	SM	Silty SAND:
17-18.5	8" Sonic		Silty SAND:
18.5-19	8" Sonic	ML	Sandy SILT:
19-20.25	8" Sonic	SP/SM	SAND with silt:
20.25-22	8" Sonic	CL	Sandy CLAY:
22-24	8" Sonic		Sandy CLAY:
24-25	8" Sonic	SC	Clayey SAND:
25-27.5	8" Sonic	CH	CLAY:
27.5-36.5	8" Sonic		CLAY:
36.5-40	8" Sonic	SP	SAND:
40-41.25	8" Sonic		SAND:
41.25-43.75	8" Sonic	SP/SM	SAND with silt:
43.75-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50	8" Sonic	SM	Silty SAND:
50-57.5	8" Sonic	CH	CLAY:
57.5-60	8" Sonic	SW	SAND:
60-62.5	8" Sonic		SAND:
62.5-64	8" Sonic	SP	SAND:
64-65	8" Sonic	CH	CLAY:
65-66.25	8" Sonic		Sandy CLAY:
66.25-67.5	8" Sonic		CLAY:
67.5-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 57 to 67; PVC 4-inch riser from -2.5 to 57

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

BA-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/24/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SC	Clayey SAND:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
5-6	8" Sonic	SP	SAND:
6-9.5	8" Sonic		SAND:
9.5-11	8" Sonic		SAND:
11-11.5	8" Sonic	SM	Silty SAND:
11.5-12	8" Sonic		Silty SAND:
12-13	8" Sonic	SP/SM	SAND with silt:
13-17	8" Sonic	SP	SAND:
17-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22.5	8" Sonic		SAND:
22.5-25	8" Sonic	SM	Silty SAND:
25-26	8" Sonic	SP	SAND:
26-27.5	8" Sonic	SP/SM	SAND with silt:
27.5-28.25	8" Sonic	SM	Silty SAND with clay:
28.25-29.25	8" Sonic	SP/SM	SAND with silt:
29.25-30	8" Sonic	CL	CLAY:
30-31.5	8" Sonic		Sandy CLAY:
31.5-33	8" Sonic	ML	Sandy SILT:
33-35	8" Sonic	SM	Silty SAND with clay:
35-36.25	8" Sonic	SP/SM	SAND with silt:
36.25-40	8" Sonic	CH	CLAY:
40-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic	SP/SM	SAND with silt:
47.5-50	8" Sonic	SM	Silty SAND with clay:
50-51	8" Sonic	SC	Clayey SAND:
51-51.75	8" Sonic	SW	SAND:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53	8" Sonic	CH	Sandy CLAY:
53-54	8" Sonic		Sandy CLAY:
54-55	8" Sonic		CLAY:

TD = 55'; PVC 4-inch screen from 45 to 55; PVC 4-inch riser from -2.5 to 45
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

BA-U-2

Interval (feet)	Drilling Method	USCS	Sample Description
7/25/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	ML	Sandy SILT:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4	8" Sonic		SAND with silt:
4-5	8" Sonic	ML	SILT with sand and clay:
5-6	8" Sonic	SP/SM	SAND with silt:
6-7	8" Sonic	SP	SAND:
7-9	8" Sonic	SW	Gravelly SAND:
9-9.75	8" Sonic		Gravelly SAND:
9.75-10.25	8" Sonic	SP	Gravelly SAND:
10.25-11	8" Sonic	SP/SM	SAND with silt:
11-12.5	8" Sonic	CL	CLAY:
12.5-13	8" Sonic	SP	SAND:
13-15.5	8" Sonic		SAND:
15.5-18	8" Sonic		SAND:
18-22.5	8" Sonic		SAND:
22.5-23	8" Sonic		SAND:
23-23.5	8" Sonic	SM	Silty SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-30	8" Sonic	SM	Silty SAND:
30-32.5	8" Sonic	SC	Clayey SAND:
32.5-35	8" Sonic	SM	Silty SAND with clay:
35-37.5	8" Sonic		Silty SAND:
37.5-40	8" Sonic	CL	Sandy CLAY:
40-42	8" Sonic	SC	Clayey SAND:
42-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		Sandy CLAY:
47.5-51.75	8" Sonic		CLAY:
51.75-53	8" Sonic	SM	Silty SAND:
53-54	8" Sonic		Silty SAND:
54-55	8" Sonic	SC/SM	Clayey SAND with silt:
55-56.5	8" Sonic	CH	CLAY:
56.5-57.5	8" Sonic		CLAY:
57.5-60	8" Sonic	SC	Clayey SAND:
60-60.75	8" Sonic	SM	Silty SAND with clay:
60.75-61.5	8" Sonic	SC	Clayey SAND:
61.5-62.5	8" Sonic	SP	SAND:
62.5-63.5	8" Sonic		SAND:
63.5-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic		SAND:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs

IPSC

Delta, Utah

WWC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/26/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP	SAND:
2.5-5	8" Sonic		SAND:
5-6.75	8" Sonic	SM	Silty SAND:
6.75-7.5	8" Sonic	ML	Sandy SILT:
7.5-10	8" Sonic		Sandy SILT:
10-12	8" Sonic		Sandy SILT:
12-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	CL	Silty CLAY:
15-17.5	8" Sonic		Silty CLAY:
17.5-18.5	8" Sonic		Silty CLAY:
18.5-19	8" Sonic		Sandy CLAY:
19-20	8" Sonic		Silty CLAY:
20-22	8" Sonic	CH	CLAY:
22-24.5	8" Sonic		Sandy CLAY:
24.5-25.5	8" Sonic		Sandy CLAY:
25.5-27	8" Sonic		Sandy CLAY:
27-31	8" Sonic		CLAY:
31-31.5	8" Sonic		CLAY:
31.5-33	8" Sonic		CLAY:
33-34.5	8" Sonic		Sandy CLAY:
34.5-35	8" Sonic		Sandy CLAY:
35-37.5	8" Sonic	SM	Silty SAND:
37.5-40	8" Sonic		Silty SAND:
40-41.5	8" Sonic	SP	SAND:
41.5-42.5	8" Sonic		SAND:
42.5-44	8" Sonic		SAND:
44-45	8" Sonic		SAND:
45-46.5	8" Sonic	CH	CLAY:
46.5-47.5	8" Sonic		Sandy CLAY:
47.5-50.5	8" Sonic	SC/SM	SAND with silt and clay:
50.5-52.5	8" Sonic	SW	SAND:
52.5-53.5	8" Sonic		SAND:
53.5-55	8" Sonic	SM	Silty SAND:
55-57	8" Sonic		Silty SAND:
57-57.5	8" Sonic	CH	CLAY:
57.5-60			CLAY:

TD = 60'; PVC 4-inch screen from 48 to 58; PVC 4-inch riser from -2.5 to 48

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein

Boring Logs
IPSC
Delta, Utah

WWC-2

Interval (feet)	Driling Method	USCS	Sample Description
7/27/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SM	Silty SAND:
2.5-5	8" Sonic	SP	SAND:
5-7	8" Sonic		SAND:
7-9.5	8" Sonic	SW	Gravelly SAND:
9.5-10	8" Sonic	SW/SP	SAND:
10-12	8" Sonic	SP	SAND:
12-12.5	8" Sonic	SP/SW	Gravelly SAND:
12.5-14.5	8" Sonic	SW	Gravelly SAND:
14.5-15	8" Sonic	SP	SAND with gravel:
15-16	8" Sonic		SAND:
16-17.5	8" Sonic	CL	Sandy CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20	8" Sonic		Clayey SAND:
20-21	8" Sonic		Clayey SAND:
21-22	8" Sonic	CH	CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND with clay:
25-26.5	8" Sonic	SM/SC	Silty SAND and clay:
26.5-27.5	8" Sonic	SC	Clayey SAND with silt:
27.5-31.5	8" Sonic	CH	CLAY:
31.5-34	8" Sonic		Silty CLAY:
34-35.5	8" Sonic	SP	SAND:
35.5-37	8" Sonic	ML	Sandy SILT with clay:
37-38.5	8" Sonic	CL	Silty CLAY:
38.5-40	8" Sonic	SM	Silty SAND:
40-42	8" Sonic	CH	CLAY:
42-42.5	8" Sonic		Silty CLAY:
42.5-45	8" Sonic	SC	Clayey SAND:
45-46.25	8" Sonic	CH	CLAY:
46.25-46.75	8" Sonic	SW/SM	SAND with silt:
46.75-47	8" Sonic	ML	Sandy SILT:
47-47.5	8" Sonic	SM	Silty SAND:
47.5-50	8" Sonic	CH	CLAY:
50-51.5	8" Sonic	SM	Silty SAND:
51.5-52	8" Sonic	CH	Sandy CLAY:
52-52.5	8" Sonic	SM	CLAY:
52.5-53.5	8" Sonic	CH	Sandy CLAY:
53.5-55	8" Sonic	SM	Silty SAND:
55-56.25	8" Sonic	ML	Sandy SILT:
56.25-57.5	8" Sonic		SILT:
57.5-60	8" Sonic	SP/SM	SAND with silt:
60-61.5	8" Sonic	SM	Silty SAND:
61.5-62.5	8" Sonic	CH	CLAY:
62.5-63.75	8" Sonic	SP/SM	SAND with silt:
63.75-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND:
67.5-70	8" Sonic		Gravelly SAND:
70-70.5	8" Sonic	SC/SM	Silty SAND and clay:
70.5-72.5	8" Sonic	CH	CLAY:
72.5-75	8" Sonic		CLAY:

TD = 75'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWC-3

Interval (feet)	Drilling Method	USCS	Sample Description
7/30/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1	8" Sonic	SP	Gravelly SAND:
1-2.5	8" Sonic	SM	Silty SAND:
2.5-3.5	8" Sonic		Silty SAND:
3.5-5	8" Sonic	SP/SM	SAND with silt:
5-6.5	8" Sonic	ML	Sandy SILT:
6.5-7.5	8" Sonic	CL	Sandy CLAY:
7.5-8	8" Sonic	SM	Silty SAND:
8-10	8" Sonic	SC	Clayey SAND:
10-11	8" Sonic	SM	Silty SAND:
11-12.5	8" Sonic		Silty SAND with clay:
12.5-13.5	8" Sonic		Silty SAND:
13.5-14	8" Sonic	SC	Clayey SAND:
14-15	8" Sonic	SM	Silty SAND:
15-15.5	8" Sonic	CH	CLAY:
15.5-16	8" Sonic		CLAY:
16-16.5	8" Sonic		Sandy CLAY:
16.5-17.5	8" Sonic		Sandy CLAY:
17.5-20	8" Sonic		CLAY:
20-21	8" Sonic		CLAY:
21-22	8" Sonic		CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND:
25-26.25	8" Sonic	SP/SM	SAND with silt:
26.25-27	8" Sonic	SP	SAND:
27-29	8" Sonic	SM	Silty SAND:
29-30	8" Sonic	CH	CLAY:
30-31	8" Sonic		CLAY:
31-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-36	8" Sonic	CH	CLAY:
36-37	8" Sonic		CLAY:
37-39.5	8" Sonic	SP/SM	SAND with silt:
39.5-40.5	8" Sonic	SP	SAND:
40.5-41.5	8" Sonic		SAND:
41.5-43	8" Sonic	CH	CLAY:
43-44	8" Sonic	SP/SM	SAND with silt:
44-45	8" Sonic	SM	Silty SAND:
45-47.5	8" Sonic	SP	SAND:
47.5-50	8" Sonic	CH	CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic	SP	SAND:
55-61	8" Sonic		SAND:
61-62.5	8" Sonic	SW	SAND:
62.5-65	8" Sonic		SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-69.5	8" Sonic	SW	SAND:
69.5-70	8" Sonic	CH	CLAY:

TD = 70'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWC-4

Interval (feet)	Drilling Method	USCS	Sample Description
7/29/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-5	8" Sonic		SAND with silt:
5-6.25	8" Sonic	ML	Sandy SILT:
6.25-7.25	8" Sonic	CL	CLAY:
7.25-8	8" Sonic	SC	Clayey SAND:
8-9	8" Sonic	SP/SC	SAND with clay:
9-10	8" Sonic	SP	SAND:
10-11	8" Sonic	ML	SILT:
11-12.5	8" Sonic	ML/CL	Clayey SILT:
12.5-14	8" Sonic	CL	CLAY:
14-15	8" Sonic		Sandy CLAY:
15-16	8" Sonic	SC	Clayey SAND:
16-18	8" Sonic		Clayey SAND:
18-19.5	8" Sonic	SM	Silty SAND:
19.5-20	8" Sonic	CH	CLAY:
20-21.25	8" Sonic		Sandy CLAY:
21.25-22.5	8" Sonic	SM	Silty SAND:
22.5-23.75	8" Sonic	CH	CLAY:
23.75-25	8" Sonic	SM	Silty SAND:
25-25.75	8" Sonic	SC	Clayey SAND:
25.75-27.5	8" Sonic	CL	Sandy CLAY:
27.5-29	8" Sonic	CH	CLAY:
29-30.5	8" Sonic		CLAY:
30.5-31.5	8" Sonic	SM	Silty SAND:
31.5-32.25	8" Sonic	CL	Sandy CLAY:
32.25-32.5	8" Sonic		Sandy CLAY:
32.5-33	8" Sonic	CH	CLAY:
33-36	8" Sonic	SP/SM	SAND with silt:
36-37	8" Sonic	SM	Silty SAND:
37-40	8" Sonic	SP	SAND:
40-42.5	8" Sonic		SAND:
42.5-45	8" Sonic		SAND:
45-46	8" Sonic	SP/SW	SAND:
46-46.5	8" Sonic	CH	CLAY:
45.5-47.5	8" Sonic		Sandy CLAY:
47.5-48.5	8" Sonic		CLAY:
48.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		CLAY:
50.5-52.5	8" Sonic	SM	Silty SAND:
52.5-54	8" Sonic	CH	CLAY:
54-55	8" Sonic	SP	SAND:
55-57	8" Sonic	CH	Sandy CLAY:
57-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic	SM	Silty SAND:
60-62	8" Sonic		Silty SAND:
62-62.5	8" Sonic	SC	Clayey SAND:
62.5-63	8" Sonic	CH	Sandy CLAY:
63-65	8" Sonic	SM	Silty SAND:
65-67.5	8" Sonic	SW	SAND:
67.5-69.5	8" Sonic	SP	SAND:
69.5-70	8" Sonic	SW	SAND:
70-72	8" Sonic		SAND:
72-72.5	8" Sonic	SP/SM	SAND with silt:
72.5-75	8" Sonic	SM	Silty SAND:
75-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Logs
ISPC
Delta, Utah

WWC-5

Interval (feet)	Drilling Method	USCS	Sample Description
7/28/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4.25	8" Sonic	SM	Silty SAND:
4.25-5	8" Sonic	SP	SAND:
5-7.5	8" Sonic	ML	Clayey SILT:
7.5-9	8" Sonic	CL	Silty CLAY:
9-10	8" Sonic		Sandy CLAY:
10-10.5	8" Sonic	SC	Clayey SAND:
10.5-11.25	8" Sonic	CL	CLAY:
11.25-12.5	8" Sonic	ML	Clayey SILT:
12.5-13.25	8" Sonic	SM	Silty SAND:
13.25-13.75	8" Sonic	SC	Clayey SAND:
13.75-15	8" Sonic	CL	CLAY:
15-16	8" Sonic		CLAY:
16-17.5	8" Sonic	CH	CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20.5	8" Sonic	CH	CLAY:
20.5-21.25	8" Sonic		Sandy CLAY:
21.25-22	8" Sonic		CLAY:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-24	8" Sonic	SM	Silty SAND:
24-25	8" Sonic	CH	CLAY:
25-26	8" Sonic	SM/CH	Silty SAND / CLAY:
26-27.5	8" Sonic	CH	CLAY:
27.5-28	8" Sonic		Sandy CLAY:
28-28.25	8" Sonic	SM	Silty SAND:
28.25-30	8" Sonic	CH	CLAY:
30-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-37.5	8" Sonic		SAND:
37.5-40	8" Sonic	SP/SM	SAND with silt:
40-42.5	8" Sonic	CH	CLAY:
42.5-42.75	8" Sonic	SM	Silty SAND:
42.75-44	8" Sonic	CH	Sandy CLAY:
44-44.5	8" Sonic	SM	Silty SAND:
44.5-45	8" Sonic		Silty SAND:
45-45.5	8" Sonic		Silty SAND:
45.5-46.75	8" Sonic		Silty SAND:
46.75-47.5	8" Sonic	CH	CLAY:
47.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		Sandy CLAY:
50.5-51.5	8" Sonic		CLAY:
51.5-52	8" Sonic	SM	Silty SAND:
52-53.25	8" Sonic	CH	CLAY:
53.25-53.5	8" Sonic		CLAY:
53.5-54	8" Sonic	SC	Clayey SAND:
54-55	8" Sonic	SM/SC	Silty SAND and clay:
55-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic		SAND:
60-60.75	8" Sonic		SAND:
60.75-61.5	8" Sonic	CH	CLAY:
61.5-62.5	8" Sonic	SP/SM	SAND with silt:
62.5-64	8" Sonic		SAND with silt:
64-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND with gravel:
67.5-70	8" Sonic		Gravelly SAND:
70-72.5	8" Sonic		SAND:
72.5-75	8" Sonic		SAND:

TD = 75'; PVC 4-inch screen from 64 to 74; PVC 4-inch riser from -2.5 to 64
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein

Boring Log

ISPC

Delta, Utah

WWU-1

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-4.75	8" Sonic	SP	SAND:
4.75-5	8" Sonic	SC	Clayey SAND:
5-7	8" Sonic	SP/SM	SAND with silt:
7-10.75	8" Sonic	SC	Clayey SAND:
10.75-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SC	Clayey SAND:
13-14	8" Sonic	SM	Silty SAND:
14-15	8" Sonic	SP	SAND:
15-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22	8" Sonic	SP/SM	SAND with silt:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-25	8" Sonic	CL	Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-28	8" Sonic	SC	Clayey SAND:
28-30	8" Sonic	SW	Gravelly SAND:
30-32.5	8" Sonic	SP/SM	SAND with silt:
32.5-35	8" Sonic	SM	Silty SAND:
35-37.5	8" Sonic	SP	SAND:
37.5-40	8" Sonic		SAND:
40-42.5	8" Sonic	SW/SM	SAND with silt:
42.5-43.25	8" Sonic	SM	Silty SAND:
43.25-44.25	8" Sonic		Silty SAND:
44.25-45	8" Sonic	SP/SW	SAND:
45-47.5	8" Sonic	SW	SAND:
47.5-50	8" Sonic	SP	SAND:
50-50.5	8" Sonic		SAND:
50.5-51.75	8" Sonic	ML	Sandy SILT:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53.25	8" Sonic	SC	Clayey SAND:
53.25-55	8" Sonic		Clayey SAND:
55-56.5	8" Sonic		Clayey SAND:
56.5-57.5	8" Sonic		Clayey SAND:
57.5-60	8" Sonic		Clayey SAND:
60-61	8" Sonic	ML	Clayey SILT with sand:
61-62.5	8" Sonic	SM	Silty SAND:
62.5-63.75	8" Sonic	CL	Sandy CLAY:
63.75-64.75	8" Sonic	SM	Silty SAND:
64.75-65.5	8" Sonic	SP	SAND:
65.5-66.5	8" Sonic	ML	Clayey SILT with sand:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-70	8" Sonic	SM	Silty SAND with clay:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

WWU-2

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-2.5	8" Sonic	ML	Gravelly SILT with sand:
2.5-4	8" Sonic	SP	SAND:
4-5	8" Sonic		SAND:
5-5.5	8" Sonic		SAND:
5.5-7.5	8" Sonic		SAND:
7.5-9.5	8" Sonic	SP/SW	SAND:
9.5-10	8" Sonic	SP	SAND:
10-11	8" Sonic	SW	SAND:
11-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	ML	Sandy SILT:
15-15.5	8" Sonic	SP	SAND:
15.5-17	8" Sonic	SC	Clayey SAND with gravel:
17-17.5	8" Sonic	SW	Gravelly SAND with sand:
17.5-19	8" Sonic		SAND:
19-20	8" Sonic		SAND:
20-22.5	8" Sonic	GW	Sandy GRAVEL:
22.5-23.5	8" Sonic	SW	SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-32.5	8" Sonic		SAND with silt:
32.5-33.5	8" Sonic	SW/SC	Gravelly SAND with clay:
33.5-35	8" Sonic	SP/SM	SAND with silt:
35-37.5	8" Sonic		SAND with silt:
37.5-39	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
39-40	8" Sonic	SC	Clayey SAND:
40-45	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
45-45.5	8" Sonic	SM	Silty SAND with clay:
45.5-47.5	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
47.5-49.5	8" Sonic	CH/SC	Sandy CLAY/Clayey SAND:
49.5-50	8" Sonic	SP/SM	SAND with silt:
50-51.5	8" Sonic	SC	Clayey SAND:
51.5-52.5	8" Sonic	SP/SC	SAND with clay:
52.5-55	8" Sonic	SP	SAND:
55-56.5	8" Sonic	CH	Sandy CLAY:
56.5-57.5	8" Sonic	SC	Clayey SAND:
57.5-59	8" Sonic	ML	Clayey SILT with sand:
59-60	8" Sonic	CH	Sandy CLAY:
60-62.5	8" Sonic	SC	Clayey SAND:
62.5-64	8" Sonic	CH	Sandy CLAY:
64-65	8" Sonic	SM	Silty SAND:
65-66.5	8" Sonic	SP	SAND:
66.5-67.5	8" Sonic	SM	Silty SAND:
67.5-75	8" Sonic	SW	SAND:

TD = 75'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein

Boring Logs

ISPC

Delta, Utah

WWC-6

Interval (feet)	Drilling Method	USCS	Sample Description
03/23/2018 - 03/24/2018			
0-0.5	8" Sonic	SM	Silty sand
0.7-7	8" Sonic	SP	Sand, poorly graded, dry
7-12.5	8" Sonic	CH	Silty clay
12.5-15.5	8" Sonic	SM	Sand, some silt
15.5-19.5	8" Sonic	SP	Sand, poorly graded
19.5-21.5	8" Sonic	SW/GW	Sand and gravel
21.5-27	8" Sonic	SP	Sand, poorly graded, running sands @ ~26
27-29.5	8" Sonic	SP	Sand, poorly graded, running sands
29.5-30	8" Sonic	SW	Sand with gravel
30.37	8" Sonic	CH	Clay, stiff
37-41	8" Sonic	CH	Clay, trace silt, moist, stiff
41-47	8" Sonic	CH	Clay, stiff, moist
47-48	8" Sonic	SP	Sand
48-57	8" Sonic	SW	Sand, silt and gravel
57-59	8" Sonic	SP	Sand
59-60.5	8" Sonic	CH	Clay wet
60.5-64.5	8" Sonic	MH	Silt, trace clay
64.5-67	8" Sonic	CH	Clay wet
67-72	8" Sonic	CH	Clay wet
72-77	8" Sonic	SP	Sand, saturated
77-87	8" Sonic	CH	Clay

TD = 87'; PVC sump 87-77; 4" screen 77-67; sand 87-62 centralizers 67.5 and 76.5 Drilling Method: Sonic

Drilling Company - Cascade Drilling Driller - David Donnely
Geologist - Tom Fendler

Boring Logs

ISPC

Delta, Utah

WWC-7

Interval (feet)	Drilling Method	USCS	Sample Description
03/20/2018 - 03/23/2018			
0-1.5	8" Sonic	SM	Silty sand, dry
1.5-8.5	8" Sonic	SP	Sand, poorly graded, saturated at 7.5
8.5-9	8" Sonic	CH	Sandy clay
9-14	8" Sonic	SC	Clay with trace sand
14-24	8" Sonic	SP	Sand, poorly graded, saturated with heaving sands at 17 '
24-25	8" Sonic	SW/GW	Gravel/sand and gravel
25-27	8" Sonic	CH	Clay, moist
27-34.5	8" Sonic	SP	Sandy, wet
34.5-35.5	8" Sonic	SW/GW	Sand, some gravel
35.5-37	8" Sonic	CH	Clay, moist, stiff
37-47	8" Sonic	CH	Clay, moist, stiff
47-49.5	8" Sonic	CH	Clay, moist, stiff
49.5-50.5	8" Sonic	SP	Sand, poorly softed, moist
50.5-57	8" Sonic	CH	Clay, moist, stiff
57-67	8" Sonic	CH	Clay, moist, stiff
67-72	8" Sonic	CH	Clay, moist, stiff
72-77	8" Sonic	SP	Sand, poorly graded, saturated @76.5
77-87	8" Sonic	SP	Sand, poorly graded, saturated

TD = 87'; PVC 4-inch screen from 77 to 87; sand pack 72-87; bentonite pellets 67-72; grout 67-grade

Drilling Method: Sonic

Drilling Company - Cascade Drilling

Driller - David Donnely

Geologist - Tom Fendler

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DRILLING LOG

PROJECT NAME: Intermountain Power Plant
PROJECT No.: 07.00408.01
BORING/MONITORING WELL: RW-3
COMPLETION DATE: 12/16/2007

DRILLING FIRM: Boart Longyear
DRILLER: Robert
BORING METHOD: Sonic
LOGGED BY: Thomas Hedrick
BORING DIAMETER: 6.0-inch
DEPTH TO WATER (at drilling): ~ 40 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 30 ft.

RW-3

Interval (feet)	Drilling Method	Sample Description
0 - 9	SDM	Light Brown fine grained SAND with clay matrix
9 - 17	SDM	Light Brown clayey SILT
16 - 28	SDM	Light Brown silty CLAY
28 - 31	SDM	Light Brown fine grained SAND, moist
31 - 39	SDM	Light Brown CLAY
39 - 41	SDM	Light Brown fine grained SAND, with clay matrix, slightly moist
41 - 43	SDM	Light Brown fine grained SAND, moist
43 - 46	SDM	Light Brown fine to medium grained SAND, moist
46 - 48	SDM	Brown CLAY, Dry
48 - 51	SDM	Brown medium grained SAND with clay matrix, very moist
51 - 66	SDM	Brown medium grained SAND, saturated
		Total Depth = 62 feet BGS, Screened from 47 - 62 feet, Sand 43-62', Bentonite 40-43

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Top of 2 in PVC Casing Elevation (Relative Datum Survey): NA
Casing, solid: 0 - 47 ft.
Top of Manhole Cover (Relative Datum Survey): NA
Screen: 47 – 62 ft.
Sand Pack: Oglebay Norton "Colorado Si Sand" Industrial Sands Inc. 43 – 62 ft.
Bentonite Seal: "Pure Gold" Bentonite Pellets 40 – 43 ft.

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DRILLING LOG

PROJECT NAME: Intermountain Power Plant
PROJECT No.: 07.00408.01
BORING/MONITORING WELL: RW-4
COMPLETION DATE: 12/14/2007

DRILLING FIRM: Boart Longyear
DRILLER: Robert
BORING METHOD: Sonic
LOGGED BY: Thomas Hedrick
BORING DIAMETER: 8.0-inch
DEPTH TO WATER (at drilling): ~ 26 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 30 ft.

RW-4

Interval (feet)	Drilling Method	Sample Description
0 - 8	SDM	Light Brown fine grained SAND with clay matrix
8 - 13	SDM	Light Brown CLAY
13 - 18	SDM	Brown medium grained SAND, Moist
18 - 26	SDM	Reddish brown CLAY, dry
26 - 32	SDM	Brown fine grained SAND, saturated
32 - 36	SDM	Brown course to medium grained SAND, saturated
		Total Depth = 36 feet BGS, Screened from 26 - 36 feet, Sand 23-36', Bentonite 21-23

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Top of 4 in PVC Casing Elevation (Relative Datum Survey): NA
Casing, solid: 0 - 26 ft.
Top of Manhole Cover (Relative Datum Survey): NA
Screen: 26 – 36 ft.
Sand Pack: Oglebay Norton "Colorado Si Sand" Industrial Sands Inc. 23 – 36 ft.
Bentonite Seal: "Pure Gold" Bentonite Pellets 21 – 23 ft.

jbr environmental consultants, inc.

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
PROJECT No.: 07.00408.01
BORING/MONITORING WELL: RW-5
COMPLETION DATE: 12/12/2007

DRILLING FIRM: Boart Longyear
DRILLER: Robert
BORING METHOD: Sonic
LOGGED BY: Thomas Hedrick
BORING DIAMETER: 10.0-inch
DEPTH TO WATER (at drilling): ~ 60 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 30 ft.

RW-5

Interval (feet)	Drilling Method	Sample Description
0 - 7	SDM	Light Brown fine grained SAND with clay matrix
7 - 16	SDM	Light Brown fine grained Sand
16 - 21	SDM	Dark course grained Sand
21 - 28	SDM	Brown medium grained SAND with pebbles (23-26 no pebbles)
28 - 30	SDM	Light Brown silty CLAY, very tight, slight moist
30 - 37	SDM	Light Brown clayey SILT, slight moist
37 - 43	SDM	Light Brown CLAY
43 - 54	SDM	Reddish brown CLAY
54 - 56	SDM	Light Brown silty CLAY, Dry
56 - 58	SDM	Brown fine grained SAND, very moist
58 - 60	SDM	Brown Medium grained SAND, very moist
60 - 61	SDM	Brown fine grained SAND, saturated
61 - 66	SDM	Brown course grained SAND with pebbles, saturated
66 - 73	SDM	Brown fine grained SAND, saturated
73 - 76	SDM	Brown CLAY, dry
		Total Depth = 76 feet BGS, Screened from 56 - 76 feet, Sand 53.5 - 76', Bentonite 53.5 - 49.5'

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Top of 6 in PVC Casing Elevation (Relative Datum Survey): NA
Casing, solid: 0 - 56 ft.
Top of Manhole Cover (Relative Datum Survey): NA
Screen: 56 – 76 ft.
Sand Pack: Oglebay Norton “Colorado Si Sand” Industrial Sands Inc. 53.5 – 76 ft.
Bentonite Seal: “Pure Gold” Bentonite Pellets 53.5 – 49.5 ft.

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DRILLING LOG

PROJECT NAME: Intermountain Power Plant
PROJECT No.: 07.00408.01
BORING/MONITORING WELL: RW-6
COMPLETION DATE: 12/13/2007

DRILLING FIRM: Boart Longyear
DRILLER: Robert
BORING METHOD: Sonic
LOGGED BY: Thomas Hedrick
BORING DIAMETER: 8.0-inch
DEPTH TO WATER (at drilling): ~ 47 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 30 ft.

RW-6

Interval (feet)	Drilling Method	Sample Description
0 - 9	SDM	Light Brown fine grained SAND with clay matrix
9 - 17	SDM	Light Brown clayey SILT
17 - 20	SDM	Light Brown silty CLAY, dry
20 - 33	SDM	Brown medium grained SAND, dry
30 - 33	SDM	Light Brown CLAY, Moist
33 - 37	SDM	Brown medium grained SAND, with pebbles, slightly moist
37 - 39	SDM	Brown fine grained SAND , moist
39 - 44	SDM	Reddish gray CLAY, dry
44 - 47	SDM	Gray CLAY, dry
47 - 56	SDM	Brown fine grained SAND, Saturated
		Total Depth = 56 feet BGS, Screened from 46 - 56 feet, Sand 42-56', Bentonite 38-42

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Top of 4 in PVC Casing Elevation (Relative Datum Survey): NA
Casing, solid: 0 - 46 ft.
Top of Manhole Cover (Relative Datum Survey): NA
Screen: 46 – 56 ft.
Sand Pack: Oglebay Norton "Colorado Si Sand" Industrial Sands Inc. 42 – 56 ft.
Bentonite Seal: "Pure Gold" Bentonite Pellets 38 – 42 ft.

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DRILLING LOG

PROJECT NAME: Intermountain Power Plant
PROJECT No.: 07.00408.01
BORING/MONITORING WELL: RW-7
COMPLETION DATE: 12/14/2007

DRILLING FIRM: Boart Longyear
DRILLER: Robert
BORING METHOD: Sonic
LOGGED BY: Thomas Hedrick
BORING DIAMETER: 8.0-inch
DEPTH TO WATER (at drilling): ~ 36 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 30 ft.

RW-7

Interval (feet)	Drilling Method	Sample Description
0 - 8	SDM	Light Brown fine grained SAND with clay matrix
8 - 12	SDM	Brown silty CLAY
12 - 13	SDM	White fine grained SAND
13 - 19	SDM	Reddish brown CLAY
19 - 22	SDM	Brown silty CLAY
22 - 28	SDM	Course to medium grained SAND with Pebbles, moist
28 - 31	SDM	Brown silty fine grained SAND, moist
31 - 32	SDM	Brown silty CLAY, moist
32 - 36	SDM	Brown CLAY, dry
36 - 46	SDM	Brown medium to course grained SAND, Saturated
46-76		Reddish brown CLAY, dry
		Total Depth = 46 feet BGS, Screened from 36 - 46 feet, Sand 33-46', Bentonite 29-33'

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Top of 4 in PVC Casing Elevation (Relative Datum Survey): NA
Casing, solid: 0 - 36 ft.
Top of Manhole Cover (Relative Datum Survey): NA
Screen: 36 – 46 ft.
Sand Pack: Oglebay Norton “Colorado Si Sand” Industrial Sands Inc. 33 – 46 ft.
Bentonite Seal: “Pure Gold” Bentonite Pellets 29 – 33 ft.

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
BORING/MONITORING WELL: RW-9
DRILLING FIRM: WDC Exploration & Wells
BORING METHOD: Hollow Stem Auger
BORING DIAMETER: 8.0-inch

PROJECT No.: 08.00463.01
COMPLETION DATE: 9/30/2008
DRILLER: Dennis
LOGGED BY: Thomas Hedrick
DEPTH TO WATER (at drilling): ~ 45 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 40 ft.

RW-9

Interval (feet)	Drilling Method	Sample Description
5 - 6.5	HSA	Brown to orange fine grained sand with pebbles, Dry
10 - 11.5	HSA	Brown silty CLAY, dry
15 - 16.5	HSA	Light brown fine grained silty SAND, dry
20 - 21.5	HSA	Light brown to light gray silty CLAY, dry,
25 - 26.5	HSA	Light brown to light gray CLAY, with interbeds of silty SAND, dry
30 - 31.5	HSA	Brown to black medium grained SAND, with pebbles, dry
35 - 35.5	HSA	Light brown fine grained SAND, dry
35.5 - 36.5	HSA	Dark brown, black to orange medium grained SAND, moist
40 - 41.5	HSA	Same as above, moist
45 - 46.5	HSA	Same as above, saturated
50 - 51.5	HSA	NA Heaving sands
		Diameter = 4 inch, Total Depth = 50 feet BGS, Screened from 35 - 50 feet, Sand 33-50', Bentonite 31-33'

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Casing, solid: 0 - 35 ft.
Screen: 35 – 50 ft.
Sand Pack: Oglebay Norton “Colorado Si Sand” Industrial Sands Inc. 33 – 50 ft.
Bentonite Seal: “Pure Gold” Bentonite Pellets 31 – 33 ft.

Top of 4 in PVC Casing Elevation (Relative Datum Survey): NA
Top of Manhole Cover (Relative Datum Survey): NA

January 28, 2019

Appendix B A Copy of Stantec's Tabulation of UTL, GWPS, and Confidence Limit Data

Assessment Monitoring - Statistically Significant Levels above Groundwater Protection Standards
Intermountain Power Service Corporation - Intermountain Generation Facility
Delta, Utah

Constituent	Downgradient Well ID	N	Mean	SD	SE	Median	1st Quartile	3rd Quartile	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	LCL Exceeds GWPS
BOTTOM ASH BASIN																
lithium (mg/L)	BAC-3	11	1.369	0.6401	0.193	1.06	0.944	2.13	0.812	2.53	0.0%	0.7415	0.04	0.7415	0.812	YES
molybdenum (mg/L)	BAC-2	11	0.1595	0.01643	0.004953	0.156	0.143	0.167	0.14	0.194	0.0%	0.04038	0.1	0.1	0.1506	YES
COMBUSTION BY-PRODUCTS LANDFILL																
NO STATISTICALLY SIGNIFICANT LEVELS ABOVE GWPS																
WASTE WATER BASIN																
arsenic (mg/L)	WWC-1	11	0.01664	0.006735	0.002031	0.0181	0.0173	0.02	0.00331	0.0243	0.0%	0.01275	0.01	0.01275	0.01496	YES
arsenic (mg/L)	WWC-2	11	0.01455	0.0007488	0.0002258	0.0147	0.0141	0.0152	0.0129	0.0155	0.0%				0.01415	YES
arsenic (mg/L)	WWC-3	11	0.02086	0.003704	0.001117	0.0214	0.021	0.0226	0.0102	0.0247	0.0%				0.02045	YES

All units micrograms per liter (mg/L)
N: Number of Samples
SD: Standard Deviation
SE: Standard Error
UTL: Upper Tolerance Limit, calculated using samples collected from upgradient wells
Bottom Ash upgrandient wells: BA-U-1, BA-U-2 (n=22)
Waste Water upgradient wells: WW-U-1, WW-U-2, SI-U-1 (n=33)
GWPS: Ground water Protection Standard = the greater value of the UTL or MCL
LCL: Lower Confidence Limit of the Mean, If the LCL exceeds the GWPS it is evidence of a statistically significant level above background

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	UCL	LCL Exceeds GWPS2	UCL Exceeds GWPS
antimony (mg/L)	Background	33	0.00103	0.0001741	0.0000303	0.001	0.001	0.001	0.001	0.002	96.97	0.001	0.006	0.006				
antimony (mg/L)	WWC-1	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	33	0.006554	0.002831	0.0004929	0.00573	0.004425	0.00935	0.001	0.0109	3.03	0.01275	0.01	0.01275				
arsenic (mg/L)	WWC-1	11	0.01664	0.006735	0.002031	0.0181	0.0173	0.02	0.00331	0.0243	0				0.01496	0.0203	YES	YES
arsenic (mg/L)	WWC-2	11	0.01455	0.0007488	0.0002258	0.0147	0.0141	0.0152	0.0129	0.0155	0				0.01415	0.01496	YES	YES
arsenic (mg/L)	WWC-3	11	0.02086	0.003704	0.001117	0.0214	0.021	0.0226	0.0102	0.0247	0				0.02045	0.02262	YES	YES
arsenic (mg/L)	WWC-4	11	0.01206	0.002721	0.0008204	0.013	0.0116	0.0135	0.00498	0.0145	0				0.01147	0.01344	NO	YES
arsenic (mg/L)	WWC-5	11	0.008509	0.002536	0.0007647	0.00783	0.00717	0.0104	0.00371	0.0131	0				0.007123	0.009895	NO	NO
barium (mg/L)	Background	33	0.07908	0.02935	0.005109	0.0761	0.05565	0.09225	0.0446	0.178	0	0.1481	2	2				
barium (mg/L)	WWC-1	11	0.03876	0.01967	0.00593	0.0317	0.0268	0.0536	0.0209	0.077	0				0.02755	0.04481	NO	NO
barium (mg/L)	WWC-2	11	0.03947	0.007406	0.002233	0.0361	0.0339	0.0421	0.031	0.0543	0				0.03543	0.04352	NO	NO
barium (mg/L)	WWC-3	11	0.03304	0.01088	0.003279	0.0302	0.0278	0.0342	0.0242	0.0638	0				0.0242	0.0357	NO	NO
barium (mg/L)	WWC-4	11	0.0646	0.01769	0.005334	0.061	0.0507	0.0768	0.0463	0.101	0				0.05493	0.07427	NO	NO
barium (mg/L)	WWC-5	11	0.05179	0.02411	0.00727	0.0438	0.034	0.067	0.0302	0.103	0				0.03844	0.06223	NO	NO
beryllium (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	33	0.004887	0.0006476	0.0001127	0.005	0.005	0.005	0.00128	0.005	96.97	0.005	0.005	0.005				
cadmium (mg/L)	WWC-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-5	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
chromium (mg/L)	Background	33	0.00627	0.012	0.002088	0.00217	0.002	0.00481	0.000602	0.067	27.27	0.067	0.1	0.1				
chromium (mg/L)	WWC-1	11	0.00337	0.00355	0.00107	0.002	0.002	0.00348	0.002	0.0139	72.73				0.002	0.00369	NO	NO
chromium (mg/L)	WWC-2	11	0.004285	0.006663	0.002009	0.002	0.002	0.00335	0.002	0.0243	72.73				0.002	0.00348	NO	NO
chromium (mg/L)	WWC-3	11	0.002442	0.001151	0.0003471	0.002	0.002	0.002	0.002	0.00577	81.82				0.002	0.00309	NO	NO
chromium (mg/L)	WWC-4	11	0.002615	0.002041	0.0006155	0.002	0.002	0.002	0.002	0.00877	90.91				0.002	0.002	NO	NO
chromium (mg/L)	WWC-5	11	0.002665	0.002078	0.0006264	0.002	0.002	0.00202	0.002	0.00892	72.73				0.002	0.00238	NO	NO
cobalt (mg/L)	Background	33	0.004097	0.000557	0.00009697	0.004	0.004	0.004	0.004	0.0072	96.97	0.0072	0.006	0.0072				
cobalt (mg/L)	WWC-1	11	0.004522	0.001352	0.0004077	0.004	0.004	0.004	0.004	0.00842	81.82				0.004	0.00532	NO	NO
cobalt (mg/L)	WWC-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-5	11	0.004136	0.0004523	0.0001364	0.004	0.004	0.004	0.004	0.0055	90.91				0.004	0.004	NO	NO
fluoride (mg/L)	Background	33	0.4106	0.2331	0.04058	0.458	0.276	0.548	0	1.01	15.15	0.9086	4	4				
fluoride (mg/L)	WWC-1	11	0.1627	0.1651	0.04978	0.133	0	0.256	0	0.507	36.36				0.0767	0.2488	NO	NO
fluoride (mg/L)	WWC-2	11	0.4225	0.1728	0.0521	0.42	0.358	0.452	0.158	0.833	0				0.328	0.5169	NO	NO
fluoride (mg/L)	WWC-3	11	0.9894	0.09192	0.02772	1.01	0.897	1.06	0.845	1.13	0				0.9391	1.04	NO	NO
fluoride (mg/L)	WWC-4	11	0.4473	0.08237	0.02484	0.435	0.387	0.509	0.319	0.576	0				0.4023	0.4923	NO	NO
fluoride (mg/L)	WWC-5	11	0.3261	0.1374	0.04143	0.331	0.292	0.401	0	0.544	9.091				0.251	0.4012	NO	NO
lead (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lithium (mg/L)	Background	33	0.5821	0.3149	0.05482	0.479	0.4385	0.784	0.235	1.35	0	1.35	0.04	1.35				
lithium (mg/L)	WWC-1	11	1.325	0.7251	0.2186	0.964	0.819	2.18	0.755	2.69	0				0.755	2.41	NO	YES
lithium (mg/L)	WWC-2	11	0.1539	0.05544	0.01672	0.124	0.112	0.225	0.104	0.243	0				0.104	0.241	NO	NO
lithium (mg/L)	WWC-3	11	0.1649	0.04891	0.01475	0.139	0.127	0.23	0.123	0.243	0				0.123	0.241	NO	NO
lithium (mg/L)	WWC-4	11	0.5123	0.2318	0.0699	0.382	0.351	0.75	0.309	0.909	0				0.309	0.879	NO	NO
lithium (mg/L)	WWC-5	11	1.106	1.165	0.3513	0.555	0.497	1.4	0.472	4.41	0				0.472	1.41	NO	YES
mercury (mg/L)	Background	33	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	WWC-1	11	0.0002225	0.00006787	0.00002046	0.000198	0.000168	0.00031	0.00015	0.000328	18.18				0.0001872	0.0002579	NO	NO
mercury (mg/L)	WWC-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	33	0.008239	0.00735	0.001279	0.00619	0.00286	0.009505	0.00182	0.0342	0	0.02676	0.1	0.1				
molybdenum (mg/L)	WWC-1	11	0.008871	0.00245	0.0007387	0.00896	0.0068	0.00995	0.00596	0.0147	0				0.007532	0.01021	NO	NO
molybdenum (mg/L)	WWC-2	11	0.004055	0.001372	0.0004137	0.00372	0.00341	0.00402	0.00304	0.00809	0				0.00304	0.00405	NO	NO
molybdenum (mg/L)	WWC-3	11	0.008955	0.01226	0.003697	0.00537	0.00482	0.00574	0.00464	0.0459	0				0.00464	0.00593	NO	NO
molybdenum (mg/L)	WWC-4	11	0.002949	0.002736	0.0008249	0.00215	0.001	0.00467	0.001	0.0082	45.45				0.001	0.00783	NO	NO
molybdenum (mg/L)	WWC-5	11	0.008649	0.007883	0.002377	0.00523	0.00324	0.0119	0.00301	0.0265	0				0.004262	0.009735	NO	NO
radium226and228combined (pCi/L)	Background	30	1.633	0.7959	0.1453	1.54	1.045	2.19	0.27	3.3	0	3.4	5	5				
radium226and228combined (pCi/L)	WWC-1	10	1.56	0.551	0.1743	1.41	1.15	2.18	0.96	2.51	0				1.241	1.879	NO	NO
radium226and228combined (pCi/L)	WWC-2	10	0.86	0.5302	0.1677	0.715	0.515	1.23	0	1.89	10				0.5526	1.167	NO	NO
radium226and228combined (pCi/L)	WWC-3	10	0.801	1.124	0.3553	0.445	0.015	1.475	-0.14	3.43	10				0.02739	0.9845	NO	NO
radium226and228combined (pCi/L)	WWC-4	10	0.846	0.5889	0.1862	0.815	0.375	1.2	-0.02	1.97	10				0.5046	1.187	NO	NO
radium226and228combined (pCi/L)	WWC-5	10	1.511	0.4353	0.1377	1.555	1.12	1.77	0.92	2.42	0				1.259	1.763	NO	NO
selenium (mg/L)	Background	33	0.005938	0.003461	0.0006026	0.00617	0.002	0.007975	0.002	0.0122	33.33	0.0122	0.05	0.05				
selenium (mg/L)	WWC-1	11	0.01358	0.002457	0.0007407	0.0145	0.0139	0.015	0.00824	0.0153	0				0.00824	0.0152	NO	NO
selenium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	WWC-4	11	0.002142	0.0001713	0.00005166	0.00207	0.002	0.00238	0.002	0.00241	36.36				0.002	0.00239	NO	NO
selenium (mg/L)	WWC-5	11	0.003691	0.0007226	0.0002179	0.00395	0.00336	0.0041	0.002	0.00478	9.091				0.003296	0.004086	NO	NO

thallium (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTLs	MCL	GWPS	LC L	UCL	LCL Exceed GWPS	UCL Exceed GWPS
antimony (mg/L)	Background	22	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100	0.001	0.006	0.006				
antimony (mg/L)	CLW-1	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-6	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-7	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-8	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	22	0.03012	0.006689	0.001426	0.02775	0.0251	0.0333	0.0236	0.0507	0	0.047	0.01	0.047				
arsenic (mg/L)	CLW-1	11	0.02857	0.001619	0.0004882	0.0285	0.0266	0.0298	0.0264	0.0309	0				0.02769	0.02946	NO	NO
arsenic (mg/L)	CLW-2	11	0.02601	0.001529	0.0004609	0.0258	0.0246	0.0277	0.0243	0.0284	0				0.02517	0.02684	NO	NO
arsenic (mg/L)	CLW-3	11	0.03979	0.002278	0.000687	0.0402	0.0378	0.0412	0.0364	0.0437	0				0.03855	0.04104	NO	NO
arsenic (mg/L)	CLW-4	11	0.03304	0.005682	0.001713	0.0352	0.0308	0.0375	0.0196	0.0388	0				0.02993	0.03614	NO	NO
arsenic (mg/L)	CLW-5	11	0.02075	0.001594	0.0004806	0.021	0.0189	0.0216	0.0182	0.023	0				0.01987	0.02162	NO	NO
arsenic (mg/L)	CLW-6	11	0.01817	0.005867	0.001769	0.0164	0.0143	0.0246	0.0104	0.0287	0				0.01497	0.02138	NO	NO
arsenic (mg/L)	CLW-7	11	0.02379	0.00104	0.0003135	0.0239	0.0234	0.0244	0.0215	0.0257	0				0.02322	0.02436	NO	NO
arsenic (mg/L)	CLW-8	11	0.02325	0.00291	0.0008773	0.0239	0.0224	0.0254	0.0155	0.0258	0				0.0222	0.02476	NO	NO
barium (mg/L)	Background	22	0.09319	0.0127	0.002708	0.0915	0.087	0.0957	0.0758	0.129	0	0.129	2	2				
barium (mg/L)	CLW-1	11	0.06474	0.01389	0.004187	0.0615	0.0582	0.0648	0.053	0.105	0				0.053	0.0668	NO	NO
barium (mg/L)	CLW-2	11	0.08037	0.007668	0.002312	0.0811	0.072	0.0855	0.0711	0.0957	0				0.07618	0.08456	NO	NO
barium (mg/L)	CLW-3	11	0.09952	0.006035	0.00182	0.0995	0.0948	0.103	0.089	0.111	0				0.09622	0.1028	NO	NO
barium (mg/L)	CLW-4	11	0.09573	0.01558	0.004697	0.09	0.0801	0.109	0.0786	0.122	0				0.08721	0.1042	NO	NO
barium (mg/L)	CLW-5	11	0.07757	0.007172	0.002163	0.0801	0.0714	0.0851	0.0671	0.0869	0				0.07365	0.08149	NO	NO
barium (mg/L)	CLW-6	11	0.09176	0.003801	0.001146	0.0902	0.0885	0.0961	0.0873	0.0976	0				0.08969	0.09384	NO	NO
barium (mg/L)	CLW-7	11	0.05569	0.008609	0.002596	0.0539	0.0514	0.0581	0.0475	0.0794	0				0.0475	0.0593	NO	NO
barium (mg/L)	CLW-8	11	0.07477	0.01305	0.003936	0.0707	0.0643	0.0797	0.0609	0.107	0				0.06764	0.08191	NO	NO
beryllium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	22	0.004802	0.0009274	0.0001977	0.005	0.005	0.005	0.00065	0.005	95.45	0.005	0.005	0.005				
cadmium (mg/L)	CLW-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-5	10	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-6	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-7	10	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-8	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
chromium (mg/L)	Background	22	0.002286	0.001172	0.0002499	0.002	0.002	0.002	0.000529	0.00613	81.82	0.00613	0.1	0.1				
chromium (mg/L)	CLW-1	11	0.007546	0.008927	0.002692	0.002	0.002	0.0157	0.00102	0.0271	45.45				0.00102	0.0187	NO	NO
chromium (mg/L)	CLW-2	11	0.003625	0.003655	0.001102	0.002	0.002	0.00411	0.002	0.014	72.73				0.002	0.00576	NO	NO
chromium (mg/L)	CLW-3	11	0.001997	0.0006608	0.0001992	0.002	0.002	0.002	0.000505	0.00346	81.82				0.000505	0.002	NO	NO
chromium (mg/L)	CLW-4	11	0.00652	0.01496	0.004511	0.002	0.002	0.002	0.000762	0.0516	72.73				0.000762	0.00336	NO	NO
chromium (mg/L)	CLW-5	11	0.002622	0.002475	0.0007463	0.002	0.002	0.002	0.000712	0.00999	72.73				0.000712	0.00214	NO	NO
chromium (mg/L)	CLW-6	11	0.002869	0.00296	0.0008924	0.002	0.002	0.002	0.000612	0.0116	72.73				0.000612	0.00335	NO	NO
chromium (mg/L)	CLW-7	11	0.00338	0.00254	0.0007658	0.002	0.002	0.00421	0.002	0.00891	63.64				0.002	0.00772	NO	NO
chromium (mg/L)	CLW-8	11	0.00317	0.003032	0.0009141	0.002	0.002	0.00224	0.002	0.012	72.73				0.002	0.00463	NO	NO
cobalt (mg/L)	Background	22	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100	0.004	0.006	0.006				
cobalt (mg/L)	CLW-1	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-5	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-6	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-7	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-8	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
fluoride (mg/L)	Background	22	0.9517	0.1236	0.02635	0.976	0.8675	1.02	0.611	1.17	0	1.242	4	4				
fluoride (mg/L)	CLW-1	11	1.045	0.1158	0.03492	1.06	1.02	1.15	0.834	1.18	0				0.982	1.109	NO	NO
fluoride (mg/L)	CLW-2	11	1.132	0.1564	0.04715	1.18	1.13	1.21	0.695	1.29	0				1.094	1.209	NO	NO
fluoride (mg/L)	CLW-3	11	1.234	0.1135	0.03422	1.23	1.19	1.33	0.948	1.35	0				1.18	1.296	NO	NO
fluoride (mg/L)	CLW-4	11	1.442	0.1068	0.03219	1.44	1.35	1.53	1.27	1.6	0				1.383	1.5	NO	NO
fluoride (mg/L)	CLW-5	11	1.728	0.1058	0.0319	1.71	1.69	1.82	1.51	1.83	0				1.67	1.786	NO	NO
fluoride (mg/L)	CLW-6	11	1.592	0.1303	0.03928	1.61	1.46	1.73	1.38	1.73	0				1.521	1.663	NO	NO
fluoride (mg/L)	CLW-7	11	1.009	0.1205	0.03632	1.02	0.945	1.11	0.792	1.16	0				0.9427	1.074	NO	NO
fluoride (mg/L)	CLW-8	11	0.9985	0.1176	0.03545	1.03	0.933	1.08	0.782	1.13	0				0.9342	1.063	NO	NO
lead (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

lithium (mg/L)	Background	22	0.2651	0.07813	0.01666	0.2155	0.207	0.3485	0.19	0.401	0	0.401	0.04	0.401				
lithium (mg/L)	CLW-1	11	0.2355	0.07161	0.02159	0.192	0.184	0.316	0.173	0.361	0				0.173	0.318	NO	NO
lithium (mg/L)	CLW-2	11	0.2844	0.09059	0.02731	0.227	0.219	0.391	0.211	0.438	0				0.211	0.396	NO	NO
lithium (mg/L)	CLW-3	11	0.2722	0.08772	0.02645	0.217	0.214	0.368	0.197	0.435	0				0.197	0.375	NO	NO
lithium (mg/L)	CLW-4	11	0.2514	0.07328	0.02209	0.204	0.199	0.336	0.189	0.375	0				0.189	0.338	NO	NO
lithium (mg/L)	CLW-5	11	0.217	0.1204	0.03631	0.21	0.188	0.346	0.025	0.411	0				0.1511	0.2828	NO	NO
lithium (mg/L)	CLW-6	11	0.2383	0.09904	0.02986	0.203	0.193	0.333	0.05	0.4	9.091				0.1841	0.2924	NO	NO
lithium (mg/L)	CLW-7	11	0.2294	0.06576	0.01983	0.189	0.182	0.302	0.169	0.331	0				0.169	0.327	NO	NO
lithium (mg/L)	CLW-8	11	0.2343	0.06641	0.02002	0.192	0.188	0.308	0.176	0.35	0				0.176	0.32	NO	NO
mercury (mg/L)	Background	22	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	CLW-1	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-6	11	0.01677	0.05513	0.01662	0.00015	0.00015	0.00015	0.00015	0.183	90.91				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-7	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-8	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	22	0.004216	0.000791	0.0001686	0.00403	0.003815	0.004215	0.00359	0.00733	0	0.00733	0.1	0.1				
molybdenum (mg/L)	CLW-1	11	0.005008	0.001067	0.0003218	0.00454	0.00407	0.00589	0.00388	0.0068	0				0.004425	0.005591	NO	NO
molybdenum (mg/L)	CLW-2	11	0.004662	0.0004551	0.0001372	0.00461	0.00437	0.00472	0.00427	0.00593	0				0.00427	0.00481	NO	NO
molybdenum (mg/L)	CLW-3	11	0.004852	0.0001833	0.00005526	0.00483	0.00472	0.00498	0.00463	0.0052	0				0.004752	0.004952	NO	NO
molybdenum (mg/L)	CLW-4	11	0.006171	0.002332	0.0007033	0.00525	0.00459	0.00762	0.00414	0.0115	0				0.004892	0.007143	NO	NO
molybdenum (mg/L)	CLW-5	11	0.006953	0.00147	0.0004431	0.00679	0.0054	0.00841	0.00519	0.00922	0				0.00615	0.007756	NO	NO
molybdenum (mg/L)	CLW-6	11	0.008009	0.002976	0.0008972	0.00746	0.00711	0.0105	0.001	0.0117	9.091				0.006383	0.009635	NO	NO
molybdenum (mg/L)	CLW-7	11	0.01692	0.04282	0.01291	0.00396	0.00331	0.00425	0.00329	0.146	0				0.00329	0.00638	NO	NO
molybdenum (mg/L)	CLW-8	11	0.004575	0.0007728	0.000233	0.00435	0.00391	0.00503	0.00359	0.00626	0				0.004153	0.004998	NO	NO
radium226and228combined (pCi/L)	Background	20	1.207	0.7924	0.1772	1.11	0.71	1.66	0	3.7	5	3.106	5	5				
radium226and228combined (pCi/L)	CLW-1	10	1.24	0.6247	0.1975	1.25	0.54	1.885	0.34	2.16	0				0.8779	1.602	NO	NO
radium226and228combined (pCi/L)	CLW-2	10	1.333	0.6785	0.2146	1.195	0.965	1.48	0.65	3.12	0				0.9641	1.603	NO	NO
radium226and228combined (pCi/L)	CLW-3	10	0.998	0.5829	0.1843	1.18	0.465	1.56	0	1.7	10				0.6601	1.336	NO	NO
radium226and228combined (pCi/L)	CLW-4	10	1.063	0.6487	0.2051	1.03	0.49	1.605	0.22	2.24	0				0.687	1.439	NO	NO
radium226and228combined (pCi/L)	CLW-5	10	1.165	0.8818	0.2788	1.015	0.455	2.185	0	2.6	10				0.6538	1.676	NO	NO
radium226and228combined (pCi/L)	CLW-6	10	1.036	0.5369	0.1698	1.02	0.52	1.47	0.25	1.99	0				0.7248	1.347	NO	NO
radium226and228combined (pCi/L)	CLW-7	10	0.682	0.346	0.1094	0.625	0.465	0.93	0.14	1.4	0				0.4814	0.8826	NO	NO
radium226and228combined (pCi/L)	CLW-8	10	0.921	0.5334	0.1687	1.02	0.42	1.305	0.09	1.85	0				0.6118	1.23	NO	NO
selenium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.05	0.05				
selenium (mg/L)	CLW-1	11	0.001903	0.0003232	0.00009745	0.002	0.002	0.002	0.000928	0.002	90.91				0.000928	0.002	NO	NO
selenium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-6	11	0.002436	0.001447	0.0004364	0.002	0.002	0.002	0.002	0.0068	90.91				0.002	0.002	NO	NO
selenium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	UCL	LCL Exceeds GWPS	UCL Exceeds GWPS
antimony (mg/L)	Background	22	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100	0.001	0.006	0.006				
antimony (mg/L)	BAC-1	11	0.001212	0.0004318	0.0001302	0.001	0.001	0.00138	0.001	0.00237	72.73				0.001	0.00158	NO	NO
antimony (mg/L)	BAC-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-6	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-7	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	22	0.01936	0.01013	0.00216	0.02085	0.01585	0.02415	0.001	0.0362	9.091	0.04317	0.01	0.04317				
arsenic (mg/L)	BAC-1	11	0.01477	0.002596	0.0007828	0.0146	0.0129	0.0164	0.0103	0.0202	0				0.01335	0.01619	NO	NO
arsenic (mg/L)	BAC-2	11	0.04513	0.005039	0.001519	0.0444	0.0416	0.0469	0.0386	0.0565	0				0.04237	0.04788	NO	YES
arsenic (mg/L)	BAC-3	11	0.03214	0.01602	0.004831	0.0239	0.0192	0.0496	0.0158	0.0588	0				0.02259	0.03865	NO	NO
arsenic (mg/L)	BAC-4	11	0.03271	0.00833	0.002512	0.0352	0.0322	0.0362	0.00882	0.0407	0				0.03142	0.03659	NO	NO
arsenic (mg/L)	BAC-5	11	0.03282	0.003337	0.001006	0.0325	0.0297	0.0357	0.0275	0.0392	0				0.03099	0.03464	NO	NO
arsenic (mg/L)	BAC-6	11	0.01851	0.005069	0.001528	0.0214	0.0134	0.0229	0.0115	0.0248	0				0.01574	0.02128	NO	NO
arsenic (mg/L)	BAC-7	11	0.02408	0.00717	0.002162	0.0234	0.0191	0.0241	0.0154	0.0434	0				0.02023	0.02683	NO	NO
barium (mg/L)	Background	22	0.1102	0.03251	0.006932	0.1055	0.08195	0.139	0.0636	0.175	0	0.1866	2	2				
barium (mg/L)	BAC-1	11	0.1682	0.2106	0.06349	0.0643	0.049	0.279	0.0391	0.702	0				0.0391	0.39	NO	NO
barium (mg/L)	BAC-2	11	0.02595	0.008703	0.002624	0.0228	0.021	0.0248	0.0202	0.0472	0				0.0202	0.0385	NO	NO
barium (mg/L)	BAC-3	11	0.04248	0.0155	0.004672	0.0376	0.0317	0.048	0.0306	0.0827	0				0.03428	0.04787	NO	NO
barium (mg/L)	BAC-4	11	0.06728	0.01782	0.005373	0.0705	0.0666	0.0772	0.0171	0.0821	0				0.06453	0.07578	NO	NO
barium (mg/L)	BAC-5	11	0.08295	0.008322	0.002509	0.0877	0.0736	0.0893	0.0706	0.0928	0				0.07841	0.0875	NO	NO
barium (mg/L)	BAC-6	11	0.04864	0.02748	0.008286	0.0287	0.0245	0.0781	0.0227	0.0859	0				0.0227	0.0833	NO	NO
barium (mg/L)	BAC-7	11	0.02886	0.0109	0.003288	0.026	0.0214	0.0315	0.0195	0.0577	0				0.0231	0.03327	NO	NO
beryllium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	22	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100	0.005	0.005	0.005				
cadmium (mg/L)	BAC-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-5	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-6	11	0.004607	0.001303	0.000393	0.005	0.005	0.005	0.000677	0.005	90.91				0.000677	0.005	NO	NO
cadmium (mg/L)	BAC-7	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
chromium (mg/L)	Background	22	0.002836	0.002757	0.0005879	0.002	0.002	0.00208	0.000506	0.0125	68.18	0.0125	0.1	0.1				
chromium (mg/L)	BAC-1	11	0.0195	0.03328	0.01003	0.00612	0.00451	0.0184	0.0028	0.114	0				0.0028	0.0412	NO	NO
chromium (mg/L)	BAC-2	11	0.008191	0.003057	0.0009216	0.00777	0.00547	0.0111	0.00483	0.0145	0				0.00652	0.009861	NO	NO
chromium (mg/L)	BAC-3	11	0.01152	0.01677	0.005055	0.00676	0.00447	0.00968	0.00362	0.0615	0				0.00362	0.0114	NO	NO
chromium (mg/L)	BAC-4	11	0.003085	0.002737	0.0008253	0.002	0.002	0.0022	0.002	0.011	63.64				0.002	0.00461	NO	NO
chromium (mg/L)	BAC-5	11	0.003285	0.00425	0.001281	0.002	0.002	0.002	0.002	0.0161	81.82				0.002	0.00204	NO	NO
chromium (mg/L)	BAC-6	11	0.00525	0.0103	0.003106	0.002	0.002	0.00257	0.002	0.0363	63.64				0.002	0.00283	NO	NO
chromium (mg/L)	BAC-7	11	0.004414	0.007316	0.002206	0.002	0.002	0.00217	0.002	0.0264	72.73				0.002	0.00398	NO	NO
cobalt (mg/L)	Background	22	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100	0.004	0.006	0.006				
cobalt (mg/L)	BAC-1	11	0.004242	0.000627	0.000189	0.004	0.004	0.004	0.004	0.00605	81.82				0.004	0.00461	NO	NO
cobalt (mg/L)	BAC-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-5	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-6	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-7	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
fluoride (mg/L)	Background	22	1.081	0.3373	0.07191	0.959	0.843	1.39	0.727	1.75	0	1.75	4	4				
fluoride (mg/L)	BAC-1	11	0.3694	0.2444	0.07368	0.401	0.266	0.507	0	0.854	18.18				0.242	0.4967	NO	NO
fluoride (mg/L)	BAC-2	11	0.8338	0.4598	0.1386	0.986	0.684	1.11	0	1.33	18.18				0.5942	1.073	NO	NO
fluoride (mg/L)	BAC-3	11	0.9784	0.8142	0.2455	0.794	0	1.62	0	2.51	27.27				0.5541	1.403	NO	NO
fluoride (mg/L)	BAC-4	11	1.236	0.1279	0.03857	1.26	1.13	1.35	1.01	1.38	0				1.166	1.306	NO	NO
fluoride (mg/L)	BAC-5	11	1.144	0.1387	0.04181	1.11	1.04	1.26	0.916	1.34	0				1.068	1.219	NO	NO
fluoride (mg/L)	BAC-6	11	0.8664	0.1652	0.04981	0.847	0.754	1.01	0.582	1.15	0				0.7761	0.9566	NO	NO
fluoride (mg/L)	BAC-7	11	1.093	0.3078	0.09282	1.09	0.936	1.31	0.388	1.51	0				0.9252	1.262	NO	NO
lead (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-2	11	0.002019	0.00006332	0.00001909	0.002	0.002	0.002	0.002	0.00221	90.91				0.002	0.002	NO	NO
lead (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

lead (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lithium (mg/L)	Background	22	0.322	0.1536	0.03275	0.288	0.2125	0.3525	0.191	0.773	0	0.7415	0.04	0.7415				
lithium (mg/L)	BAC-1	11	0.7318	0.4543	0.137	0.581	0.402	1.3	0.305	1.52	0				0.4639	0.8974	NO	YES
lithium (mg/L)	BAC-2	11	0.7655	0.408	0.123	0.524	0.44	1.22	0.414	1.38	0				0.414	1.32	NO	YES
lithium (mg/L)	BAC-3	11	1.369	0.6401	0.193	1.06	0.944	2.13	0.812	2.53	0				0.812	2.37	YES	YES
lithium (mg/L)	BAC-4	11	0.3416	0.1315	0.03966	0.262	0.243	0.508	0.228	0.532	0				0.228	0.509	NO	NO
lithium (mg/L)	BAC-5	11	0.3574	0.1144	0.03449	0.294	0.277	0.479	0.219	0.538	0				0.2914	0.4126	NO	NO
lithium (mg/L)	BAC-6	11	0.3775	0.1536	0.04631	0.28	0.265	0.542	0.25	0.599	0				0.25	0.597	NO	NO
lithium (mg/L)	BAC-7	11	0.4395	0.193	0.0582	0.327	0.285	0.674	0.269	0.699	0				0.269	0.681	NO	NO
mercury (mg/L)	Background	22	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	BAC-1	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-6	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-7	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	22	0.01015	0.01031	0.002198	0.00717	0.00297	0.01355	0.00215	0.0408	0	0.04038	0.1	0.1				
molybdenum (mg/L)	BAC-1	11	0.05256	0.03347	0.01009	0.0467	0.0288	0.0607	0.0232	0.143	0				0.03483	0.06541	NO	NO
molybdenum (mg/L)	BAC-2	11	0.1595	0.01643	0.004953	0.156	0.143	0.167	0.14	0.194	0				0.1506	0.1685	YES	YES
molybdenum (mg/L)	BAC-3	11	0.03511	0.008635	0.002604	0.0337	0.0275	0.0396	0.026	0.0525	0				0.03039	0.03983	NO	NO
molybdenum (mg/L)	BAC-4	11	0.01258	0.002503	0.0007548	0.012	0.0104	0.0143	0.00992	0.017	0				0.01122	0.01395	NO	NO
molybdenum (mg/L)	BAC-5	11	0.008795	0.00228	0.0006875	0.0077	0.00728	0.00926	0.00666	0.0134	0				0.00666	0.0128	NO	NO
molybdenum (mg/L)	BAC-6	11	0.07072	0.02813	0.008481	0.0858	0.0359	0.0921	0.0213	0.0968	0				0.07083	0.08867	NO	NO
molybdenum (mg/L)	BAC-7	11	0.07822	0.00959	0.002892	0.075	0.0702	0.0888	0.0681	0.0944	0				0.0681	0.0942	NO	NO
radium226and228combined (pCi/L)	Background	20	1.231	0.6188	0.1384	1.245	0.84	1.675	0.28	2.42	0	2.713	5	5				
radium226and228combined (pCi/L)	BAC-1	10	1.643	0.7154	0.2262	1.555	0.99	2.435	0.61	2.6	0				1.228	2.058	NO	NO
radium226and228combined (pCi/L)	BAC-2	10	1.067	0.8147	0.2576	0.905	0.405	1.595	0.22	2.9	0				0.5947	1.539	NO	NO
radium226and228combined (pCi/L)	BAC-3	10	1.311	0.5293	0.1674	1.335	0.88	1.78	0.38	2.09	0				1.004	1.618	NO	NO
radium226and228combined (pCi/L)	BAC-4	10	0.85	0.7078	0.2238	0.84	0.31	1	0	2.6	10				0.3394	1.157	NO	NO
radium226and228combined (pCi/L)	BAC-5	10	1.052	0.8877	0.2807	0.665	0.335	1.78	0.19	2.96	0				0.5374	1.567	NO	NO
radium226and228combined (pCi/L)	BAC-6	10	1.22	1.109	0.3508	1.01	0.675	1.5	-0.09	4.07	0				-0.09	1.79	NO	NO
radium226and228combined (pCi/L)	BAC-7	10	1.231	1.035	0.3274	0.95	0.435	1.975	0	3.38	10				0.6308	1.831	NO	NO
selenium (mg/L)	Background	22	0.002272	0.0007933	0.0001691	0.002	0.002	0.002105	0.000691	0.00426	68.18	0.00426	0.05	0.05				
selenium (mg/L)	BAC-1	11	0.01246	0.004803	0.001448	0.0131	0.00818	0.0168	0.00643	0.0204	0				0.009831	0.01508	NO	NO
selenium (mg/L)	BAC-2	11	0.01469	0.001404	0.0004233	0.0144	0.0136	0.0157	0.0128	0.0173	0				0.01392	0.01546	NO	NO
selenium (mg/L)	BAC-3	11	0.02131	0.002908	0.0008769	0.0211	0.019	0.0228	0.0184	0.0287	0				0.01973	0.02278	NO	NO
selenium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	BAC-6	11	0.002646	0.0009703	0.0002925	0.002	0.002	0.00369	0.002	0.0045	54.55				0.002	0.00414	NO	NO
selenium (mg/L)	BAC-7	11	0.004189	0.001492	0.0004499	0.00446	0.00276	0.00541	0.00257	0.007	0				0.003374	0.005005	NO	NO
thallium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

ATTACHMENT 3 - JUNE 2019 SEMI-ANNUAL PROGRESS, SELECTING AND DESIGNING OF GROUNDWATER CORRECTIVE ACTION REMEDY REPORT

June 2019 Semi-Annual Progress Report, Selecting and Designing of Groundwater Corrective Action Remedy

Intermountain Generating Facility
Delta, Utah

Prepared for:
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

Prepared by:
Stantec Consulting Services, Inc.
8160 South Highland Drive
Sandy, UT 84093

Project No.: 203709098

June 21, 2019

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services Inc. (“Stantec”) for Intermountain Power Service Corporation (the “Client”). The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: ______________________

John G. Russell, III
Utah PG #5216074-2250
Sr. Hydrogeologist, Environmental Risk Manager

Reviewed by: ______________________

Chad Tomlinson, PE
Utah Licensed PE

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1.0 EXECUTIVE SUMMARY

1.1 PURPOSE OF THIS REPORT

On behalf of Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this progress report to summarize recent investigative activities designed to help assess corrective measures required by the United States Environmental Protection Agency's 2015 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")). The activities summarized herein were proposed and outlined in detail within IPSC's January 2019 *Annual Groundwater Monitoring and Corrective Action Summary Report* and IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report.

The January 2019 reports presented IPSC's approach for addressing requirements specified by the Federal CCR Rule as well as the facility's Utah Department of Environmental Quality ("UDEQ"), Division of Water Quality ("DWQ") Groundwater Discharge Permit No. UGW270004. The most recent permit renewal was issued by the UDEQ to IPSC's Intermountain Generating Facility ("IGF"), effective May 24, 2016.

The DWQ has regulatory oversight for IPSC's compliance with its Groundwater Discharge Permit. The UDEQ Division of Waste Management and Radiation Control ("DWMRC") also has regulatory oversight pursuant to the State CCR Rule, under which DWMRC will be issuing a separate permit for the CCR Units. The CCR Rules apply to each of IPSC's three (3) CCR units (reference Figures 1 and 2 for regional and site-specific, location maps):

- Combustion By-Products Landfill ("CB Landfill");
- Bottom Ash Basin; and
- Waste Water Basin.

In summary, the primary contaminant of potential concern within groundwater beneath the site is Total Dissolved Solids (TDS), as there are two localized TDS plumes beneath the site, namely: one plume located southwest of the Bottom Ash Basin and a second, smaller plume located southwest of the Waste Water Basin. To date, metal constituents have only been quantified at localized areas at the two basin's boundaries. TDS is considered a leading indicator parameter of impacted groundwater quality for fashioning a suitable groundwater remediation approach, as the recovery of TDS-impacted groundwater at select recovery wells will also intercept metal constituents that might be present, as TDS is expected to migrate at a faster rate than dissolved metals in groundwater and the clay-rich aquifer.

As proposed in IPSC's January 2019 reports, IPSC initiated supplemental investigative activities designed to support and enhance ongoing, groundwater remediation activities during Spring 2019. Supplemental wells were installed, sampled, and pump-tested to refine IPSC's current Conceptual Site Model (CSM) and understanding of hydraulic conditions characterizing localized portions of the uppermost aquifer at the site, as well as help investigate how the existing groundwater remediation program might be enhanced and expanded for control of the two TDS plumes. Summary activities include:

1) During April and May 2019, IPSC expanded the network of monitoring and recovery wells intended to monitor and control the down-gradient (predominantly southwest), leading edge of the TDS plume associated with historical releases from the Bottom Ash Basin, through installation of supplemental monitoring (remediation, if needed) wells BAC-8, BAC-9, and BAC-10.

2) During April and May 2019, IPSC expanded the network of monitoring and recovery wells in apparent down-gradient directions (predominantly southwest) in relation to recently discovered, apparent release areas (west and south sides) at the Waste Water Basin, through installation of supplemental monitoring (remediation, if needed) wells WWC-8, WWC-9, and WWC-10.

3) During May 2019, IPSC conducted pump-tests of new wells BAC-8, BAC-10, WWC-9, and WWC-10 and older wells RW-4 and RW-5 to investigate well yields and radial cones of influence/capture. Currently, and as anticipated to continue into July 2019, the pump-test data are being analyzed using Stantec's groundwater model (discussed in more detail in following report section *1.2 Background*) to extrapolate well yield, Specific Capacity, and potential lateral extent of capture zones. The results will be used to identify existing wells that might be used for groundwater recovery and TDS plume control including localized, Appendix IV metals, if and where such control might be warranted. The model will also be used to identify if, and where, additional/supplemental monitoring and/or recovery wells might be needed, currently and possibly in the future.

   It is anticipated that the groundwater modeling results will be evaluated by IPSC during July 2019 and reported within IPSC's next semi-annual summary report (anticipated to be IPSC's *Annual Ground Water Monitoring and Corrective Action Summary Report*, tentatively scheduled for documentation during January 2020). Any additional, investigative and/or remedial actions implemented in the interim will also be discussed within IPSC's annual summary report.

4) The new wells will be sampled and incorporated into IPSC's ongoing semi-annual, groundwater quality monitoring program. Since analytical results are not available at this time, all such results will be reported within IPSC's next-scheduled, summary report tentatively scheduled for January 2020.

This report provides summary details regarding IPSC's installation of monitoring wells BAC-8, BAC-9, BAC-10, WWC-8, WWC-9, and WWC-10, including Drilling Logs and well construction diagrams. IPSC has prepared this report to "provide a semi-annual summary describing the progress in selecting and designing the (groundwater) remedy," as specified by UDEQ Rule R315-319-97(a).

1.2 BACKGROUND

Historically, when complying with its Groundwater Discharge Permit, and as reported to the UDEQ, whenever IPSC identified a potential release from a permitted basin, IPSC implemented investigative and remedial actions to identify the source and then repair the leak area (typically a localized tear in the 80-mil high-density, polyethylene [HDPE] liner material). Investigative and remedial measures were implemented and communicated to the UDEQ in a timely manner and in accordance with Groundwater Discharge Permit requisites.

As a result of localized, historical releases from the Bottom Ash Basin, a plume of TDS in excess of background concentrations impacted the uppermost groundwater quality and migrated with groundwater toward the southwest (the predominant, uppermost aquifer flow direction in relation to the Bottom Ash Basin). Since March 2010, IPSC has operated three groundwater recovery wells that recover groundwater from areas that exhibit elevated TDS concentrations within the uppermost aquifer beneath the site. The three recovery wells (wells WR-101, WR-102, and WR-103) collectively recover approximately 25 gallons per minute (gpm) and route recovered groundwater to the Ash Recycle Basin.

The three recovery wells were designed to remove TDS mass from the apparent center of the TDS plume, as proposed in IPSC's original June 2007 *Corrective Action Plan Report*, which was 'approved' by the UDEQ and implemented sequentially, as documented in IPSC's March 2010 *Groundwater Recovery Well Installation Report*. At the time of installation, the three recovery wells were not intended to control the downgradient migration of the TDS plume, but rather to reduce TDS mass within the uppermost aquifer at locations positioned in relatively close proximity to release source areas. In turn, it is anticipated that reduction of total TDS mass in the aquifer should also help promote natural attenuation processes (such as dilution, dispersion, diffusion, etc.), which ultimately should help remediate the TDS plume.

As of September 2016, TDS water quality data indicated that the down-gradient, leading edge of the TDS plume was moving beyond groundwater recovery measures in place at the time. IPSC's September 2016 *Updated Corrective Action Plan* report included a summary of Stantec's groundwater modeling and preliminary analysis of subsurface, hydraulic characteristics which were used in part to formulate a proposed enhanced, groundwater recovery program. The model was developed generally in accordance with ASTM International's (American Standard for Testing and Materials) *Standard Guide for Application of Groundwater Model to a Site-Specific Problem* and the current version of United States Geological Survey (USGS) *Modular Three-Dimensional Finite Difference Groundwater Flow Model* (MODFLOW-2005).

IPSC proposed to install and test additional groundwater recovery wells near the downgradient, leading edge of the TDS plume to enhance TDS plume control measures and help IPSC gain a clearer understanding of the hydraulic characteristics of the leading edge of the TDS plume. The TDS plume associated with historical releases at the Bottom Ash Basin is located within the boundaries of IPSC-owned property and as such poses no risk to potential on- and/or off-site receptors. Likewise, supplemental monitoring wells were also installed down-gradient of the Waste Water Basin. This report provides a summary of the installation and pump-testing of the newly-installed wells.

2.0 APRIL AND MAY 2019 GROUNDWATER MONITORING WELL INSTALLATIONS

During April and May 2019, Stantec oversaw the drilling, soil screening, installation, and development of groundwater monitoring wells BAC-8, BAC-9, BAC-10, WWC-8, WWC-9, and WWC-10 at the site by Cascade Drilling, LP of Salt Lake City, Utah, a Utah-certified, water well drilling firm. Each well was installed and developed in similar fashion as previous, historical wells at the site. Figure 3 identifies the locations of the six new wells, as well as historical groundwater monitoring wells and recovery wells WR-101, WR-102, and WR-103.

The new wells were drilled by the sonic drilling method, whereby soil samples were collected continuously in 10-feet, sampling intervals for continuous, real-time visual inspection and Drill Log recording of subsurface soil lithologic and moisture characteristics. Stantec's field geologists screened and logged all soil samples during drilling of each of the six well borings. All down-hole drilling and sampling equipment were decontaminated before use between well locations.

In turn, the subsurface soil data were used to help determine respective ground water monitoring well construction details. Typically, once each boring was advanced approximately 20 to 25 feet into the uppermost saturated soils, a monitoring well was constructed within each respective borehole. Each groundwater monitoring well was comprised of 6-inch diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) pipe with a solid, PVC end-cap. The bottom 25 feet of each well was comprised of 6-inch diameter, flush-threaded, 0.02-slotted, Schedule 40 PVC well screen.

Following installation of each well, 16/30 washed, silica sand was emplaced around the well screen from the bottom of the borehole to an approximate height of several feet above the top of the well screen interval. An approximate five to seven feet thick, bentonite pellet seal was added on top of the sand pack material. Then, a cement-bentonite (typically, 10:1 ratio) grout was tremie-slurried from the top of the bentonite pellet seal to an approximate height of two feet below grade. A 5-ft. long, 6-inch diameter, steel, protective casing/monument was emplaced in concrete around each wellhead, with an approximate 2.5-ft. stick-up above natural grade. Each PVC well was furnished with a locking, expandable well cap and lock.

Following well installations, the ground surface and the top of each wellhead were surveyed in relation to one another and the same on-site, mean sea level benchmark used for surveying the tops of other historical monitoring wells. Table 1 presents a summary of all ground water monitoring well construction specific details. Copies of Stantec's Drilling Logs and Schematic Well Diagrams are presented in Appendix A.

Shortly after well installations, each well was developed by a dedicated, well development drill rig. Typically, the rig removed water from each well by means of bailing followed by air-lift. Well water was removed from each well, until return water was relatively clear and free of fine-grained, formational materials.

3.0 MAY 2019 PUMP-TESTING PROGRAM

During May 2019, IPSC conducted pump-tests of new wells BAC-8, BAC-10, WWC-9, and WWC-10 and older wells RW-4 and RW-5 to investigate well yields and radial cones of influence/capture. In summary, each pump-test was conducted by a two-member, Stantec field team. Stantec utilized decontaminated, submersible pumps and dedicated, down-hole, pressure transducers to monitor water levels in pumping and nearby observation wells. Individual well pump-tests were conducted at variable pumping and constant, steady-state pumping rates. Each test approximated 4 to 6 hours, and water levels were allowed to return to steady-state, non-pumping levels, prior to conducting each sequential test. All down-hole equipment was decontaminated with potable water washings, prior to each use between wells

Currently, and as anticipated to continue into July 2019, the pump-test data are being analyzed using Stantec's groundwater model to extrapolate well yield, Specific Capacity, and potential lateral extent of capture zones for existing groundwater monitoring wells. The results will be used to identify existing wells that might be used for groundwater recovery and TDS plume control, if and where such control might be warranted. The model will also be used to identify if, and where, additional/supplemental monitoring and/or recovery wells might be needed, currently and possibly in the future.

It is anticipated that the groundwater modeling results will be evaluated by IPSC during July 2019 and reported within IPSC's next semi-annual summary report (anticipated to be IPSC's *Annual Ground Water Monitoring and Corrective Action Summary Report*, tentatively scheduled for documentation during January 2020). Any additional, investigative and/or remedial actions implemented in the interim will also be discussed within IPSC's annual summary report.

4.0 ONGOING CORRECTIVE ACTIONS AND PROGRESS TOWARD SELECTING ADDITIONAL GROUNDWATER CORRECTIVE ACTION REMEDY

4.1 ONGOING GROUNDWATER RECOVERY AT EXISTING RECOVERY WELLS WR-101, WR-102, AND WR-103

IPSC intends to continue operation of existing groundwater recovery wells WR-101, WR-102, and WR-103 identified on Figure 3. The three wells are recovering groundwater that contains elevated concentrations of TDS, located in relatively close proximity to the apparent historical TDS release areas associated with the Bottom Ash Basin. Wells WR-102 and WR-103 are located generally along the apparent TDS plume centerline, as explained in detail in IPSC's 2016 *Updated Corrective Action Plan*. Continued removal of TDS-enriched groundwater from each of these three wells is helping reduce the total mass of TDS within the uppermost aquifer beneath the site in a generalized down-gradient/southwesterly direction in relation to the Bottom Ash Basin.

4.2 SUMMARY OF ONGOING ACTIONS ASSOCIATED WITH SELECTION OF FINAL GROUNDWATER REMEDY

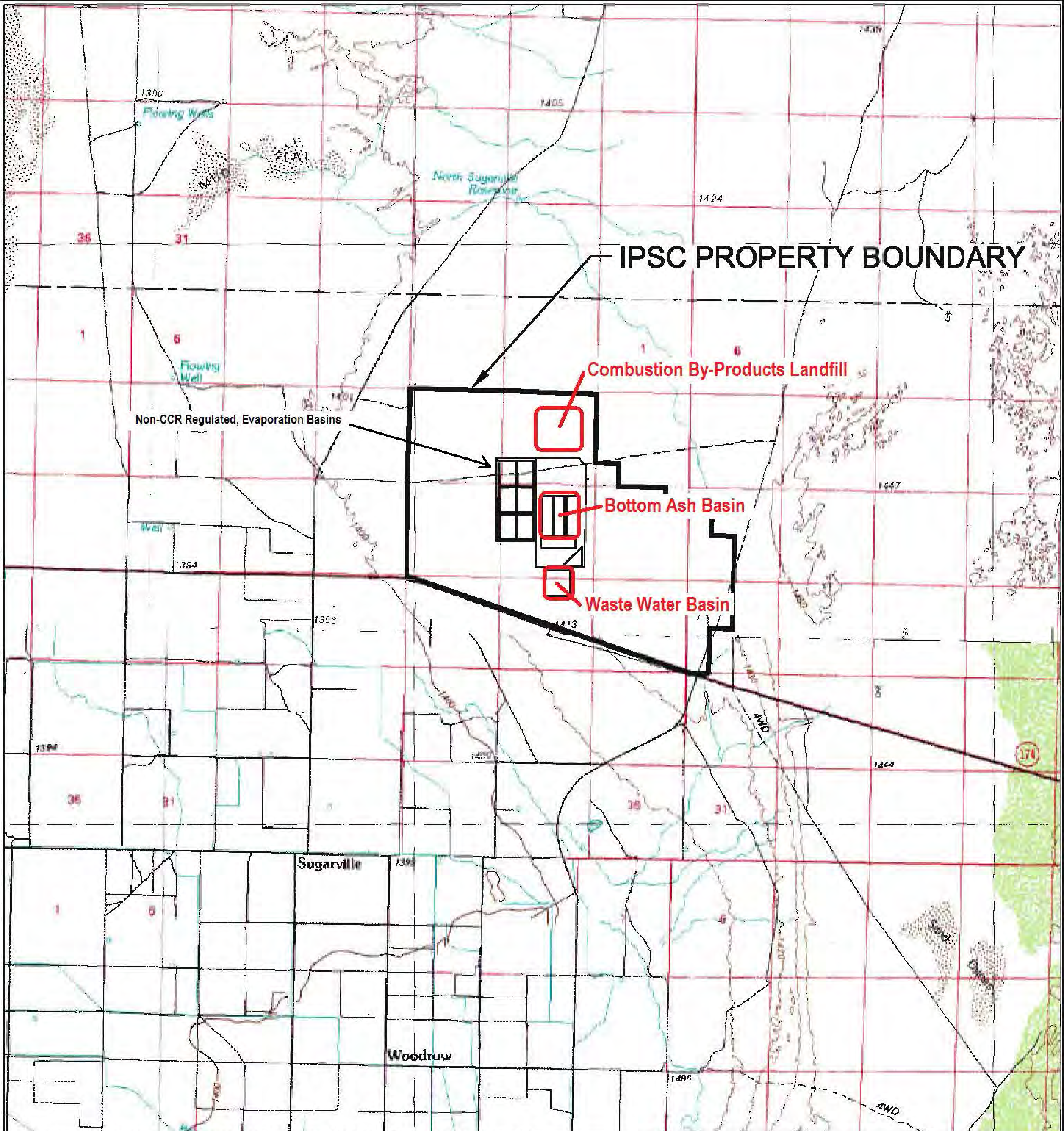
Stantec is in the process of reviewing the results of May 2019 pump-testing of newly-installed, groundwater monitoring wells BAC-8, BAC-10, WWC-9, and WWC-10 and older wells RW-4 and RW-5 to investigate well yields and radial cones of influence/capture. The respective well yields will be analyzed using Stantec's site-specific, groundwater model to extrapolate potential lateral extent of capture for each well and help extrapolate yields and possible capture zones for supplemental groundwater recovery wells, if and where deemed warranted. Additionally, upon receipt of all May 2019 water quality analytical results, IPSC/Stantec will review all data to help identify if the two TDS plumes and localized, Appendix IV metals have been delineated sufficiently, as well as identify how the existing groundwater recovery program might be enhanced/expanded to provide appropriate control, where needed.

It is anticipated that one or more of the newly-installed wells BAC-8, BAC-9, and/or BAC-10, and one or both older wells RW-4 and RW-5, will be converted to groundwater recovery wells to help supplement existing recovery wells WR-101, WR-102, and WR-103 associated with ongoing Bottom Ash Basin corrective actions. Likewise, the forthcoming pump-test, groundwater model, and water quality results will be used to estimate placement of future-proposed, on-site and off-site, groundwater monitoring and recovery wells associated with the Waste Water Basin. It is anticipated that newly-installed, well WWC-6 will most probably be converted to a groundwater recovery well, and it is anticipated that two or more groundwater monitoring wells may be installed farther southwest/down-gradient of well WWC-6.

Following evaluation of the forthcoming results, IPSC intends to initiate groundwater recovery to control the migration of the TDS plume down-gradient of the Waste Water Basin. The intent of the recovery well program will be to control the down-gradient leading edge of the TDS plume associated with the Waste Water Basin, as well as Appendix IV metals, where warranted.

Upon implementation of the enhanced groundwater recovery and monitoring program proposed in this report, IPSC will evaluate the degree to which groundwater recovery and natural attenuation processes control the down-gradient leading edges of TDS plumes located down-gradient of the Bottom Ash Basin and the Waste Water Basin. IPSC also intends to evaluate potential, alternative means for ongoing enhancement of remediating TDS mass from the uppermost aquifer beneath the site. IPSC will continue to conduct and report to the UDEQ its routine, semi-annual, groundwater monitoring and remediation program in formal Summary Reports.

Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES

N

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'

DATE DRAWN 1-26-17

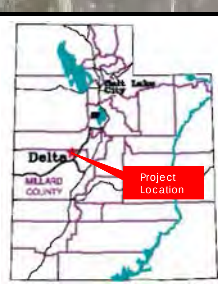
REVISION

drawings\Ipsc-04\Fig2 Site Topographic Map.dwg

Figure 2. CCR Units Location Map

Legend

CCR Unit



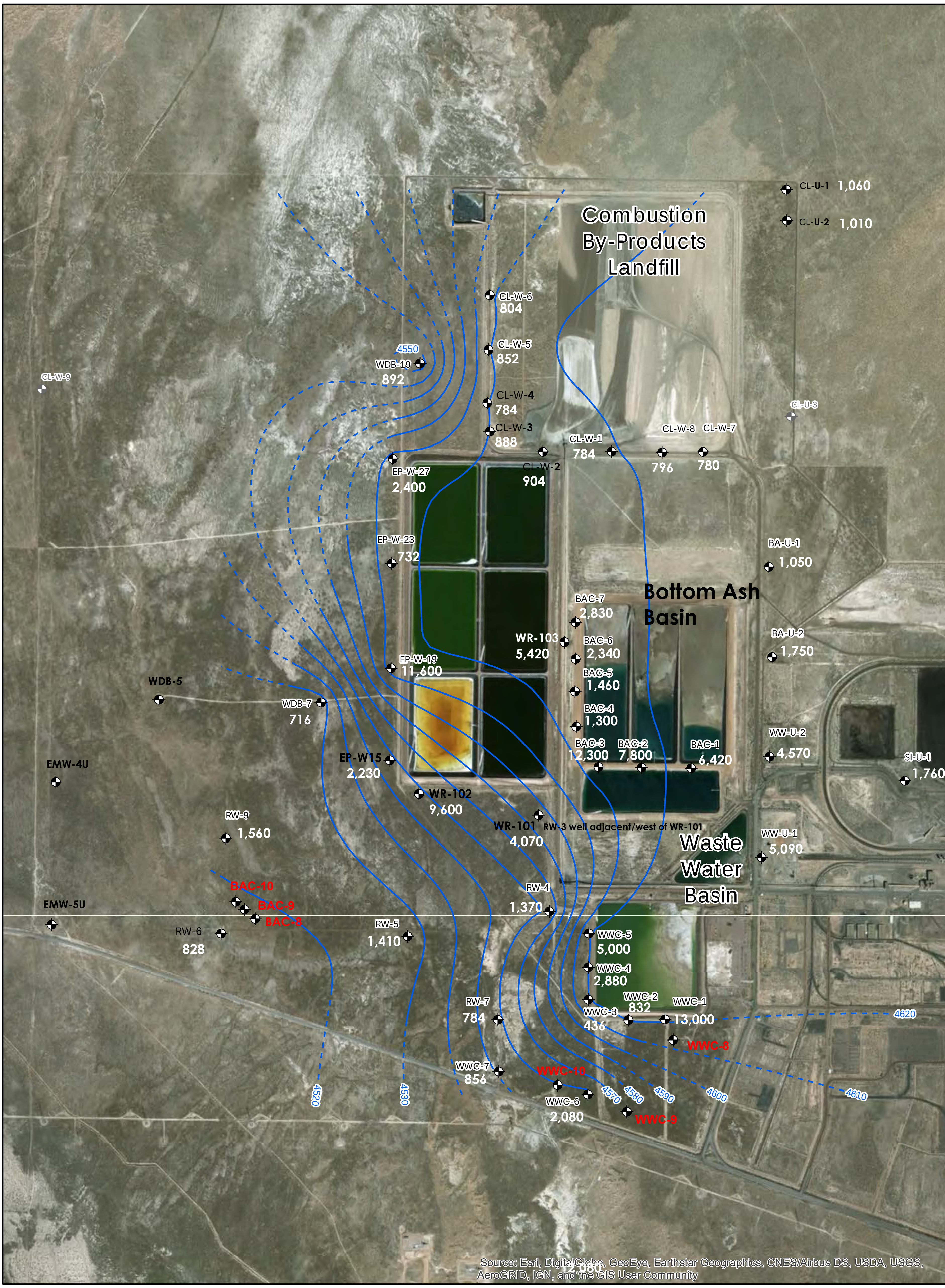
INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

DRAWN BY	JR	DATE DRAWN	9/30/2016
SCALE	1 in. approx. 1700 ft.		
PROJECT	203709098.409		

Figure 3. Map identifying Monitoring Wells

Q:\active\203709098 Intermountain Power\GIS\2018_11\fig12_Oct2018GWE_20181105.mxd



LEGEND:

- MONITORING WELL TDS Concentration (milligrams per Liter; i.e., ppm)
- GROUND WATER CONTOUR

NOTE:

1) BASE MAP INCLUDES OCTOBER 2018 POTENTIOMETRIC MAP AND OCTOBER 2018 TDS RESULTS.
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL.

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

SPRING 2019-INSTALLED
MONITORING WELLS
Superimposed atop
Oct. 2018 Potentiometric & TDS Concentration Map;
Most Recent, Semi-Annual Map

FIGURE: 3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	JR	ALL		1/15/19

TABLE 1 GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4555.98
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4606.01
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BAC-8	4/29/2019	6-inch PVC	77	52-77	4626.42
BAC-9	5/1/2019	6-inch PVC	77	52-77	4626.27
BAC-10	5/3/2019	6-inch PVC	87	62-87	4626.27

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WWC-6	3/24/2018	4-inch PVC	87	67-77	4576.26
WWC-7	3/22/2018	4-inch PVC	87	77-87	4570.78
WWC-8	4/25/2019	6-inch PVC	96	71-96	4647.799
WWC-9	4/28/2019	6-inch PVC	89	62-87	4642.58
WWC-10	4/26/2019	6-inch PVC	90	62-87	4633.72
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59
WC-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WC-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46

BGS = Below Ground Surface
MSL = Mean Sea Level

Appendix A Drilling Logs and Well Schematic Diagrams

Stantec

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: WWC-8

Project No.: 203709098

Completion Date: 2019-04-25

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 77 feet

Depth to Water at Drilling (static at 24 hours): 27 feet

WWC-8

Interval (feet)	Description
0 - 3	Light brown sand, moist
3 - 7	Light brown sand with silt, dry
7 - 9	Medium brown clay with sand, moist
9 - 13	Medium brown clay, moist
13 - 15	Light brown clay, moist
15 - 17	Light brown clay, dry
17 - 26	Light brown clay, moist
26 - 35	Light brown clay with sand, moist
35 - 37	Light brown clay, moist
37 - 41	Medium brown medium grained sand, moist
41 - 43	Medium brown medium grained sand, moist
43 - 55	Medium brown medium grained sand, moist
55 - 59	Light brown clay, moist
59 - 63	Light brown clay with sand, moist
63 - 66	Light brown clay, moist
66 - 67	Light brown clay with sand, moist
67 - 68	Light brown sand, moist
68 - 77	Light brown clay with sand, moist
77 - 88	Medium brown sand, saturated
88 - 93	Light brown clay
93 - 94	Light brown clay with sand
94 - 96	Light brown clay
96 - 97	Medium brown sand

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-69.38 feet

Screen (6 inch, 0.02 slotted, PVC): 69.38-94.38 feet

Sand Pack: 16/30 sand, 64.38-94.38 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 57.38-64.38 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA

Stantec

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: WWC-9

Project No.: 203709098

Completion Date: 2019-04-28

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 67 feet

Depth to Water at Drilling (static at 24 hours): 23.75 feet

WWC-9

Interval (feet)	Description
0 - 0.5	Medium brown silt, dry
0.5 - 1	Medium brown clay, dry
1 - 4	Light brown fine-grained sand, dry
4 - 8	Light brown clay, dry
8 - 13	Light brown fine-grained sand, dry
13 - 15	Light brown clay, dry
15 - 16	Light brown clay with sand, dry
16 - 17	Light brown clay, dry
17 - 18	Light brown clay with sand, moist
18 – 21.5	Light brown clay, moist
21.5 - 22	Light brown clay with sand, moist
22 - 23	Light brown clay, moist
23 - 26	Light brown clay with sand, moist
26 - 27	Light brown clay, moist
27 - 30	Light brown clay, moist
30 - 31	Light brown clay, saturated
31 - 32	Light brown clay with sand, moist
32 - 36	Light brown clay, moist
36 - 37	Light brown clay with sand, moist
37 - 38	Light brown clay with sand, moist
38 - 51	Medium brown medium grained sand, moist
51 - 54	Light brown clay, moist
54 - 58	Medium brown medium grained sand, moist
58 - 59	Medium brown medium grained sand, moist
59 - 62	Medium brown medium grained sand, moist
62 - 63	Light brown clay, moist to moist
63 - 66	Light brown clay with sand, moist
66 - 67	Light brown clay, moist
67 - 69	Light brown clay with sand, saturated

Interval (feet)	Description
69 – 69.5	Medium brown sand
69.5 - 70	Light brown clay with sand
70 - 71	Light brown clay
71 - 74	Light brown clay with sand
74 - 75	Medium brown sand
75 - 77	Light brown clay
77 - 83	Medium brown sand
83 - 85	Light brown clay
85 - 87	Light brown clay with sand

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-61.7 feet

Screen (6 inch, 0.02 slotted, PVC): 61.7-86.7 feet

Sand Pack: 16/30 sand, 56.7-86.7 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 49.7-56.7 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA

Stantec

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: WWC-10

Project No.: 203709098

Completion Date: 2019-04-26

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 67 feet

Depth to Water at Drilling (static at 24 hours): 17.65 feet

WWC-10

Interval (feet)	Description
0 - 5	Light brown sand, moist
5 – 9.5	Light brown clay with sand, moist
9.5 - 13	Dark gray clay, moist
13 - 14	Dark brown silt with organic plant matter, moist
14 - 15	Dark gray clay, moist
15 - 17	Gray medium grained sand, moist
17 - 34	Gray medium grained sand, moist
34 - 45	Brown medium grained sand, moist
45 - 47	Medium brown clay, moist
47 - 49	Medium brown clay with sand, moist
49 - 50	Medium brown medium grained sand, moist
50 - 51	Medium brown clay with sand, moist
51 - 52	Medium brown medium grained sand, moist
52 - 53	Medium brown clay with sand, moist
53 - 54	Medium brown medium grained sand, moist
54 - 60	Medium brown clay, moist
60 - 61	Medium brown clay with sand, moist
61 - 67	Medium brown clay, moist
67 - 68	Medium brown clay, saturated
68 - 69	Medium brown clay with sand
69 - 70	Medium brown clay
70 - 76	Medium brown clay with sand
76 - 87	Medium brown clay

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-62.75 feet

Screen (6 inch, 0.02 slotted, PVC): 62.75-87.75 feet

Sand Pack: 16/30 sand, 57.75-87.75 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 50.75-57.75 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: BAC-8

Project No.: 203709098

Completion Date: 2019-04-29

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 67 feet

Depth to Water at Drilling (static at 24 hours): 45.59 feet

BAC-8

Interval (feet)	Description
0 - 1	Light brown fine-grained sand with clay, dry
1 - 13	Light brown clay with silt, dry
13 - 17	Light brown fine-grained sand with clay, dry
17 - 18	Light brown clay with sand, moist
18 - 19	Medium brown sand, saturated
19 - 21	Light brown clay with sand, moist
21 - 27	Light brown clay with sand, dry
27 - 28	Brown with red clay, moist
28 - 31	Brown clay, moist
31 - 34	Gray clay, moist
34 - 43	Brown clay, moist
43 - 56	Medium brown medium-grained sand, moist
56 – 56.5	Medium brown medium-grained sand with pebbles, moist
56.5 - 57	Medium brown medium-grained sand, moist
57 - 63	Brown clay, moist
63 - 65	Medium brown fine-grained sand, moist
65 – 66.5	Brown clay, moist
66.5 - 67	Medium brown fine-grained sand, moist
67 - 68	Medium brown fine-grained sand, saturated
68 - 69.5	Medium brown fine-grained sand
69.5 - 77	Red and brown clay

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-52.62 feet

Screen (6 inch, 0.02 slotted, PVC): 52.62-77.62 feet

Sand Pack: 16/30 sand, 47.62-77.62 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 40.62-47.62 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA

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Project Name: Intermountain Power Service Corporation

Boring Monitor Well: BAC-9

Project No.: 203709098

Completion Date: 2019-05-1

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: John Russell

Depth to Water at Drilling: 60 feet

Depth to Water at Drilling (static at 24 hours): 44.82 feet

BAC-9

Interval (feet)	Description
0 - 10	Light gray to brown silt with clay to clay with silt, dry
10 - 20	Light gray to brown silt, dry
20 - 30	Light brown silt, dry
30 - 44	Light brown silt, dry
44 - 50	Medium brown clay, dry
50 - 54	Light brown silt to clay with silt, moist
54 – 54.5	Medium brown silt with clay, moist
54.5 - 60	Light brown clay with silt, moist
60 - 77	Medium brown silt with clay and silt stringers, saturated

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-53.11 feet

Screen (6 inch, 0.02 slotted, PVC): 53.11-78.11 feet

Sand Pack: 16/30 sand, 48.11-78.11 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 41.11-48.11 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA

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Project Name: Intermountain Power Service Corporation

Boring Monitor Well: BAC-10

Project No.: 203709098

Completion Date: 2019-05-3

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 69 feet

Depth to Water at Drilling (static at 24 hours): 63.1 feet

BAC-10

Interval (feet)	Description
0 - 1	Light brown silt, dry
1 - 3	Light brown silt with clay, dry
3 - 14	Light brown clay with silt, dry
14 - 17	Light brown fine-grained sand, dry
17 - 19	Light brown fine-grained sand with clay, moist
19 - 21	Light brown fine-grained sand with clay, moist
21 - 23	Light brown fine-grained sand, moist
23 - 25	Light brown fine-grained sand with clay, moist
25 - 26	Light brown fine-grained sand, moist
26 - 27	Light brown fine-grained sand with clay, moist
27 - 28	Light brown fine-grained sand, moist to moist
27 - 34	Light brown fine-grained sand, moist
34 – 34.5	Light brown silt with clay, dry
34.5 – 40.5	Red brown clay, dry
40.5 - 41	Medium brown medium grained sand, moist to moist
41 - 45	Medium brown clay, moist
45 - 46	Medium brown sand, moist to moist
46 - 48	Medium brown clay, moist
48 – 56.5	Red brown clay, moist
56.5 - 57	Gray clay, moist
57 - 62	Light brown clay, moist to moist
62 - 63	Medium brown medium grained sand, moist
63 - 64	Medium brown medium grained sand with clay, moist
64 - 69	Red, brown, and gray clay, moist
69 – 69.5	Medium brown sand, saturated
69.5 - 77	Red, brown, and gray clay
77 - 79	Medium brown clay with sand
79 - 81	Medium brown clay
81 - 85	Medium brown clay with sand

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85 - 87	Medium brown clay, moist

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-62.95 feet

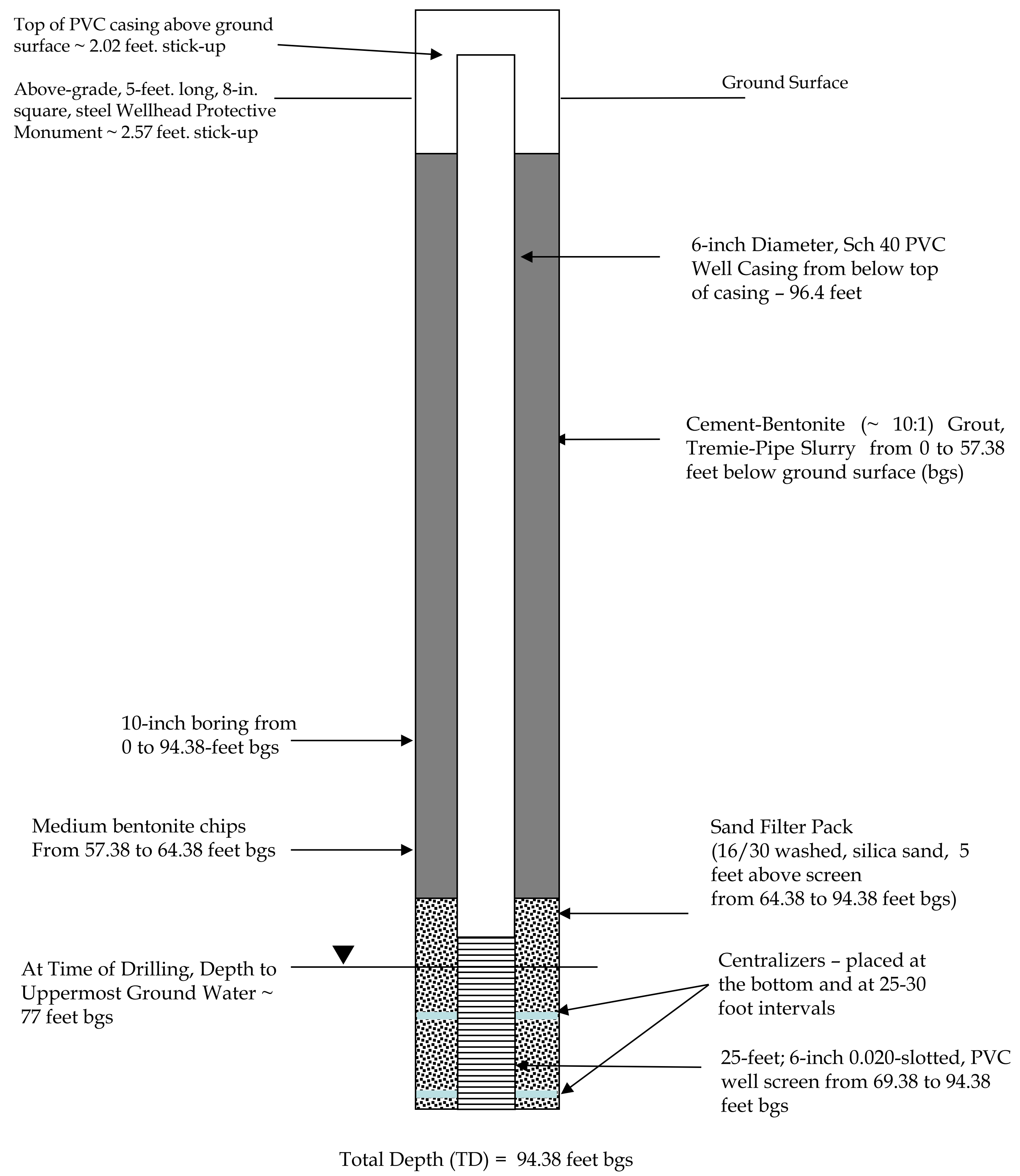
Screen (6 inch, 0.02 slotted, PVC): 62.95-87.95 feet

Sand Pack: 16/30 sand, 57.95-87.95 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 50.95-57.95 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA



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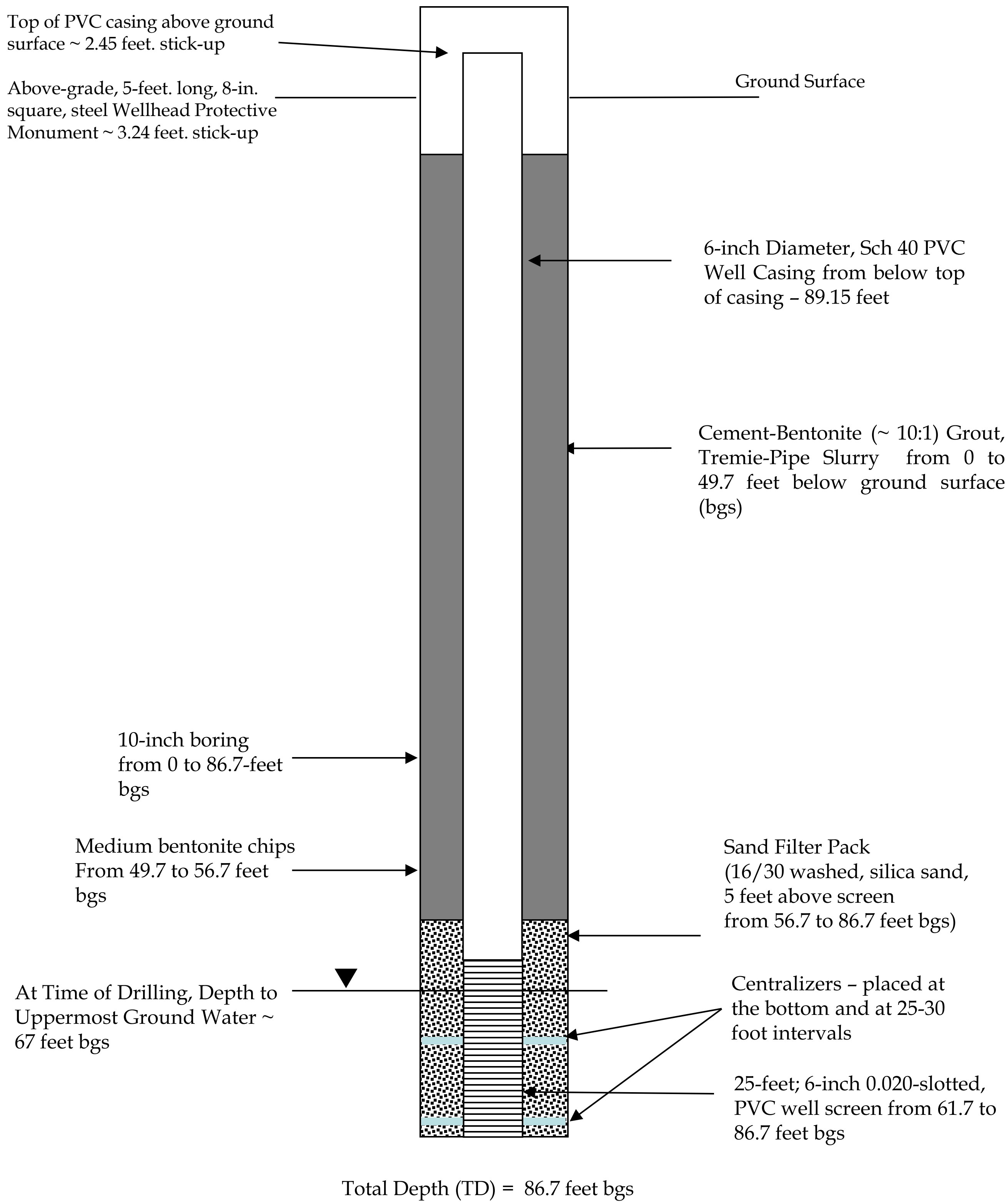
Intermountain Power Service Corporation
Delta, Utah

WWC-8 Monitoring Well Schematic

Design by TH	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

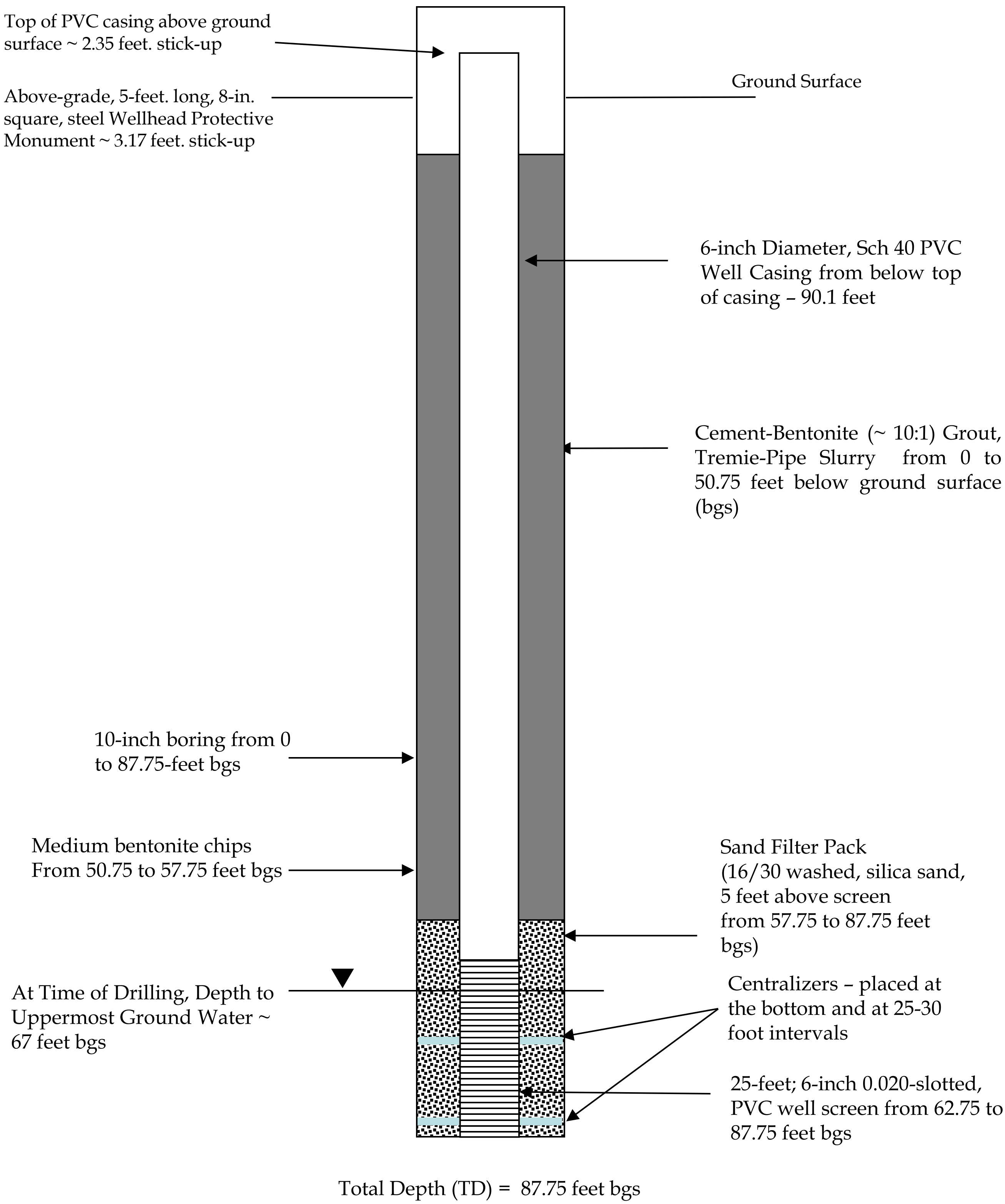


Stantec

Intermountain Power Service Corporation
Delta, Utah

WWC-9 Monitoring Well Schematic

Date Drawn	6-4-19
Last Revision Date	
Design by	TH
Drawn by	RP
Scale	

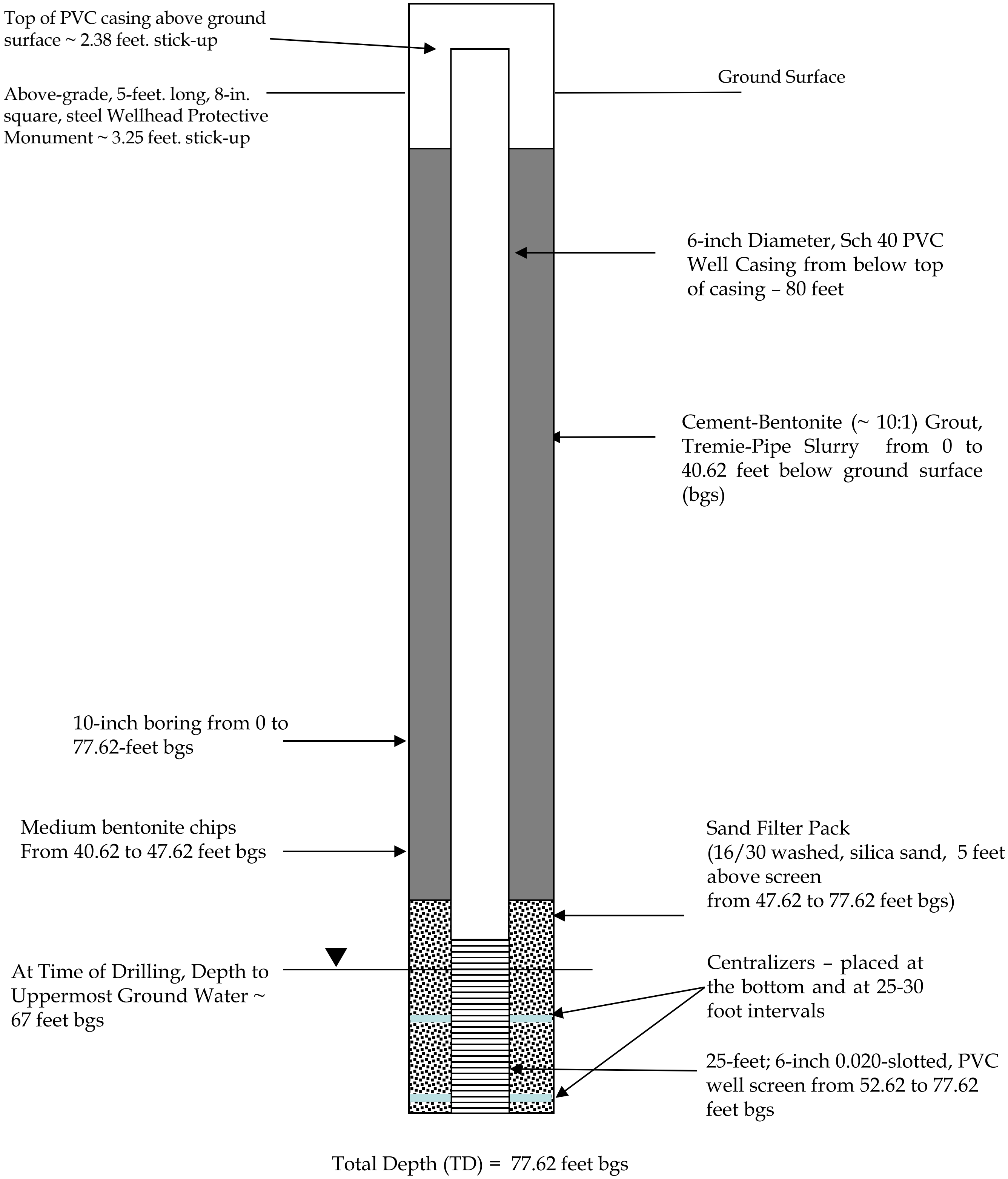


Stantec

Intermountain Power Service Corporation
Delta, Utah

WWC-10 Monitoring Well Schematic

Design by TH	Drawn by RP	Scale
Date Drawn 6-4-19	Last Revision Date	

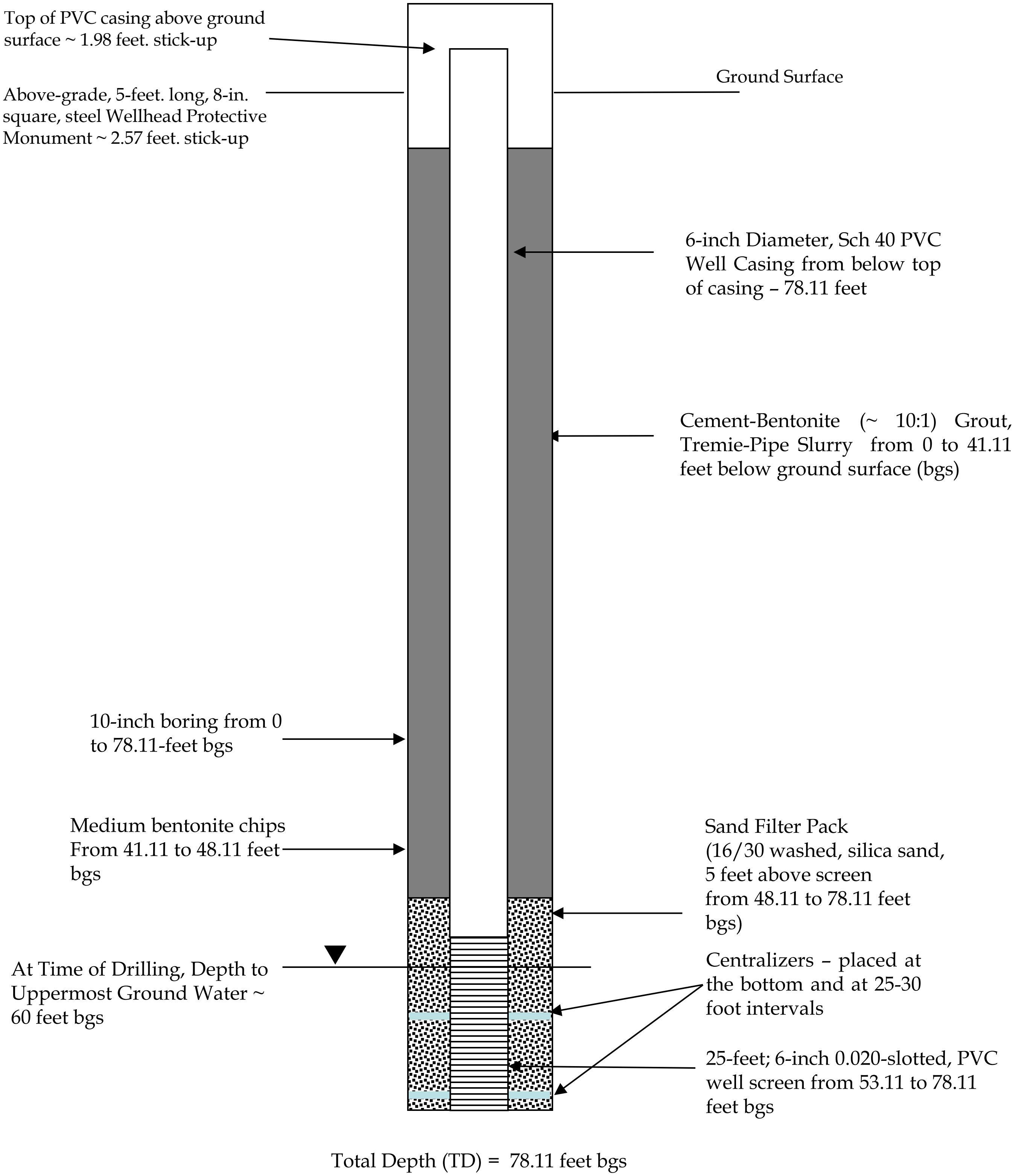


Stantec

Intermountain Power Service Corporation
Delta, Utah

BAC-8 Monitoring Well Schematic

Design by TH	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

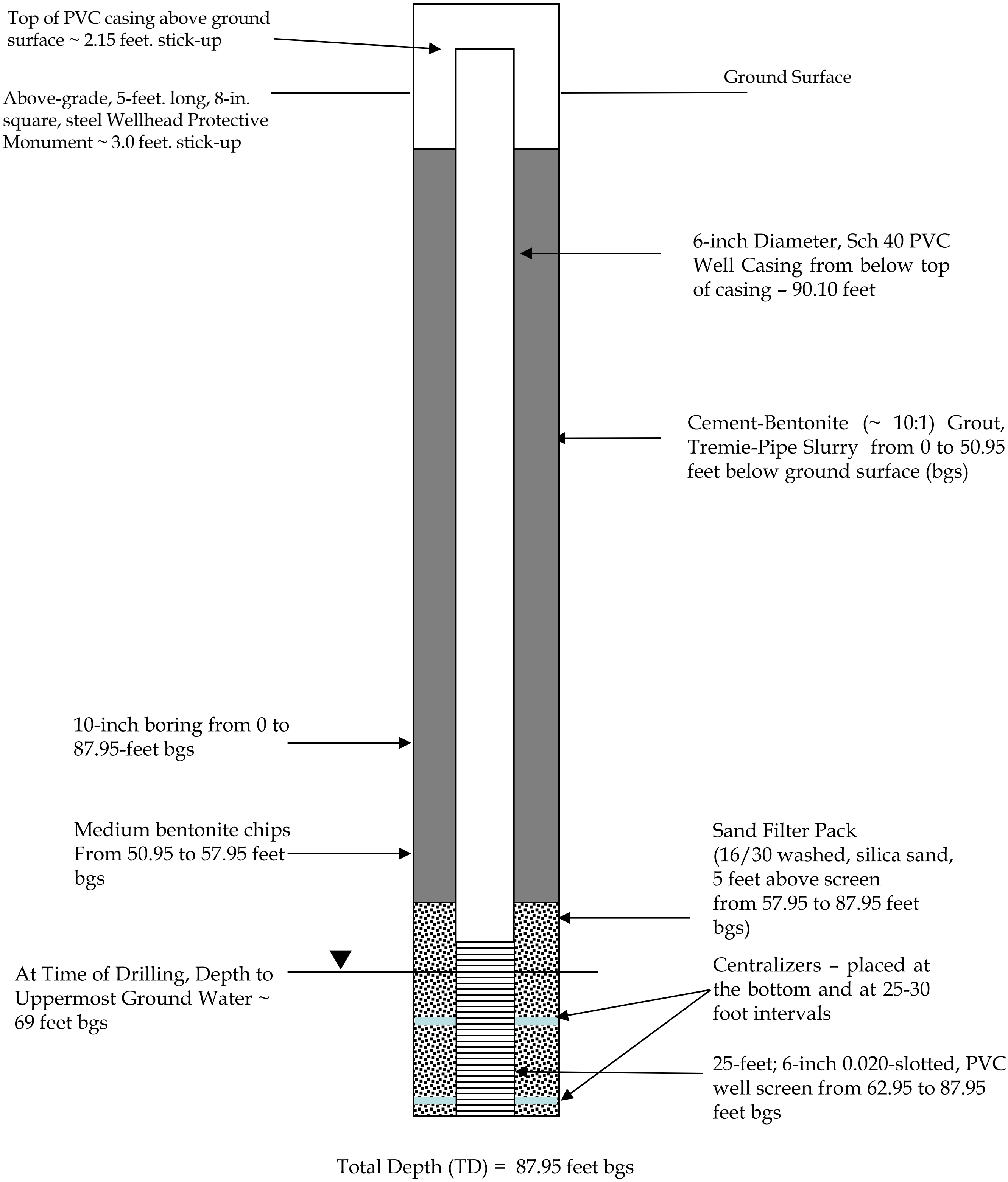


Stantec

Intermountain Power Service Corporation
Delta, Utah

BAC-9 Monitoring Well Schematic

Design by TH	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date



Stantec

Intermountain Power Service Corporation
Delta, Utah

BAC-10 Monitoring Well Schematic

Date Drawn	6-4-19
Last Revision Date	

Design by	Drawn by	Scale
TH	RP	

ATTACHMENT 4 - DECEMBER 2019 SEMI-ANNUAL PROGRESS, SELECTING AND DESIGNING OF GROUNDWATER CORRECTIVE ACTION REMEDY REPORT

December 2019 Semi-Annual Progress Report, Selecting and Designing of Groundwater Corrective Action Remedy

Intermountain Generating Facility
Delta, Utah

Prepared for:
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

Prepared by:
Stantec Consulting Services, Inc.
2890 East Cottonwood Parkway Suite 300
Salt Lake City UT 84121-7283

Project No.: 203709098

December 19, 2019

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: ____________________

John G. Russell, III, CPG
Utah PG #5216074-2250
Sr. Hydrogeologist, Environmental Risk Manager

Reviewed by: ____________________

Chad Tomlinson, PE
Utah Licensed PE #4777863-2202
Principal Engineer

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1.0 EXECUTIVE SUMMARY

1.1 BACKGROUND

On behalf of Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this progress report to summarize recent investigative activities designed to further assess corrective measures required by the United States Environmental Protection Agency's 2015 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")). The activities summarized herein were proposed and outlined in detail within IPSC's January 2019 *Annual Groundwater Monitoring and Corrective Action Summary Report*; IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report; and IPSC's June 2019 *Semi-Annual Progress Report, Selecting and Designing of Groundwater Corrective Action Remedy* report.

The historical reports presented IPSC's approach for addressing requirements specified by the State and Federal CCR Rule as well as the facility's Utah Department of Environmental Quality ("UDEQ"), Division of Water Quality ("DWQ") Groundwater Discharge Permit No. UGW270004. The most recent permit renewal was issued by the UDEQ to IPSC's Intermountain Generating Facility ("IGF"), effective May 24, 2016.

The DWQ has regulatory oversight for IPSC's compliance with its Groundwater Discharge Permit. The UDEQ Division of Waste Management and Radiation Control ("DWMRC") also has regulatory oversight pursuant to the State CCR Rule, under which DWMRC will be issuing a separate permit for the CCR Units. The CCR Rules apply to each of IPSC's three (3) CCR units (reference Figures 1 and 2 for regional and site-specific, location maps):

- Combustion By-Products Landfill ("CB Landfill");
- Bottom Ash Basin; and
- Waste Water Basin.

As reported in IPSC's historical reports, groundwater in localized, down-gradient directions in relation to the Bottom Ash Basin and the Waste Water Basin (surface impoundments) contains Total Dissolved Solids (TDS). IPSC is implementing a groundwater monitoring and recovery program, currently. Supplemental monitoring wells have been installed in sequential phases during April-May 2019 and November-December 2019 to help define more definitively the down-gradient, leading edges and centers of mass of the two TDS plumes. The 2019 monitoring and analytical data are being evaluated to expand IPSC's current groundwater recovery well network in pursuit of TDS plume control.

As reported within IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report, three metal constituents (arsenic, lithium, and molybdenum) were also quantified at localized areas within wells located immediately adjacent to the two surface impoundment boundaries. Statistical analyses to date indicate that the metals are localized at the boundaries of the two surface impoundments.

Although it is documented throughout Utah and in close proximity to the site that arsenic and lithium can be present naturally at elevated concentrations, IPSC will continue monitoring metal concentrations in groundwater as part of its routine groundwater monitoring program. As supplemental water quality data is generated, potential contaminants such as metals will be evaluated through statistical analysis, in accordance with CCR Rule requisites.

Groundwater quality data to date indicate that TDS has migrated farther down-gradient of the two surface impoundments than the metal constituents located near the impoundment boundaries. TDS is expected to continue to migrate at a faster rate than dissolved metals in the clay-rich aquifer that underlies the property. TDS is being used as the leading indicator parameter of impacted groundwater quality for fashioning a suitable groundwater remediation approach, as the recovery of TDS-impacted groundwater at select recovery wells will also intercept metal constituents that might be present.

1.2 PURPOSE OF THIS REPORT

IPSC implemented a sequential, groundwater quality investigative program during 2019 to refine IPSC's current Conceptual Site Model (CSM) and understanding of hydraulic conditions characterizing localized portions of the uppermost aquifer beneath the site. Six wells were installed and sampled during the Spring of 2019, the analytical results of which were then used to help locate 10 additional wells that were installed during the Fall of 2019. The sequenced, investigative approach helped delineate more definitively the physical characteristics and footprints of the TDS groundwater plumes located down-gradient (generally southwest) of the surface impoundments.

In summary, a total of 16 new, 6-inch diameter, groundwater monitoring/recovery wells were installed during 2019, such that each well might be used as a groundwater recovery well if needed. Some wells were located to provide better identification of the two TDS plumes' respective, down-gradient, leading edges. Other wells were located within outer edges and/or middle areas within the two TDS plumes to provide more definition regarding the plumes' centers of TDS mass.

Summary 2019 activities included:

1) During April and May 2019, IPSC expanded the network of monitoring/recovery wells intended to monitor and control the down-gradient (predominantly southwest), leading edge of the TDS plume associated with historical releases from the Bottom Ash Basin, through installation of supplemental monitoring (remediation, if needed) wells BAC-8, BAC-9, and BAC-10 (reference Figure 3).

2) During April and May 2019, IPSC expanded the network of monitoring/recovery wells in apparent down-gradient directions (predominantly southwest) in relation to recently discovered, apparent release areas (west and south sides) at the Waste Water Basin, through installation of supplemental monitoring (remediation, if needed) wells WWC-8, WWC-9, and WWC-10.
   The drilling and installation activities associated with the six wells installed during April-May 2019 were discussed in detail, including drilling logs and well schematic diagrams, within IPSC's June 2019 *Semi-Annual Progress Report*. At the time of preparation of the June 2019 report; however, laboratory result reports had not been received by IPSC. Reference Figures 3 and 5 for a groundwater flow map and a TDS iso-concentration map, based on results of the May 2019 monitoring/sampling event. Monitoring and analytical results are tabulated in Attachment 1 herein.

3) The April/May 2019 results associated with sampling and monitoring of all CCR Rule monitoring wells at the site, including the six wells installed during April-May 2019, were reviewed and used to help identify data-gap areas where supplemental TDS plume delineation was deemed warranted. Ten (10) supplemental monitoring/recovering wells (wells BAC-11 through BAC-17 and wells WWC-11 through WWC-13) were drilled and installed during November and December 2019 (reference Figure 4 for an October 2019 groundwater flow map).

   The ten new wells are being developed presently at the time of preparation of this report and will be sampled in early 2020. Figure 6 presents TDS iso-concentration data associated with all other wells that were sampled during the October 2019 groundwater sampling event.

4) Currently, Stantec is conducting conceptual design of a network of groundwater recovery wells, designed to focus recovery of groundwater near the down-gradient, leading edges of the two TDS plumes, thereby enhancing current groundwater recovery operations. Following IPSC review and comment on the conceptual design, the project will be advanced to a Pre-Final (90-percent) level design.

Although the TDS plumes pose little to no risk to human health or the environment at the present and foreseeable time, IPSC anticipates initiating construction of the expanded groundwater recovery network as soon as practicable, such that installation of the expanded system might be initiated sometime during mid-2020. It is anticipated that the analytical results associated with IPSC's proposed-Spring 2020 sampling of all CCR Rule compliance wells, including the ten wells that were installed during November-December 2019, may also influence what, if any, additional monitoring wells and recovery wells might be necessary in pursuit of TDS plume delineation and control.

IPSC has prepared this report to "provide a semi-annual summary describing the progress in selecting and designing a (groundwater) remedy," as specified by UDEQ Rule R315-319-97(a). IPSC and Stantec have been reviewing historical groundwater quality data to delineate the two TDS plumes and decide how best to enhance groundwater recovery and TDS plume control through expanding the existing groundwater recovery well network. In summary, a total of 16 groundwater monitoring/recovery wells were installed during 2019 toward refinement of IPSC's CSM and better delineation of the two TDS plumes.

This report provides summary details regarding investigative activities conducted subsequent to activities reported within IPSC's June 2019 *Semi-Annual Progress Report*. This report details IPSC's November-December 2019 installation of monitoring/recovery wells BAC-11 through BAC-17 and WWC-11 through WWC-13, including drilling logs and well schematic diagrams. The report includes updated TDS iso-concentration maps and groundwater flow maps associated with all available 2019 water level measurement data, as of the May 2019 and October 2019 monitoring events.

2.0 NOVEMBER AND DECEMBER 2019 GROUNDWATER MONITORING/RECOVERY WELL INSTALLATIONS

Figure 5 presents a TDS iso-concentration map superimposed atop a groundwater potentiometric/flow map, based on the May 2019 groundwater monitoring well network. Analysis of the analytical results and groundwater flow patterns was used to help locate the BAC-11 through BAC-17 and WWC-11 through WWC-13 monitoring/recovery wells that were installed and developed during November and December 2019.

Stantec oversaw the drilling, soil screening, installation, and development of groundwater monitoring/recovery wells BAC-11 through BAC-17 and wells WWC-11 through WWC-13 at the site by Cascade Drilling, LP of Salt Lake City, Utah, a Utah-certified, water well drilling firm. Each well was installed and developed in similar fashion as previous, historical wells at the site.

The 10 new wells were drilled by the sonic drilling method, whereby soil samples were collected continuously in 10-feet, sampling intervals for continuous, real-time visual inspection and Drill Log recording of subsurface soil lithologic and moisture characteristics. Stantec's field geologists screened and logged all soil samples during drilling of each of the ten well borings. All down-hole drilling and sampling equipment were decontaminated before use between well locations.

In turn, the subsurface soil data were used to help determine respective ground water monitoring well construction details. Typically, once each boring was advanced approximately 20 to 25 feet into the uppermost saturated soils, a monitoring well was constructed within each respective borehole. Each groundwater monitoring/recovery well was comprised of 6-inch diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) pipe with a solid, PVC end-cap. The bottom 25 feet of each well was comprised of 6-inch diameter, flush-threaded, 0.02-slotted, Schedule 40 PVC well screen.

Following installation of each well, 16/30 washed, silica sand was emplaced around the well screen from the bottom of the borehole to an approximate height of several feet above the top of the well screen interval. An approximate five to seven feet thick, bentonite pellet seal was added on top of the sand pack material. Then, a cement-bentonite (typically, 10:1 ratio) grout was tremie-slurried from the top of the bentonite pellet seal to an approximate height of two feet below grade. A 5-ft. long, 6-inch diameter, steel, protective casing/monument was emplaced in concrete around each wellhead, with an approximate 2.5-ft. stick-up above natural grade. Each PVC well was furnished with a locking, expandable well cap and lock.

During December 2019, the ground surface and the top of each wellhead will be surveyed in relation to one another and the same on-site, mean sea level benchmark used for surveying the tops of other historical monitoring wells. Table 1 presents a summary of all groundwater monitoring well construction specific details. Copies of Stantec's Drilling Logs and Schematic Well Diagrams associated with the 10 new wells are presented in Appendix A.

3.0 ONGOING CORRECTIVE ACTIONS AND PROGRESS TOWARD SELECTING ADDITIONAL GROUNDWATER CORRECTIVE ACTION REMEDY

3.1 ONGOING GROUNDWATER RECOVERY AT EXISTING RECOVERY WELLS WR-101, WR-102, AND WR-103

IPSC intends to continue operation of existing groundwater recovery wells WR-101, WR-102, and WR-103 identified on Figure 3. The three wells are recovering groundwater that contains elevated concentrations of TDS, located in relatively close proximity to the apparent historical TDS release areas associated with the Bottom Ash Basin. Wells WR-102 and WR-103 are located generally along the apparent TDS plume centerline, as explained in detail in IPSC's 2016 *Updated Corrective Action Plan*. Continued removal of TDS-enriched groundwater from each of these three wells is helping reduce the total mass of TDS within the uppermost aquifer beneath the site in a generalized down-gradient/southwesterly direction in relation to the Bottom Ash Basin.

3.2 SUMMARY OF ONGOING ACTIONS ASSOCIATED WITH SELECTION OF FINAL GROUNDWATER REMEDY

Currently, Stantec is providing advisory services to IPSC, related to alternative, conceptual design options for enhanced TDS plume control and associated groundwater recovery. Conceptual design elements include, for instance:

- Finalizing basis of design;
- Process flow diagram supported by a hydraulic pumping and conveyance model;
- Preliminary piping and instrumentation (P&ID) drawings;
- Typical recovery well completion detail; and
- Finalized location of wells.

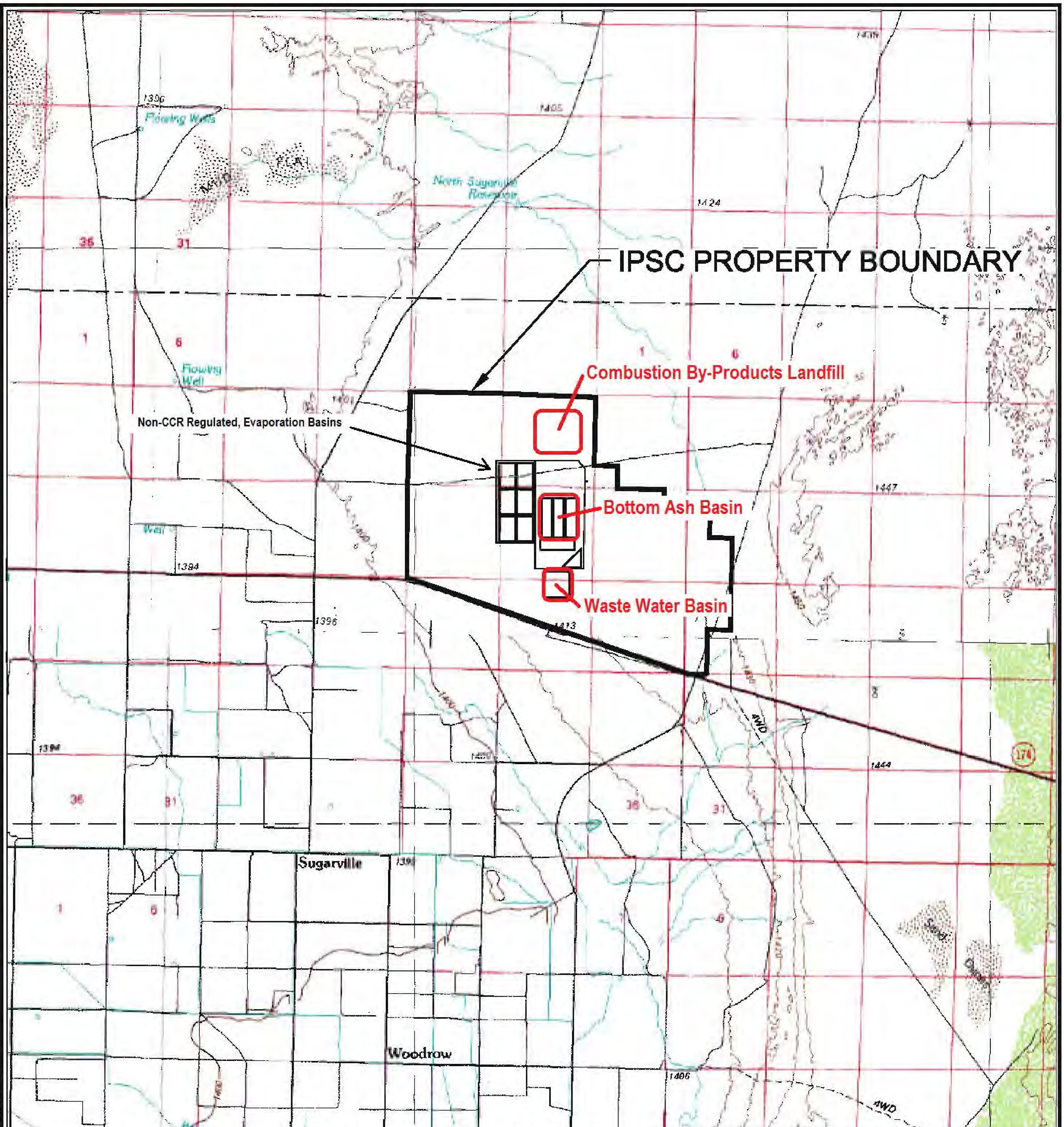
Following IPSC review and comment on the preliminary design, the project will be advanced to a Pre-Final (90-percent) level design. The Pre-Final Design (PFD) will build upon the deliverables associated with the preliminary design and will include the following:

- Finalized PFD of the system;
- Finalized P&IDs;
- Finalized hydraulic model of the pumping and conveyance system;

- Typical design details for the recovery wells and surface completions;
- Underground yard piping;
- Control philosophy for the system;
- Electrical single-line and termination drawings; and
- Equipment and construction specifications.

Following evaluation of the forthcoming remedial design, IPSC intends to initiate groundwater recovery to control the migration of the TDS plumes down-gradient of the surface impoundments. Upon implementation of the enhanced groundwater recovery and monitoring program proposed in this report, IPSC will evaluate the degree to which groundwater recovery and natural attenuation processes control the down-gradient leading edges of the two TDS plumes. IPSC also intends to evaluate potential, alternative means for ongoing enhancement of remediating TDS mass from the uppermost aquifer beneath the site. IPSC will continue to conduct and report to the UDEQ its routine, semi-annual, groundwater monitoring and remediation program in formal Summary Reports.

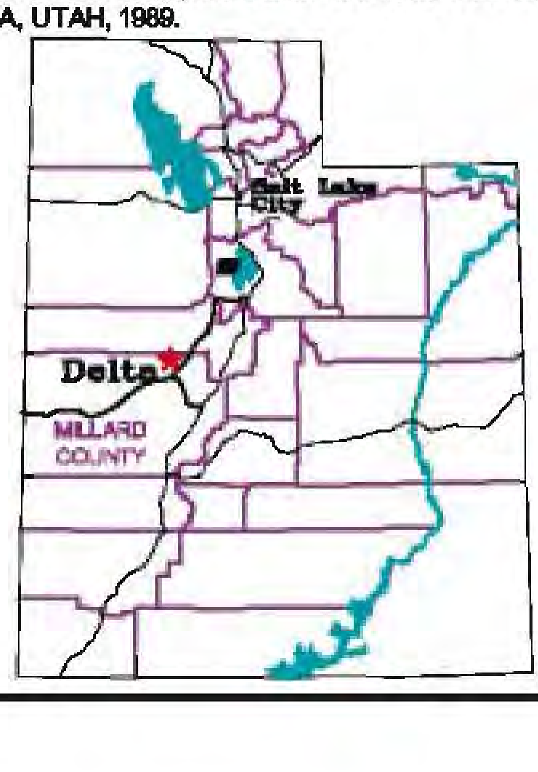
Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES



N

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'	DATE DRAWN	1-26-17

REVISION

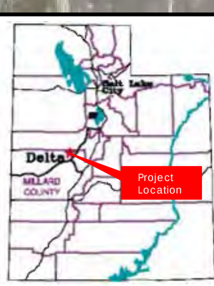
drawings\ipsc-04\Fig2 Site Topographic Map.dwg

Figure 2. CCR Units Location Map

Legend

CCR Unit

N



INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

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DRAWN BY JR	DATE DRAWN 9/30/2016
SCALE 1 in. approx. 1700 ft.	
PROJECT 203709098.409	

Figure 3 May 2019 Groundwater Flow Map

Q:\active\203709098 Intermountain Power\GIS\2019_06\fig03_May2019GWE_20190724.mxd

LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED JUNE 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

N

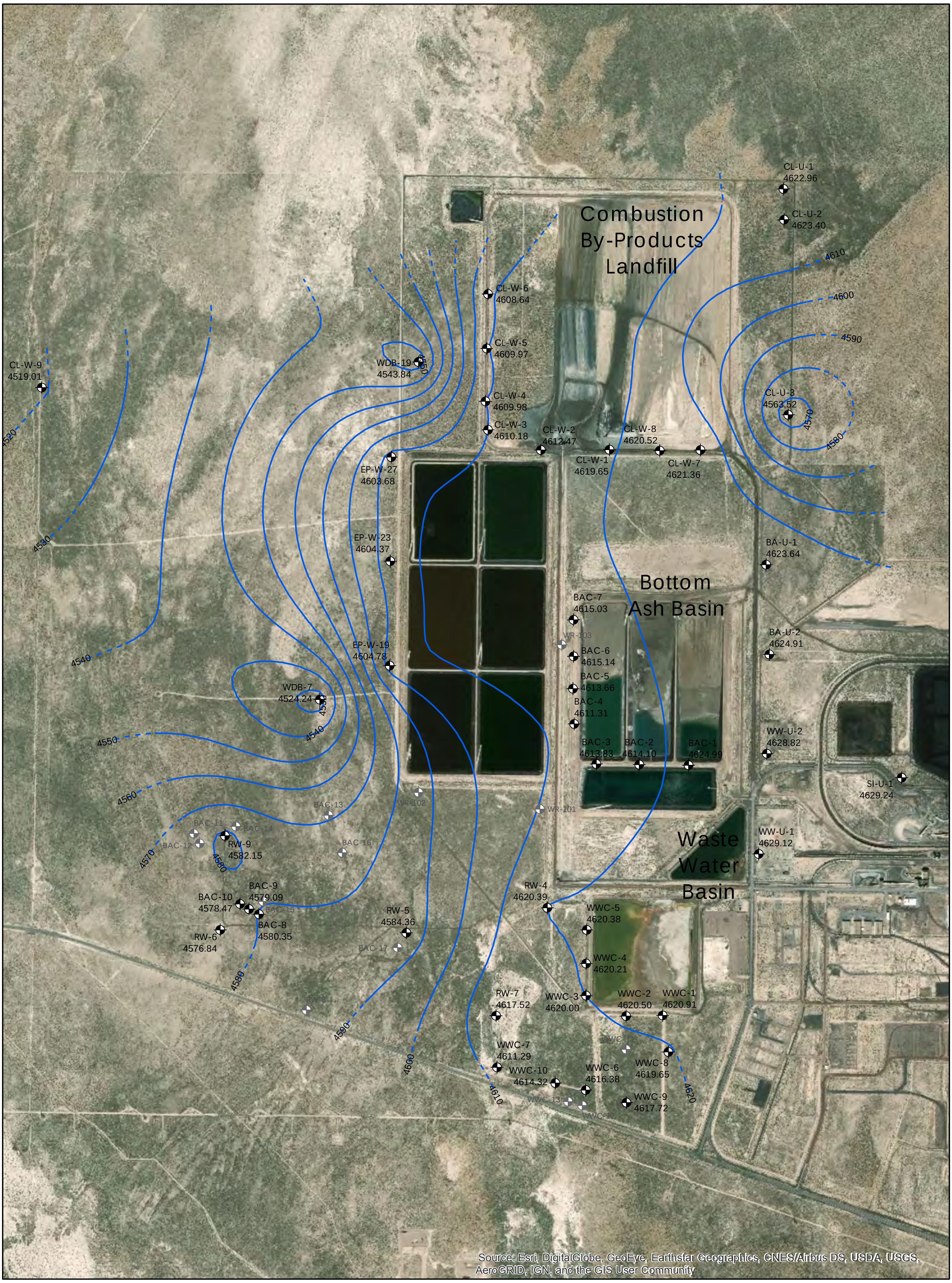
0 — 1,300 — 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:		MAY 20, 2019 POTENTIOMETRIC MAP AND GROUNDWATER FLOW MAP		FIGURE: 3
INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH				
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 07/24/19

Figure 4 October 2019 Groundwater Flow Map

Q:\active\203709098 Intermountain Power\GIS\2019_10\fig04_Oc2019GWE_20191216.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 4617.52 GROUNDWATER ELEVATION
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED OCTOBER 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600 Feet

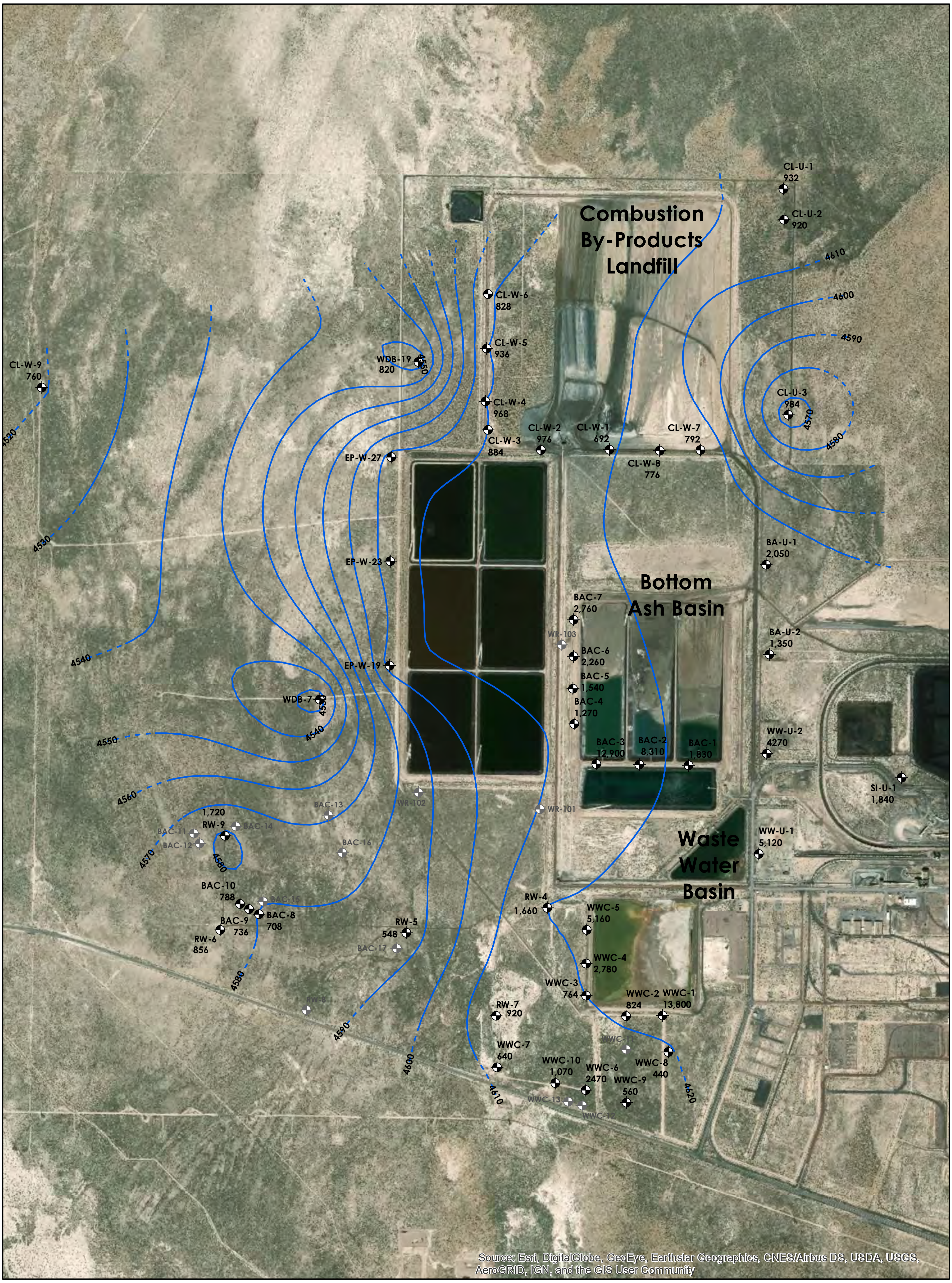
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		OCTOBER 10, 2019 POTENTIOMETRIC MAP AND GROUNDWATER FLOW MAP		FIGURE: 4
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 12/18/19

Figure 5 May 2019 TDS Results

Q:\active\203709098 Intermountain Power\GIS\2019_10\fig05_Spring2019TDSResults_20191216.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 718 TDS RESULT (parts per million-ppm)
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED SPRING 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

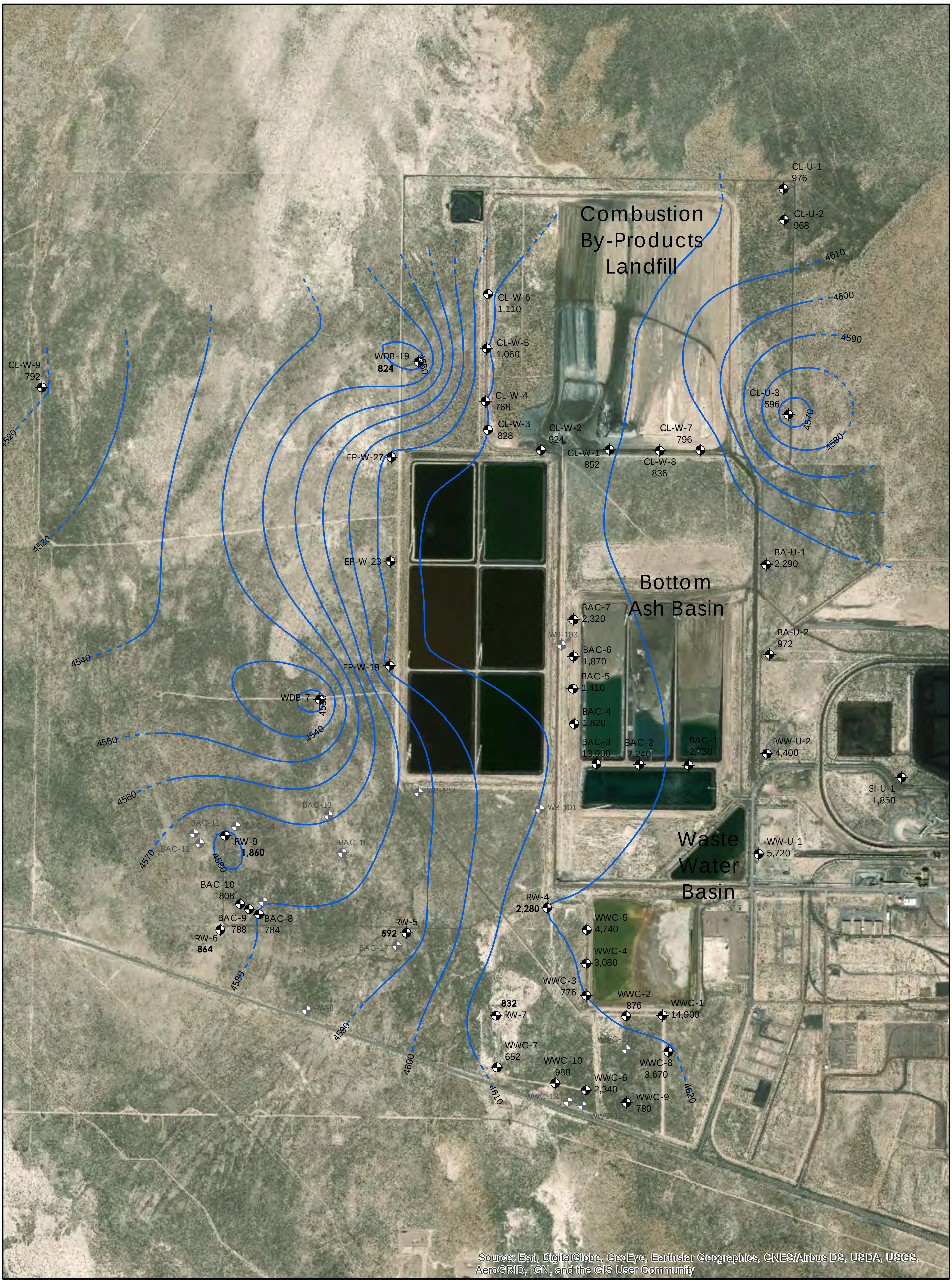
0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		SPRING 2019 TDS RESULTS		FIGURE: 5
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 12/18/19

Figure 6 October TDS Results

Q:\active\203709098 Intermountain Power\GIS\2019_10\fig06_Fall2019TDSResults_20191216.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 718 TDS RESULT (parts per million-ppm)
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED FALL 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600 Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		FALL 2019 TDS RESULTS		FIGURE: 6
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 12/18/19

TABLE 1 GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4555.98
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4606.01
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BAC-8	4/29/2019	6-inch PVC	77	52-77	4626.42
BAC-9	5/1/2019	6-inch PVC	77	52-77	4626.27
BAC-10	5/3/2019	6-inch PVC	87	62-87	4626.27

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
BAC-11	12/7/2019	6-inch PVC	81	50-75	4624.96
BAC-12	12/6/2019	6-inch PVC	81	53-78	4625.055
BAC-13	11/18/2019	6-inch PVC	91	65-90	4629.834
BAC-14	12/4/2019	6-inch PVC	81	53-78	4627.506
BAC-15	12/9/2019	6-inch PVC	81	50-75	4626.494
BAC-16	11/21/2019	6-inch PVC	91	64-89	4630.426
BAC-17	12/10/2019	6-inch PVC	82	56-81	4629.648
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WWC-6	3/24/2018	4-inch PVC	87	67-77	4576.26
WWC-7	3/22/2018	4-inch PVC	87	77-87	4570.78
WWC-8	4/25/2019	6-inch PVC	96	71-96	4647.799
WWC-9	4/28/2019	6-inch PVC	89	62-87	4642.58
WWC-10	4/26/2019	6-inch PVC	90	62-87	4633.72
WWC-11	11/16/2019	6-inch PVC	91	65-90	4641.919
WWC-12	11/12/2019	6-inch PVC	91	65-90	4636.661
WWC-13	11/15/2019	6-inch PVC	91	65-90	4635.128
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59
WW-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WW-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46

BGS = Below Ground Surface

MSL = Mean Sea Level

Appendix A Drilling Logs and Well Schematic Diagrams

MONITORNG WELL ID: **WWC-11**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

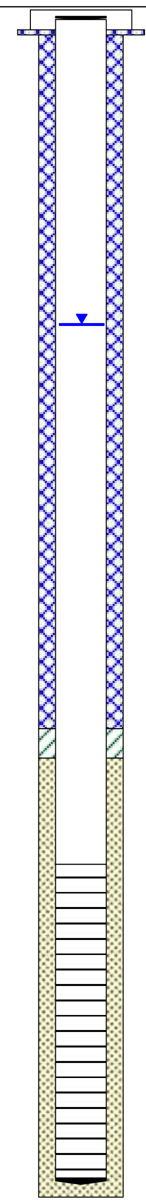
SITE LOCATION: South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. | Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 22.82
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/15/2019	DATE FINISHED: 11/16/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), fine sand 95%, loose, soft, dry, very pale brown (10 YR 7/4), trace gravel 5%.
	Clay (CL), medium plasticity, cohesive, moist, soft to medium density, light gray (10 YR 7/1), mottled with some trace interfingered clay, brownish yellow (10 YR 6/8).
	Well Graded Sand with Clay (SW-SC), medium grained sand 85%, gravel 10%, clay 5%, moist, loose, pale brown (10 YR 6/3).
	Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, dry to moist, brown (10 YR 5/3).
	Same as above, Clay (CL), no sand.
	Poorly Graded Sand (SP), fine sand 98%, loose soft, dry, pale brown (10 YR 6/3), 2% gravel, subrounded.
36	Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, moist, brown (10 YR 5/3), gravel are subangular to subrounded, assorted gravel matrix.
45	Clay (CL), medium plasticity, medium density, moist to wet, cohesive, pale brown (10 YR 6/3).
	Well Graded Sand with gravel (SW), fine to coarse sand 90%, gravel 10%, loose, soft, brown (10 YR 5/3).
	Same as above, becoming wet.
	Clay (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
	Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, moist, pale brown (10 YR 6/3).
	Same as above, fine grained sand, saturated, low plasticity, non cohesive.
	Same as above, with trace interfingering clay, reddish yellow (5 YR 6/6).
	Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, wet, brown (10 YR 5/3), gravel are subrounded, assorted matrix.
90	Clay with Sand (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**WWC-12**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

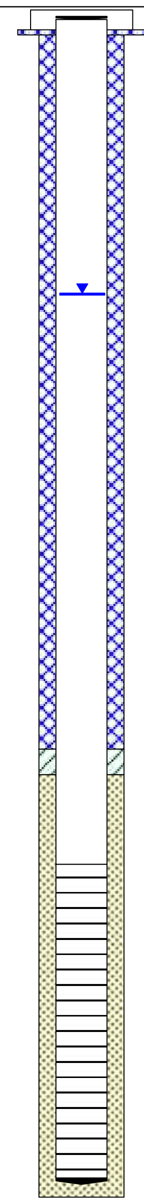
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 20.46
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/11/2019	DATE FINISHED: 11/12/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), 90% sand, 10% silts, light gray (7.5 YR 7/1), soft, loose, fine grained, dry, sand are mostly quartz, subangular quartz grains.
5	Same as above, becoming light yellowish brown (10 YR 6/4).
10	Same as above, becoming wet at 8.5 ft bgs., perched groundwater.
	Clay (CL), medium plasticity, medium stiff, cohesive, very pale brown (10 YR 7/4).
	Poorly Graded Sand with Silt (SP-SM), 95% fine grained sand, 5% silts, loose, soft, moist, brown (10 YR 4/3), trace gravel.
15	Well Graded Sand with Gravel (SW), 80% sand, 20% gravel, fine to coarse sand, moist, loose soft, dark yellowish brown (10YR 4/4), gravel are subrounded to rounded, small.
20	
25	Clay (CL), medium plasticity, medium density, moist, cohesive, light yellowish brown (10 YR 6/4), thickly bedded, sharp contact at 25 ft bgs.
30	
35	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10YR 5/3).
40	Well Graded Sand with Gravel (SW), fine to coarse grained sand 90%, small gravel 10%, loose, soft, moist, dark yellowish brown (10 YR 4/4).
45	Same as above, increase in gravel to 30%.
	Same as above, decrease in gravel to 10%.
50	Poorly Graded Sand (SP), fined grained sand 100%, loose, moist, brown (10YR 4/3). Sharp contact.
55	Clay (CL), high plasticity, stiff, moist, cohesive, light yellowish brown (10 YR 6/4), sharp contact.
60	Lost core sample from sonic casing.
	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
65	
70	Well Graded Sand with Silt and Clay (SW-SM), fine or medium grained sand 100%, soft, loose, brown (10 YR 4/3).
75	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
80	Poorly Graded Sand with Silts and Clay (SP-SC), fine grained sand 95%s, soft, loose, wet, light yellowish brown (10 YR 6/4), trace clay.
85	Clay with Sand (CL), medium plasticity, soft to medium density, wet, pale brown (10YR 6/3), sand are fine grained.
	Same as above with gradational transition to clay.
90	Clay (CH), high plasticity, mottled, wet, cohesive, pale brown (10 YR 6/3), mottled color is reddish yellow (7.5 YR 7/6).
95	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

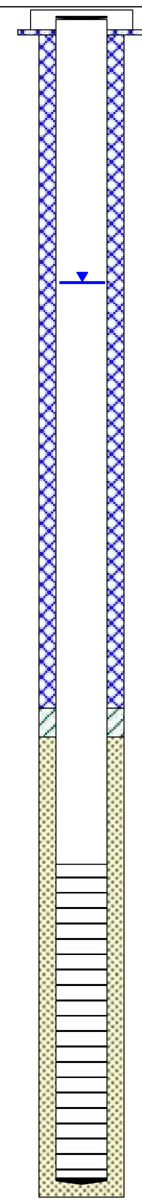
Stantec

MONITORNG WELL ID:	**WWC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 19.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/13/2019	DATE FINISHED: 11/15/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly Graded Sand with Silts (SP-SM), fine sand 95%, 5% silts, soft, loose, dry, light gray (7.5 YR 7/1).
5		Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, dry, pinkish gray (7.5 YR 7/2), trace gravel, small gravel, assorted matrix, subrounded.
10		Same as above, with clay, increase gravel 10%, wet.
		Clay with Sand (CL), low to medium plasticity, moist, cohesive, very pale brown (10 YR 7/4).
		Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, , moist, pale brown (10 YR 6/3), trace gravel 5%, subrounded.
15		
20		
		Same as above, with clay (SW-SC) at 10%, wet, soft, low plasticity clay.
25		Clay with Sand (CL), medium plasticity, moist cohesive, thick bedded, fine sand, sharp contact at 23 ft, bgs,
		Same as above, Clay (CL), trace black staining.
30		Clay with Sand (CL), medium plasticity, moist cohesive, fine sand.
		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
35		
40		
		Well Graded Sand with gravel (SW), fine to coarse sand 85%, 15% gravel, loose, soft, moist, brown (10 YR 5/3), gravel are small, subrounded, assorted matrix.
45		Poorly Graded Sand (SP), fine to medium grained sand 98%, loose, soft, moist, brown (10 YR 5/3), trace small gravel 2%, subrounded.
50		Same as above, trace clay.
		Clay with Sand (CL), low to medium plasticity, soft to medium density, moist, yellowish brown (10 YR 5/4), secondary sand are fine grained.
55		
60		Clay (CL), medium to high plasticity, medium to stiff density, moist, thickly bedded, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
65		
		Clay with Sand (CL) , medium plasticity, moist to wet, cohesive, brown (10 YR 5/3).
70		Clay (CL), medium plasticity, medium to stiff density, moist, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
75		
		Poorly Graded Sand with Clay (SP-SC), fine grained sand 95%, loose, soft, wet, brown (10 YR 5/3), some trace interfingering clay 5%, reddish yellow (5 YR 5/3).
80		Clay with Sand (CL), low plasticity, soft, wet, non cohesive, pale brown (10 YR 6/3).
85		Clay (CL), medium to high plasticity, wet, cohesive, pale brown (10 YR 6/3), interfingering clay reddish yellow (5 YR 6/6), trace sand.
90		Same as above, becoming medium plasticity.
		End of borehole to 91 ft bgs., per scope of work.
95		

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 52.8 ft bgs.

Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 52.8 to 55 ft bgs.

Filter pack sand 55 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-11**

INTERMOUNTAIN POWER SERVICE CORP.

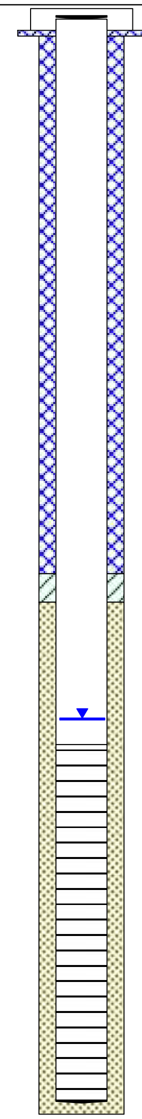
Stantec

CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 48.21
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/6/2019	DATE FINISHED: 12/7/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Fill
		Poorly Graded Sand with Silt (SP-SM), fine grained sand 100%, loose, soft, dry, very pale brown (10 YR 7/3).
5		
		Clay with Sand (CL), low plasticity, soft to medium density, moist, light brownish gray (10 YR 6/2).
10		Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, loose, medium dense, moist, light brownish gray (10 YR 6/2); clay are low plasticity, medium dense.
15		
20		Clay (CL), medium plasticity, medium dense, cohesive, moist, light brownish gray (10 YR 6/2), mottled with brownish yellow (10 YR 6/8).
25		
30		Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, moist, light yellowish brown (10 YR 6/4); clay low plasticity, soft, non cohesive.
35		Same as above, becoming brown (10 YR 5/3).
40		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
45		
50		Poorly Graded Sand (SP), fine to medium grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
55		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
		Clay with Sand (CL), low plasticity, soft, wet, pale brown (10 YR 6/3).
60		Well Graded Sand (SW), fine to coarse Sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel, subrounded.
65		Same as above, increase in coarse grained sand between 65.2 to 65.8 ft bgs.
		Same as 60 ft bgs.
70		
75		Clay (CL), medium plasticity, medium dense, moist, cohesive, light yellowish brown (10 YR 6/4).
80		
		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 76 ft bgs., and 4 inches from 76 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 50 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 76 ft bgs.

50 to 75 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

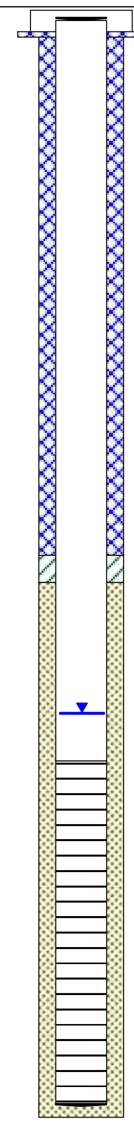
Stantec

MONITORNG WELL ID:	**BAC-12**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.):	81	GROUNDWATER LEVEL (ft. btoc.):	49.55
		DATE STARTED:	12/4/2019	DATE FINISHED:	12/6/2019
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), fine grained sand 95%, loose, soft, dry, pale brown (10 YR 6/3).
10	Clay (CL), medium plasticity, medium dense, moist, cohesive, light brownish gray (10 YR 6/2).
	Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, dry, light brownish gray (10 YR 6/2); clay 10%, low plasticity, soft.
20	Clay (CL), medium plasticity, medium dense, moist, cohesive, very pale brown (10 YR 7/3), mottled with brownish yellow (10 YR 6/8).
25	Poorly Graded Sand with Silt (SP-SM), loose, soft, dry, pale brown (10 YR 6/3).
28.5	Well Graded Sand with Gravel (SW), fine to coarse sand 85%, loose, soft, dry, light brownish gray (10 YR 6/2), gravel 15%, small, subangular to subrounded, assorted matrix.
	Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, moist, pale brown (10 YR 6/3), 5% clay.
39.5	Clay with Sand (CL), medium plasticity, medium dense, moist, light yellowish brown (10 YR 6/3).
	Clay (CL), medium plasticity, stiff, moist, cohesive, pale brown (10 YR 6/2).
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
	Clay (CL), Same as 39.5 ft bgs.
	Clay with Sand (CL), Same as 38.5 ft bgs.
	Clay (CL), Same as 41.5 ft bgs.
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
	Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3), mottled with yellowish brown (10 YR 5/6).
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
	Well Graded Sand (SW) fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), trace gravel.
	Clay with Sand (CL), low to medium plasticity, medium dense, wet, non cohesive, brown (10 YR 5/3), mottled with light brownish gray (10 YR 6/2).
	Well Graded Sand with Clay (SW-SC), fine grained sand 90%, loose, soft, wet, brown (10 YR 5/3): clay 10%, low plasticity, non cohesive.
75	Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs., and 4 inches from 79 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 79 ft bgs.

53 to 78ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

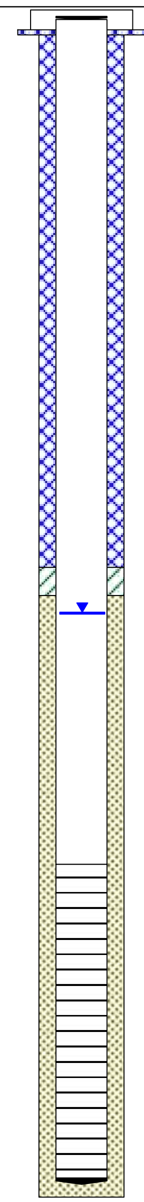
Stantec

MONITORNG WELL ID:	**BAC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.):	91	GROUNDWATER LEVEL (ft. btoc.):	45.38
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED:	11/16/2019	DATE FINISHED:	11/18/2019
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly Graded Sand with Silt and Gravel (SP-SM), fine grained sand 85%, silts 10%, trace gravel 5%, loose, dry, light gray (10 YR 7/2).
5		Same as above, becoming dense, consolidated.
		Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
10		Same as above, no gravel, sand 100%.
		Clay with Sand (CL), low plasticity, dry to moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
15		Same as above, moist.
		Same as above, medium plasticity.
20		Poorly Graded Sand (SP), fine grained sand 100%, loose, dry, dark brown (10 YR 3/3), thinly bedded.
		Clay with Sand (CL), low plasticity, moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
25		
30		
35		Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
		Poorly Graded Sand (SP), medium grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
40		Clay (CL), medium plasticity, medium dense, moist, brownish yellow (10 YR 6/6).
		Clay with Sand (CL), low plasticity, soft density, wet, non cohesive, light yellowish brown (10 YR 6/4).
45		Clay (CL), medium plasticity, medium dense, moist, cohesive, brownish yellow (10 YR 6/6), with mottled clay, brownish yellow (10 YR 6/8).
50		
55		Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, non cohesive, brown (10 YR 6/3).
60		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
		Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, brown (10 YR 6/3).
65		Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
70		Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
		Poorly Graded Sand (SP), medium grained sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel 5%, rounded to subrounded, assorted matrix.
75		
80		
85		Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, brown gray (10 YR 5/3).
90		End of borehole to 91 ft bgs., per scope of work.
95		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; Sch. = Schedule; dia. = diameter; YR = Yellow-Red; ft = feet

MONITORNG WELL ID:	**BAC-14**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

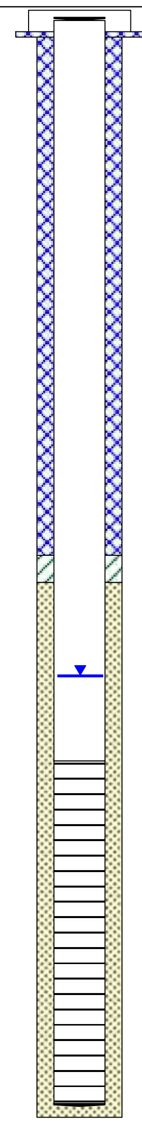
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 81 ft bgs., 10 inch sonic core barrel 0 to 78 ft bgs.	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.81
		DATE STARTED: 11/21/2019	DATE FINISHED: 12/4/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Well Graded Sand (SW), fine to coarse sand 95%, loose, soft, dry, yellowish brown (10 YR 5/4); 5% gravel, subrounded, small.
5		Well Graded Sand with Clay (SW-SC), fine to coarse sand 95%, medium dense, dry, light gray (10 YR 7/4).
10		Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry to moist, very pale brown (10 YR 7/3).
15		
20		Clay (CL), medium plasticity, medium dense, moist, cohesive, pale brown (10 YR 6/3), with trace mottled clay, brownish yellow (10 YR 6/8).
25		Poorly Graded Sand (SP), fine sand 100%, loose, soft, light brownish gray (10 YR 6/2).
30		Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, light brownish gray (10 YR 6/2); clay 10% low plasticity, soft, non cohesive.
35		
40		Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).
		Poorly Graded Sand (SP), fine sand 100%, loose, soft, moist to wet, brown (10 YR 5/4).
45		
50		Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
		Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, brown (10 YR 5/3); clay 10% low plasticity.
55		Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
60		Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
		Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).
65		Poorly Graded Sand with Clay (SP-SC), fine sand 85%, loose medium dense, wet, brown (10 YR 5/3); clay 15% low plasticity, non cohesive, light yellowish brown (10 YR 6/4).
		Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).
70		Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
		Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
75		Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, wet, brown (10 YR 5/3); clay 10%, low plasticity, soft, non cohesive.
		Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
80		Clay (CL), medium plasticity, medium to stiff, moist, brown (10 YR 5/3).
		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



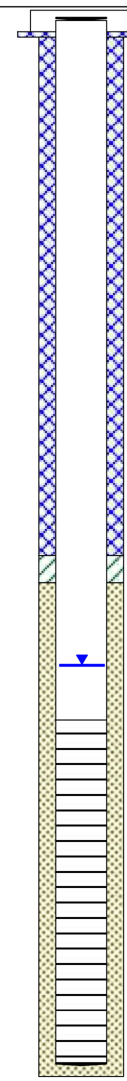
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-15**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.03
		DATE STARTED: 12/7/2019	DATE FINISHED: 12/9/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Fill
	Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, very pale brown (10 YR 7/3), trace gravel, subrounded.
5	Clay (CL), medium plasticity, medium dense, cohesive, dry, light brownish gray (10 YR 6/2), trace white (10 YR 8/1), trace calcium carbonate between clay layering, effervesces with HCL.
15	Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, light gray (10 YR 7/1), trace clay at depth.
20	Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, soft to medium dense, dry, pale brown (10 YR 6/3), clay low plasticity, medium dense.
28	Clay (CL), medium plasticity, medium dense, cohesive, moist, pale brown (10 YR 6/3).
31	Same as above, becoming light yellowish brown (10 YR 6/4).
35	Clay with Sand (CL), low plasticity, soft, non cohesive, light yellowish brown (10 YR 6/4).
37.5	Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
43	Well Graded Sand with Gravel (SW), fine to coarse sand 90%, loose, soft, wet, brown (10 YR 5/3), gravel 10%, subrounded.
53	Same as above, with trace black staining.
55	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
	Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/6).
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
59	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3)
63	Same as above, with some clay.
	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
	Same as above, color change to yellowish brown (10 YR 6/4).
69	Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
73	Same as above, with mottled yellowish red (5 YR 5/6).
76	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
	Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
80	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
	Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 76 ft bgs., and 4 inches from 76 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 50 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 76 ft bgs.

50 to 75 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

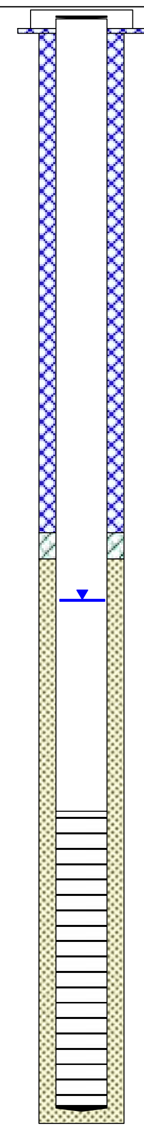
Stantec

MONITORNG WELL ID:	**BAC-16**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 47.45
		DATE STARTED: 11/18/2019	DATE FINISHED: 11/21/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Fill.
		Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
10		No core retrieved from sonic core barrel.
		Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
15		Well Graded Sand (SW), fine to coarse grained sand 95%, loose, soft, light brownish gray (10 YR 6/2), trace gravel 5%, subrounded, small.
		Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
25		Clay (CL).
30		Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry, non cohesive, pale brown (10 YR 6/3).
		Poorly Graded Sand (SP), fine grained 100%, loose to medium dense, dry, light gray (10 YR 7/1).
40		Clay (CL), medium plasticity, medium density, moist, light yellowish brown (10 YR 6/4), with some interfingering clay, brownish yellow (10 YR 6/8).
		Clay with Sand (CL).
45		Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
50		Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
55		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
60		Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, brown (10 YR 5/3), with trace interfingering clay 5%, yellowish red (5 YR5/6).
65		Well Graded Sand (SW), fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), 2% gravel, small, subrounded.
70		Clay with Sand (CL), low to medium plasticity, soft to medium density, wet, light brownish gray (10 YR 6/2).
		Clay (CL), medium plasticity, medium to stiff, cohesive, moist, light yellowish gray (10 YR 6/2).
75		Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
80		Clay (CL), medium plasticity, stiff, cohesive, moist to wet, brown (10 YR 5/3).
		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
85		Clay (CL), same as 73 ft bgs.
		Poorly Graded Sand (SP), same as 82 ft bgs.
		Clay (CL), same as 73 ft bgs.
90		Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
95		Clay (CL), same as 73 ft bgs., with mottled interbedded clay, yellowish red (5 YR 5/6).
		End of borehole at 91 ft bgs. Installed monitoring well per scope of work.
100		

WELL CONSTUCTION DIAGRAM



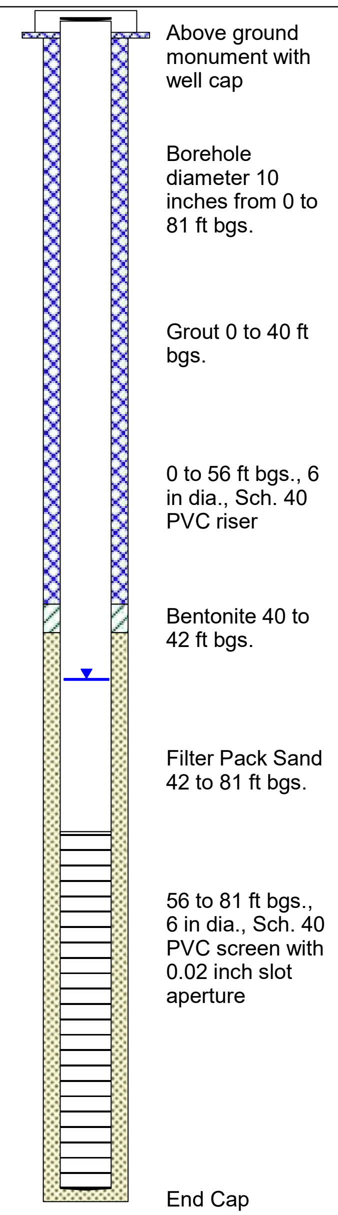
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-17**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 82	GROUNDWATER LEVEL (ft. btoc.): 45.3
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/12/9/2019	DATE FINISHED: 12/10/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with Silt (SW-SM), fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), fine silts, trace calcium carbonate.
4	Well Graded Sand (SW), fine to coarse sand 100%, loose, soft, pale brown (10 YR 6/3).
18	Well Graded Sand with Gravel and Clay (SW-SC), loose, soft, fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), clay low plasticity, soft, gravel, small, subrounded.
	Well Graded Sand (SW), fine to coarse 98%, loose, soft, light yellowish brown (10 YR 6/4), gravel 2%, small, subrounded.
29	Clay (CL), low plasticity, soft, wet, very pale brown (10 YR 7/3), perched groundwater.
31	Clay with Sand (CL), low plasticity, soft, moist, light yellowish brown (10 YR 6/4).
40	Clay (CL), medium plasticity, medium dense, cohesive, brown (10 YR 5/3), mottled with some reddish yellow (5 YR 6/6).
58	Clay with Sand (CL), low plasticity, soft, wet non cohesive, brown (10 YR 5/3).
62	Poorly Graded Sand with Clay (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), with trace gravel 2%, subrounded, small.
68	Poorly Graded Sand with Clay (SP-SC), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), clay, medium plasticity, soft to low density, non cohesive, light yellowish brown (10 YR 5/4).
	Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).
	Poorly Graded Sand with Clay (SP-SC), fine grained sand, loose, soft, wet, brown (10 YR 5/3), clay are low plasticity, soft.
	Clay with Sand (CL), low to medium plasticity, soft, wet, cohesive, brown (10 YR 5/3).
80	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

Attachment 1 TABULATED GROUND WATER MONITORING DATA

Sampling Round 13 (all results ppm)

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
Results																							
CL-U-1	0	58.9	432	0.753	7.94	109	976	0	0.0289	0.0799	0	0	0	0	0	0.239	0	0.0035	0	0	0.03	0.75	0.75
CL-U-2	0	60.6	424	0.792	7.87	112	968	0	0.0251	0.0935	0	0	0	0	0	0.229	0	0.00412	0	0	0.03	0.57	0
CLW-1	0	36	328	1.11	8.03	69.1	852	0	0.0295	0.0612	0	0	0	0	0	0.187	0	0.00357	0	0	0.29	0.38	0
CLW-2	0	50.8	438	1.13	8.15	88.1	924	0	0.0283	0.1510	0	0	0	0	0	0.253	0	0.0102	0	0	0.08	0.56	0
CLW-3	0	47	363	1.24	7.99	90.8	828	0	0.039	0.0976	0	0	0	0	0	0.242	0	0.00504	0	0	0.6	0.43	0
CLW-4	0	34.6	332	1.55	7.97	75.6	768	0	0.0387	0.0797	0	0	0	0	0	0.235	0	0.00441	0	0	0.22	1.06	1.06
CLW-5	0	37.5	351	1.89	8	76.9	1060	0	0.0231	0.0685	0	0	0	0	0	0.237	0	0.00479	0	0	0.25	0.44	0
CLW-6	0	34.5	330	1.7	7.98	74.4	1110	0	0.0145	0.0936	0	0	0	0	0	0.239	0	0.00607	0	0	0.42	1.05	1.47
CLW-7	0	43.7	362	1	7.89	71.4	796	0	0.0238	0.0523	0	0	0	0	0	0.192	0	0.00402	0	0	0.12	-0.03	0
CLW-8	0	39.9	337	1.04	7.98	70.7	836	0	0.0266	0.0521	0	0	0.00000	0	0	0.196	0	0.00449	0	0	-0.05	0.32	0
CLW-9	0	26.9	288	1.94	8.12	88.7	792	0	0.0398	0.0469	0	0	0.00287	0	0	0.181	0	0.00573	0	0	0.36	0.02	0
CL-U-3	0	64.6	304	0.429	8.85	168	596	0	0	0.0342	0	0	0.0738	0	0	0.152	0	0.00964	0	0	2.13	0.21	2.13

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
Results																							
BA-U-1	0	173	1140	0.587	7.71	314	2290	0	0.0223	0.0770	0	0	0	0	0	0.385	0	0.00302	0.00502	0	0.16	0.73	0.73
BA-U-2	0	47.1	400	0.893	8.18	56.6	972	0	0.0283	0.1270	0	0	0	0	0	0.247	0	0.00332	0	0	0.26	0.7	0
BAC-1	1.43	93.7	801	0.307	8.16	701	2730	0	0.0126	0.0460	0	0	0.00163	0	0	0.259	0	0.128	0.00436	0	0	0.14	0
BAC-2	9.49	208	1730	1.07	7.45	2760	7240	0	0.0647	0.0192	0	0	0.0058	0	0	0.466	0.00028	0.19	0.0145	0	0.12	0.39	0
BAC-3	7.32	441	3500	0.675	7.49	4310	13900	0.0027	0.0356	0.0321	0	0	0.00449	0	0	0.957	0	0.0255	0.0236	0	0	0.45	0
BAC-4	0.606	66.7	573	1.13	7.95	330	1820	0	0.0322	0.0637	0	0	0	0	0	0.279	0	0.0218	0	0	0.15	0.16	0
BAC-5	0	66.2	568	1.11	8.07	250	1410	0	0.0321	0.0814	0	0	0	0	0	0.289	0	0.00941	0	0	0.25	0.36	0
BAC-6	2.66	119	625	0.796	7.86	646	1870	0	0.0223	0.0338	0	0	0	0	0	0.288	0	0.0651	0.00273	0	0.31	0.83	1.14
BAC-7	5.06	107	566	1.31	7.96	1170	2320	0	0.0314	0.0174	0	0	0	0	0	0.248	0	0.0887	0.00276	0	0.04	0.22	0
BAC-8	0	23.2	280	1.53	8.05	95.5	784	0	0.0639	0.0389	0	0	0	0	0	0.156	0	0.00545	0	0	0.03	1.21	1.21
BAC-9	0	27.1	299	1.45	8.06	87.6	788	0	0.0593	0.0388	0	0	0	0	0	0.16	0	0.00483	0	0	0.09	0	0.53
BAC-10	0	25.7	280	1.51	8.09	87.4	808	0	0.0595	0.045	0	0	0	0	0	0.16	0	0.00584	0	0	0.8	1	1.8

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
Results																							
SI-U-1	0	136	824	0.38	7.71	281	1850	0	0.00981	0.0599	0	0	0	0	0	0.277	0	0	0	0	0.19	1.61	1.61
WW-U-1	1.41	311	1010	0	7.37	588	5720	0	0.00594	0.0419	0	0	0.00166	0	0	0.485	0	0.00689	0.0077	0	-0.08	1.42	1.42
WW-U-2	1.02	346	2020	0	7.3	855	4400	0	0.00735	0.0499	0	0	0	0	0	0.54	0	0.00317	0.011	0	-0.2	1.36	1.36
WWC-1	13.2	473	4940	0.292	7.42	3570	14900	0	0.0264	0.0205	0	0	0	0	0	0.974	0.000278	0.0113	0.016	0	0.23	0.9	0.9
WWC-2	0	57.6	349	0.427	7.99	141	876	0	0.0166	0.0336	0	0	0	0	0	0.126	0	0.00327	0	0	-0.15	0.81	0.81
WWC-3	0	33.3	262	0.986	8.13	95.3	776	0	0.0236	0.0331	0	0	0	0	0	0.151	0	0.00477	0	0	3.1	0.58	3.1
WWC-4	1.06	176	968	0.453	7.61	594	3080	0	0.0154	0.0456	0	0	0	0	0	0.329	0	0	0.00177	0	0.72	0.57	0

Round 13

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
Field Results							
CL-U-1	15.85	7.75	-159	777	0	1.62	0.497
CL-U-2	15.96	7.7	-158	743	0	1.01	0.476
CLW-1	15.83	7.73	-48	1480	1.3	2.01	0.948
CLW-2	16.6	7.79	-191	760	0	2	0.488
CLW-3	17.14	7.84	-215	1730	0.5	1.43	1.11
CLW-4	16.47	7.88	-233	1600	2.7	1.61	1.03
CLW-5	17.05	7.83	-220	1700	1.9	1.84	1.09
CLW-6	16.65	7.7	-229	1590	1.6	2.69	1.02
CLW-7	17.74	7.76	-57	1580	0.6	1.24	1.01
CLW-8	16.37	7.81	-36	1520	1	1.51	0.969
CLW-9	16.03	7.72	-299	1610	0.2	7.56	1.03
CL-U-3	16.1	9.08	-76	503	0	1.84	0.322

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
Field Results							
BA-U-1	16.68	7.47	-58	1610	0	1.29	1.03
BA-U-2	16.37	8.94	-255	1550	1.4	0.8	0.99
BAC-1	17.09	7.98	-50	3950	1.32	3.4	2.53
BAC-2	16.92	7.19	28	10600	3.3	2.45	6.59
BAC-3	17.34	7.1	20	16700	2	0.61	10.4
BAC-4	16.73	7.81	-57	2570	0.6	1.18	1.64
BAC-5	17.52	7.84	-50	2540	0.4	1.33	1.63
BAC-6	16.78	7.74	-52	2670	0.7	0.87	1.71
BAC-7	17.16	7.83	-156	4000	3.1	0.86	2.56
BAC-8	15.03	7.65	-41	1540	0.2	5.45	0.989
BAC-9	15.03	7.68	-23	1560	0.3	1.2	0.993
BAC-10	14.98	7.65	-31	1560	0.1	1.15	0.999

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
Field Results							
SI-U-1	16.51	7.63	-12	3290	0.1	0.78	2.11
WW-U-1	16.11	7.19	14	8000	2.8	1.93	5.04
WW-U-2	16.06	7.38	22	7390	0.6	1.32	4.66
WWC-1	15.13	6.79	36	1910	0	3.67	11.8
WWC-2	14.82	7.31	-29	1720	0.3	0.47	1.1
WWC-3	15.96	7.72	-244	1420	0	0.2	0.909
WWC-4	14.38	7.21	-34	4460	0	2.35	2.86

ATTACHMENT 5 - JANUARY 2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION SUMMARY REPORT

January 2020 Annual Groundwater Monitoring and Corrective Action Summary Report

Intermountain Generating Facility
Delta, Utah

Prepared for:
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Project No.: 203709098

January 24, 2020

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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1.0 EXECUTIVE SUMMARY

1.1 PURPOSE OF REPORT

On behalf of Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this report to summarize IPSC's 2019 groundwater monitoring and recovery program pursuant to the United States Environmental Protection Agency's ("US EPA") Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")) at IPSC's Intermountain Generating Facility ("IGF") located approximately ten miles north of Delta, Millard County, Utah. IPSC's compliance program addresses elements prescribed by CCR Rule Parts §257.90 (R315-319-90) Applicability; §257.91 (R315-319-91) Groundwater Monitoring Systems; §257.93 (R315-319-93) Groundwater Sampling and Analysis Requirements; §257.95 (R315-319-95) Assessment Monitoring Program; and §257.96 (R315-319-96) Assessment of Corrective Measures.

This report is formatted in general accordance with reporting requisites prescribed within §257.90(e) (R315-319-90(e)). The report provides a summary of investigative and ongoing remedial activities that were proposed and/or outlined in detail within IPSC's *January 2019 Annual Groundwater Monitoring and Corrective Action Summary Report*; IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report; and IPSC's June and December 2019 *Semi-Annual Progress Reports*.

The historical reports presented IPSC's approach for addressing requirements specified by the Federal CCR Rule as well as the facility's Utah Department of Environmental Quality ("UDEQ"), Division of Water Quality ("DWQ") Groundwater Discharge Permit No. UGW270004. The most recent permit renewal was issued by the UDEQ to IPSC's Intermountain Generating Facility ("IGF"), effective May 24, 2016.

The DWQ has regulatory oversight for IPSC's compliance with its Groundwater Discharge Permit. The UDEQ Division of Waste Management and Radiation Control ("DWMRC") also has regulatory oversight pursuant to the State CCR Rule. The CCR Rules apply to each of IPSC's three (3) CCR units (reference Figures 1 and 2 for regional and site-specific, location maps):

- Combustion By-Products Landfill ("CB Landfill");
- Bottom Ash Basin; and
- Waste Water Basin.

This annual summary report provides an overview of groundwater monitoring and recovery activities conducted at the site during 2019 in compliance with the CCR Rules. The report summarizes activities detailed within IPSC's June and December 2019 Semi-Annual Progress Reports and outlines ongoing and 'next-step' actions associated with enhancement of IPSC's existing groundwater monitoring and corrective action program. IPSC intends to utilize several additional wells for groundwater recovery in addition to existing recovery wells WR-101, WR-102, and WR-103, as discussed in detail herein.

1.2 SUMMARY OF 2019 ACTIVITIES

IPSC implemented a sequential, groundwater quality investigative program during 2019 to refine IPSC's current Conceptual Site Model (CSM) and understanding of hydraulic conditions characterizing localized portions of the uppermost aquifer beneath the site. The sequenced, investigative approach helped delineate more definitively the physical characteristics and footprints of two different Total Dissolved Solids (TDS) groundwater plumes located downgradient (generally southwest) of the Bottom Ash and Waste Water Basins (surface impoundments), respectively. Six (6) wells were installed and sampled during the Spring of 2019, the analytical results of which were then used to help locate ten additional wells that were installed during the Fall of 2019.

A total of 16 new, 6-inch diameter, groundwater monitoring/recovery wells were installed during 2019, such that each well might be used as a groundwater recovery well if needed. Some wells were located to provide better identification of the two TDS plumes' respective, downgradient, leading edges. Other wells were located to provide more definition regarding the locations of the plumes' centers of TDS mass.

Pump-tests of specific wells were used to help gain a better understanding of yields of localized wells and lateral extent of groundwater capture zones, which in turn were evaluated using Stantec's site-specific, groundwater model. The groundwater model helped IPSC/Stantec identify wells that could be used for groundwater recovery to intercept the downgradient, leading edges of the TDS plumes. The 2019 data are also being evaluated currently to investigate if, and where, additional groundwater monitoring/recovery wells might be needed for more comprehensive TDS plume identification/delineation and control.

Summary 2019 activities included:

1) During April and May 2019, IPSC expanded the network of monitoring/recovery wells intended to monitor and control the downgradient (predominantly southwest), leading edge of the TDS plume associated with historical releases from the Bottom Ash Basin, through installation of supplemental monitoring (and remediation, if needed) wells BAC-8, BAC-9, and BAC-10 (reference Figure 3).

2) During April and May 2019, IPSC expanded the network of monitoring/recovery wells in apparent downgradient directions (predominantly southwest) in relation to recently discovered, apparent release areas (west and south sides) at the Waste Water Basin, through installation of supplemental monitoring (and remediation, if needed) wells WWC-8, WWC-9, and WWC-10 (reference Figure 3).

   The drilling and installation activities associated with the six wells installed during April-May 2019 were discussed in detail, including drilling logs and well schematic diagrams, within

IPSC's *June 2019 Semi-Annual Progress Report*. However, at the time of preparation of the June 2019 report, laboratory result reports associated with the May sampling event had not been received by IPSC. Reference Figure 3 herein for a May 2019 groundwater flow map and Figure 5 for a map noting May 2019 TDS concentrations. Monitoring and analytical results are tabulated in Attachment 1 herein.

3) The May 2019 results associated with sampling and monitoring of all CCR Rules monitoring wells at the site, including the six wells installed during April-May 2019, were reviewed and used to help identify data-gap areas where supplemental TDS plume delineation was deemed warranted. Ten supplemental monitoring/recovery wells (wells BAC-11 through BAC-17 located downgradient of the Bottom Ash Basin and wells WWC-11 through WWC-13 located downgradient of the Waste Water Basin) were drilled and installed during November and December 2019 (reference Figure 4 for an October 2019 groundwater flow map).

   The ten new wells were being developed at the time of preparation of IPSC's *December 2019 Semi-Annual Progress Report* and will be sampled during IPSC's next semi-annual, groundwater quality sampling event, scheduled tentatively for April 2020. Figure 6 presents TDS concentrations associated with all other wells that were sampled during the October 2019 groundwater sampling event.

4) Stantec has identified several existing wells that will be used as supplemental groundwater recovery wells, designed to focus recovery of groundwater near the downgradient, leading edges and generalized centers of mass associated with the two TDS plumes. Currently, Stantec is designing well-specific, submersible pumps, water level and electrical controls, pump-houses, water conveyance piping, appurtenances, and supervisory control and data acquisition [SCADA] instrumentations, etc. For the foreseeable future, recovered groundwater will be discharged for evaporation within the Recycling Basin, into which existing recovery wells WR-101, WR-102, and WR-103 currently discharge recovered groundwater. Final design is expected to be completed during early-2020.

Although the TDS plumes pose little to no risk to human health or the environment at the present and foreseeable time, IPSC anticipates that the expanded groundwater recovery network will be installed as soon as practicable, likely sometime during mid-2020. It is anticipated that the analytical results associated with IPSC's proposed-Spring 2020 sampling of all CCR Rules compliance wells, including the ten wells that were installed during November-December 2019, may also influence what, if any, additional monitoring wells and recovery wells might be warranted in pursuit of TDS plume delineation and control.

2.0 BACKGROUND

As summarized in IPSC's January 2019 Annual Summary Report, the quantitative analytical results from the Detection and Assessment Monitoring programs under the CCR Rule indicated the following Appendix IV constituent-specific Lower Confidence Limit (LCL) exceedances above corollary Groundwater Protection Standards (GWPSs) at groundwater monitoring wells located at two of the three CCR-regulated units (all concentrations in mg/L):

CCR Unit	Well	Appendix IV Constituent	LCL Concentration	GWPS Concentration
CB Landfill		NONE	------	-----
Bottom Ash Basin	BAC-2	Molybdenum	0.1506	0.1
	BAC-3	Lithium	0.812	0.7415
Waste Water Basin	WWC-1	Arsenic	0.01496	0.01275
	WWC-2	Arsenic	0.01415	0.01275
	WWC-3	Arsenic	0.02045	0.01275

Individual sample results of Appendix IV constituents above the GWPS during Assessment Monitoring are not necessarily a demonstration of statistically significant exceedances of the GWPS. The LCL must exceed the GWPS to demonstrate a statistically significant increase (SSI). If individual constituent concentrations exceed GWPSs, then Assessment Monitoring is to continue at that specific CCR unit, as was conducted by IPSC during 2019.

Statistical analyses to date indicate that the above-listed metals are present at localized boundaries of the two surface impoundments. As additional groundwater quality data are generated at the site, water quality data and analyte-specific GWPSs will be evaluated per statistical analyses performed in accordance with CCR Rule §257.95(d)(2) and §257.95(h) [R315-319-95(d)(2) and R315-319-95(h)] and the following general guidance sources:

- US EPA "Unified Guidance" document (*Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance,* March 2009, *EPA 530/R-09-007*);
- the Interstate Technology and Regulatory Council's ("ITRC") 2013, *Groundwater Statistics for Monitoring and Compliance, Statistical Tools for the Project Lifecycle*, Online Guidance; and
- Ofungwu, J. (2014) *Statistical Applications for Environmental Analysis and Risk Assessment*. Hoboken, New Jersey: John Wiley and Sons, Inc.

Although it is documented throughout Utah and in proximity to the site that Arsenic and Lithium can be present naturally at elevated concentrations, IPSC will continue monitoring these and other CCR Rule metal constituents in groundwater as part of its routine groundwater monitoring program. As additional groundwater quality data is generated, metal concentrations will be evaluated through statistical analysis for potential SSI, in accordance with CCR Rule requisites. Ongoing/future metal water quality data will be evaluated in terms of whether additional monitoring and/or recovery wells might be warranted.

In light of the clay-rich nature of the uppermost aquifer beneath the site, and as indicated by groundwater quality data to date, Appendix IV constituents, such as Arsenic, Molybdenum, and Lithium, are not anticipated to migrate at the same velocity as natural groundwater. Natural attenuation processes, such as adsorption, cationic exchange, dispersion, dilution, and biological degradation, tend to slow the movement of metals in clay-rich aquifers.

As reported in IPSC's historical reports, groundwater in localized, downgradient directions in relation to the Bottom Ash Basin and the Waste Water Basin contains elevated concentrations of TDS. Groundwater quality data to date indicate that TDS has migrated farther downgradient of the two surface impoundments than the metal constituents located near the impoundment boundaries.

TDS is being used as the leading indicator parameter of impacted groundwater quality for fashioning a suitable groundwater remediation approach. TDS is expected to continue to migrate at a faster rate than dissolved metals in the clay-rich aquifer that underlies the property and the recovery of TDS-impacted groundwater at select recovery wells will also intercept any metal constituent that might be present.

As detailed in historical reports, Stantec constructed and calibrated a three-dimensional, numerical model to simulate groundwater flow and fate and transport of TDS in groundwater beneath the Site, based on pump-testing of existing, groundwater recovery wells. The model was developed generally in accordance with ASTM International's (American Standard for Testing and Materials) *Standard Guide for Application of Groundwater Model to a Site-Specific Problem* and the current version of United States Geological Survey (USGS) *Modular Three-Dimensional Finite Difference Groundwater Flow Model* (MODFLOW-2005).

Stantec extrapolated that the downgradient leading edge of the TDS plume located downgradient of the Bottom Ash Basin appears to be migrating naturally toward the southwest at an approximate rate of 150 to 180 feet per year. However, this is a generalized plume migration rate estimate, considering the relatively large, lateral distances between water quality monitoring well locations and the highly varied lithologic characteristics of the uppermost aquifer underlying the site. The TDS plume associated with the Bottom Ash Basin remains within IPSC property boundaries and currently poses no significant risk to human health or the environment.

Currently, and for the foreseeable future, IPSC operates existing groundwater recovery wells WR-101, WR-102, and WR-103 identified on Figure 3 to help reduce total mass of TDS in groundwater in relatively close proximity to the Bottom Ash Basin. The three wells are recovering groundwater that contains elevated concentrations of TDS, located in relatively close proximity to the apparent historical TDS release areas associated with the Bottom Ash Basin. Continued removal of TDS-elevated groundwater from each of these three wells is helping reduce the total mass of TDS within the uppermost aquifer beneath the site in a generalized downgradient/southwesterly direction in relation to the Bottom Ash Basin.

2.1 ESTIMATED TDS PLUME LOCATIONS

2.1.1 Bottom Ash Basin

As demonstrated in Attachment 1 and summarized on Figures 5 and 6 (2019 data), groundwater quality data to date indicate that elevated concentrations of TDS extend from the western and southern perimeter boundaries of the Bottom Ash Basin toward the southwest. The downgradient, leading edge of the TDS plume appears to be located somewhere near monitoring well RW-9. During the two 2019 sampling events, downgradient monitoring wells RW-5, RW-6, RW-8, BAC-8, BAC-9, and BAC-10 did not contain any TDS concentration in excess of the Groundwater Discharge Permit GWPS for TDS of 1,100 ppm.

It is anticipated that the downgradient, leading edge of the TDS plume is located generally southwest of well RW-9; northeast of wells BAC-8, BAC-9, and BAC-10; and northwest of well RW-5. Spring 2020 sampling of the six (6), newly installed wells BAC-11 through BAC-16 will provide additional delineation of the TDS plume.

2.1.2 Waste Water Basin

As may be noted by review of historical water quality data presented in Attachment 1 and summarized on Figures 5 and 6 (2019 data), groundwater quality data to date indicate that elevated concentrations of TDS have been identified within monitoring wells WWC-4 and WWC-5 located near the generalized, northwestern-most corner of the surface impoundment. Data to date indicate a generally southwesterly/westerly component of groundwater flow in this area of the site. Downgradient monitoring wells RW-7, WWC-7, and WWC-10 have not contained elevated concentrations of TDS, to date.

Based on data to date, it is unknown whether the elevated TDS concentrations detected at well RW-4 might be attributable to TDS migration from the Bottom Ash Basin and/or the Waste Water Basin. Since well RW-4 is proposed for future groundwater recovery, it is anticipated that future monitoring of water quality in this general area will be used to investigate if additional recovery measures might be needed in this area.

Additionally, groundwater quality data to date indicate that elevated concentrations of TDS have been identified within wells WWC-1, WWC-6, and WWC-8, with an apparent TDS source possibly being in the vicinity of the southeastern-most corner of the surface impoundment. The apparent downgradient, leading edge of the TDS plume appears to be located somewhere near monitoring well WWC-6. During the two 2019 sampling events, downgradient monitoring wells RW-7, WWC-7, WWC-9, and WWC-10 did not contain elevated concentrations of TDS.

It is anticipated that the downgradient, leading edge of the TDS plume is located generally southwest of well WWC-6; northwest of WWC-9; and east of WWC-10 – along a generally, narrow, elongated TDS plume whose apparent source area appears to be the southeastern-most corner of the Waste Water Basin. Spring 2020 sampling of the three, newly installed wells

WWC-11, WWC-12, and WWC-13 will help investigate and provide additional delineation of the TDS plume in this general area of the site.

3.0 SPRING 2019 GROUNDWATER MONITORING/RECOVERY WELL INSTALLATIONS AND SAMPLING EVENT

This report section presents a summary overview of information presented within IPSC's June and December 2019 Semi-Annual Progress Reports. Copies of drilling logs and well schematic diagrams may be referenced by review of the previous reports.

During April and May 2019, Stantec oversaw the drilling, soil logging, installation, and development of groundwater monitoring wells BAC-8, BAC-9, BAC-10, WWC-8, WWC-9, and WWC-10 at the site by Cascade Drilling, LP of Salt Lake City, Utah, a Utah-certified, water well drilling firm. Each well was installed and developed in similar fashion as previous, historical wells at the site. Figure 4 identifies the locations of the six wells and historical groundwater monitoring wells, as well as groundwater flow patterns associated with those wells monitored during Spring 2019 as part of the CCR Rules compliance monitoring program.

The six new wells were drilled by the sonic drilling method, whereby soil samples were collected continuously in 10-foot, sampling intervals for continuous, real-time visual inspection and Drill Log recording of subsurface soil lithologic and moisture characteristics. Stantec's field geologists screened and logged all soil samples during drilling of each of the six well borings. All down-hole drilling and sampling equipment were decontaminated before use between well locations.

In turn, the subsurface soil data were used to help determine respective groundwater monitoring well construction details. Typically, once each boring was advanced approximately 20 to 25 feet into the uppermost saturated soils, a monitoring well was constructed within each respective borehole. Each groundwater monitoring well was comprised of 6-inch diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) pipe with a solid, PVC end-cap. The bottom 25 feet of each well was comprised of 6-inch diameter, flush-threaded, 0.02-slotted, Schedule 40 PVC well screen.

Following installation of each well, 16/30 washed, silica sand was emplaced around the well screen from the bottom of the borehole to an approximate height of several feet above the top of the well screen interval. An approximate five to seven feet thick, bentonite pellet seal was added on top of the sand pack material. Then, a cement-bentonite (typically, 10:1 ratio) grout was tremie-slurried from the top of the bentonite pellet seal to an approximate height of two feet below grade. A 5-ft. long, 6-inch diameter, steel, protective casing/monument was emplaced in concrete around each wellhead, with an approximate 2.5-ft. stick-up above natural grade. Each PVC well was furnished with a locking, expandable well cap and lock.

Following well installations, the ground surface and the top of each wellhead were surveyed in relation to one another and the same on-site, mean sea level benchmark used for surveying the tops of other historical monitoring wells. Table 1 presents a summary of all groundwater monitoring well construction specific details. Copies of Stantec's drilling logs and schematic well diagrams are presented in Appendix A of IPSC's *June 2019 Semi-Annual Progress Report*.

Shortly after well installations, each well was developed by a dedicated, well development drill rig. Typically, the rig removed water from each well by means of bailing followed by air-lift. Well water was removed from each well, until return water was relatively clear and free of fine-grained, formational materials.

Following well development, wells were purged and then sampled in accordance with purging, sampling, and quality assurance/quality control (QA/QC) protocol detailed within IPSC's November 2015 *Groundwater Sampling and Analysis Plan*. TDS analytical results associated with the Spring 2019 sampling event are presented on Figure 5 herein. Only those wells associated with IPSC's CCR Rules compliance monitoring program were sampled. As detailed within following report section *4.0 Fall 2019 Groundwater Monitoring/Recovery Well Installations and Sampling Event*, the analytical results associated with the Spring 2019 sampling event were used to locate ten additional, groundwater monitoring wells that were installed and sampled during the Fall of 2019 to help ongoing TDS plume characterization and delineation.

4.0 FALL 2019 GROUNDWATER MONITORING/RECOVERY WELL INSTALLATIONS

This report section presents a summary overview of information presented within IPSC's June and December 2019 Semi-Annual Progress Reports. Copies of drilling logs and well schematic diagrams may be referenced by review of the previous reports.

During November and December 2019, Stantec oversaw the drilling, soil logging, installation, and development of groundwater monitoring/recovery wells BAC-11 through BAC-17 and wells WWC-11 through WWC-13 at the site by Cascade Drilling, LP of Salt Lake City, Utah, a Utah-certified, water well drilling firm. Each well was installed and developed in similar fashion as previous, historical wells at the site. Figure 5 identifies the locations of the ten new wells and historical groundwater monitoring wells, as well as groundwater flow patterns associated with those wells monitored during Fall 2019 as part of the CCR Rules compliance monitoring program.

The ten new wells were drilled by the sonic drilling method, whereby soil samples were collected continuously in 10-foot, sampling intervals for continuous, real-time visual inspection and Drill Log recording of subsurface soil lithologic and moisture characteristics. Stantec's field geologists screened and logged all soil samples during drilling of each of the ten well borings. All down-hole drilling and sampling equipment were decontaminated before use between well locations.

In turn, the subsurface soil data were used to help determine respective groundwater monitoring well construction details. Typically, once each boring was advanced approximately 20 to 25 feet into the uppermost saturated soils, a monitoring well was constructed within each respective borehole. Each groundwater monitoring/recovery well was comprised of 6-inch diameter, flush-threaded, Schedule 40 PVC pipe with a solid, PVC end-cap. The bottom 25 feet of each well was comprised of 6-inch diameter, flush-threaded, 0.02-slotted, Schedule 40 PVC well screen.

Following installation of each well, 16/30 washed, silica sand was emplaced around the well screen from the bottom of the borehole to an approximate height of several feet above the top of the well screen interval. An approximate five to seven feet thick, bentonite pellet seal was added on top of the sand pack material. Then, a cement-bentonite (typically, 10:1 ratio) grout was tremie-slurried from the top of the bentonite pellet seal to an approximate height of two feet below grade. A 5-ft. long, 6-inch diameter, steel, protective casing/monument was emplaced in concrete around each wellhead, with an approximate 2.5-ft. stick-up above natural grade. Each PVC well was furnished with a locking, expandable well cap and lock.

During December 2019, the ground surface and the top of each wellhead was surveyed in relation to one another and the same on-site, mean sea level benchmark used for surveying the tops of other historical monitoring wells. Table 1 presents a summary of all groundwater monitoring well construction specific details. Copies of Stantec's drilling logs and schematic well diagrams associated with the ten new wells are presented in Appendix A of IPSC's *December 2019 Semi-Annual Progress Report*.

Shortly after well installations, each well was developed by a dedicated, well development drill rig. Typically, the rig removed water from each well by means of bailing followed by air-lift. Well water was removed from each well, until return water was relatively clear and free of fine-grained, formational materials.

Prior to the installation of the ten new wells, IPSC sampled all other CCR Rules compliance monitoring wells in October of 2019. The TDS analytical results associated with this sampling event are presented on Figure 6 herein. The ten new wells will be sampled during IPSC's next semi-annual, groundwater quality sampling event, scheduled tentatively for April 2020.

As detailed within the following report section, IPSC and Stantec have initiated design of an expanded groundwater recovery network that will start recovering groundwater impacted by TDS at, and/or near, the apparent downgradient, leading edge of each of the two TDS plumes. The lateral extent of the downgradient, leading edge of each TDS plume has not been delineated completely, as yet; however, IPSC intends to install additional groundwater recovery equipment within select wells, as soon as practicable during mid-2020. It is anticipated that the analytical results associated with IPSC's proposed Spring 2020 sampling of all CCR Rules compliance wells will influence what additional monitoring wells and recovery wells might be warranted in pursuit of TDS plume delineation and control.

5.0 ONGOING CORRECTIVE ACTIONS AND PROGRESS TOWARD IMPLEMENTING ADDITIONAL GROUNDWATER CORRECTIVE ACTION REMEDY

5.1 ONGOING GROUNDWATER RECOVERY AT EXISTING RECOVERY WELLS WR-101, WR-102, AND WR-103

IPSC intends to continue operating existing groundwater recovery wells WR-101, WR-102, and WR-103 identified on Figure 3. The three wells are recovering groundwater that contains elevated concentrations of TDS, located in relatively close proximity to the apparent historical TDS release areas associated with the Bottom Ash Basin. Wells WR-102 and WR-103 are located generally along the apparent TDS plume centerline, as explained in detail in IPSC's 2016 *Updated Corrective Action Plan*. Continued removal of TDS-enriched groundwater from each of these three wells is helping reduce the total mass of TDS within the uppermost aquifer beneath the site in a generalized downgradient/southwesterly direction in relation to the Bottom Ash Basin.

5.2 SUMMARY OF ONGOING ACTIONS ASSOCIATED WITH DESIGN OF EXPANDED GROUNDWATER REMEDY

Currently, Stantec is designing an enhanced TDS plume control and associated groundwater recovery network. The groundwater recovery program will focus on two aspects of TDS plume control, namely: recovery of groundwater from the downgradient, leading edges of each TDS plume, as well as recovery of groundwater from the generalized center of TDS mass of each of the two TDS plumes.

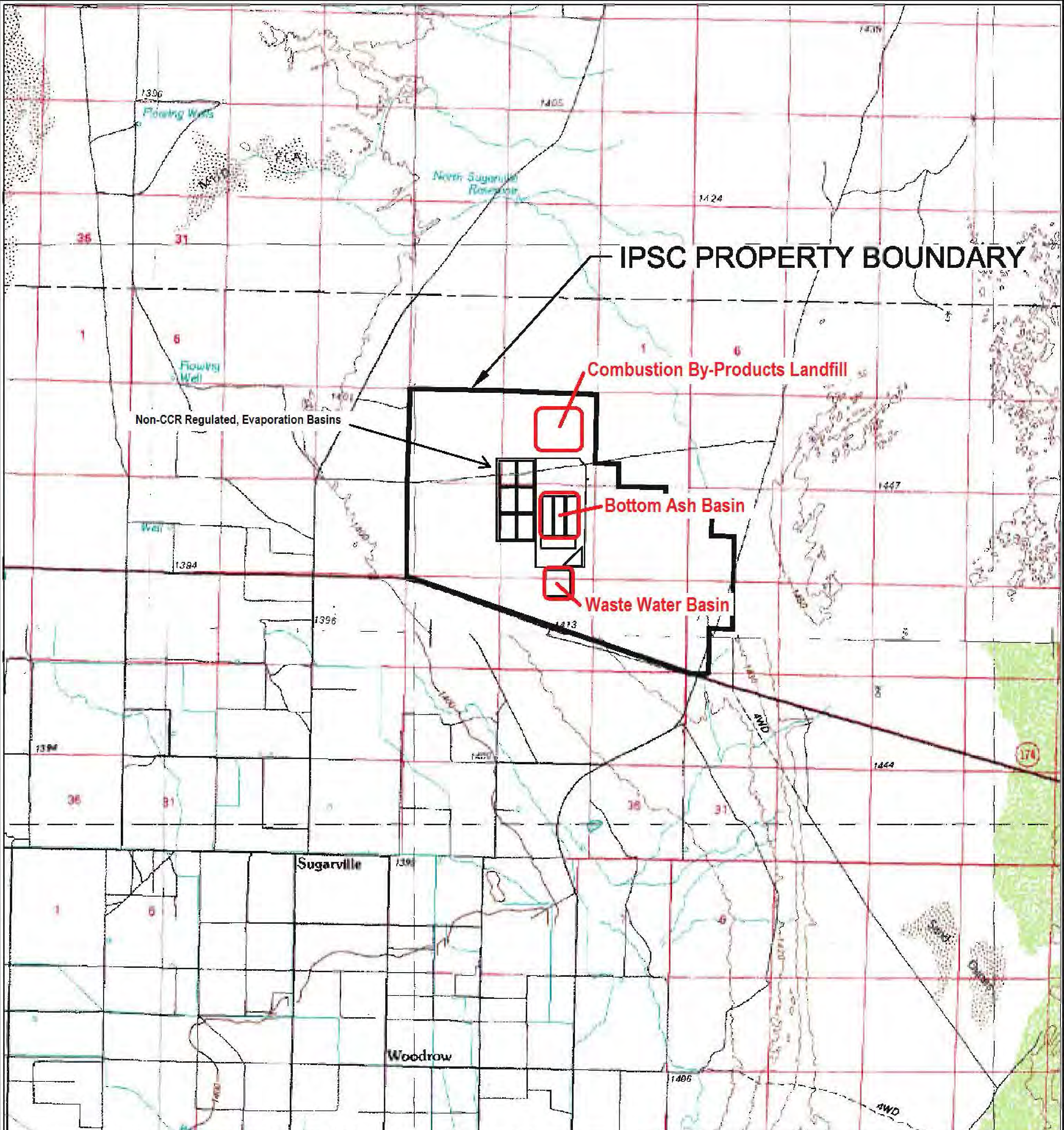
IPSC/Stantec have identified the following wells for *anticipated* groundwater recovery, based on data generated to date and anticipating that these specific wells *will most probably* be found to contain elevated concentrations of TDS during the upcoming, Spring 2020 sampling event – based on extrapolation of elevated TDS concentrations associated with wells that have been sampled historically. Future groundwater monitoring results will influence what additional monitoring and/or recovery wells might also be considered for groundwater monitoring and/or recovery, in addition to the following anticipated, groundwater recovery wells:

- Bottom Ash Basin TDS Plume Recovery Wells: BAC-13; BAC-14, BAC-16 (and possibly well BAC-15).
- Waste Water Basin Plume Recovery Wells: RW-4, WWC-8, and WWC-6.

Currently, Stantec is designing well-specific, submersible pumps, water level and electrical controls, pump-houses, water conveyance piping, appurtenances, and SCADA instrumentations for anticipated/possible use in each of the afore-listed wells. It is anticipated that installation and construction of the enhanced groundwater recovery network will be initiated during mid-2020. The Spring 2020 water quality data, which will include analytical results associated with newly-installed wells BAC-11 through BAC-17, as well as WWC-11, WWC-12, and WWC-13, will be evaluated to help investigate which of these specific wells might be used for groundwater recovery.

Upon completion of installation and start-up of the enhanced groundwater recovery network, IPSC will evaluate the degree to which groundwater recovery and natural attenuation processes control the downgradient leading edges of the two TDS plumes. IPSC will continue to conduct and report to the UDEQ its routine, semi-annual, groundwater monitoring and remediation program in formal Summary Reports.

Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES

N

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'

DATE DRAWN 1-26-17

REVISION

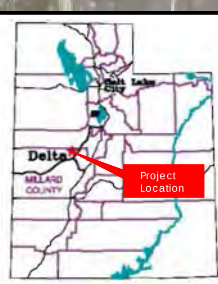
drawings\ipsc-04\Fig2 Site Topographic Map.dwg

Figure 2. CCR Units Location Map

Legend

CCR Unit

N



INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

Stantec

DRAWN BY: JR	DATE DRAWN: 9/30/2016
SCALE: 1 in. approx. 1700 ft.	
PROJECT: 203709098.409	

Figure 3 May 2019 Groundwater Flow Map

Q:\active\203709098 Intermountain Power\GIS\2019_06\fig03_May2019GWE_20190724.mxd

LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED JUNE 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

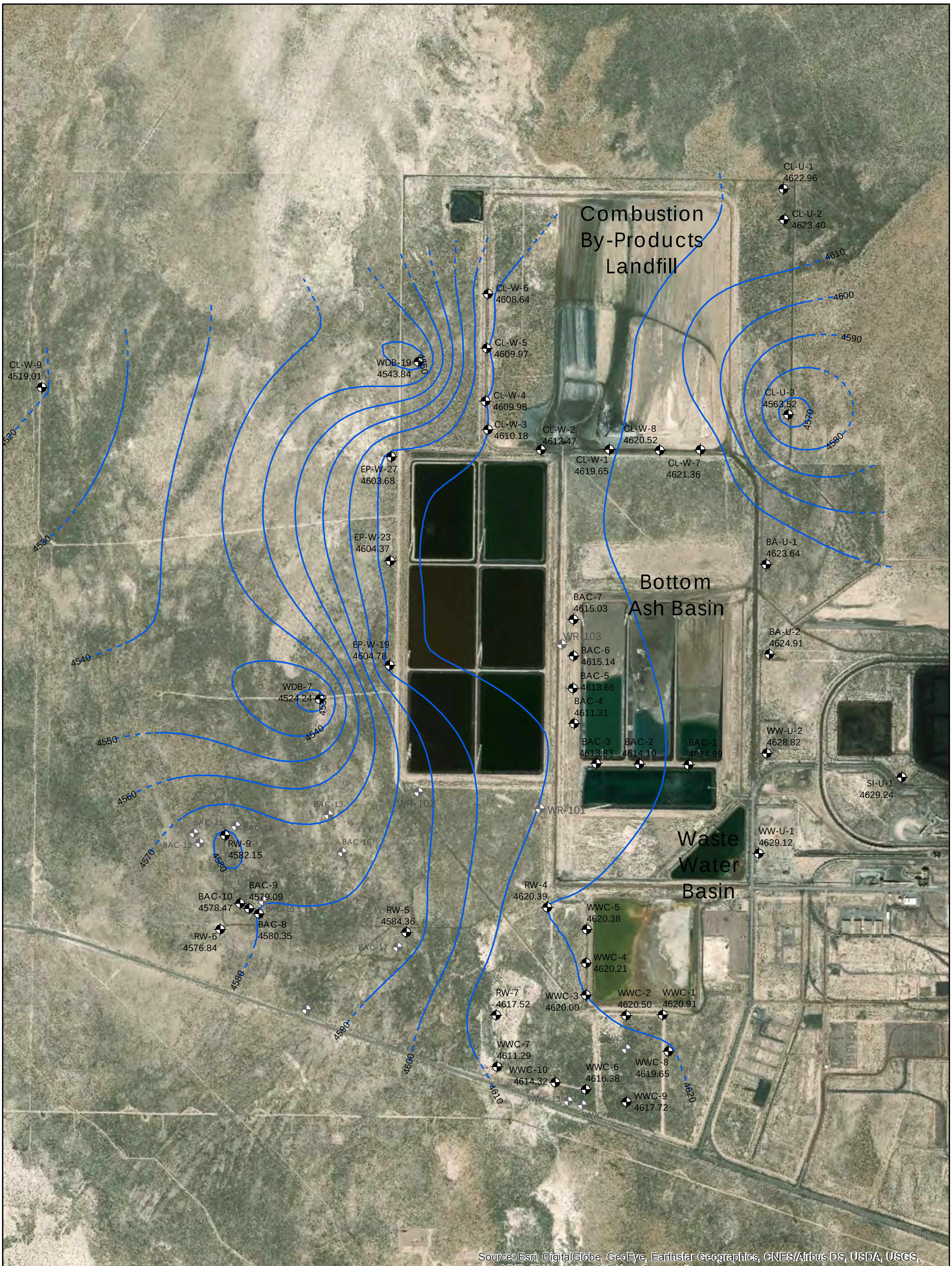
0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		MAY 20, 2019 POTENTIOMETRIC MAP AND GROUNDWATER FLOW MAP		FIGURE: 3
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 07/24/19

Figure 4 October 2019 Groundwater Flow Map

Q:\active\203709098 Intermountain Power\GIS\2019_10\fig04_Oc2019GWE_20191216.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 4617.52 GROUNDWATER ELEVATION
- GROUNDWATER CONTOUR

NOTE:
1) DATA COLLECTED OCTOBER 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

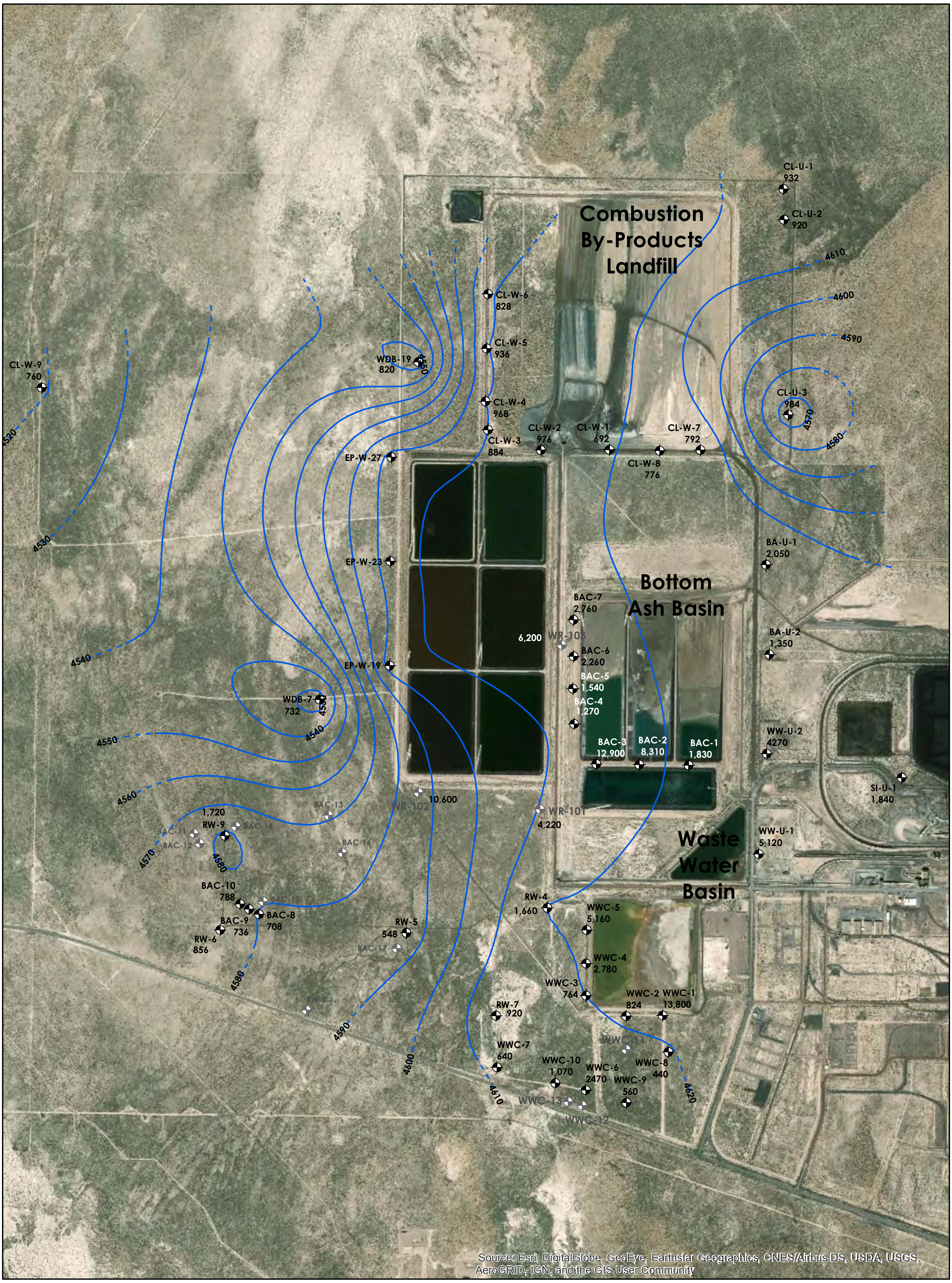
0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH	OCTOBER 10, 2019 POTENTIOMETRIC MAP AND GROUNDWATER FLOW MAP	FIGURE: 4
JOB NUMBER: 203709098 / DRAWN BY: CK	CHECKED BY: ALL / APPROVED BY:	DATE: 12/18/19

Figure 5 May 2019 TDS Results

Q:\active\203709098 Intermountain Power\GIS\2019_10\fig05_Spring2019TDSResults_20191216.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 718 TDS RESULT (parts per million-ppm)
- GROUNDWATER CONTOUR

NOTE:
1) DATA COLLECTED SPRING 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

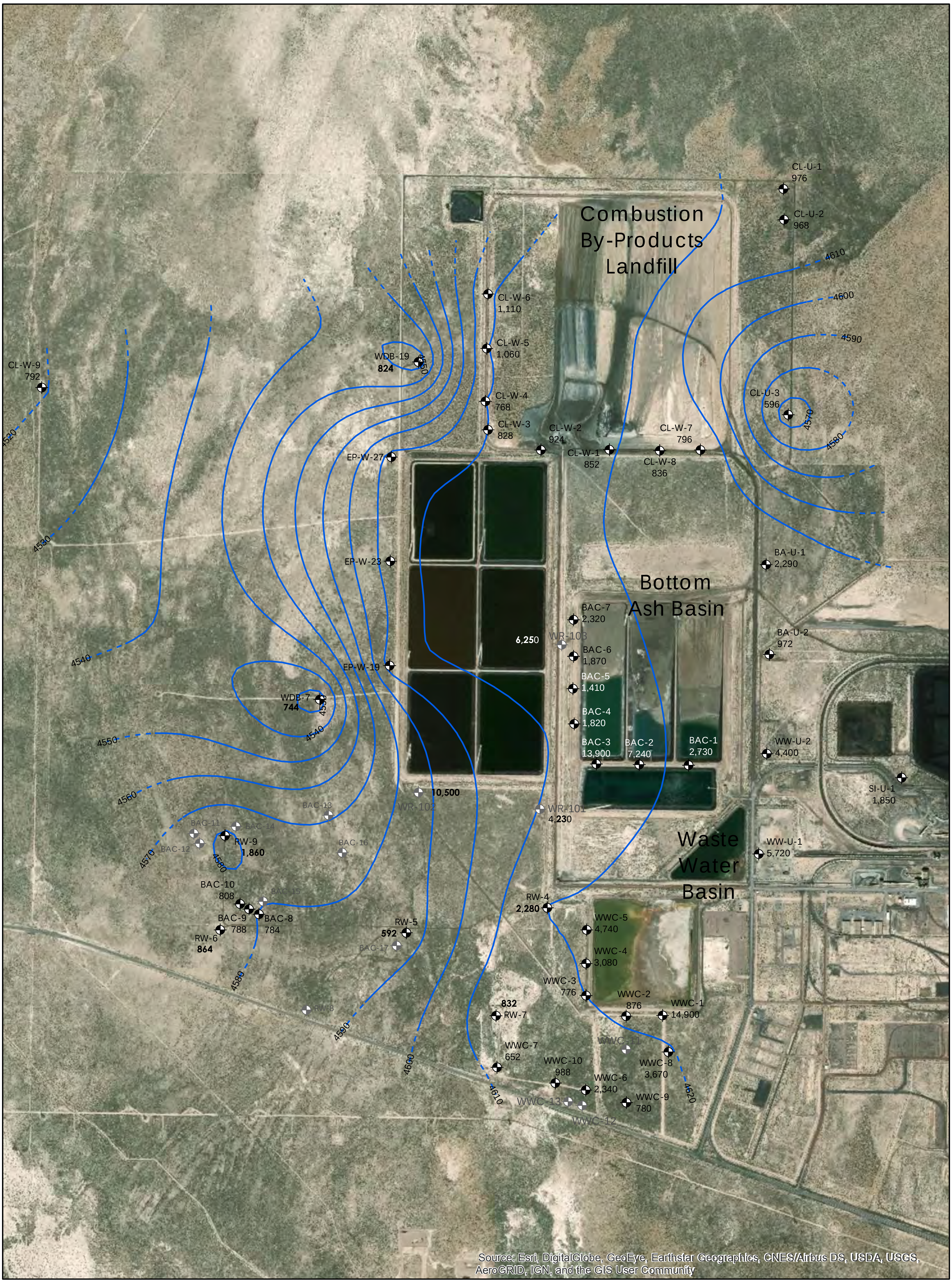
0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		SPRING 2019 TDS RESULTS		FIGURE: 5
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 12/18/19

Figure 6 October TDS Results

Q:\active\203709098 Intermountain Power\GIS\2019_10\fig06_Fall2019TDSResults_20191216.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 718 TDS RESULT (parts per million-ppm)
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED FALL 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		FALL 2019 TDS RESULTS		FIGURE: 6
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 12/18/19

TABLE 1 GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4555.98
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4606.01
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BAC-8	4/29/2019	6-inch PVC	77	52-77	4626.42
BAC-9	5/1/2019	6-inch PVC	77	52-77	4626.27
BAC-10	5/3/2019	6-inch PVC	87	62-87	4626.27

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
BAC-11	12/7/2019	6-inch PVC	81	50-75	4624.96
BAC-12	12/6/2019	6-inch PVC	81	53-78	4625.055
BAC-13	11/18/2019	6-inch PVC	91	65-90	4629.834
BAC-14	12/4/2019	6-inch PVC	81	53-78	4627.506
BAC-15	12/9/2019	6-inch PVC	81	50-75	4626.494
BAC-16	11/21/2019	6-inch PVC	91	64-89	4630.426
BAC-17	12/10/2019	6-inch PVC	82	56-81	4629.648
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WWC-6	3/24/2018	4-inch PVC	87	67-77	4576.26
WWC-7	3/22/2018	4-inch PVC	87	77-87	4570.78
WWC-8	4/25/2019	6-inch PVC	96	71-96	4647.799
WWC-9	4/28/2019	6-inch PVC	89	62-87	4642.58
WWC-10	4/26/2019	6-inch PVC	90	62-87	4633.72
WWC-11	11/16/2019	6-inch PVC	91	65-90	4641.919
WWC-12	11/12/2019	6-inch PVC	91	65-90	4636.661
WWC-13	11/15/2019	6-inch PVC	91	65-90	4635.128
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59
WW-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WW-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46

BGS = Below Ground Surface

MSL = Mean Sea Level

Appendix A Drilling Logs and Well Schematic Diagrams

MONITORNG WELL ID: **WWC-11**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 22.82
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/15/2019	DATE FINISHED: 11/16/2019
		LOGGED BY: Michael Ward	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95

Poorly graded Sand with Silt (SP), fine sand 95%, loose, soft, dry, very pale brown (10 YR 7/4), trace gravel 5%.

Clay (CL), medium plasticity, cohesive, moist, soft to medium density, light gray (10 YR 7/1), mottled with some trace interfingered clay, brownish yellow (10 YR 6/8).

Well Graded Sand with Clay (SW-SC), medium grained sand 85%, gravel 10%, clay 5%, moist, loose, pale brown (10 YR 6/3).

Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, dry to moist, brown (10 YR 5/3).

Same as above, Clay (CL), no sand.

Poorly Graded Sand (SP), fine sand 98%, loose soft, dry, pale brown (10 YR 6/3), 2% gravel, subrounded.

Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, moist, brown (10 YR 5/3), gravel are subangular to subrounded, assorted gravel matrix.

Clay (CL), medium plasticity, medium density, moist to wet, cohesive, pale brown (10 YR 6/3).

Well Graded Sand with gravel (SW), fine to coarse sand 90%, gravel 10%, loose, soft, brown (10 YR 5/3).

Same as above, becoming wet.

Clay (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).

Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, moist, pale brown (10 YR 6/3).

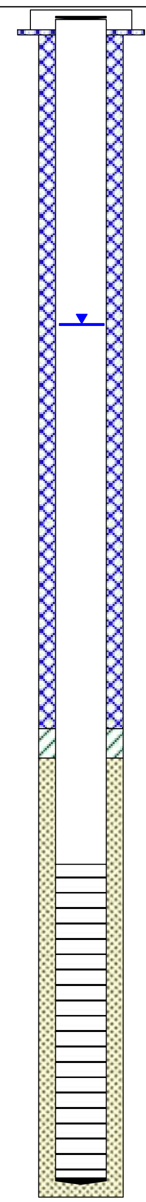
Same as above, fine grained sand, saturated, low plasticity, non cohesive.

Same as above, with trace interfingering clay, reddish yellow (5 YR 6/6).

Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, wet, brown (10 YR 5/3), gravel are subrounded, assorted matrix.

Clay with Sand (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).

End of borehole to 91 ft bgs., per scope of work.



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID: **WWC-12**

CLIENT: Intermountain Power Service Corporation

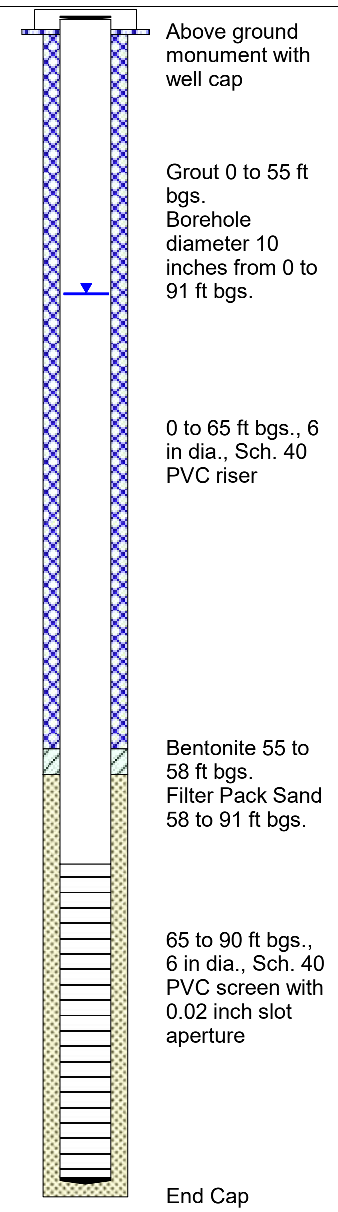
PROJECT: Monitoring Well Installation

SITE LOCATION: South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 20.46
		DATE STARTED: 11/11/2019	DATE FINISHED: 11/12/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), 90% sand, 10% silts, light gray (7.5 YR 7/1), soft, loose, fine grained, dry, sand are mostly quartz, subangular quartz grains.
5	Same as above, becoming light yellowish brown (10 YR 6/4).
10	Same as above, becoming wet at 8.5 ft bgs., perched groundwater.
	Clay (CL), medium plasticity, medium stiff, cohesive, very pale brown (10 YR 7/4).
	Poorly Graded Sand with Silt (SP-SM), 95% fine grained sand, 5% silts, loose, soft, moist, brown (10 YR 4/3), trace gravel.
15	Well Graded Sand with Gravel (SW), 80% sand, 20% gravel, fine to coarse sand, moist, loose soft, dark yellowish brown (10YR 4/4), gravel are subrounded to rounded, small.
20	
25	Clay (CL), medium plasticity, medium density, moist, cohesive, light yellowish brown (10 YR 6/4), thickly bedded, sharp contact at 25 ft bgs.
30	
	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10YR 5/3).
35	
40	Well Graded Sand with Gravel (SW), fine to coarse grained sand 90%, small gravel 10%, loose, soft, moist, dark yellowish brown (10 YR 4/4).
45	Same as above, increase in gravel to 30%.
	Same as above, decrease in gravel to 10%.
	Poorly Graded Sand (SP), fined grained sand 100%, loose, moist, brown (10YR 4/3). Sharp contact.
50	
55	Clay (CL), high plasticity, stiff, moist, cohesive, light yellowish brown (10 YR 6/4), sharp contact.
60	Lost core sample from sonic casing.
	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
65	
70	Well Graded Sand with Silt and Clay (SW-SM), fine or medium grained sand 100%, soft, loose, brown (10 YR 4/3).
	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
75	
80	Poorly Graded Sand with Silts and Clay (SP-SC), fine grained sand 95%s, soft, loose, wet, light yellowish brown (10 YR 6/4), trace clay.
	Clay with Sand (CL), medium plasticity, soft to medium density, wet, pale brown (10YR 6/3), sand are fine grained.
85	
	Same as above with gradational transition to clay.
90	Clay (CH), high plasticity, mottled, wet, cohesive, pale brown (10 YR 6/3), mottled color is reddish yellow (7.5 YR 7/6).
95	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **WWC-13**

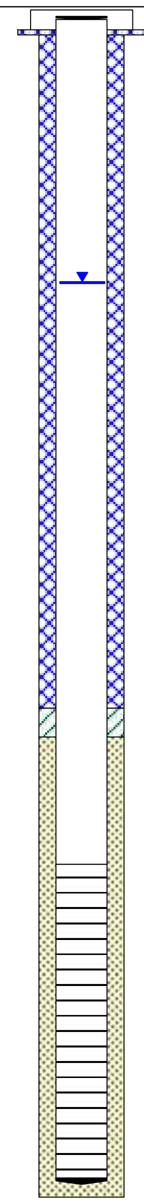
INTERMOUNTAIN POWER SERVICE CORP. — Stantec

CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 19.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/13/2019	DATE FINISHED: 11/15/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silts (SP-SM), fine sand 95%, 5% silts, soft, loose, dry, light gray (7.5 YR 7/1).
5	Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, dry, pinkish gray (7.5 YR 7/2), trace gravel, small gravel, assorted matrix, subrounded.
	Same as above, with clay, increase gravel 10%, wet.
10	Clay with Sand (CL), low to medium plasticity, moist, cohesive, very pale brown (10 YR 7/4).
	Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, , moist, pale brown (10 YR 6/3), trace gravel 5%, subrounded.
15	
20	
	Same as above, with clay (SW-SC) at 10%, wet, soft, low plasticity clay.
25	Clay with Sand (CL), medium plasticity, moist cohesive, thick bedded, fine sand, sharp contact at 23 ft, bgs,
	Same as above, Clay (CL), trace black staining.
30	Clay with Sand (CL), medium plasticity, moist cohesive, fine sand.
	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
35	
40	
	Well Graded Sand with gravel (SW), fine to coarse sand 85%, 15% gravel, loose, soft, moist, brown (10 YR 5/3), gravel are small, subrounded, assorted matrix.
45	Poorly Graded Sand (SP), fine to medium grained sand 98%, loose, soft, moist, brown (10 YR 5/3), trace small gravel 2%, subrounded.
50	Same as above, trace clay.
	Clay with Sand (CL), low to medium plasticity, soft to medium density, moist, yellowish brown (10 YR 5/4), secondary sand are fine grained.
55	
60	Clay (CL), medium to high plasticity, medium to stiff density, moist, thickly bedded, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
65	
	Clay with Sand (CL) , medium plasticity, moist to wet, cohesive, brown (10 YR 5/3).
70	Clay (CL), medium plasticity, medium to stiff density, moist, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
75	
	Poorly Graded Sand with Clay (SP-SC), fine grained sand 95%, loose, soft, wet, brown (10 YR 5/3), some trace interfingering clay 5%, reddish yellow (5 YR 5/3).
80	Clay with Sand (CL), low plasticity, soft, wet, non cohesive, pale brown (10 YR 6/3).
85	Clay (CL), medium to high plasticity, wet, cohesive, pale brown (10 YR 6/3), interfingering clay reddish yellow (5 YR 6/6), trace sand.
90	Same as above, becoming medium plasticity.
	End of borehole to 91 ft bgs., per scope of work.
95	

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 52.8 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 52.8 to 55 ft bgs.

Filter pack sand 55 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-11**

INTERMOUNTAIN POWER SERVICE CORP.

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: Southwest of Bottom Ash Basin Surface Impoundment

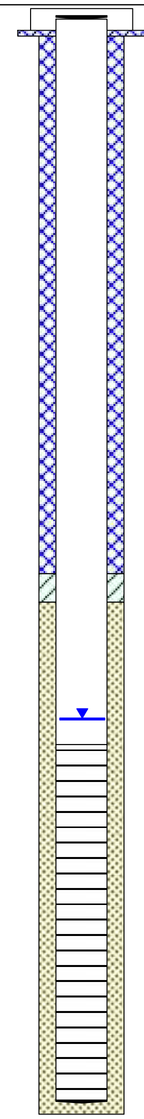
Stantec

DRILLING CONTRACTOR:	Cascade Drilling
DRILLING METHOD:	Sonic
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.

COORDINATE SYSTEM:			
EASTING:		NORTHING:	
ELEVATION:		BOREHOLE ANGLE:	90 degrees
TOTAL DEPTH (ft.):	81	GROUNDWATER LEVEL (ft. btoc.):	48.21
DATE STARTED:	12/6/2019	DATE FINISHED:	12/7/2019
LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Fill
	Poorly Graded Sand with Silt (SP-SM), fine grained sand 100%, loose, soft, dry, very pale brown (10 YR 7/3).
5–10	Clay with Sand (CL), low plasticity, soft to medium density, moist, light brownish gray (10 YR 6/2).
10	Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, loose, medium dense, moist, light brownish gray (10 YR 6/2); clay are low plasticity, medium dense.
15–20	Clay (CL), medium plasticity, medium dense, cohesive, moist, light brownish gray (10 YR 6/2), mottled with brownish yellow (10 YR 6/8).
30	Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, moist, light yellowish brown (10 YR 6/4); clay low plasticity, soft, non cohesive.
35	Same as above, becoming brown (10 YR 5/3).
40	Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
50	Poorly Graded Sand (SP), fine to medium grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
55	Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
60	Clay with Sand (CL), low plasticity, soft, wet, pale brown (10 YR 6/3).
60	Well Graded Sand (SW), fine to coarse Sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel, subrounded.
65	Same as above, increase in coarse grained sand between 65.2 to 65.8 ft bgs.
65	Same as 60 ft bgs.
75	Clay (CL), medium plasticity, medium dense, moist, cohesive, light yellowish brown (10 YR 6/4).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85	

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 76 ft bgs., and 4 inches from 76 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 50 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 76 ft bgs.

50 to 75 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-12**

INTERMOUNTAIN POWER SERVICE CORP.

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

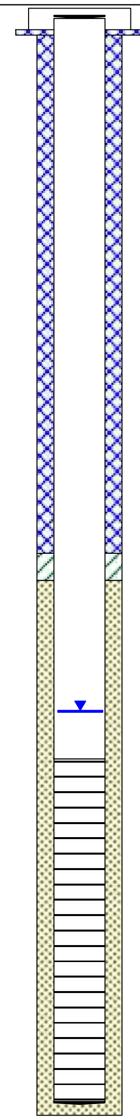
SITE LOCATION: Southwest of Bottom Ash Basin Surface Impoundment

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 49.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/4/2019	DATE FINISHED: 12/6/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), fine grained sand 95%, loose, soft, dry, pale brown (10 YR 6/3).
9	Clay (CL), medium plasticity, medium dense, moist, cohesive, light brownish gray (10 YR 6/2).
10	Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, dry, light brownish gray (10 YR 6/2); clay 10%, low plasticity, soft.
19	Clay (CL), medium plasticity, medium dense, moist, cohesive, very pale brown (10 YR 7/3), mottled with brownish yellow (10 YR 6/8).
24	Poorly Graded Sand with Silt (SP-SM), loose, soft, dry, pale brown (10 YR 6/3).
27.5	Well Graded Sand with Gravel (SW), fine to coarse sand 85%, loose, soft, dry, light brownish gray (10 YR 6/2), gravel 15%, small, subangular to subrounded, assorted matrix.
30.5	Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, moist, pale brown (10 YR 6/3), 5% clay.
38.5	Clay with Sand (CL), medium plasticity, medium dense, moist, light yellowish brown (10 YR 6/3).
	Clay (CL), medium plasticity, stiff, moist, cohesive, pale brown (10 YR 6/2).
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
	Clay (CL), Same as 39.5 ft bgs.
	Clay with Sand (CL), Same as 38.5 ft bgs.
	Clay (CL), Same as 41.5 ft bgs.
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
53	Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3), mottled with yellowish brown (10 YR 5/6).
58	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
61	Well Graded Sand (SW) fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), trace gravel.
65.5	Clay with Sand (CL), low to medium plasticity, medium dense, wet, non cohesive, brown (10 YR 5/3), mottled with light brownish gray (10 YR 6/2).
68	Well Graded Sand with Clay (SW-SC), fine grained sand 90%, loose, soft, wet, brown (10 YR 5/3): clay 10%, low plasticity, non cohesive.
74	Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs., and 4 inches from 79 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 79 ft bgs.

53 to 78ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

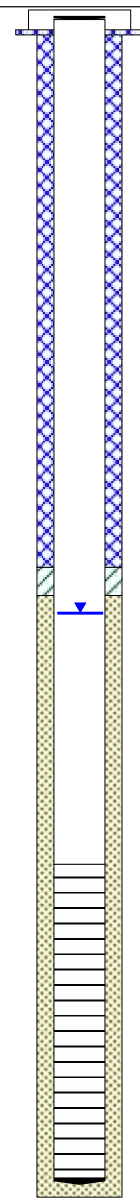
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 45.38
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/16/2019	DATE FINISHED: 11/18/2019
		LOGGED BY: Michael Ward	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Poorly Graded Sand with Silt and Gravel (SP-SM), fine grained sand 85%, silts 10%, trace gravel 5%, loose, dry, light gray (10 YR 7/2).
Same as above, becoming dense, consolidated.
Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
Same as above, no gravel, sand 100%.
Clay with Sand (CL), low plasticity, dry to moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
Same as above, moist.
Same as above, medium plasticity.
Poorly Graded Sand (SP), fine grained sand 100%, loose, dry, dark brown (10 YR 3/3), thinly bedded.
Clay with Sand (CL), low plasticity, moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
Poorly Graded Sand (SP), medium grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
Clay (CL), medium plasticity, medium dense, moist, brownish yellow (10 YR 6/6).
Clay with Sand (CL), low plasticity, soft density, wet, non cohesive, light yellowish brown (10 YR 6/4).
Clay (CL), medium plasticity, medium dense, moist, cohesive, brownish yellow (10 YR 6/6), with mottled clay, brownish yellow (10 YR 6/8).
Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, non cohesive, brown (10 YR 6/3).
Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, brown (10 YR 6/3).
Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
Poorly Graded Sand (SP), medium grained sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel 5%, rounded to subrounded, assorted matrix.
Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, brown gray (10 YR 5/3).
End of borehole to 91 ft bgs., per scope of work.



Above ground monument with well cap

Grout 0 to 42 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 42 to 44 ft bgs.

Filter pack sand 44 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-14**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

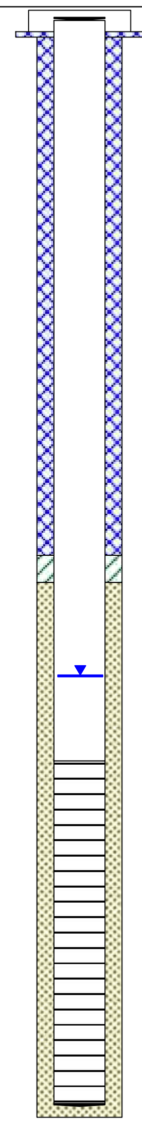
SITE LOCATION: Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 81 ft bgs., 10 inch sonic core barrel 0 to 78 ft bgs.	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.81
		DATE STARTED: 11/21/2019	DATE FINISHED: 12/4/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand (SW), fine to coarse sand 95%, loose, soft, dry, yellowish brown (10 YR 5/4); 5% gravel, subrounded, small.
5	Well Graded Sand with Clay (SW-SC), fine to coarse sand 95%, medium dense, dry, light gray (10 YR 7/4).
8	Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry to moist, very pale brown (10 YR 7/3).
18	Clay (CL), medium plasticity, medium dense, moist, cohesive, pale brown (10 YR 6/3), with trace mottled clay, brownish yellow (10 YR 6/8).
27	Poorly Graded Sand (SP), fine sand 100%, loose, soft, light brownish gray (10 YR 6/2).
28	Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, light brownish gray (10 YR 6/2); clay 10% low plasticity, soft, non cohesive.
38	Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).
41	Poorly Graded Sand (SP), fine sand 100%, loose, soft, moist to wet, brown (10 YR 5/4).
48	Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
53	Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, brown (10 YR 5/3); clay 10% low plasticity.
54	Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
59	Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
61	Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).
63	Poorly Graded Sand with Clay (SP-SC), fine sand 85%, loose medium dense, wet, brown (10 YR 5/3); clay 15% low plasticity, non cohesive, light yellowish brown (10 YR 6/4).
67	Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).
69	Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
70	Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
73	Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, wet, brown (10 YR 5/3); clay 10%, low plasticity, soft, non cohesive.
78	Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
79	Clay (CL), medium plasticity, medium to stiff, moist, brown (10 YR 5/3).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

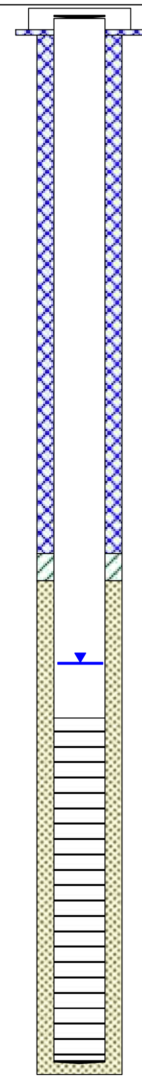
MONITORNG WELL ID:	**BAC-15**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.03
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/7/2019	DATE FINISHED: 12/9/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Fill
		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, very pale brown (10 YR 7/3), trace gravel, subrounded.
5		Clay (CL), medium plasticity, medium dense, cohesive, dry, light brownish gray (10 YR 6/2), trace white (10 YR 8/1), trace calcium carbonate between clay layering, effervesces with HCL.
10		
15		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, light gray (10 YR 7/1), trace clay at depth.
20		Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, soft to medium dense, dry, pale brown (10 YR 6/3), clay low plasticity, medium dense.
25		
30		Clay (CL), medium plasticity, medium dense, cohesive, moist, pale brown (10 YR 6/3).
		Same as above, becoming light yellowish brown (10 YR 6/4).
35		Clay with Sand (CL), low plasticity, soft, non cohesive, light yellowish brown (10 YR 6/4).
40		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
45		Well Graded Sand with Gravel (SW), fine to coarse sand 90%, loose, soft, wet, brown (10 YR 5/3), gravel 10%, subrounded.
50		
		Same as above, with trace black staining.
55		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/6).
		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
60		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3)
		Same as above, with some clay.
65		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
		Same as above, color change to yellowish brown (10 YR 6/4).
70		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
		Same as above, with mottled yellowish red (5 YR 5/6).
75		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
80		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3).
		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-16**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP.

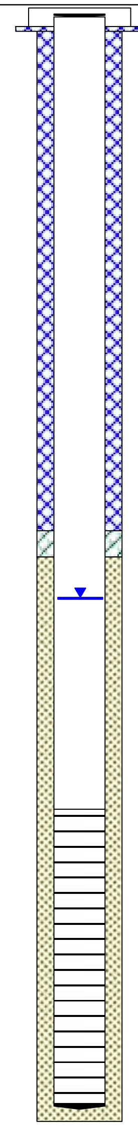
Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 47.45
		DATE STARTED: 11/18/2019	DATE FINISHED: 11/21/2019
		LOGGED BY: Michael Ward	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100

- Fill.
- Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
- No core retrieved from sonic core barrel.
- Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
- Well Graded Sand (SW), fine to coarse grained sand 95%, loose, soft, light brownish gray (10 YR 6/2), trace gravel 5%, subrounded, small.
- Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
- Clay (CL).
- Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry, non cohesive, pale brown (10 YR 6/3).
- Poorly Graded Sand (SP), fine grained 100%, loose to medium dense, dry, light gray (10 YR 7/1).
- Clay (CL), medium plasticity, medium density, moist, light yellowish brown (10 YR 6/4), with some interfingering clay, brownish yellow (10 YR 6/8).
- Clay with Sand (CL).
- Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
- Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
- Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
- Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
- Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, brown (10 YR 5/3), with trace interfingering clay 5%, yellowish red (5 YR5/6).
- Well Graded Sand (SW), fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), 2% gravel, small, subrounded.
- Clay with Sand (CL), low to medium plasticity, soft to medium density, wet, light brownish gray (10 YR 6/2).
- Clay (CL), medium plasticity, medium to stiff, cohesive, moist, light yellowish gray (10 YR 6/2).
- Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
- Clay (CL), medium plasticity, stiff, cohesive, moist to wet, brown (10 YR 5/3).
- Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
- Clay (CL), same as 73 ft bgs.
- Poorly Graded Sand (SP), same as 82 ft bgs.
- Clay (CL), same as 73 ft bgs.
- Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
- Clay (CL), same as 73 ft bgs., with mottled interbedded clay, yellowish red (5 YR 5/6).
- End of borehole at 91 ft bgs. Installed monitoring well per scope of work.



Above ground monument with well cap

Grout 0 to 42 ft bgs. Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 42 to 44 ft bgs.

Filter Pack Sand 44 to 91 ft bgs.

64 to 89 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-17**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

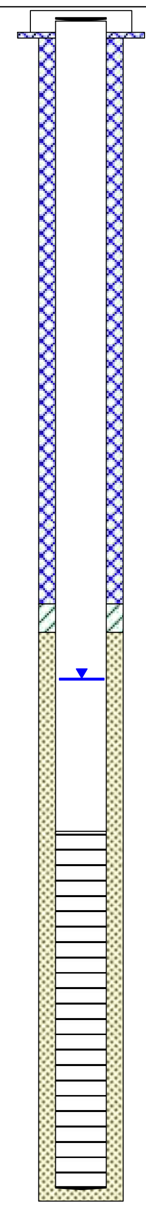
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 82	GROUNDWATER LEVEL (ft. btoc.): 45.3
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/12/9/2019	DATE FINISHED: 12/10/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with Silt (SW-SM), fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), fine silts, trace calcium carbonate.
5	Well Graded Sand (SW), fine to coarse sand 100%, loose, soft, pale brown (10 YR 6/3).
18	Well Graded Sand with Gravel and Clay (SW-SC), loose, soft, fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), clay low plasticity, soft, gravel, small, subrounded.
21	Well Graded Sand (SW), fine to coarse 98%, loose, soft, light yellowish brown (10 YR 6/4), gravel 2%, small, subrounded.
29	Clay (CL), low plasticity, soft, wet, very pale brown (10 YR 7/3), perched groundwater.
31	Clay with Sand (CL), low plasticity, soft, moist, light yellowish brown (10 YR 6/4).
40	Clay (CL), medium plasticity, medium dense, cohesive, brown (10 YR 5/3), mottled with some reddish yellow (5 YR 6/6).
58	Clay with Sand (CL), low plasticity, soft, wet non cohesive, brown (10 YR 5/3).
61	Poorly Graded Sand with Clay (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), with trace gravel 2%, subrounded, small.
68	Poorly Graded Sand with Clay (SP-SC), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), clay, medium plasticity, soft to low density, non cohesive, light yellowish brown (10 YR 5/4).
72	Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).
74	Poorly Graded Sand with Clay (SP-SC), fine grained sand, loose, soft, wet, brown (10 YR 5/3), clay are low plasticity, soft.
77	Clay with Sand (CL), low to medium plasticity, soft, wet, cohesive, brown (10 YR 5/3).
80	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

Attachment 1 TABULATED GROUNDWATER MONITORING DATA

Round 12 (all results ppm) Assessment Monitoring - April 4 - May 15, 2019

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	61.1	388	0.989	7.74	112	932	0	0.0279	0.0841	0	0	0	0	0	0.231	0	0.0036	0	0	0.13	0.4	0
CL-U-2	0	68.4	378	1.02	7.74	97.6	920	0	0.0254	0.0943	0	0	0	0	0	0.214	0	0.00405	0	0	0.31	0.94	1.25
CLW-1	0	39.4	303	1.12	7.88	64.5	692	0	0.002	0.0589	0	0	0.00742	0	0	0.203	0	0.00481	0	0	0	0.41	0
CLW-2	0	55.1	416	1.25	7.8	96.4	976	0	0.0259	0.0743	0	0	0	0	0	0.253	0	0.00423	0	0	0.21	0.75	0
CLW-3	0	44.5	351	1.34	7.83	98.4	884	0	0.0382	0.0970	0	0	0	0	0	0.243	0	0.00488	0	0	0.16	0.49	0
CLW-4	0	38.8	321	1.45	7.90	85.5	968	0	0.0376	0.0819	0	0	0	0	0	0.232	0	0.00425	0	0	0.47	0.54	0
CLW-5	0	38.5	340	1.85	7.93	85.6	936	0	0.0236	0.0707	0	0	0	0	0	0.226	0	0.00515	0	0	0.14	0.28	0
CLW-6	0	38.4	270	1.55	7.89	72.8	828	0	0.0271	0.0896	0	0	0	0	0	0.214	0	0.00478	0	0	0.2	0.78	0
CLW-7	0	51.3	336	1.07	7.76	68.9	792	0	0.0228	0.0511	0	0	0	0	0	0.205	0	0.00323	0	0	-0.09	0.54	0
CLW-8	0	44.3	317	1.11	7.81	67.2	776	0	0.0257	0.0621	0	0	0.00200	0	0	0.212	0	0.00358	0	0	0.27	0.22	0
CLW-9	0	26.2	298	2.02	7.91	86.4	760	0	0.0368	0.0462	0	0	0	0	0	0.168	0	0.00518	0	0	0.21	0.21	0
CL-U-3	0	59.6	390	0.872	7.83	114	984	0	0.0183	0.0495	0	0	0.00565	0	0	0.212	0	0.00372	0	0	0	0.48	0

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	174	934	0.919	7.61	271	2050	0	0.002	0.0776	0	0	0	0	0	0.354	0	0.00312	0.00458	0	0	0.4	0
BA-U-2	0	91.8	718	0.844	7.68	102	1350	0	0.0211	0.1670	0	0	0	0	0	0.300	0	0.0022	0.00234	0	0.18	0.62	0
BAC-1	1.31	72.4	431	0.197	8.42	404	1830	0	0.0121	0.0567	0	0	0.00359	0	0	0.172	0	0.142	0.00278	0	0.28	0.09	0
BAC-2	10.3	233	1700	1.11	7.2	2590	8310	0	0.0519	0.0180	0	0	0.00556	0	0	0.491	0	0.163	0.0145	0	0.17	0.48	0
BAC-3	8.64	417	3400	1.3	7.24	4090	12900	0	0.0472	0.0272	0	0	0.00593	0	0	1.030	0.000105	0.0388	0.0206	0	0.17	0.77	0
BAC-4	0.553	72.4	488	1.22	7.76	269	1270	0	0.0319	0.0641	0	0	0	0	0	0.281	0	0.0196	0	0	0.16	0.58	0
BAC-5	0	91.8	585	1.07	7.73	393	1540	0	0.0294	0.0594	0	0	0	0	0	0.334	0	0.0168	0	0	-0.1	0.27	0
BAC-6	4.4	137	536	0.866	7.84	963	2260	0	0.0248	0.0206	0	0	0	0	0	0.283	0	0.0923	0	0	-0.09	-0.38	0
BAC-7	5.17	142	529	1.34	7.72	985	2760	0	0.0298	0.0184	0	0	0	0	0	0.284	0	0.0908	0.00388	0	0.09	0.34	0
BAC-8	0	27.8	266	1.61	7.92	81.1	708	0	0.0519	0.0732	0	0	0	0	0	0.165	0	0.0055	0	0	0.31	0.41	0
BAC-9	0	28.4	283	1.7	7.91	82.6	736	0	0.583	0.051	0	0	0	0	0	0.167	0	0.00451	0	0	0.06	0.53	0
BAC-10	0	31.1	273	1.66	7.91	85	788	0	0.0527	0.0612	0	0	0	0	0	0.171	0	0.00567	0	0	0.15	0.5	0

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	147	744	0.519	7.59	263	1840	0	0.00927	0.0634	0	0	0	0	0	0.271	0	0.00206	0	0	0.27	0.59	0
WW-U-1	1.39	323	1820	0.416	7.27	1140	5120	0	0.00592	0.0442	0	0	0.00432	0	0	0.431	0	0.00702	0.00748	0	0.38	0.89	1.27
WW-U-2	1.16	347	1170	0.633	7.45	872	4270	0	0.0114	0.0473	0	0	0.00237	0	0	0.484	0	0.00411	0.0113	0	0.19	0.54	0
WWC-1	12.9	584	4600	0.245	7.1	3190	13800	0	0.0215	0.0183	0	0	0	0	0	1.000	0.00018	0.00794	0.0146	0	0.13	0.82	0
WWC-2	0	54.2	316	0.534	7.75	128	824	0	0.0161	0.0296	0	0	0	0	0	0.128	0	0.00348	0	0	-0.06	0.5	0
WWC-3	0	35.3	244	1.14	7.79	86	764	0	0.0226	0.0306	0	0	0	0	0	0.151	0	0.00471	0	0	0.06	0.38	0
WWC-4	1.34	240	1030	0.449	7.97	673	2780	0	0.0133	0.0412	0	0	0	0	0	0.388	0	0	0	0	-0.03	0.56	0

Round 12

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	15.92	7.84	-138	1880	1.6	0.42	1.2
CL-U-2	15.68	7.81	-119	1820	4.7	0.6	1.17
CLW-1	15.59	7.68	-68	1540	0.9	2.06	0.984
CLW-2	15.77	7.86	-187	1870	1.7	1.5	1.2
CLW-3	15.45	7.93	-201	1720	2.1	1.37	1.1
CLW-4	15.51	7.97	-203	1610	12.7	1.55	1.03
CLW-5	15.07	7.94	-214	1.69	3.8	3.03	1.08
CLW-6	16.62	8.04	-225	1570	1.1	1.54	1
CLW-7	16.75	7.76	-79	1630	0.5	0.91	1.05
CLW-8	16.41	7.82	-99	1570	0.07	1.7	1.01
CLW-9	15.39	7.98	-184	1550	3.6	0.83	0.993
CL-U-3	15.07	7.55	-197	1830	0.3	2.51	1.17

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.39	7.67	-60	3720	1.1	0.31	2.38
BA-U-2	16.57	7.81	-97	2710	2	0.38	1.74
BAC-1	19.56	8.75	-282	1340	22.8	1.17	0.852
BAC-2	18.83	7.25	-39	5370	2.2	1.1	3.38
BAC-3	17.57	7.34	-11	8.95	1.1	1.61	5.64
BAC-4	15.14	7.6	-57	2600	0	1.94	1.66
BAC-5	15.26	7.68	-62	2960	0	2.03	1.9
BAC-6	15.21	7.63	-44	3880	0	1.48	2.48
BAC-7	15.95	7.74	-71	4210	0	1.37	2.7
BAC-8	17.34	7.98	-91	1490	3.9	1.21	0.954
BAC-9	16.49	8.02	-69	1460	1.6	0.96	0.937
BAC-10	17.35	8	-80	1500	2.9	0.94	0.963

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.23	7.68	-37	3470	1.9	0.36	2.22
WW-U-1	16.64	7.24	-17	8020	0	0.41	5.05
WW-U-2	17.11	7.41	-8	7650	1.1	0.51	4.82
WWC-1	16.68	7.13	2	9830	0	1.37	6.19
WWC-2	15.94	8.03	-95	1550	2.9	1.56	0.989
WWC-3	16.07	8.01	-144	1310	0	2.09	0.841
WWC-4	15.29	7.38	-19	4910	0	1.4	3.14

Round 13 (all results ppm) Assessment Monitoring - September 23 - October 15, 2019

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	58.9	432	0.753	7.94	109	976	0	0.0289	0.0799	0	0	0	0	0	0.239	0	0.0035	0	0	0.03	0.75	0.75
CL-U-2	0	60.6	424	0.792	7.87	112	968	0	0.0251	0.0935	0	0	0	0	0	0.229	0	0.00412	0	0	0.03	0.57	0
CLW-1	0	36	328	1.11	8.03	69.1	852	0	0.0295	0.0612	0	0	0	0	0	0.187	0	0.00357	0	0	0.29	0.38	0
CLW-2	0	50.8	438	1.13	8.15	88.1	924	0	0.0283	0.1510	0	0	0	0	0	0.253	0	0.0102	0	0	0.08	0.56	0
CLW-3	0	47	363	1.24	7.99	90.8	828	0	0.039	0.0976	0	0	0	0	0	0.242	0	0.00504	0	0	0.6	0.43	0
CLW-4	0	34.6	332	1.55	7.97	75.6	768	0	0.0387	0.0797	0	0	0	0	0	0.235	0	0.00441	0	0	0.22	1.06	1.06
CLW-5	0	37.5	351	1.89	8	76.9	1060	0	0.0231	0.0685	0	0	0	0	0	0.237	0	0.00479	0	0	0.25	0.44	0
CLW-6	0	34.5	330	1.7	7.98	74.4	1110	0	0.0145	0.0936	0	0	0	0	0	0.239	0	0.00607	0	0	0.42	1.05	1.47
CLW-7	0	43.7	362	1	7.89	71.4	796	0	0.0238	0.0523	0	0	0	0	0	0.192	0	0.00402	0	0	0.12	-0.03	0
CLW-8	0	39.9	337	1.04	7.98	70.7	836	0	0.0266	0.0521	0	0	0.00000	0	0	0.196	0	0.00449	0	0	-0.05	0.32	0
CLW-9	0	26.9	288	1.94	8.12	88.7	792	0	0.0398	0.0469	0	0	0.00287	0	0	0.181	0	0.00573	0	0	0.36	0.02	0
CL-U-3	0	64.6	304	0.429	8.85	168	596	0	0	0.0342	0	0	0.0738	0	0	0.152	0	0.00964	0	0	2.13	0.21	2.13

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	173	1140	0.587	7.71	314	2290	0	0.0223	0.0770	0	0	0	0	0	0.385	0	0.00302	0.00502	0	0.16	0.73	0.73
BA-U-2	0	47.1	400	0.893	8.18	56.6	972	0	0.0283	0.1270	0	0	0	0	0	0.247	0	0.00332	0	0	0.26	0.7	0
BAC-1	1.43	93.7	801	0.307	8.16	701	2730	0	0.0126	0.0460	0	0	0.00163	0	0	0.259	0	0.128	0.00436	0	0	0.14	0
BAC-2	9.49	208	1730	1.07	7.45	2760	7240	0	0.0647	0.0192	0	0	0.0058	0	0	0.466	0.00028	0.19	0.0145	0	0.12	0.39	0
BAC-3	7.32	441	3500	0.675	7.49	4310	13900	0.0027	0.0356	0.0321	0	0	0.00449	0	0	0.957	0	0.0255	0.0236	0	0	0.45	0
BAC-4	0.606	66.7	573	1.13	7.95	330	1820	0	0.0322	0.0637	0	0	0	0	0	0.279	0	0.0218	0	0	0.15	0.16	0
BAC-5	0	66.2	568	1.11	8.07	250	1410	0	0.0321	0.0814	0	0	0	0	0	0.289	0	0.00941	0	0	0.25	0.36	0
BAC-6	2.66	119	625	0.796	7.86	646	1870	0	0.0223	0.0338	0	0	0	0	0	0.288	0	0.0651	0.00273	0	0.31	0.83	1.14
BAC-7	5.06	107	566	1.31	7.96	1170	2320	0	0.0314	0.0174	0	0	0	0	0	0.248	0	0.0887	0.00276	0	0.04	0.22	0
BAC-8	0	23.2	280	1.53	8.05	95.5	784	0	0.0639	0.0389	0	0	0	0	0	0.156	0	0.00545	0	0	0.03	1.21	1.21
BAC-9	0	27.1	299	1.45	8.06	87.6	788	0	0.0593	0.0388	0	0	0	0	0	0.16	0	0.00483	0	0	0.09	0	0.53
BAC-10	0	25.7	280	1.51	8.09	87.4	808	0	0.0595	0.045	0	0	0	0	0	0.16	0	0.00584	0	0	0.8	1	1.8

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	136	824	0.38	7.71	281	1850	0	0.00981	0.0599	0	0	0	0	0	0.277	0	0	0	0	0.19	1.61	1.61
WW-U-1	1.41	311	1010	0	7.37	588	5720	0	0.00594	0.0419	0	0	0.00166	0	0	0.485	0	0.00689	0.0077	0	-0.08	1.42	1.42
WW-U-2	1.02	346	2020	0	7.3	855	4400	0	0.00735	0.0499	0	0	0	0	0	0.54	0	0.00317	0.011	0	-0.2	1.36	1.36
WWC-1	13.2	473	4940	0.292	7.42	3570	14900	0	0.0264	0.0205	0	0	0	0	0	0.974	0.000278	0.0113	0.016	0	0.23	0.9	0.9
WWC-2	0	57.6	349	0.427	7.99	141	876	0	0.0166	0.0336	0	0	0	0	0	0.126	0	0.00327	0	0	-0.15	0.81	0.81
WWC-3	0	33.3	262	0.986	8.13	95.3	776	0	0.0236	0.0331	0	0	0	0	0	0.151	0	0.00477	0	0	3.1	0.58	3.1
WWC-4	1.06	176	968	0.453	7.61	594	3080	0	0.0154	0.0456	0	0	0	0	0	0.329	0	0	0.00177	0	0.72	0.57	0

Round 13

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	15.85	7.75	-159	777	0	1.62	0.497
CL-U-2	15.96	7.7	-158	743	0	1.01	0.476
CLW-1	15.83	7.73	-48	1480	1.3	2.01	0.948
CLW-2	16.6	7.79	-191	760	0	2	0.488
CLW-3	17.14	7.84	-215	1730	0.5	1.43	1.11
CLW-4	16.47	7.88	-233	1600	2.7	1.61	1.03
CLW-5	17.05	7.83	-220	1700	1.9	1.84	1.09
CLW-6	16.65	7.7	-229	1590	1.6	2.69	1.02
CLW-7	17.74	7.76	-57	1580	0.6	1.24	1.01
CLW-8	16.37	7.81	-36	1520	1	1.51	0.969
CLW-9	16.03	7.72	-299	1610	0.2	7.56	1.03
CL-U-3	16.1	9.08	-76	503	0	1.84	0.322

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.68	7.47	-58	1610	0	1.29	1.03
BA-U-2	16.37	8.94	-255	1550	1.4	0.8	0.99
BAC-1	17.09	7.98	-50	3950	1.32	3.4	2.53
BAC-2	16.92	7.19	28	10600	3.3	2.45	6.59
BAC-3	17.34	7.1	20	16700	2	0.61	10.4
BAC-4	16.73	7.81	-57	2570	0.6	1.18	1.64
BAC-5	17.52	7.84	-50	2540	0.4	1.33	1.63
BAC-6	16.78	7.74	-52	2670	0.7	0.87	1.71
BAC-7	17.16	7.83	-156	4000	3.1	0.86	2.56
BAC-8	15.03	7.65	-41	1540	0.2	5.45	0.989
BAC-9	15.03	7.68	-23	1560	0.3	1.2	0.993
BAC-10	14.98	7.65	-31	1560	0.1	1.15	0.999

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.51	7.63	-12	3290	0.1	0.78	2.11
WW-U-1	16.11	7.19	14	8000	2.8	1.93	5.04
WW-U-2	16.06	7.38	22	7390	0.6	1.32	4.66
WWC-1	15.13	6.79	36	1910	0	3.67	11.8
WWC-2	14.82	7.31	-29	1720	0.3	0.47	1.1
WWC-3	15.96	7.72	-244	1420	0	0.2	0.909
WWC-4	14.38	7.21	-34	4460	0	2.35	2.86

ATTACHMENT 6 - JUNE 2020 SEMI-ANNUAL PROGRESS REPORT

June 2020 Semi-Annual Progress Report

Intermountain Generating Facility
Delta, Utah

Prepared for:
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

Prepared by:
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Project No.: 203709098

June 25, 2020

Sign-off Sheet and Signatures of Environmental Professionals

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1.0 EXECUTIVE SUMMARY

1.1 BACKGROUND

On behalf of Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this progress report to summarize recent investigative and remedial design activities designed to further assess and design corrective measures required by the United States Environmental Protection Agency's 2015 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")). The activities summarized herein were outlined in in detail within IPSC's *January 2020 Annual Groundwater Monitoring and Corrective Action Summary Report*.

IPSC historical reports presented IPSC's approach for addressing requirements specified by the CCR Rules as well as the facility's Utah Department of Environmental Quality ("UDEQ"), Division of Water Quality ("DWQ") Groundwater Discharge Permit No. UGW270004, effective May 24, 2016. The DWQ has regulatory oversight for IPSC's compliance with its Groundwater Discharge Permit.

The UDEQ Division of Waste Management and Radiation Control ("DWMRC") also has regulatory oversight pursuant to the State CCR Rule, under which DWMRC will be issuing a separate permit for the CCR Units. The CCR Rules apply to each of IPSC's three (3) CCR units (reference Figures 1 and 2 for regional and site-specific, location maps):

- Combustion By-Products Landfill ("CB Landfill"),
- Bottom Ash Basin, and
- Waste Water Basin.

As reported in IPSC's historical reports, groundwater in localized, down-gradient directions in relation to the Bottom Ash Basin and the Waste Water Basin (surface impoundments) contains Total Dissolved Solids (TDS). IPSC is currently implementing a groundwater monitoring and recovery program. Supplemental monitoring and recovery wells were installed in sequential phases during the past year, and an additional twenty-five (25) wells are being installed currently to help define more definitively the down-gradient, leading edges of the two TDS plumes, and will be used for recovery of groundwater at select locations for TDS plume control.

As reported in IPSC's January 2019 *Assessment of Corrective Measures and Amended Corrective Action Plan* report, three metal constituents (arsenic, lithium, and molybdenum) were also quantified at localized areas within wells located immediately adjacent to the two surface impoundment boundaries. Statistical analyses to date indicate that the metals are localized at the boundaries of the two surface impoundments.

Although it is documented throughout Utah and near the site that arsenic and lithium can be present naturally at elevated concentrations, IPSC will continue monitoring metal concentrations in groundwater as part of its routine groundwater monitoring program. As supplemental water quality data is generated, potential contaminants such as metals will be evaluated through statistical analysis, in accordance with CCR Rule requirements.

Groundwater quality data to date indicate that TDS has migrated farther down-gradient of the two surface impoundments than the metal constituents detected near the impoundment boundaries. TDS is therefore being used as the leading indicator parameter of impacted groundwater quality for evaluating a suitable groundwater remediation approach. The recovery of TDS-impacted groundwater at select recovery wells will also intercept metal constituents that might be present, as TDS is expected to continue to migrate at a faster rate than dissolved metals in the clay-rich aquifer that underlies the property.

1.2 PURPOSE OF THIS REPORT

IPSC implemented a sequential, groundwater quality investigative program during the past year to refine IPSC's current Conceptual Site Model (CSM) and understanding of the hydraulic conditions of localized portions of the uppermost aquifer beneath the site. Sixteen (16) wells were installed and sampled during 2019, the analytical results of which were then used to help locate the 25 additional wells that are being installed presently. The sequenced, investigative approach helped delineate more definitively the physical characteristics and footprints of the TDS groundwater plumes located down-gradient (generally southwest) of the surface impoundments.

Currently, IPSC is installing and developing 25 additional groundwater monitoring wells, with intentions to use many of the wells for groundwater recovery and TDS plume control. The six-inch diameter, 80 to 90-feet deep wells are being installed currently and are scheduled for development during June 2020. IPSC anticipates that all 25 wells will be installed, developed, and surveyed in relation to existing wells by mid-June 2020. Select wells will be pump-tested to estimate well yield and radial cones of groundwater capture. Thereafter, IPSC intends to install groundwater recovery pumps in select wells to supplement and enhance ongoing groundwater recovery and TDS plume control operations.

The 25 new wells are being drilled currently by Cascade Drilling, LP of Salt Lake City, Utah, a Utah-certified, water well drilling firm. Each well is being drilled, installed, and developed by the sonic drilling method in similar fashion as previous, historical wells at the site. Drilling logs, schematic well construction diagrams, and details related to the drilling, installation, and development of the 25 new wells will be discussed in detail within IPSC's next semi-annual, summary report.

Currently, Stantec is conducting conceptual design, sizing, and layout of the submersible pumps and associated down-well, water level controls; groundwater conveyance piping and discharge equipment; and all related appurtenances and electrical needs. The expanded groundwater recovery network is designed to recover groundwater near the down-gradient, leading edges of the two TDS plumes and help supplement existing groundwater recovery wells. Following IPSC review and comment on the conceptual design, the project will be advanced to a Pre-Final (90-percent) level design, followed by construction and startup of the enhanced, groundwater recovery system.

Although the TDS plumes pose little to no risk to human health or the environment at the present and foreseeable time, IPSC anticipates initiating construction of the expanded groundwater recovery network as soon as mid-2020. It is anticipated that the analytical results associated with ongoing monitoring of water quality beneath the site will influence what, if any, additional monitoring wells and/or recovery wells might be necessary in the future in pursuit of TDS plume delineation and control.

IPSC and Stantec have been reviewing historical groundwater quality data to delineate the two TDS plumes and decide how best to enhance groundwater recovery and TDS plume control through expanding the existing groundwater recovery well network. IPSC has prepared this report to "provide a semi-annual summary describing the progress in selecting and designing a (groundwater) remedy," as specified by UDEQ Rule R315-319-97(a).

This report provides summary details regarding investigative activities conducted subsequent to activities reported within IPSC's *January 2020 Annual Groundwater Monitoring and Corrective Action Summary Report*. This report details IPSC's Spring 2020 semi-annual groundwater sampling results. The report includes an updated TDS iso-concentration map and groundwater flow map, as of the Spring 2020 monitoring event.

2.0 MARCH-APRIL 2020 GROUNDWATER MONITORING PROGRAM

Figure 3 is a groundwater elevation potentiometric map based on mean sea level water level measurements collected during March 2020. Figure 4 presents March and April 2020 TDS iso-concentrations superimposed atop the Figure 3 groundwater potentiometric map. Analysis of the analytical results and groundwater flow patterns was used to help locate the 25 monitoring/recovery wells that are being installed currently.

Table 1 presents a summary of all groundwater monitoring well construction specific details. Attachment 1 presents a tabulated summary of water quality results associated with all existing CCR Rule monitoring wells, including the most recent March-April 2020 sampling results.

Groundwater potentiometric and apparent flow direction characteristics remain similar to those observed historically. The predominant groundwater flow direction in relatively close proximity to the Bottom Ash Basin and the Waste Water Basin is generally toward the southwest, with a more westerly component of flow due west of the Waste Water Basin.

The quantitative, analytical results are similar to those observed during recent monitoring events. The supplemental monitoring and recovery wells being installed currently are located in areas deemed to investigate down-gradient, leading edges of the TDS plumes southwest of the Bottom Ash Basin (west and southwest of existing well BAC-11) and the Waste Water Basin (southwest and southeast of existing well WWC-6).

3.0 ONGOING CORRECTIVE ACTIONS AND PROGRESS TOWARD SELECTING ADDITIONAL GROUNDWATER CORRECTIVE ACTION REMEDY

3.1 ONGOING GROUNDWATER RECOVERY AT EXISTING RECOVERY WELLS WR-101, WR-102, AND WR-103

IPSC intends to continue operation of existing groundwater recovery wells WR-101, WR-102, and WR-103 identified on Figure 3. The three wells are recovering groundwater that contains elevated concentrations of TDS, located in relatively close proximity to the apparent historical TDS release areas associated with the Bottom Ash Basin. Wells WR-102 and WR-103 are located generally along the apparent TDS plume centerline, as explained in detail in IPSC's 2016 *Updated Corrective Action Plan*. Continued removal of TDS-enriched groundwater from each of these three wells is helping reduce the total mass of TDS within the uppermost aquifer beneath the site in a generalized down-gradient/southwesterly direction in relation to the Bottom Ash Basin.

3.2 SUMMARY OF ONGOING ACTIONS ASSOCIATED WITH SELECTION OF FINAL GROUNDWATER REMEDY

Currently, Stantec is providing advisory services to IPSC, related to conceptual design elements for enhanced TDS plume control and associated groundwater recovery. Conceptual design elements include, for instance:

- Finalizing basis of design;
- Process flow diagram supported by a hydraulic pumping and conveyance model;
- Preliminary piping and instrumentation (P&ID) drawings; and
- Typical recovery well completion detail.

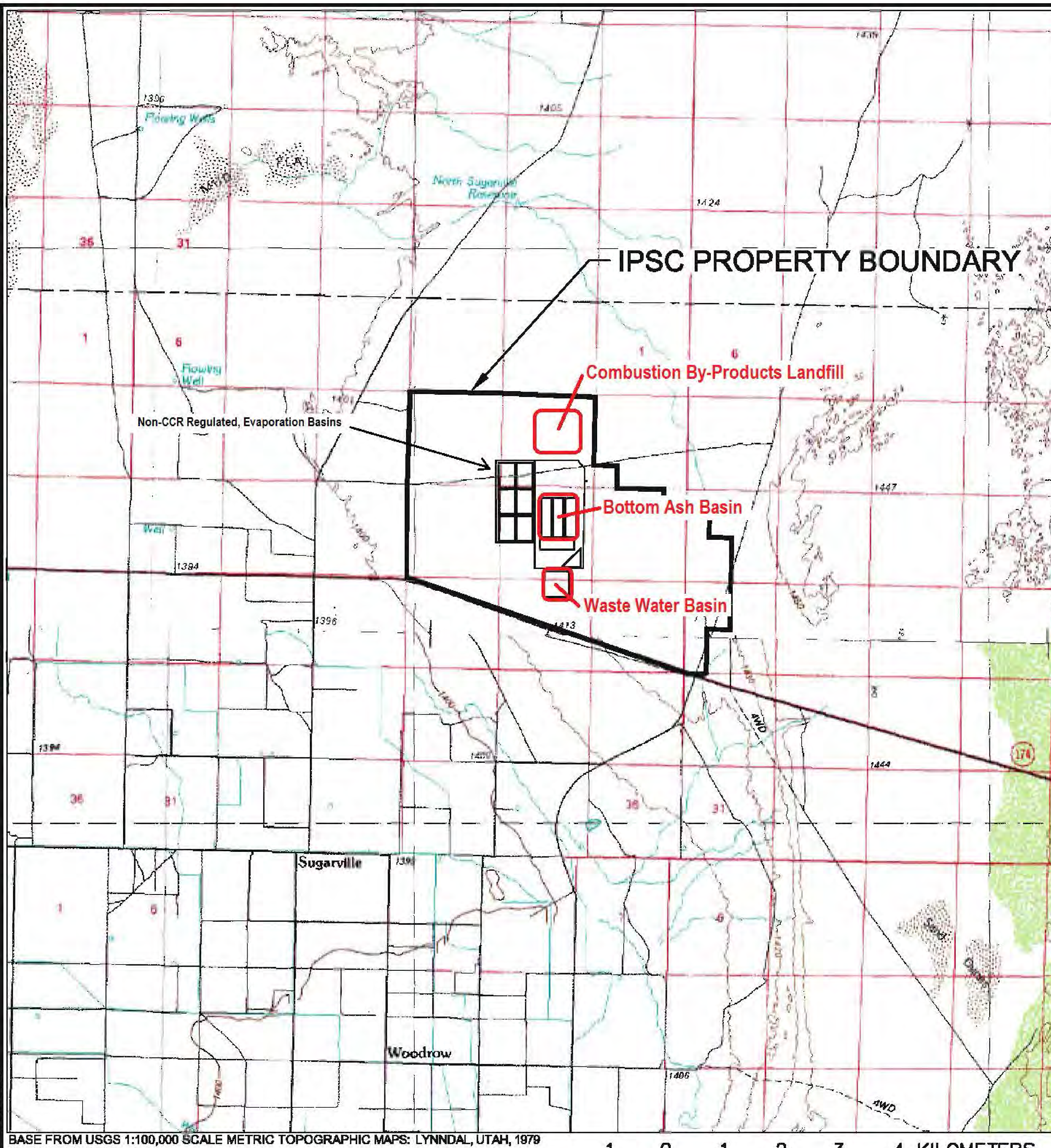
Following IPSC review and comment on the preliminary design, the project will be advanced to a Pre-Final (90-percent) level design. The Pre-Final Design (PFD) will build upon the deliverables associated with the preliminary design and will include the following:

- Finalized PFD of the system;
- Finalized P&IDs;
- Finalized hydraulic model of the pumping and conveyance system;
- Typical design details for the recovery wells and surface completions;

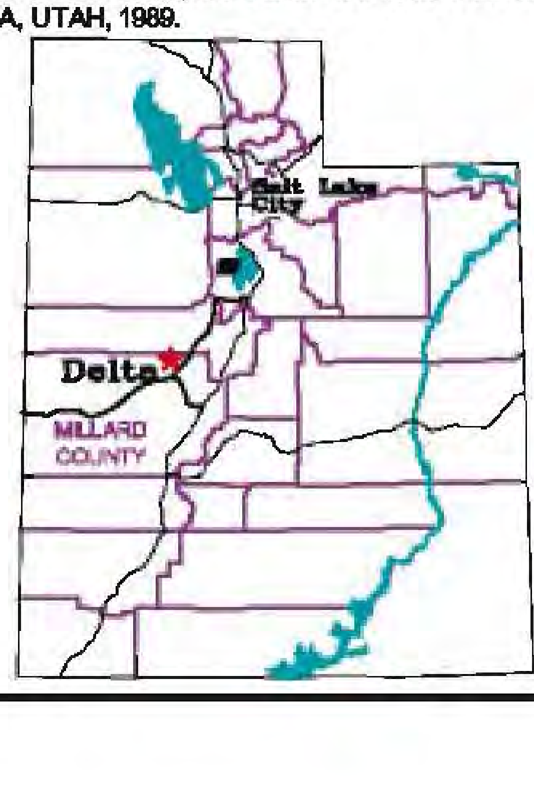
- Underground yard piping;
- Control philosophy for the system;
- Electrical single-line and termination drawings; and
- Equipment and construction specifications.

Following evaluation of the forthcoming remedial design, IPSC intends to initiate groundwater recovery to control the migration of the TDS plumes down-gradient of the surface impoundments. Upon implementation of the enhanced groundwater recovery and monitoring program proposed in this report, IPSC will evaluate the degree to which groundwater recovery and natural attenuation processes control the down-gradient leading edges of the two TDS plumes. IPSC also intends to evaluate potential, alternative means for ongoing enhancement of remediating TDS mass from the uppermost aquifer beneath the site. IPSC will continue to conduct and report to the UDEQ its routine, semi-annual groundwater monitoring and remediation program in formal Summary Reports.

Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.



1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES

N

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'	DATE DRAWN	1-26-17

REVISION

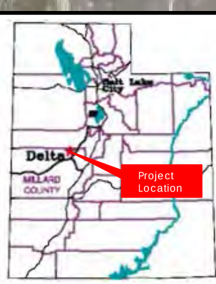
drawings\ipsc-04\Fig2 Site Topographic Map.dwg

Figure 2. CCR Units Location Map

Legend

CCR Unit

N



INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

Stantec

DRAWN BY JR	DATE DRAWN 9/30/2016
SCALE 1 in. approx. 1700 ft.	
PROJECT 203709098.409	

Figure 3 March 2020 Groundwater Potentiometric Map

C:\Users\ckwiatkowski\Desktop\203709098 Intermountain Power\GIS\2020_05\fig04_March2020GWE_withEMW_DeltaUT_20200413_11x17.mxd

LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 4578.67 GROUNDWATER ELEVATION
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED MARCH 2020
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,375 2,750
Feet
1 in = 1,417 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

MARCH 23, 2020 POTENTIOMETRIC MAP AND GROUNDWATER FLOW MAP WITH EMW WELLS

FIGURE: 4

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL		05/04/20

Figure 4 March-April TDS Results

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LEGEND:

MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)

4578.67 GROUNDWATER ELEVATION

GROUNDWATER CONTOUR

NS NOT SAMPLED

NOTE:

1) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600
Feet
1 in = 1,300 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

MARCH-APRIL 2020 TDS CONCENTRATIONS
SUPERIMPOSED ON MARCH 2020 POTENTIOMETRIC MAP

FIGURE: 4

JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY: JR	DATE: 05/04/20

TABLE 1 GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4555.98
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4606.01
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BAC-8	4/29/2019	6-inch PVC	77	52-77	4626.42
BAC-9	5/1/2019	6-inch PVC	77	52-77	4626.27
BAC-10	5/3/2019	6-inch PVC	87	62-87	4626.27

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
BAC-11	12/7/2019	6-inch PVC	81	50-75	4624.96
BAC-12	12/6/2019	6-inch PVC	81	53-78	4625.055
BAC-13	11/18/2019	6-inch PVC	91	65-90	4629.834
BAC-14	12/4/2019	6-inch PVC	81	53-78	4627.506
BAC-15	12/9/2019	6-inch PVC	81	50-75	4626.494
BAC-16	11/21/2019	6-inch PVC	91	64-89	4630.426
BAC-17	12/10/2019	6-inch PVC	82	56-81	4629.648
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
WELL CONSTRUCTION SUMMARY
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL*)
Waste Water Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WWC-6	3/24/2018	4-inch PVC	87	67-77	4576.26
WWC-7	3/22/2018	4-inch PVC	87	77-87	4570.78
WWC-8	4/25/2019	6-inch PVC	96	71-96	4647.799
WWC-9	4/28/2019	6-inch PVC	89	62-87	4642.58
WWC-10	4/26/2019	6-inch PVC	90	62-87	4633.72
WWC-11	11/16/2019	6-inch PVC	91	65-90	4641.919
WWC-12	11/12/2019	6-inch PVC	91	65-90	4636.661
WWC-13	11/15/2019	6-inch PVC	91	65-90	4635.128
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59
WW-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WW-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46

BGS = Below Ground Surface

MSL = Mean Sea Level

APPENDIX A DRILLING LOGS AND WELL SCHEMATIC DIAGRAMS

MONITORNG WELL ID: **WWC-11**

INTERMOUNTAIN POWER SERVICE CORP.

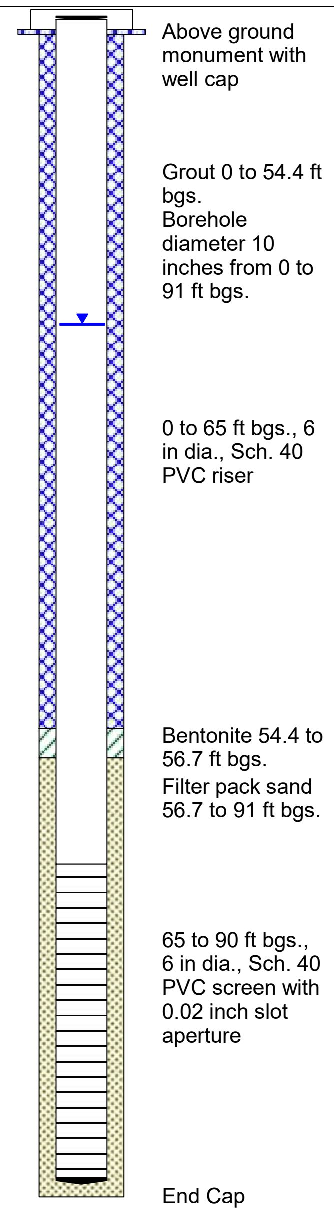
Stantec

CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.):	91	GROUNDWATER LEVEL (ft. btoc.):	22.82
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED:	11/15/2019	DATE FINISHED:	11/16/2019
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), fine sand 95%, loose, soft, dry, very pale brown (10 YR 7/4), trace gravel 5%.
5	
	Clay (CL), medium plasticity, cohesive, moist, soft to medium density, light gray (10 YR 7/1), mottled with some trace interfingered clay, brownish yellow (10 YR 6/8).
10	Well Graded Sand with Clay (SW-SC), medium grained sand 85%, gravel 10%, clay 5%, moist, loose, pale brown (10 YR 6/3).
15	Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, dry to moist, brown (10 YR 5/3).
	Same as above, Clay (CL), no sand.
20	Poorly Graded Sand (SP), fine sand 98%, loose soft, dry, pale brown (10 YR 6/3), 2% gravel, subrounded.
25	
30	
35	
	Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, moist, brown (10 YR 5/3), gravel are subangular to subrounded, assorted gravel matrix.
40	
45	Clay (CL), medium plasticity, medium density, moist to wet, cohesive, pale brown (10 YR 6/3).
	Well Graded Sand with gravel (SW), fine to coarse sand 90%, gravel 10%, loose, soft, brown (10 YR 5/3).
50	
	Same as above, becoming wet.
55	Clay (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
	Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, moist, pale brown (10 YR 6/3).
60	Same as above, fine grained sand, saturated, low plasticity, non cohesive.
65	Same as above, with trace interfingering clay, reddish yellow (5 YR 6/6).
70	Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, wet, brown (10 YR 5/3), gravel are subrounded, assorted matrix.
75	
80	
85	
90	Clay with Sand (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
95	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **WWC-12**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR: Cascade Drilling

DRILLING METHOD: Sonic

DRILLING EQUIPMENT: Pro Sonic 600 11-77287

SAMPLING METHOD: 4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.

COORDINATE SYSTEM:

EASTING: NORTHING:

ELEVATION: BOREHOLE ANGLE: 90 degrees

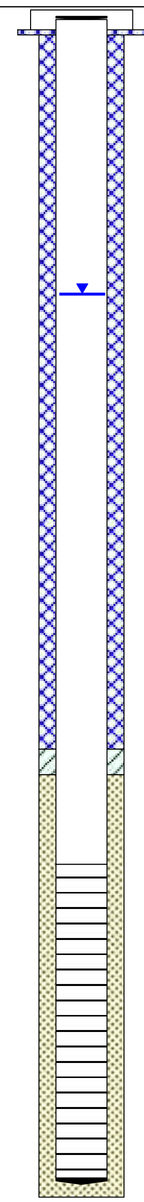
TOTAL DEPTH (ft.): 91 GROUNDWATER LEVEL (ft. btoc.): 20.46

DATE STARTED: 11/11/2019 DATE FINISHED: 11/12/2019

LOGGED BY: Michael Ward

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), 90% sand, 10% silts, light gray (7.5 YR 7/1), soft, loose, fine grained, dry, sand are mostly quartz, subangular quartz grains.
5	Same as above, becoming light yellowish brown (10 YR 6/4).
10	Same as above, becoming wet at 8.5 ft bgs., perched groundwater.
	Clay (CL), medium plasticity, medium stiff, cohesive, very pale brown (10 YR 7/4).
	Poorly Graded Sand with Silt (SP-SM), 95% fine grained sand, 5% silts, loose, soft, moist, brown (10 YR 4/3), trace gravel.
15	Well Graded Sand with Gravel (SW), 80% sand, 20% gravel, fine to coarse sand, moist, loose soft, dark yellowish brown (10YR 4/4), gravel are subrounded to rounded, small.
20	
25	Clay (CL), medium plasticity, medium density, moist, cohesive, light yellowish brown (10 YR 6/4), thickly bedded, sharp contact at 25 ft bgs.
30	
35	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10YR 5/3).
40	Well Graded Sand with Gravel (SW), fine to coarse grained sand 90%, small gravel 10%, loose, soft, moist, dark yellowish brown (10 YR 4/4).
45	Same as above, increase in gravel to 30%.
	Same as above, decrease in gravel to 10%.
	Poorly Graded Sand (SP), fined grained sand 100%, loose, moist, brown (10YR 4/3). Sharp contact.
50	
55	Clay (CL), high plasticity, stiff, moist, cohesive, light yellowish brown (10 YR 6/4), sharp contact.
60	Lost core sample from sonic casing.
	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
65	
70	Well Graded Sand with Silt and Clay (SW-SM), fine or medium grained sand 100%, soft, loose, brown (10 YR 4/3).
75	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
80	Poorly Graded Sand with Silts and Clay (SP-SC), fine grained sand 95%s, soft, loose, wet, light yellowish brown (10 YR 6/4), trace clay.
85	Clay with Sand (CL), medium plasticity, soft to medium density, wet, pale brown (10YR 6/3), sand are fine grained.
	Same as above with gradational transition to clay.
90	Clay (CH), high plasticity, mottled, wet, cohesive, pale brown (10 YR 6/3), mottled color is reddish yellow (7.5 YR 7/6).
95	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 55 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 55 to 58 ft bgs.
Filter Pack Sand 58 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

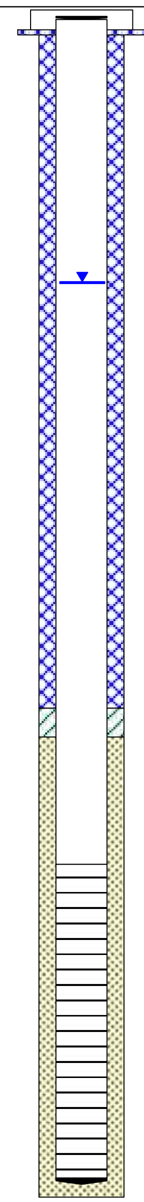
Stantec

MONITORNG WELL ID:	**WWC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 19.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/13/2019	DATE FINISHED: 11/15/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silts (SP-SM), fine sand 95%, 5% silts, soft, loose, dry, light gray (7.5 YR 7/1).
5	Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, dry, pinkish gray (7.5 YR 7/2), trace gravel, small gravel, assorted matrix, subrounded.
	Same as above, with clay, increase gravel 10%, wet.
10	Clay with Sand (CL), low to medium plasticity, moist, cohesive, very pale brown (10 YR 7/4).
	Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, , moist, pale brown (10 YR 6/3), trace gravel 5%, subrounded.
23	Same as above, with clay (SW-SC) at 10%, wet, soft, low plasticity clay.
25	Clay with Sand (CL), medium plasticity, moist cohesive, thick bedded, fine sand, sharp contact at 23 ft, bgs,
	Same as above, Clay (CL), trace black staining.
30	Clay with Sand (CL), medium plasticity, moist cohesive, fine sand.
	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
44	Well Graded Sand with gravel (SW), fine to coarse sand 85%, 15% gravel, loose, soft, moist, brown (10 YR 5/3), gravel are small, subrounded, assorted matrix.
45	Poorly Graded Sand (SP), fine to medium grained sand 98%, loose, soft, moist, brown (10 YR 5/3), trace small gravel 2%, subrounded.
50	Same as above, trace clay.
	Clay with Sand (CL), low to medium plasticity, soft to medium density, moist, yellowish brown (10 YR 5/4), secondary sand are fine grained.
60	Clay (CL), medium to high plasticity, medium to stiff density, moist, thickly bedded, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
69	Clay with Sand (CL) , medium plasticity, moist to wet, cohesive, brown (10 YR 5/3).
70	Clay (CL), medium plasticity, medium to stiff density, moist, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
78	Poorly Graded Sand with Clay (SP-SC), fine grained sand 95%, loose, soft, wet, brown (10 YR 5/3), some trace interfingering clay 5%, reddish yellow (5 YR 5/3).
80	Clay with Sand (CL), low plasticity, soft, wet, non cohesive, pale brown (10 YR 6/3).
85	Clay (CL), medium to high plasticity, wet, cohesive, pale brown (10 YR 6/3), interfingering clay reddish yellow (5 YR 6/6), trace sand.
90	Same as above, becoming medium plasticity.
91	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 52.8 ft bgs.

Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 52.8 to 55 ft bgs.

Filter pack sand 55 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

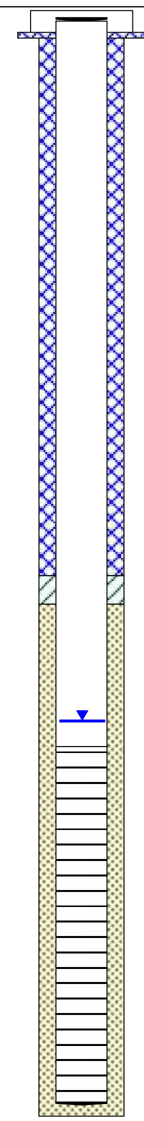
MONITORNG WELL ID:	**BAC-11**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 48.21
		DATE STARTED: 12/6/2019	DATE FINISHED: 12/7/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Fill
		Poorly Graded Sand with Silt (SP-SM), fine grained sand 100%, loose, soft, dry, very pale brown (10 YR 7/3).
5		Clay with Sand (CL), low plasticity, soft to medium density, moist, light brownish gray (10 YR 6/2).
10		Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, loose, medium dense, moist, light brownish gray (10 YR 6/2); clay are low plasticity, medium dense.
15		Clay (CL), medium plasticity, medium dense, cohesive, moist, light brownish gray (10 YR 6/2), mottled with brownish yellow (10 YR 6/8).
20		
25		
30		Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, moist, light yellowish brown (10 YR 6/4); clay low plasticity, soft, non cohesive.
35		Same as above, becoming brown (10 YR 5/3).
40		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
45		
50		Poorly Graded Sand (SP), fine to medium grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
55		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
		Clay with Sand (CL), low plasticity, soft, wet, pale brown (10 YR 6/3).
60		Well Graded Sand (SW), fine to coarse Sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel, subrounded.
65		Same as above, increase in coarse grained sand between 65.2 to 65.8 ft bgs.
		Same as 60 ft bgs.
70		
75		Clay (CL), medium plasticity, medium dense, moist, cohesive, light yellowish brown (10 YR 6/4).
80		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



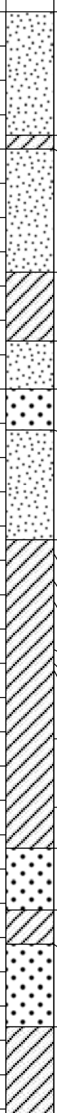
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

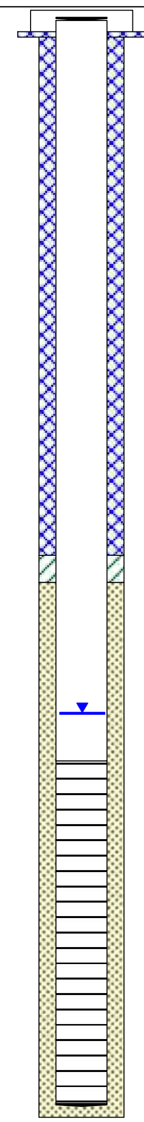
Stantec

MONITORNG WELL ID:	**BAC-12**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 49.55
		DATE STARTED: 12/4/2019	DATE FINISHED: 12/6/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly Graded Sand with Silt (SP-SM), fine grained sand 95%, loose, soft, dry, pale brown (10 YR 6/3).
10		Clay (CL), medium plasticity, medium dense, moist, cohesive, light brownish gray (10 YR 6/2).
		Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, dry, light brownish gray (10 YR 6/2); clay 10%, low plasticity, soft.
20		Clay (CL), medium plasticity, medium dense, moist, cohesive, very pale brown (10 YR 7/3), mottled with brownish yellow (10 YR 6/8).
25		Poorly Graded Sand with Silt (SP-SM), loose, soft, dry, pale brown (10 YR 6/3).
		Well Graded Sand with Gravel (SW), fine to coarse sand 85%, loose, soft, dry, light brownish gray (10 YR 6/2), gravel 15%, small, subangular to subrounded, assorted matrix.
30		Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, moist, pale brown (10 YR 6/3), 5% clay.
40		Clay with Sand (CL), medium plasticity, medium dense, moist, light yellowish brown (10 YR 6/3).
		Clay (CL), medium plasticity, stiff, moist, cohesive, pale brown (10 YR 6/2).
		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Clay (CL), Same as 39.5 ft bgs.
		Clay with Sand (CL), Same as 38.5 ft bgs.
		Clay (CL), Same as 41.5 ft bgs.
		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
55		Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3), mottled with yellowish brown (10 YR 5/6).
60		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Well Graded Sand (SW) fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), trace gravel.
65		Clay with Sand (CL), low to medium plasticity, medium dense, wet, non cohesive, brown (10 YR 5/3), mottled with light brownish gray (10 YR 6/2).
70		Well Graded Sand with Clay (SW-SC), fine grained sand 90%, loose, soft, wet, brown (10 YR 5/3): clay 10%, low plasticity, non cohesive.
75		Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3).
80		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs., and 4 inches from 79 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 79 ft bgs.

53 to 78ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

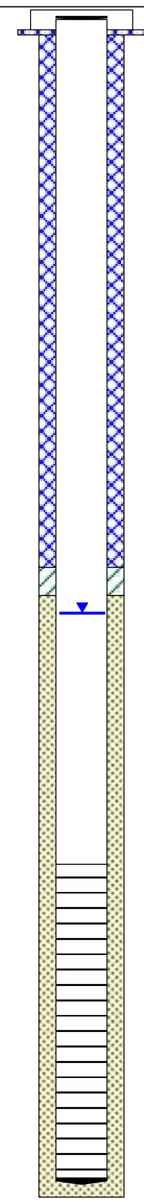
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 45.38
		DATE STARTED: 11/16/2019	DATE FINISHED: 11/18/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly Graded Sand with Silt and Gravel (SP-SM), fine grained sand 85%, silts 10%, trace gravel 5%, loose, dry, light gray (10 YR 7/2).
5		Same as above, becoming dense, consolidated.
		Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
10		Same as above, no gravel, sand 100%.
		Clay with Sand (CL), low plasticity, dry to moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
15		Same as above, moist.
		Same as above, medium plasticity.
20		Poorly Graded Sand (SP), fine grained sand 100%, loose, dry, dark brown (10 YR 3/3), thinly bedded.
		Clay with Sand (CL), low plasticity, moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
25		
30		
35		Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
		Poorly Graded Sand (SP), medium grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
40		Clay (CL), medium plasticity, medium dense, moist, brownish yellow (10 YR 6/6).
		Clay with Sand (CL), low plasticity, soft density, wet, non cohesive, light yellowish brown (10 YR 6/4).
45		Clay (CL), medium plasticity, medium dense, moist, cohesive, brownish yellow (10 YR 6/6), with mottled clay, brownish yellow (10 YR 6/8).
50		
55		Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, non cohesive, brown (10 YR 6/3).
60		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
		Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, brown (10 YR 6/3).
65		Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
70		Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
		Poorly Graded Sand (SP), medium grained sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel 5%, rounded to subrounded, assorted matrix.
75		
80		
85		Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, brown gray (10 YR 5/3).
90		End of borehole to 91 ft bgs., per scope of work.
95		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; Sch. = Schedule; dia. = diameter; YR = Yellow-Red; ft = feet

INTERMOUNTAIN POWER SERVICE CORP.

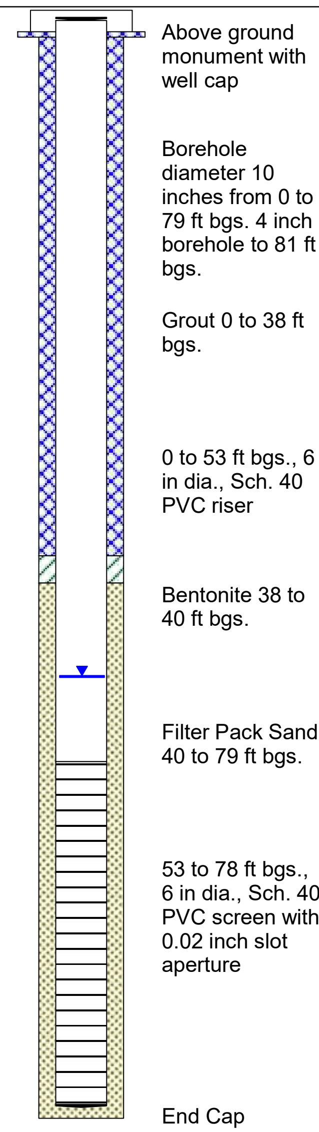
Stantec

MONITORNG WELL ID:	**BAC-14**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 81 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.81
	10 inch sonic core barrel 0 to 78 ft bgs.	DATE STARTED: 11/21/2019	DATE FINISHED: 12/4/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Well Graded Sand (SW), fine to coarse sand 95%, loose, soft, dry, yellowish brown (10 YR 5/4); 5% gravel, subrounded, small.
5		Well Graded Sand with Clay (SW-SC), fine to coarse sand 95%, medium dense, dry, light gray (10 YR 7/4).
10		Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry to moist, very pale brown (10 YR 7/3).
15		
20		Clay (CL), medium plasticity, medium dense, moist, cohesive, pale brown (10 YR 6/3), with trace mottled clay, brownish yellow (10 YR 6/8).
25		
30		Poorly Graded Sand (SP), fine sand 100%, loose, soft, light brownish gray (10 YR 6/2). Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, light brownish gray (10 YR 6/2); clay 10% low plasticity, soft, non cohesive.
35		
40		Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4). Poorly Graded Sand (SP), fine sand 100%, loose, soft, moist to wet, brown (10 YR 5/4).
45		
50		Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
55		Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, brown (10 YR 5/3); clay 10% low plasticity. Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
60		Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3). Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).
65		Poorly Graded Sand with Clay (SP-SC), fine sand 85%, loose medium dense, wet, brown (10 YR 5/3); clay 15% low plasticity, non cohesive, light yellowish brown (10 YR 6/4).
70		Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4). Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3). Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
75		Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, wet, brown (10 YR 5/3); clay 10%, low plasticity, soft, non cohesive. Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
80		Clay (CL), medium plasticity, medium to stiff, moist, brown (10 YR 5/3). End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-15**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

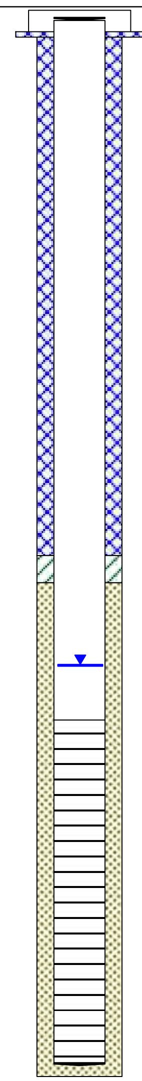
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.03
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/7/2019	DATE FINISHED: 12/9/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Fill
		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, very pale brown (10 YR 7/3), trace gravel, subrounded.
5		Clay (CL), medium plasticity, medium dense, cohesive, dry, light brownish gray (10 YR 6/2), trace white (10 YR 8/1), trace calcium carbonate between clay layering, effervesces with HCL.
10		
15		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, light gray (10 YR 7/1), trace clay at depth.
20		Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, soft to medium dense, dry, pale brown (10 YR 6/3), clay low plasticity, medium dense.
25		
30		Clay (CL), medium plasticity, medium dense, cohesive, moist, pale brown (10 YR 6/3).
		Same as above, becoming light yellowish brown (10 YR 6/4).
35		Clay with Sand (CL), low plasticity, soft, non cohesive, light yellowish brown (10 YR 6/4).
40		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
45		Well Graded Sand with Gravel (SW), fine to coarse sand 90%, loose, soft, wet, brown (10 YR 5/3), gravel 10%, subrounded.
50		
		Same as above, with trace black staining.
55		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/6).
		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
60		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3)
		Same as above, with some clay.
65		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
		Same as above, color change to yellowish brown (10 YR 6/4).
70		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
		Same as above, with mottled yellowish red (5 YR 5/6).
75		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
80		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3).
		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

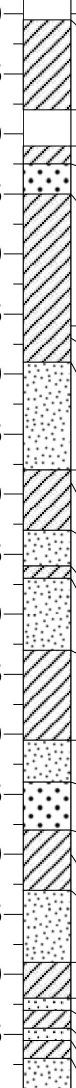
Stantec

MONITORNG WELL ID:	**BAC-16**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

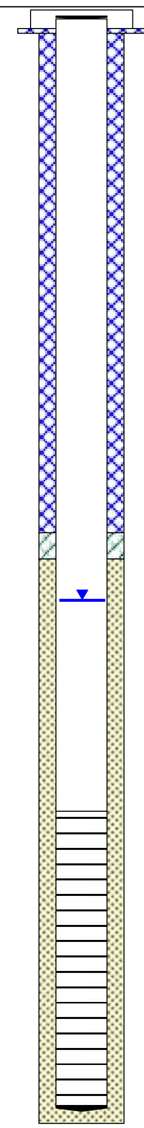
DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 47.45
		DATE STARTED: 11/18/2019	DATE FINISHED: 11/21/2019
		LOGGED BY: Michael Ward	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100



Fill.
Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
No core retrieved from sonic core barrel.
Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
Well Graded Sand (SW), fine to coarse grained sand 95%, loose, soft, light brownish gray (10 YR 6/2), trace gravel 5%, subrounded, small.
Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
Clay (CL).
Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry, non cohesive, pale brown (10 YR 6/3).
Poorly Graded Sand (SP), fine grained 100%, loose to medium dense, dry, light gray (10 YR 7/1).
Clay (CL), medium plasticity, medium density, moist, light yellowish brown (10 YR 6/4), with some interfingering clay, brownish yellow (10 YR 6/8).
Clay with Sand (CL).
Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, brown (10 YR 5/3), with trace interfingering clay 5%, yellowish red (5 YR5/6).
Well Graded Sand (SW), fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), 2% gravel, small, subrounded.
Clay with Sand (CL), low to medium plasticity, soft to medium density, wet, light brownish gray (10 YR 6/2).
Clay (CL), medium plasticity, medium to stiff, cohesive, moist, light yellowish gray (10 YR 6/2).
Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
Clay (CL), medium plasticity, stiff, cohesive, moist to wet, brown (10 YR 5/3).
Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
Clay (CL), same as 73 ft bgs.
Poorly Graded Sand (SP), same as 82 ft bgs.
Clay (CL), same as 73 ft bgs.
Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
Clay (CL), same as 73 ft bgs., with mottled interbedded clay, yellowish red (5 YR 5/6).
End of borehole at 91 ft bgs. Installed monitoring well per scope of work.



Above ground monument with well cap

Grout 0 to 42 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 42 to 44 ft bgs.

Filter Pack Sand 44 to 91 ft bgs.

64 to 89 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-17**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 82	GROUNDWATER LEVEL (ft. btoc.): 45.3
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/12/9/2019	DATE FINISHED: 12/10/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85

Well Graded Sand with Silt (SW-SM), fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), fine silts, trace calcium carbonate.

Well Graded Sand (SW), fine to coarse sand 100%, loose, soft, pale brown (10 YR 6/3).

Well Graded Sand with Gravel and Clay (SW-SC), loose, soft, fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), clay low plasticity, soft, gravel, small, subrounded.

Well Graded Sand (SW), fine to coarse 98%, loose, soft, light yellowish brown (10 YR 6/4), gravel 2%, small, subrounded.

Clay (CL), low plasticity, soft, wet, very pale brown (10 YR 7/3), perched groundwater.

Clay with Sand (CL), low plasticity, soft, moist, light yellowish brown (10 YR 6/4).

Clay (CL), medium plasticity, medium dense, cohesive, brown (10 YR 5/3), mottled with some reddish yellow (5 YR 6/6).

Clay with Sand (CL), low plasticity, soft, wet non cohesive, brown (10 YR 5/3).

Poorly Graded Sand with Clay (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), with trace gravel 2%, subrounded, small.

Poorly Graded Sand with Clay (SP-SC), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), clay, medium plasticity, soft to low density, non cohesive, light yellowish brown (10 YR 5/4).

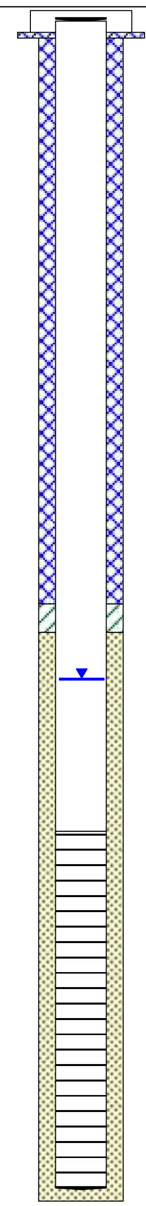
Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).

Poorly Graded Sand with Clay (SP-SC), fine grained sand, loose, soft, wet, brown (10 YR 5/3), clay are low plasticity, soft.

Clay with Sand (CL), low to medium plasticity, soft, wet, cohesive, brown (10 YR 5/3).

Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).

End of borehole at 81 ft bgs. Installed monitoring well per scope of work.



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

ATTACHMENT 1 TABULATED GROUND WATER MONITORING DATA

Round 14 (all results ppm) Assessment Monitoring - March 25 - April 9, 2020

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.6	429	0.979	7.70	122	916	0	0.0310	0.0800	0	0	0.00551	0	0	0.241	0	0.00505	0	0	0.36	0.93	1.29
CL-U-2	0	60.0	408	1.01	7.68	118	964	0	0.0266	0.0901	0	0	0	0	0	0.221	0	0.00404	0	0	0.09	1.23	1.23
CLW-1	0	36.6	304	0.979	7.91	61.0	856	0	0.0300	0.0612	0	0	0.00551	0	0	0.172	0	0.00527	0	0	0.25	0.12	0
CLW-2	0	47.0	418	1.23	7.84	86.0	992	0	0.0258	0.0770	0	0	0.00337	0	0	0.212	0	0.00556	0	0	0.03	0.54	0
CLW-3	0	39.4	361	1.27	7.88	101	488	0	0.0387	0.0991	0	0	0.00251	0	0	0.206	0	0.00560	0	0	0.20	-0.04	0
CLW-4	0	33.6	323	1.34	7.88	85.5	960	0	0.0381	0.0822	0	0	0.00245	0	0	0.204	0	0.00508	0	0	-0.03	0.47	0
CLW-5	0	34.5	340	1.58	7.86	83.9	800	0	0.0227	0.0737	0	0	0	0	0	0.198	0	0.00585	0	0	0.15	0.62	0
CLW-6	0	33.0	312	1.48	7.94	81.2	544	0	0.0225	0.0878	0	0	0	0	0	0.203	0	0.00540	0	0	0.43	-0.06	0
CLW-7	0	44.3	329	1.03	7.79	60.5	1020	0	0.0242	0.0526	0	0	0	0	0	0.180	0	0.00392	0	0	0.20	-0.08	0
CLW-8	0	40.8	316	1.03	7.86	63.7	880	0	0.0267	0.0634	0	0	0	0	0	0.182	0	0.00400	0	0	0.12	0.12	0
CLW-9	0	25.2	296	1.90	7.96	83.5	932	0	0.0402	0.0499	0	0	0	0	0	0.170	0	0.00597	0	0	0.15	0.32	0
CL-U-3	0	57.7	386	0.889	7.75	116	1090	0	0.0206	0.0478	0	0	0.00553	0	0	0.205	0	0.00467	0	0	-0.06	0.95	0.95

Round 14

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
Round 13	14.31	7.53	-172	1970	1.0	0.46	1.26
CL-U-2	14.47	7.47	-132	1890	1.1	4.72	1.21
CLW-1	15.51	7.45	-110	1500	0.3	0.40	0.96
CLW-2	15.46	7.59	-189	1950	1.0	0.14	1.25
CLW-3	15.26	7.66	-230	1760	1.0	0.16	1.13
CLW-4	15.25	7.67	-237	1650	3.3	0.17	1.06
CLW-5	15.20	7.57	-234	1730	7.5	0.40	1.11
CLW-6	14.63	7.57	-236	1650	0.9	0.26	1.06
CLW-7	16.02	7.45	-97	1610	0.2	0.24	1.03
CLW-8	16.24	7.47	-106	1540	6.0	0.37	0.98
CLW-9	13.95	7.72	-276	1590	1.9	6.57	1.02
CL-U-3	14.31	7.51	-210	1870	1.7	5.53	1.20

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	188	1090	0.817	7.50	367	3050	0	0.0226	0.0774	0	0	0.0711	0	0	0.375	0	0.0152	0.00519	0	0.28	1.20	1.2
BA-U-2	0	2.47	395	0.912	10.70	42.7	872	0	0.00683	0.0804	0	0	0.00611	0	0	0.327	0	0.00629	0	0	-0.03	0.70	0
BAC-1	3.00	239	1890	0.645	7.39	1300	5270	0	0.0154	0.0340	0	0	0.00219	0	0	0.547	0	0.0170	0.00791	0	0.09	0.83	0.83
BAC-2	8.38	210	1710	1.16	7.27	2440	6380	0	0.0609	0.0206	0	0	0.00986	0	0	0.431	0.000192	0.172	0.0128	0	0.33	1.21	1.21
BAC-3	7.47	447	3620	1.26	7.21	4380	12500	0	0.0321	0.0284	0	0	0.0150	0	0	0.913	0	0.0251	0.0204	0	0.16	0.51	0
BAC-4	0.613	70.5	541	1.09	7.89	295	1540	0	0.0330	0.0649	0	0	0	0	0	0.272	0	0.0211	0	0	-0.06	0.17	0
BAC-5	0.547	83.5	552	0.991	7.79	416	1760	0	0.0297	0.0560	0	0	0	0	0	0.306	0	0.0242	0	0	0.03	0.22	0
BAC-6	4.02	115	560	0.847	7.74	1020	2340	0	0.0255	0.0215	0	0	0	0	0	0.242	0	0.0805	0	0	0.14	0.52	0
BAC-7	5.48	92.6	532	1.48	7.91	1090	2400	0	0.0350	0.0168	0	0	0	0	0	0.218	0	0.0805	0.00202	0	0.21	0.25	0
BAC-8	0	25.4	264	1.61	7.97	84.4	784	0	0.0596	0.0370	0	0	0	0	0	0.183	0	0.00581	0	0	0	0.16	0
BAC-9	0	31.4	305	1.47	7.94	77.5	824	0	0.0488	0.0400	0	0	0	0	0	0.185	0	0.00487	0	0	0.09	0.29	0
BAC-10	0.571	26.1	278	1.62	7.95	84.0	804	0	0.0531	0.0381	0	0	0	0	0	0.171	0	0.00617	0	0	0.22	0.19	0
BAC-11	0	84.4	676	0.984	7.71	147	1100	0	0.0312	0.1160	0	0	0	0	0	0.244	0	0.00345	0	0	0.36	0.09	0
BAC-12	0	25.9	210	1.24	7.99	71.7	360	0	0.0423	0.0938	0	0	0	0	0	0.132	0	0.00479	0	0	0.23	0.18	0
BAC-13	0.604	115	929	0.957	7.50	276	46400	0	0.0329	0.0773	0	0	0	0	0	0.285	0	0.00250	0	0	0.35	0.55	0
BAC-14	0.565	158	940	0.972	7.53	432	1180	0	0.0359	0.0542	0	0	0	0	0	0.321	0	0.00222	0	0	0.03	0.08	0
BAC-15	0	26.2	263	1.75	8.01	78.9	600	0	0.0539	0.0395	0	0	0	0	0	0.172	0	0.00827	0	0	0.08	0.18	0
BAC-16	0	24.2	304	1.89	8.15	77.8	900	0	0.0783	0.0346	0	0	0	0	0	0.183	0	0.00732	0	0	0.20	0.22	0

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	15.43	7.22	-203	4340	5.7	0.20	2.78
BA-U-2	15.98	10.31	-330	469	0.0	0.35	0.305
BAC-1	17.25	7.20	-60	8060	2.4	0.32	5.09
BAC-2	16.70	7.16	-30	10100	8.1	5.44	6.26
BAC-3	16.05	7.18	-5	16500	3.7	0.50	10.2
BAC-4	15.70	7.53	-107	2600	0.0	0.18	1.67
BAC-5	15.76	7.51	-74	2900	0.2	0.16	1.86
BAC-6	16.17	7.49	-63	3540	0.9	0.33	2.26
BAC-7	15.35	7.66	-115	3840	1.9	2.47	2.46
BAC-8	14.78	7.54	68	1510	0.8	0.89	0.969
BAC-9	15.30	7.55	-28	1590	2.4	1.12	1.02
BAC-10	15.23	7.60	-50	1540	3.2	0.92	0.991
BAC-11	15.03	7.41	12	2980	7.1	7.33	1.91
BAC-12	14.93	7.75	-152	1280	1.4	6.36	0.821
BAC-13	14.46	7.28	-47	3850	1.1	6.99	2.47
BAC-14	14.81	7.20	4230	22	2.0	4.84	2.7
BAC-15	14.67	7.72	-45	1550	1.5	7.69	0.99
BAC-16	14.41	7.71	-64	1710	0.5	7.76	1.1

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	113	699	0.511	7.70	279	1230	0	0.00865	0.0609	0	0	0.00305	0	0	0.239	0	0.00280	0	0	0.20	1.04	1.04
WW-U-1	1.42	286	1940	0.324	7.24	1270	4740	0	0.00653	0.0391	0	0	0.00544	0	0	0.412	0	0.00811	0.00724	0	0.21	1.38	1.38
WW-U-2	1.23	337	2020	0.473	7.42	981	4020	0	0.0108	0.0502	0	0	0.00696	0	0	0.498	0	0.00309	0.0112	0	0	1.08	1.08
WWC-1	13.4	464	4800	0	7.29	3440	13000	0	0.0256	0.0207	0	0	0	0	0	0.936	0.000238	0.0136	0.0133	0	0.32	0.36	0
WWC-2	0	51.7	322	0.452	7.88	124	644	0	0.0159	0.0357	0	0	0.00332	0	0	0.119	0	0.00455	0	0	0.24	-0.15	0
WWC-3	0	31.8	254	1.06	7.96	85.8	712	0	0.0219	0.0304	0	0	0.00240	0	0	0.142	0	0.00536	0	0	-0.08	0.19	0
WWC-4	1.20	182	935	0.426	7.44	638	2730	0	0.0140	0.0437	0	0	0	0	0	0.314	0	0.00207	0.00228	0	0.47	0.27	0

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.33	7.30	3	789	0.0	3.90	0.505
WW-U-1	15.39	7.01	-38	3910	1.2	0.17	2.5
WW-U-2	13.24	7.19	-19	3800	0.7	1.02	2.43
WWC-1	14.71	6.90	-20	19400	2.8	0.31	12.0
WWC-2	13.47	7.59	-97	1690	12.8	0.54	1.08
WWC-3	14.65	7.67	-154	1430	1.1	0.17	0.916
WWC-4	14.61	7.13	-12	4750	1.4	0.40	3.04

Round 13 (all results ppm) Assessment Monitoring - September 23 - October 15, 2019

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	58.9	432	0.753	7.94	109	976	0	0.0289	0.0799	0	0	0	0	0	0.239	0	0.0035	0	0	0.03	0.75	0.75
CL-U-2	0	60.6	424	0.792	7.87	112	968	0	0.0251	0.0935	0	0	0	0	0	0.229	0	0.00412	0	0	0.03	0.57	0
CLW-1	0	36	328	1.11	8.03	69.1	852	0	0.0295	0.0612	0	0	0	0	0	0.187	0	0.00357	0	0	0.29	0.38	0
CLW-2	0	50.8	438	1.13	8.15	88.1	924	0	0.0283	0.1510	0	0	0	0	0	0.253	0	0.0102	0	0	0.08	0.56	0
CLW-3	0	47	363	1.24	7.99	90.8	828	0	0.039	0.0976	0	0	0	0	0	0.242	0	0.00504	0	0	0.6	0.43	0
CLW-4	0	34.6	332	1.55	7.97	75.6	768	0	0.0387	0.0797	0	0	0	0	0	0.235	0	0.00441	0	0	0.22	1.06	1.06
CLW-5	0	37.5	351	1.89	8	76.9	1060	0	0.0231	0.0685	0	0	0	0	0	0.237	0	0.00479	0	0	0.25	0.44	0
CLW-6	0	34.5	330	1.7	7.98	74.4	1110	0	0.0145	0.0936	0	0	0	0	0	0.239	0	0.00607	0	0	0.42	1.05	1.47
CLW-7	0	43.7	362	1	7.89	71.4	796	0	0.0238	0.0523	0	0	0	0	0	0.192	0	0.00402	0	0	0.12	-0.03	0
CLW-8	0	39.9	337	1.04	7.98	70.7	836	0	0.0266	0.0521	0	0	0.00000	0	0	0.196	0	0.00449	0	0	-0.05	0.32	0
CLW-9	0	26.9	288	1.94	8.12	88.7	792	0	0.0398	0.0469	0	0	0.00287	0	0	0.181	0	0.00573	0	0	0.36	0.02	0
CL-U-3	0	64.6	304	0.429	8.85	168	596	0	0	0.0342	0	0	0.0738	0	0	0.152	0	0.00964	0	0	2.13	0.21	2.13

Round 13

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	15.85	7.75	-159	777	0	1.62	0.497
CL-U-2	15.96	7.7	-158	743	0	1.01	0.476
CLW-1	15.83	7.73	-48	1480	1.3	2.01	0.948
CLW-2	16.6	7.79	-191	760	0	2	0.488
CLW-3	17.14	7.84	-215	1730	0.5	1.43	1.11
CLW-4	16.47	7.88	-233	1600	2.7	1.61	1.03
CLW-5	17.05	7.83	-220	1700	1.9	1.84	1.09
CLW-6	16.65	7.7	-229	1590	1.6	2.69	1.02
CLW-7	17.74	7.76	-57	1580	0.6	1.24	1.01
CLW-8	16.37	7.81	-36	1520	1	1.51	0.969
CLW-9	16.03	7.72	-299	1610	0.2	7.56	1.03
CL-U-3	16.1	9.08	-76	503	0	1.84	0.322

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	173	1140	0.587	7.71	314	2290	0	0.0223	0.0770	0	0	0	0	0	0.385	0	0.00302	0.00502	0	0.16	0.73	0.73
BA-U-2	0	47.1	400	0.893	8.18	56.6	972	0	0.0283	0.1270	0	0	0	0	0	0.247	0	0.00332	0	0	0.26	0.7	0
BAC-1	1.43	93.7	801	0.307	8.16	701	2730	0	0.0126	0.0460	0	0	0.00163	0	0	0.259	0	0.128	0.00436	0	0	0.14	0
BAC-2	9.49	208	1730	1.07	7.45	2760	7240	0	0.0647	0.0192	0	0	0.0058	0	0	0.466	0.00028	0.19	0.0145	0	0.12	0.39	0
BAC-3	7.32	441	3500	0.675	7.49	4310	13900	0.0027	0.0356	0.0321	0	0	0.00449	0	0	0.957	0	0.0255	0.0236	0	0	0.45	0
BAC-4	0.606	66.7	573	1.13	7.95	330	1820	0	0.0322	0.0637	0	0	0	0	0	0.279	0	0.0218	0	0	0.15	0.16	0
BAC-5	0	66.2	568	1.11	8.07	250	1410	0	0.0321	0.0814	0	0	0	0	0	0.289	0	0.00941	0	0	0.25	0.36	0
BAC-6	2.66	119	625	0.796	7.86	646	1870	0	0.0223	0.0338	0	0	0	0	0	0.288	0	0.0651	0.00273	0	0.31	0.83	1.14
BAC-7	5.06	107	566	1.31	7.96	1170	2320	0	0.0314	0.0174	0	0	0	0	0	0.248	0	0.0887	0.00276	0	0.04	0.22	0
BAC-8	0	23.2	280	1.53	8.05	95.5	784	0	0.0639	0.0389	0	0	0	0	0	0.156	0	0.00545	0	0	0.03	1.21	1.21
BAC-9	0	27.1	299	1.45	8.06	87.6	788	0	0.0593	0.0388	0	0	0	0	0	0.16	0	0.00483	0	0	0.09	0	0.53
BAC-10	0	25.7	280	1.51	8.09	87.4	808	0	0.0595	0.045	0	0	0	0	0	0.16	0	0.00584	0	0	0.8	1	1.8

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.68	7.47	-58	1610	0	1.29	1.03
BA-U-2	16.37	8.94	-255	1550	1.4	0.8	0.99
BAC-1	17.09	7.98	-50	3950	1.32	3.4	2.53
BAC-2	16.92	7.19	28	10600	3.3	2.45	6.59
BAC-3	17.34	7.1	20	16700	2	0.61	10.4
BAC-4	16.73	7.81	-57	2570	0.6	1.18	1.64
BAC-5	17.52	7.84	-50	2540	0.4	1.33	1.63
BAC-6	16.78	7.74	-52	2670	0.7	0.87	1.71
BAC-7	17.16	7.83	-156	4000	3.1	0.86	2.56
BAC-8	15.03	7.65	-41	1540	0.2	5.45	0.989
BAC-9	15.03	7.68	-23	1560	0.3	1.2	0.993
BAC-10	14.98	7.65	-31	1560	0.1	1.15	0.999

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	136	824	0.38	7.71	281	1850	0	0.00981	0.0599	0	0	0	0	0	0.277	0	0	0	0	0.19	1.61	1.61
WW-U-1	1.41	311	1010	0	7.37	588	5720	0	0.00594	0.0419	0	0	0.00166	0	0	0.485	0	0.00689	0.0077	0	-0.08	1.42	1.42
WW-U-2	1.02	346	2020	0	7.3	855	4400	0	0.00735	0.0499	0	0	0	0	0	0.54	0	0.00317	0.011	0	-0.2	1.36	1.36
WWC-1	13.2	473	4940	0.292	7.42	3570	14900	0	0.0264	0.0205	0	0	0	0	0	0.974	0.000278	0.0113	0.016	0	0.23	0.9	0.9
WWC-2	0	57.6	349	0.427	7.99	141	876	0	0.0166	0.0336	0	0	0	0	0	0.126	0	0.00327	0	0	-0.15	0.81	0.81
WWC-3	0	33.3	262	0.986	8.13	95.3	776	0	0.0236	0.0331	0	0	0	0	0	0.151	0	0.00477	0	0	3.1	0.58	3.1
WWC-4	1.06	176	968	0.453	7.61	594	3080	0	0.0154	0.0456	0	0	0	0	0	0.329	0	0	0.00177	0	0.72	0.57	0

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.51	7.63	-12	3290	0.1	0.78	2.11
WW-U-1	16.11	7.19	14	8000	2.8	1.93	5.04
WW-U-2	16.06	7.38	22	7390	0.6	1.32	4.66
WWC-1	15.13	6.79	36	1910	0	3.67	11.8
WWC-2	14.82	7.31	-29	1720	0.3	0.47	1.1
WWC-3	15.96	7.72	-244	1420	0	0.2	0.909
WWC-4	14.38	7.21	-34	4460	0	2.35	2.86

ATTACHMENT 7. A COPY OF IPSC'S NOVEMBER 2020 AMENDED ASSESSMENT OF CORRECTIVE MEASURES REPORT

Amended Assessment of Corrective Measures Report

Intermountain Generating Facility
Delta, Utah

Stantec

Prepared for:
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Prepared by:
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Project No.: 203709098

November 30, 2020

Sign-off Sheet and Signatures of Environmental Professionals

This document was prepared by Stantec Consulting Services Inc. ("Stantec") for Intermountain Power Service Corporation (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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Abbreviations

CB Landfill	Combustion By-Products Landfill
CoC	Chain-of-Custody
DQO	Data Quality Objective
ft	Foot or feet
IGF	Intermountain Generating Facility
IPSC	Intermountain Power Service Corporation
LCL	Lower Confidence Limit
MCL	Maximum Contaminant Level
mg/l	milligrams per liter
msl	mean sea level
ORP	Oxygen Reduction Potential
QA/QC	Quality Assurance and Quality Control
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SOPs	Standard Operating Procedures
Stantec	Stantec Consulting Services Inc.
SSI	Statistically Significant Increase
UDEQ	Utah Department of Environmental Quality
UTL	Upper Tolerance Limit
US EPA	United States Environmental Protection Agency

1.0 EXECUTIVE SUMMARY

1.1 PURPOSE OF THIS REPORT

On behalf of Intermountain Power Service Corporation ("IPSC"), Stantec Consulting Services Inc. ("Stantec") has prepared this report to amend IPSC's original January 2019 assessment of corrective measures required by the coal combustion residuals rules, and which supplemented IPSC's September 2016 Updated Corrective Action Plan report at the request of the Utah Department of Environmental Quality ("UDEQ"), Division of Water Quality ("DWQ"). The 2016 report presented IPSC's approach for addressing requirements specified by the facility's DWQ Ground Water Discharge Permit No. UGW270004. The most recent permit renewal was issued by the UDEQ to IPSC's Intermountain Generating Facility ("IGF"), effective May 24, 2016.

During the generalized timeframe of December 2015 through today, IPSC has been complying with facility monitoring measures prescribed by the United States Environmental Protection Agency's 2015 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR 257 Subpart D (the "Federal CCR Rule")(and the corresponding Utah CCR Rule at Utah Admin. Code R315-319 (the "State CCR Rule")(collectively, the "CCR Rules")). IPSC implemented a ground water quality monitoring program prescribed by the CCR Rules that included monitoring of CCR units and installation, monitoring, and sampling of several new, additional monitoring wells that were not part of IPSC's Ground Water Discharge Permit.

Since January 2019, IPSC has been, and still is, conducting semi-annual Assessment Monitoring as prescribed by the CCR Rule, including ongoing monitoring and delineation of CCR constituents, as well as remediation of Total Dissolved Solids (TDS) in groundwater beneath localized areas of the site in compliance with its Groundwater Discharge Permit. This 2020 report incorporates by reference IPSC's September 2016 Updated Corrective Action Plan report and January 2019 Assessment of Corrective Measures and Amended Corrective Action Plan report. This report also incorporates by reference IPSC's routine, semi-annual reports that IPSC has submitted historically to the DWQ as part of ongoing compliance with its Ground Water Discharge Permit and Semi-Annual Progress Reports that have been published on IPSC's public website as part of CCR Rule compliance. Copies of potentiometric and TDS concentration maps, excerpted from historical semi-annual reports, are presented herein in Appendix A.

IPSC commenced a ground water quality monitoring program prescribed sequentially by CCR Rules Parts §257.90 (R315-319-90) Applicability; §257.91 (R315-319-91) Ground Water Monitoring Systems; §257.93 (R315-319-93) Ground Water Sampling and Analysis Requirements; §257.94 (R315-319-94) Detection Monitoring Program; §257.95 (R315-319-95) Assessment Monitoring Program; and §257.96 (R315-319-96) Assessment of Corrective Measures. The CCR Rules apply to each of IPSC's three (3) CCR units (reference Figures 1 and 2 for regional and site-specific, location maps):

- Combustion By-Products Landfill ("CB Landfill");

- Bottom Ash Basin; and
- Waste Water Basin.

The DWQ has regulatory oversight for IPSC's compliance with its Ground Water Discharge Permit. The UDEQ Division of Waste Management and Radiation Control ("DWMRC") also has regulatory oversight pursuant to the State CCR Rule, under which DWMRC issued a permit for the CCR Units. IPSC has prepared this report to provide a summary of its CCR Rule compliance activities while proposing a dove-tailed, ground water monitoring and recovery program intended to comply with the Federal and State CCR Rules and its Ground Water Discharge Permit.

1.2 BACKGROUND

Historically, when complying with its Ground Water Discharge Permit, and as reported to the UDEQ, whenever IPSC identified a potential release from a permitted basin, IPSC implemented investigative and remedial actions to identify the source and then repair the leak area (typically a localized tear in the 80-mil high-density, polyethylene [HDPE] liner material). Investigative and remedial measures were implemented and communicated to the UDEQ in a timely manner and in accordance with Ground Water Discharge Permit requisites.

As a result of localized, historical releases from the Bottom Ash Basin, a plume of Total Dissolved Solids (TDS) in excess of background concentrations impacted the uppermost ground water quality and migrated with ground water toward the southwest (the predominant, uppermost aquifer flow direction in relation to the Bottom Ash Basin). Since March 2010, IPSC has operated three ground water recovery wells that recover ground water from areas that exhibit elevated TDS concentrations within the uppermost aquifer beneath the site. The permit compliance concentration for TDS for Compliance Wells in the Ground Water Discharge Permit is 1,100 ppm. The three recovery wells (wells WR-101, WR-102, and WR-103) collectively recover approximately 25 gallons per minute (gpm) and route recovered ground water to the Ash Recycle Basin.

The three recovery wells were designed to remove TDS mass from the apparent center of the TDS plume, as proposed in IPSC's original June 2007 Corrective Action Plan Report, which was 'approved' by the UDEQ and implemented sequentially, as documented in IPSC's March 2010 Ground Water Recovery Well Installation Report. At the time of installation, the three recovery wells were not intended to control the downgradient migration of the TDS plume, but rather to reduce TDS mass within the uppermost aquifer at locations positioned in relatively close proximity to release source areas.

As of September 2016, TDS water quality data indicated that the down-gradient leading edge of the TDS plume was moving beyond ground water recovery measures in place at the time. IPSC's September 2016 Updated Corrective Action Plan report included a summary of Stantec's ground water modeling and preliminary analysis of subsurface, hydraulic characteristics which were used in part to formulate a proposed enhanced, ground water recovery program. The model was developed generally in accordance with ASTM International's (American Standard for Testing and Materials) Standard Guide for Application of Groundwater Model to a Site-

Specific Problem and the current version of United States Geological Survey (USGS) Modular Three-Dimensional Finite Difference Groundwater Flow Model (MODFLOW-2005).

IPSC proposed to install and test additional ground water recovery wells near the downgradient leading edge of the TDS plume to enhance TDS plume control measures and help IPSC gain a clearer understanding of the hydraulic characteristics of the leading edge of the TDS plume. The TDS plume associated with historical releases at the Bottom Ash Basin is located within the boundaries of IPA-owned property and as such has posed no risk historically or currently to potential on- and/or off-site receptors.

2.0 CCR RULE *DETECTION MONITORING* PROGRAM, 2015-2017

As detailed in IPSC's November 2015 CCR Unit Monitoring Well Design and Installation Summary Report, IPSC installed a series of ground water monitoring wells to monitor uppermost ground water quality in up-gradient (e.g., "background" water quality) and down-gradient directions in relation to the CB Landfill, Bottom Ash Basin, and Waste Water Basin. Table 1 presents a summary of all CCR Rules-related, ground water monitoring well construction details and completion dates, including numerous wells that were installed during IPSC's Assessment Monitoring Program discussed in the following report section *3.0 CCR Rule, Assessment Monitoring Program*. Appendix A includes copies of the drilling logs and well schematic diagrams.

During late-October 2015, IPSC initiated its CCR unit-specific, monitoring, sampling, and analysis program for background and down-gradient, monitoring wells, in accordance with §257.94 (R315-319-94) Detection Monitoring Program and IPSC's November 2015 Ground Water Sampling and Analysis Plan. As prescribed by §257.94(b) (R315-319-94(b)) for existing CCR-regulated landfills and surface impoundments, IPSC analyzed all ground water samples for Appendix III and Appendix IV constituents. As of October 2017, IPSC completed eight (8) independent sampling events from each background and down-gradient monitoring well in accordance with §257.94(b) (R315-319-94(b)).

In accordance with §257.90(e) (R315-319-90(e)), IPSC's January 2018 Annual Ground Water Monitoring Summary Report presented the results of IPSC's eight ground water monitoring and sampling events that comprised its Detection Monitoring Program pursuant to §257.94 (R315-319-94). All monitoring and sampling procedures were implemented in accordance with IPSC's November 2015 *CCR* Unit Monitoring Well Design and Installation Summary Report and corollary Ground Water Sampling and Analysis Plan report. All three predecessor reports are stand-alone documents that are incorporated by reference herein.

As reported in IPSC's January 2018 summary report, statistical analyses indicated potential statistically significant increases ("SSIs") over background concentrations of certain Appendix III constituents associated with each of the three CCR units. Therefore, as of the first quarter of 2018, IPSC initiated implementation of an Assessment Monitoring Program at each of the three CCR units in accordance with measures and timeframes prescribed by CCR Rule §257.95 (R315-319-95), as detailed in following report section 3.0. Table 2 herein provides a summary of all ground water sampling results associated with sampling to date, including the 2015-2017 Detection Monitoring Program and ongoing Assessment Monitoring Program.

3.0 CCR RULE *ASSESSMENT MONITORING* PROGRAM

3.1 ASSESSMENT MONITORING RESULTS

Activities conducted during 2018-2019 entailed implementation of an Assessment Monitoring Program prescribed by CCR Rule §257.95 (R315-319-95), including evaluation of ground water monitoring data, establishment of Ground Water Protection Standards ("GWPSs") for Appendix IV constituents, and §257.96 (R315-319-96) Assessment of Corrective Measures. Simultaneously and as reported to the UDEQ under separate cover, IPSC also continued its Ground Water Discharge Permit compliance program, which included ongoing monitoring and localized recovery of uppermost ground water containing elevated TDS concentrations down-gradient of the Bottom Ash Basin. All such qualitative and quantitative data associated with the commencement of IPSC's Assessment Monitoring Program are discussed in detail within IPSC's January 2019 Assessment of Corrective Actions and Amended Corrective Action Plan report, which is incorporated by reference herein. Copies of semi-annual groundwater flow and TDS concentration maps are presented within Appendix A herein.

During 2015 through 2017, IPSC implemented its Detection Monitoring Program in compliance with the CCR Rule. Subsequently, IPSC transitioned to an Assessment Monitoring Program which continues currently, due to the large acreage (4,614-acres) of the site and ongoing sequential installation of 84 monitoring wells in pursuit of appropriate delineation of the down-gradient leading edge of the TDS plume and monitoring for CCR constituents at the three CCR Rule-regulated units. Through such monitoring, IPSC is refining its Conceptual Site Model and understanding of CCR constituents in groundwater. Additionally, IPSC discovered the presence of TDS plumes located down-gradient of the Waste Water Basin (southwest of the southeastern corner of the basin and west of the northwestern corner of the basin). Groundwater quality down-gradient of the CB Landfill has been consistent with typical background concentrations for all CCR constituents since monitoring began.

Specific to CCR Rule compliance monitoring, IPSC monitors groundwater quality at a total of 84 monitoring wells, located at the boundaries and down-gradient of the CCR-regulated units. TDS, heavy metals, boron, pH, and other CCR constituents will continue to be monitored in compliance with both the DWQ Groundwater Discharge Permit and the CCR Rule.

Groundwater monitoring wells have been installed sequentially since CCR Rule Assessment Monitoring began to further delineate CCR constituents in groundwater and refine IPSC's Conceptual Site Model of subsurface hydrogeologic characteristics. Additional monitoring wells were installed sequentially to more accurately define the down-gradient leading edges of TDS plumes located down-gradient of both the Bottom Ash Basin and the Waste Water Basin.

Aside from some of the Groundwater Discharge Permit monitoring wells, the following wells and installation dates are associated with IPSC's CCR Rule compliance program affiliated with the Bottom Ash Basin:

- Up-gradient monitoring wells BA-U-1 and BA-U-2 were installed during July 2015;
- Wells BAC-1 through BAC-7 were installed during July and August 2015;
- Wells BAC-8, BAC-9, and BAC-10 were installed during April and May 2019;
- Wells BAC-11 through BAC-17 were installed during November and December 2019; and
- Wells BAC-18 through BAC-38 were installed during May 2020.

The following wells and installation dates comprise IPSC's CCR Rule compliance program associated with the Waste Water Basin:

- Wells WWC-1 through WWC-5 were installed during July 2015;
- Up-gradient monitoring wells SI-U-1, WW-U-1, and WW-U-2 were installed during August 2015;
- Wells WWC-6 and WWC-7 were installed during March 2018;
- Wells WWC-8, WWC-9, and WWC-10 were installed during April 2019; and
- Wells WWC-11, WWC-12, and WWC-13 were installed during November 2019; and
- Wells WWC-14 through WWC-17 were installed during April 2020.

The following wells and installation dates comprise IPSC's CCR Rule compliance program associated with the CB Landfill:

- Up-gradient monitoring wells CL-U-1 and CL-U-2 were installed during July 2015;
- Wells CL-W-1 through CL-W-8 were installed during July 2015;
- Well CL-W-9 was installed during March 2018; and
- Up-gradient monitoring well CL-U-3 was installed during March 2018.

Figure 3 identifies the locations of those CCR Rule compliance monitoring wells installed and sampled as of April 2020, the most recent sampling event for which IPSC has received analytical result reports. The figure includes a groundwater potentiometric map as well as TDS and Appendix IV metal analytical data, as discussed in more detail within following paragraphs.

Wells BAC-18 through BAC-38 and WWC-14 through WWC-17 were installed, developed, and pump-tested during the Spring and Summer of 2020. All 25 of these additional wells were installed such that each well can be used as a recovery well, if needed, in support of TDS plume control and containment, as is discussed in more detail within following report sections pertaining to corrective actions. Reference Figure 4 for the locations of all BAC and WWC monitoring wells, including the 25 new BAC and WWC wells.

The 25 wells were sampled, along with other wells during October 2020; however, IPSC has not received the analytical laboratory results as of this report. Upon receipt, the analytical results will be presented within IPSC's Annual Progress Report to be prepared in January 2021, which, as with other CCR Rule reports, will be posted on IPSC's public website. Upon receipt and analysis of the forthcoming water quality data associated with the 25 new wells, Stantec will prepare updated TDS iso-concentration maps for the apparent TDS plumes located down-gradient of the two impoundments. Likewise, similar maps will be developed, if any other CCR constituents exceed corollary Groundwater Protection Standards, including Appendix IV metals.

3.1.1 Ground Water Flow Characteristics

During each ground water monitoring and sampling event, field personnel implemented consistent water level measurement procedures, field techniques, and quality assurance/quality control (QA/QC) protocol in accordance with methodologies specified within IPSC's CCR Rules-specific and Ground Water Discharge Permit-specific, Ground Water Sampling and Analysis Plans. Water levels were measured prior to purging and sampling of each well with field data recorded in a dedicated, project notebook for archiving.

The depth to static water in each well was measured utilizing an electronic meter, capable of measuring to 0.01-foot (ft.). The meter was decontaminated prior to each use to minimize the potential for cross-well contamination, when using the meter between wells. During each sampling event, static ground water level measurements were made to the nearest 0.01-ft. from a consistent, reference point established on the northern top of each PVC monitoring well casing.

Copies of historical semi-annual groundwater flow and TDS concentration maps are presented within Appendix B herein. Figure 3 in this report presents the most recent groundwater flow and TDS result data, as observed during the April 2020 Assessment Monitoring event.

As may be noted by review of the potentiometric maps, the predominant regional ground water flow direction is generally from the east/northeast toward the west/southwest, with more southwesterly, localized components of flow near the Bottom Ash Basin and Waste Water Basin. Although there were slight, localized changes in hydraulic gradient across the site during each individual monitoring event, in general, the gradient patterns appear relatively consistent over time.

Stantec's review of natural topographic elevations presented on the 1971 USGS *Rain Lake, Utah Quadrangle* topographic map indicates that the natural topography grades generally from the east toward the west across the generalized vicinity of the CB Landfill (T15S, R7W, Section 11), while the natural grade becomes more southwesterly in the vicinity of the Bottom Ash Basin (T15S, R7W, Section 14) and the Waste Water Basin (T15S, R7W, Sections 14 and 23) and on-site land located south and southwest of the surface impoundments and north of the Brush Wellman Highway (i.e., State Route 174). In summary, and on a generalized scale, the potentiometric maps tend to mimic the expression of the topography of the land surface across the site.

3.1.2 CCR Unit-Specific, Ground Water Quality Results

Background and down-gradient, CCR unit-specific ground water monitoring wells were purged and sampled as part of the Assessment Monitoring Program on a semi-annual basis as prescribed by the CCR Rule. All purging, sampling, laboratory analysis, and Quality Assurance/Quality Control ("QA/QC") protocols were administered as specified by §257.95 (R315-319-95) Assessment Monitoring Program and as proposed within IPSC's November 2015 Ground Water Sampling and Analysis Plan. Tabulated analytical results and water level measurement data associated with the CCR Rule Detection and Assessment Monitoring Program events are presented in Table 2 herein.

In accordance with §257.95(d), IPSC has been sampling wells on a semi-annual basis in compliance with CCR Rule Assessment Monitoring and every six months as prescribed by its Groundwater Discharge Permit. As additional groundwater quality data are generated at the site, water quality data and analyte-specific GWPSs will continue to be reported in annual reports and evaluated per statistical analyses performed in accordance with CCR Rule §257.95(d)(2) and §257.95(h) [R315-319-95(d)(2) and R315-319-95(h)] and the following general guidance sources, as has been used for reference to date:

- US EPA "Unified Guidance" document (*Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, Unified Guidance,* March 2009, *EPA 530/R-09-007*);
- the Interstate Technology and Regulatory Council's (ITRC) 2013, *Groundwater Statistics for Monitoring and Compliance, Statistical Tools for the Project Lifecycle*, Online Guidance; and
- Ofungwu, J. (2014) *Statistical Applications for Environmental Analysis and Risk Assessment*. Hoboken, New Jersey: John Wiley and Sons, Inc.

The Unified Guidance recommends the use of Upper Tolerance Limits ("UTLs") for Assessment Monitoring. Tolerance limits consist of two values expected to contain a pre-specified proportion of the underlying data population with a specified level of confidence. For example, a 95% tolerance interval with a 95% confidence level, there is 95% confidence that, on average, 95% of the data population is contained within the interval. The upper, one-sided UTL is used commonly in environmental monitoring and is constructed using background data (Ofungwu 2014).

In the context of the CCR Rule, data from all background wells is used to estimate a 95% UTL with 95% coverage for each Appendix IV constituent at each CCR-regulated unit. This represents a 95% upper confidence limit on the 95th percentile. In Assessment Monitoring, the UTL may be used to represent the GWPS if: 1) the constituent does not have an established MCL; or 2) the background UTL exceeds the established MCL.

Three Appendix IV constituents do not have a US EPA-promulgated MCL: Cobalt, Lithium, and Molybdenum. However, the US EPA amended the original CCR rule in July 2018 and established the following alternate, regulatory limits for these compounds: Cobalt (0.006 milligrams per liter, mg/L), Lithium (0.04 mg/L), and Molybdenum (0.1 mg/L).

As specified by CCR Rule §257.95(d)(2) and §257.95(h) (R315-319-95(d)(2) and R315-319-95(h)), each constituent-specific GWPS shall be either the MCL for that constituent (or above-referenced, CCR Rule-established, alternate, regulatory limits for Cobalt, Lithium, and Molybdenum) or the UTL in instances where the UTL exceeds the established MCL. Appendix C presents a tabulation of UTL and GWPS data for each CCR unit and each monitoring well.

During Assessment Monitoring, the site is assumed to be free of impacts, unless proven otherwise through statistical testing. The statistical null hypothesis (Ho) represents a mean downgradient concentration less than or equal to the GWPS, while the alternate hypothesis (Ha) represents a mean downgradient concentration greater than the GWPS (ITRC, 2013). To test this hypothesis, the Lower Confidence Limits (LCL) around the mean downgradient Appendix IV concentrations are estimated using data collected during the Detection Monitoring and Assessment Monitoring programs. The LCL for each constituent/well pair are then compared to their respective GWPS. If the LCL exceeds the GWPS, then downgradient concentrations are at a statistically significant level (SSL) above the GWPS, which *may* trigger corrective action at the Site.

It should be noted that individual sample results of Appendix IV constituents above the GWPS during Assessment Monitoring are not necessarily a demonstration of statistically significant exceedances of the GWPS. The LCL must exceed the GWPS to conclude a statistically significant increase (SSI). However, if individual constituent concentrations exceed GWPSs, then Assessment Monitoring is to continue at that specific CCR unit. Appendix C presents a tabulation of UTL, GWPS, and Confidence Limit data for each CCR unit and each monitoring well.

In summary, and as presented on Figure 3, the quantitative analytical results associated with monitoring under the CCR Rules indicated the following Appendix IV constituent-specific, LCL exceedances above corollary GWPS concentrations at ground water monitoring wells located at each CCR-regulated unit (all concentrations in mg/L):

CCR Unit	Well	Appendix IV Constituent	LCL Concentration	GWPS Concentration
CB Landfill		No Exceedances	------	-----
Bottom Ash Basin	BAC-2	Molybdenum	0.1506	0.1
	BAC-3	Lithium	0.812	0.7415
Waste Water Basin	WWC-1	Arsenic	0.01496	0.01275
	WWC-2	Arsenic	0.01415	0.01275
	WWC-3	Arsenic	0.02045	0.01275

Groundwater quality down-gradient of the CB Landfill is consistent with typical background concentrations for all CCR constituents. It must be noted that recently-installed, down-gradient monitoring wells, used to help delineate the down-gradient leading edges of CCR constituent plumes, will require additional sampling data for comparative analysis to corollary GWPSs; i.e., a few sampling data-sets are insufficient for appropriate statistical analysis.

Since 2001 when groundwater quality monitoring began at IGF with issuance of the Groundwater Discharge Permit, and as observed to date, TDS is the CCR constituent found to be the most wide-spread and has migrated further down-gradient from the surface impoundments than any other CCR constituent. In compliance with its Groundwater Discharge Permit, IPSC commenced recovery of TDS-impacted groundwater in 2010. TDS will continue to be used as the leading indicator parameter of impacted groundwater quality for fashioning a groundwater remediation approach to address both TDS and slower-migrating CCR constituents including heavy metals. This is appropriate because TDS is expected to continue to migrate at a much faster rate than dissolved metals in the clay-rich aquifer that underlies the property.

3.1.2.1 Regional Ground Water Quality

The site is located within the Basin and Range Physiographic Province and the Sevier Desert on a more localized scale. It is well-documented throughout arid Utah that localized, historical Lake Bonneville basin-fill sediments (that underlie the site) and associated uppermost ground water located in close proximity to igneous/volcanic and metamorphic formations contain high concentrations of abundant, naturally-occurring Arsenic (typically attributable to chemical and physical weathering of arsenopyrite). Likewise, Basin and Range Physiographic Province sediments, surface water, and ground water can also exhibit elevated concentrations of natural Lithium – especially in areas that are characterized by hydrologically-closed basins and thermal ground water.

Arsenic and Lithium concentrations within uppermost ground water can vary considerably, over short, lateral distances, in many instances. Indeed, ground water quality data associated with the site exhibits considerable variation in Arsenic and Lithium concentrations across relatively-short, lateral distances, including up-gradient monitoring wells.

Stantec's familiarity with the regional geology surrounding the site, as well as review of United States Geological Survey (USGS) geologic maps associated with areas surrounding, and in a presumed up-gradient direction (northeast of) in relation to the site, indicate vast acreages encompassing square miles of volcanic and metamorphic mountainous areas with interspersed Lake Bonneville-related sediments, which could provide source material for soluble Arsenic and Lithium to impact localized, uppermost ground water quality. Baker Hot Springs and the mountainous Butte Fumarole formation are located a few miles northwest of the site, for instance. Reportedly, there are third-party companies investigating the possibility of Lithium mining/brine processing within nearby areas such as the Sevier Lake watershed and Tule Valley, areas located several miles southwest and west of the site.

4.0 ASSESSMENT OF CORRECTIVE MEASURES

The primary contaminant of potential concern at the site is TDS, as there are localized TDS plumes beneath the site, namely: one plume located southwest of the Bottom Ash Basin and smaller TDS plumes located southwest and west of the Waste Water Basin. TDS is being considered the leading indicator parameter of impacted ground water quality for fashioning a suitable ground water remediation approach. It is anticipated that recovery of TDS-impacted ground water at select recovery wells will also intercept any metal constituents that might be present, as TDS is expected to migrate at a faster rate than dissolved metals in ground water.

4.1 SUMMARY GROUND WATER MODELING RESULTS AND FINDINGS

IPSC's September 2016 Updated Corrective Action Plan report included a summary of Stantec's ground water modeling and preliminary analysis of subsurface, hydraulic characteristics which were used to formulate a proposed enhanced, ground water recovery program, designed to control the down-gradient leading edge of the TDS plume located down-grade/southwest of the Bottom Ash Basin. Stantec constructed and calibrated a three-dimensional, numerical model to simulate ground water flow and fate and transport of TDS in ground water beneath the IGF in an effort to better understand the hydraulic characteristics of the uppermost aquifer beneath the site and for better containment of expansion of the TDS plume. The model was developed generally in accordance with ASTM's Standard Guide for Application of Groundwater Model to a Site-Specific Problem and the current version of USGS Modular Three-Dimensional Finite Difference Groundwater Flow Model (MODFLOW-2005).

In summary, the model was based on site-specific, hydrogeologic and hydraulic characteristics identified during Stantec's past drilling and sampling of soil test borings and ground water monitoring wells located in relatively close proximity to the Bottom Ash Basin, as well as historical pump-testing of the three existing, ground water recovery wells WR-101, WR-102, and WR-103, identified on Figure 5-1 herein, a figure excerpted from IPSC's 2016 report. Stantec also reviewed historical soil boring and ground water monitoring well drilling logs associated with mid- to late-1980s well installations overseen by other consulting firms prior to the construction of the facility.

Stantec's analysis of all hydrogeologic data indicates that the depth to uppermost ground water varies across the site but approximates a range between 55 to 75 feet below grade. Subsurface lithologic conditions in the immediate vicinity of each of the three CCR units were generally as follows:

<u>CCR Unit</u>	Depth to Uppermost Sand Aquifer <u>(feet below ground surface-bgs)</u>	Thickness of Clay-Rich Soils Above the Aquifer <u>(in feet-ft.)</u>
CB Landfill	between 52 to 78	33 to 57 ft. thick
Bottom Ash Basin	between 55 to 60	17 to 33 ft. thick
Waste Water Basin	between 48 to 65	8 to 20 ft. thick

Static water level measurements indicate that the uppermost aquifer beneath the site is under semi-confined to confined, hydraulic conditions, whereby static water levels rose within the wells following well installation and development. In other words, during the drilling of each borehole, uppermost, saturated soils were encountered at a certain subsurface depth. Subsequently, and as evidenced by recent water level measurements, the potentiometric surface of the water table was under such hydraulic pressure that the static water level within each monitoring well rose to a height 20 to 40 feet higher than the original depth at which uppermost saturated soils were first encountered. Water levels have been measured consistently to date, utilizing an electronic water level indicator that measures depth to static water in each well from the northern top of each well casing.

Stantec extrapolated that the down-gradient leading edge of the TDS plume appears to be migrating naturally toward the southwest at an approximate rate of 150 to 180 feet per year. However, this is a generalized plume migration rate estimate, considering the relatively large, lateral distances between water quality monitoring well locations and the highly-varied, lithologic characteristics of the uppermost aquifer underlying the site.

Stantec used the groundwater model to help estimate the total number of vertical ground water recovery wells that might be needed to intercept the TDS plume's southwestern-most, down-gradient leading edge. Each proposed well would be constructed as a 6-inch diameter well, with 20- to 25-lineal feet of well screen at the bottom of each well. The model examined use of a line of equally-spaced, ground water recovery wells located perpendicular to the natural, southwesterly ground water flow direction. Since the three existing recovery wells WR-101, WR1-02, and WR-103 had sustainable yields between 8 to 15 gallons per minute (gpm), Stantec's model estimated that the following scenarios should provide satisfactory containment of the TDS plume southwest of the Bottom Ash Basin:

- 15 wells, located at approximate 188-ft. equidistant, lateral spacings; each well producing at 15 gpm

to

- 19 wells, located at approximate 146-ft. equidistant, lateral spacings; each well producing at 10 gpm.

The model indicated that the lateral capture zone for a recovery well pumping ground water at a rate of 10 gpm should extend out approximately 146 feet to either, lateral side of the well (i.e., generally perpendicular to the southwesterly groundwater flow direction). The lateral capture zone for a well pumping ground water at a rate of 15 gpm was projected to extend out approximately 188 feet to either side of the well. Figures 5-2, 5-3, and 5-4 herein are figures excerpted from the 2016 and 2019 reports that depict groundwater modeling results and proposed supplemental groundwater recovery well locations, based on plume orientation estimated in 2016.

Subsequently, as noted on Figure 5-4, well RW-5 was determined to not contain TDS in excess of the Groundwater Discharge Permit action level of 1,100 ppm, including the most recent sampling event of April 2020. Ongoing monitoring also indicated that Groundwater Discharge

Permit monitoring well RW-9 contained elevated TDS concentrations, deemed attributable to the southwesterly migration of the down-gradient leading edge of the TDS plume. In summary, water quality data indicated that the down-gradient leading edge of the plume was positioned northwest of what had been estimated previously.

As part of subsequent investigation and pursuit of more accurate delineation of the down-gradient leading edge of the TDS plume, IPSC installed additional monitoring wells (constructed such that all may be used for recovery, if needed) west of wells RW-5 and RW-9, namely wells BAC-8, BAC-9, BAC-10 (April-May 2019) and wells BAC-11 through BAC-17 (November-December 2019). The TDS water quality data indicated that the down-gradient leading edge of the TDS plume had migrated farther west than monitoring well BAC-11 and appeared to be located somewhere between wells WDB-5 and WDB-7 to the north and wells BAC-10, BAC-14, and BAC-15 to the south (all TDS concentrations of latter five wells are well below 1,100 ppm), as presented on Figure 3.

Several of the BAC wells were pump-tested during May and June 2019, with results evaluated by Stantec's groundwater model. Each well yielded between 10 to 15 gpm. The model was used to investigate where additional down-gradient wells might be installed for more precise delineation and possible recovery of the down-gradient leading edge of the TDS plume. The model estimated that wells should be positioned at approximate 150-foot lateral distances between one another to provide appropriate capture zones, based on an approximate recovery rate of 10 gpm for each proposed well.

During April through June 2020, 21 additional wells (BAC-18 through BAC-38 on Figure 4) were installed, developed, and pump-tested to investigate areas farther west of the existing network of monitoring wells. The wells were arranged along generalized northwest-to-southeast orientations, anticipated to be perpendicular to the regional, southwesterly groundwater flow direction and deemed most suitable for possible use as groundwater recovery wells, if needed.

According to IPSC's most recent monitoring data, the three existing recovery wells' recovery rates have declined since initial pumping began in 2010 and approximate 3.5 to 9 gpm, currently. Thus, in a conservative mode and instead of well placements every 150 feet, in case the yields of the proposed wells were less than 10 gpm, the 21 new wells were installed at approximate 100- to 125-foot lateral spacings between one another, typically.

All 21 new wells were sampled along with other CCR Rule monitoring wells during the recent October 2020 sampling event as part of IPSC's ongoing assessment monitoring program. IPSC has not received the analytical result reports, as yet. The analytical results will be evaluated upon receipt of laboratory result reports. It is anticipated that the analytical results will be reported within IPSC's forthcoming January 2021 Annual Report. The analytical results will be used to help identify if additional monitoring and/or recovery wells are needed to provide appropriate monitoring and containment of the TDS plume.

4.2 EVALUATION OF ALTERNATIVE CORRECTIVE MEASURES

After Appendix IV constituents were detected above the GWPS during Assessment Monitoring, IPSC completed the requirements in §257.95(g). Notification identifying the constituents in Appendix IV that exceeded the GWPS was made by IPSC. Because there have been no releases from the impoundments that are discernible from the daily recorded impoundment levels, IPSC estimates that any material releases have been in small quantities over indeterminable periods of time into the uppermost aquifer. This confined to semi-confined aquifer is approximately 50 to 70 feet below grade. Because the concentrations of metals within coal burned at the IGF vary, it is anticipated that metal concentrations within CCR material will vary depending on when such material was deposited within a particular basin area. As such, it has been impractical to attempt to estimate concentrations of Appendix IV constituents within the large impoundments.

IPSC has worked with Stantec to install additional monitoring wells to further characterize and define the nature and extent of the TDS plumes. These wells include new monitoring wells at the facility boundary in the direction of contaminant migration. Analytical results associated with the most recent October 2020 and upcoming sampling events will be used by IPSC and Stantec to help further characterize the nature and extent of the release. To date, sampling results show that the plumes have not migrated off-site.

IPSC initiated an assessment of corrective measures within 90 days of detecting Appendix IV constituents above the GWPS. Notification stating that the assessment had been initiated was completed by IPSC, and the results of the assessment were discussed in a public meeting.

As part of ongoing remedy selection, IPSC is evaluating various remedial options, including: ongoing use and expansion of the existing groundwater recovery network used in compliance with its Groundwater Discharge Permit; possible use of horizontal interceptor trenches and Ranney-type, collector wells; possible use of Monitored Natural Attenuation (MNA); and possible use of evaporation ponds and possible construction of a water treatment facility for treatment of recovered groundwater. IPSC is waiting to review the pending October 2020 water quality analytical data before completing its final remedy selection. However, IPSC currently anticipates that the most effective (and conservative) remedial approach will be groundwater recovery and removal from the subsurface and subsequent evaporation of groundwater containing CCR constituents in consideration of the evaluation criteria prescribed by §257.96(c) and §257.97(c).

Historically and to date, TDS is the CCR constituent found to be the most wide-spread and located farthest down-gradient from both the two surface impoundments. Water quality beneath the IGF poses no risk to on- or off-site human health, currently and for the foreseeable future, such that there are no imminent health risks that might warrant immediate abatement of all CCR constituent-impacted groundwater beneath the site.

Since 2010, TDS has been recovered from the subsurface via an existing network of recovery wells and interconnected buried, water conveyance piping, pumphouses, and appurtenances as part of compliance with its Groundwater Discharge Permit. IPSC is removing TDS-impacted groundwater from existing recovery wells WR-101, WR-102, and WR-103 located down-gradient of the Bottom Ash Basin. The three wells recover groundwater from close proximity to the basin and within the generalized middle of the plume and along the generalized TDS plume centerline.

IPSC is waiting to review the pending October 2020 water quality analytical data, which includes the only sampling event conducted to date at 25 newly-installed wells, before completing its final remedy selection. Currently, IPSC and Stantec are finalizing design of an enhanced ground water recovery network that will intercept TDS-impacted groundwater associated with both the Bottom Ash Basin and the Waste Water Basin TDS plumes at the down-gradient leading edges and within the middle of the TDS plumes. If other CCR constituents become detected in excess of corollary GWPSs, data to date indicate that any such constituents will migrate at considerably slower migration rates, and most probably along similar groundwater flow paths, as TDS. If this occurs, any such CCR constituent can be intercepted and removed from the subsurface by means of the expanded, groundwater recovery network that is being designed currently, if needed. As will be reported in future reports, IPSC will monitor the progress of the expanded groundwater recovery network and is prepared to install additional groundwater monitoring and/or recovery wells , if needed to address any unanticipated release and/or migration of CCR constituents in the future and provide appropriate protection to on- and off-site human health.

IPSC believes that recovery of groundwater from beneath the IGF using vertical groundwater recovery wells, in conjunction with evaporation of recovered groundwater, is the most conservative, practical, reliable, effective, flexible, and timely measure for remediating contaminated groundwater beneath the IGF while providing appropriate protection to on- and off-site human health. Existing and proposed water recovery infrastructure can be expanded readily and in a timely manner to accommodate any supplemental groundwater recovery wells that might be needed in the future.

Historical water quality data to date indicate that MNA is not a viable option, as the down-gradient leading edges of the TDS plumes continue to migrate down-gradient, generally toward the southwest; i.e., limiting attenuation or retardation of TDS in groundwater. Even if MNA were viable, the timeframe for completing the remedy would likely be excessive as compared to other options.

Likewise, Stantec's groundwater model investigated possible use of one or more Ranney-type, collector wells (each a 13-ft diameter, vertical concrete shaft driven to a depth of approximately 70-ft below grade with 300 feet long, horizontal collector screens radiating out from the bottom of the concrete shaft), instead of vertical recovery wells for containment of the TDS plume. The model indicated that use of vertical recovery wells, when compared to use of a Ranney collector well network, provides similar cumulative yield/volume of ground water recovery. However, use of vertical wells is deemed more practical, efficient, and beneficial for TDS Plume containment for numerous reasons, including:

- Greater flexibility and precision for well locating and installation;

- More extensive lateral and vertical aquifer characterization (i.e., individual well pump-testing for investigation of localized hydraulics throughout different areas within the aquifer); and

- Recovery of ground water throughout the approximate 20- to 25-foot thick aquifer (i.e., deeper ground water recovery within the aquifer, when compared to a horizontal ground water recovery network that would be placed at the bottom of the aquifer).

IPSC also evaluated possible use of horizontal groundwater interceptor trenches located at various locations across the site. Discussions with a horizontal trench installation company indicated that installation of any such trenches would be problematic at the IGF. In consideration of the relatively-deep depth of the uppermost aquifer (approximately 50 to 70 feet below grade), as well as the clay-rich lithologic characteristics of the subsurface, installation, operation, and management of any such horizontal trench is deemed impractical and less efficient than use of vertical recovery wells, for numerous reasons including those listed above for comparison to horizontal Ranney-type wells.

Lastly, the anticipated timeframe of a few years to design, permit, and construct an appropriate water treatment facility to treat recovered groundwater was deemed impractical and unnecessary. Likewise, off-site transport of wastewater is deemed impractical due to the large volumes of water to be recovered and remote location of the site. Evaporation of recovered groundwater has been used successfully to date and will continue to be the most viable option in this regard for the foreseeable future. Treated water from a hypothetical treatment plant would need to be directed to on-site evaporation ponds anyway, in consideration of the remote location of the IGF and the extremely dry and arid climate of the area.

In summary, IPSC and Stantec evaluated the following potential remedial approaches in terms of each of the evaluation factors outlined in §257.96(c) and §257.97(c), as regards CCR constituents in groundwater that have been detected in excess of respective GWPSs:

1) Monitored Natural Attenuation (MNA);
2) Groundwater removal via vertical recovery wells and evaporation of recovered water;
3) Groundwater removal via horizontal recovery trenches/wells and evaporation of recovered water;
4) Rather than evaporation for managing recovered water – possible treatment within a to-be-constructed wastewater treatment facility; and
5) Rather than evaporation for managing recovered water – possible off-site transport and disposal of recovered water.

Upon receipt of the forthcoming October 2020 analytical results, IPSC will evaluate these results with all historical analytical data and hydrogeologic data generated at the site historically in terms of CCR Rule evaluation criteria prescribed by §257.96(c) and §257.97(c). Evaluation of data to date indicate that use of vertical groundwater recovery wells and evaporation of recovered groundwater will likely provide the most appropriate, conservative, and effective remedial approach for ongoing protection of human health and the environment, as compared to other potential corrective measure options.

Below is a brief summary comparative tabulation of the different remedial options and evaluation factors for simple reference. The alternative remedies have been ranked in numerical order, with a “1” representative of the option that provides the highest degree of anticipated effectiveness in relation to the other options, and a “3” represents the lowest degree of anticipated effectiveness in comparison to other alternative remedies.

The evaluation criteria prescribed by §257.96(c) and §257.97(c) were organized into the following four categories:

Performance – This category includes the performance and potential impacts of appropriate potential remedies including: safety impacts; cross-media impacts; control of exposure to any residual contamination; the long- and short-term effectiveness and protectiveness of the potential remedy; the degree of certainty that the remedy will prove successful based on the magnitude of reduction of existing risks; the magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy; the effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the extent to which containment practices will reduce further releases and the extent to which treatment technologies may be used.

Time Required – This category includes the time required to begin and complete the remedy—the time until full protection is achieved.

Ease of Implementation - This category includes the ease or difficulty of implementing a potential remedy based on consideration of: the degree of difficulty associated with constructing the technology; the need to coordinate with and obtain necessary approvals and permits from other agencies such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy; the availability of necessary equipment and specialists; the available capacity and location of needed treatment, storage, and disposal services; the type and degree of long-term management required, including monitoring, operation, and maintenance; the expected operational reliability of the technologies; the long-term reliability of the engineering and institutional controls; and the potential need for replacement of the remedy.

Community Concerns – This category includes: the degree to which community concerns are addressed by a potential remedy; the short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminant; and the potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment.

As noted below, the most effective remedial strategy is represented as the lowest, cumulative ranked score and is anticipated to be recovery of groundwater containing CCR constituents in excess of respective GWPSs by means of vertical groundwater recovery wells and on-site evaporation of recovered water.

EVALUATION AND RANKING OF REMEDIAL ALTERNATIVES IN TERMS OF ANTICIPATED EFFECTIVENESS

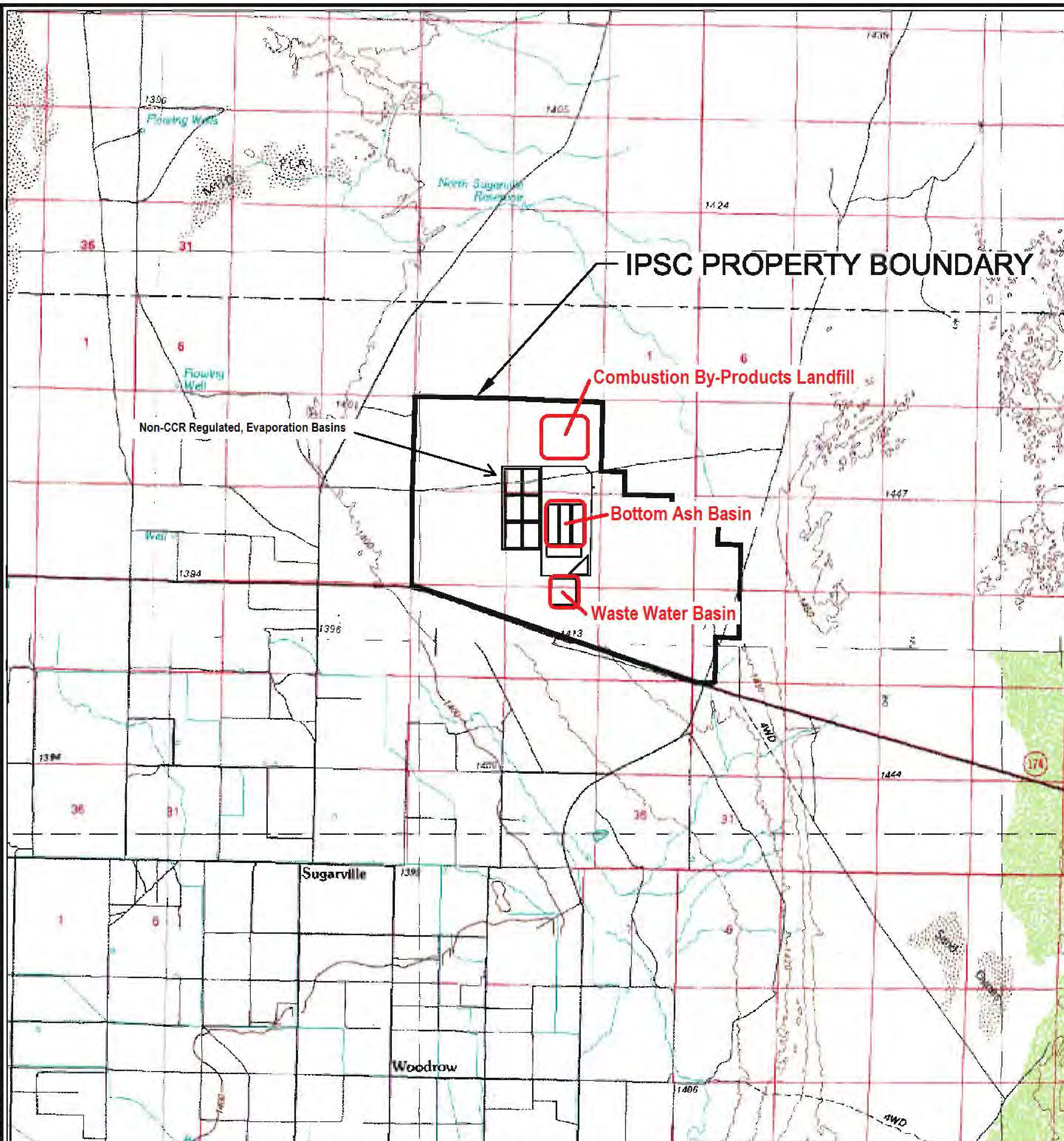
Alternative Groundwater Monitoring and Recovery Options

Possible Remedy	Performance	Time Required	Ease of Implementation	Community Concerns	Total Score
MNA	3	3	1	1	8
Vertical Recovery Wells	1	1	2	2	6
Horizontal Recovery Wells	2	2	3	2	9

Alternative Recovered Groundwater Treatment and Disposal Options

On-Site Evaporation of Recovered Water	1	1	1	1	4
On-Site Design, Permitting, & Construction of Wastewater Treatment Facility	2	3	3	2	10
Off-Site Disposal of Recovered Water	3	2	2	3	10

Figure 1 General Site Location Map



BASE FROM USGS 1:100,000 SCALE METRIC TOPOGRAPHIC MAPS: LYNNDAL, UTAH, 1979 AND DELTA, UTAH, 1989.

1 0 1 2 3 4 KILOMETERS

1 0 1 2 MILES

N

CCR-Regulated Units
DELTA, UTAH

FIGURE 1
SITE TOPOGRAHIC MAP

Stantec

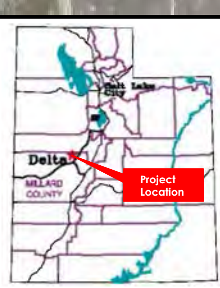
DESIGN BY	JR	DRAWN BY	CP	CH'D BY		SCALE	1"=1000'	DATE DRAWN	1-26-17

drawings\ipsc-04\Fig2 Site Topographic Map.dwg

Figure 2. CCR Units Location Map

Legend

CCR Unit



INTERMOUNTAIN GENERATING FACILITY

FIGURE 2
Site-Specific Location Map

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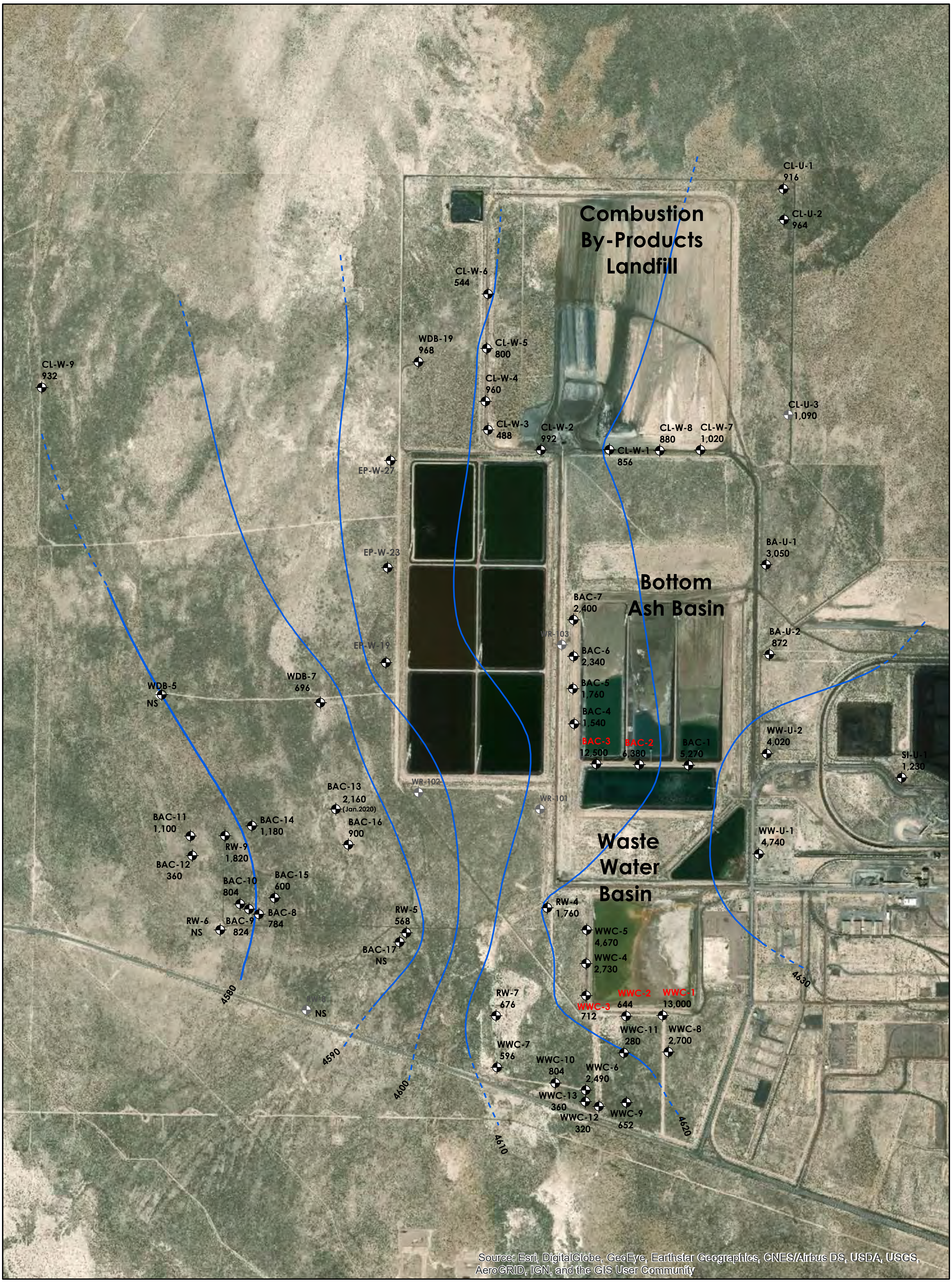
DRAWN BY: JR	DATE DRAWN: 9/30/2016
SCALE: 1 in. approx. 1700 ft.	
PROJECT: 203709098.409	

Figure 3. Potentiometric Map, TDS, and Appendix IV Exceedances, April 2020

C:\Users\ckwiatkowski\Desktop\203709098 Intermountain Power\GIS\2020_04\fig04_March2020GWE_DeltaUT_20200413_11x17.mxd



LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 600 — Total Dissolved Solids (TDS) Concentration in milligrams per liter; mg/L
- GROUNDWATER CONTOUR, mean sea level elevations
- NS — NOT SAMPLED

NOTES: ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

Appendix IV Metal Constituent Exceedances:

CCR Unit	Well	CCR Constituent	Lower Confidence Limit (LCL) Concentration	Groundwater Protection Standard (GWPS) Concentration
Bottom Ash Basin	BAC-2	Molybdenum	0.1506	0.1
	BAC-3	Lithium	0.812	0.7415
Waste Water Basin	WWC-1	Arsenic	0.01496	0.01275
	WWC-2	Arsenic	0.01415	0.01275
	WWC-3	Arsenic	0.02045	0.01275

Metal concentrations in mg/L

0 1,300 2,600
Feet
1 in = 1,300 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

APRIL 2020 TDS CONCENTRATIONS and Appendix IV Metal GWPS Exceedances
SUPERIMPOSED ON MARCH 2020 POTENTIOMETRIC MAP

FIGURE: 3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	CK	ALL	JR	05/04/20

Figure 4. Locations of 25 Newly-Installed, Developed, and Pump-Tested Wells (Spring and Summer 2020)

Legend

Monitoring Well

1,100 Total Dissolved Solids (TDS) Concentration in milligrams per liter; mg/L; RED if > greater than Groundwater Discharge Permit Action Level of 1,100 mg/L

NS - Not Sampled in April 2020

NI - Not Installed as of April 2020

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N

Feet
0 175 350 1 in = 350 feet

T15S, R7W Millard County, UT
NAD 1983 UTM Zone 12N

DRAWN BY: JT	1ST REVIEW: JR	2ND REVIEW: JR
DATE: 10/29/2020	PROJECT NO: 203709098	

Figure **4**

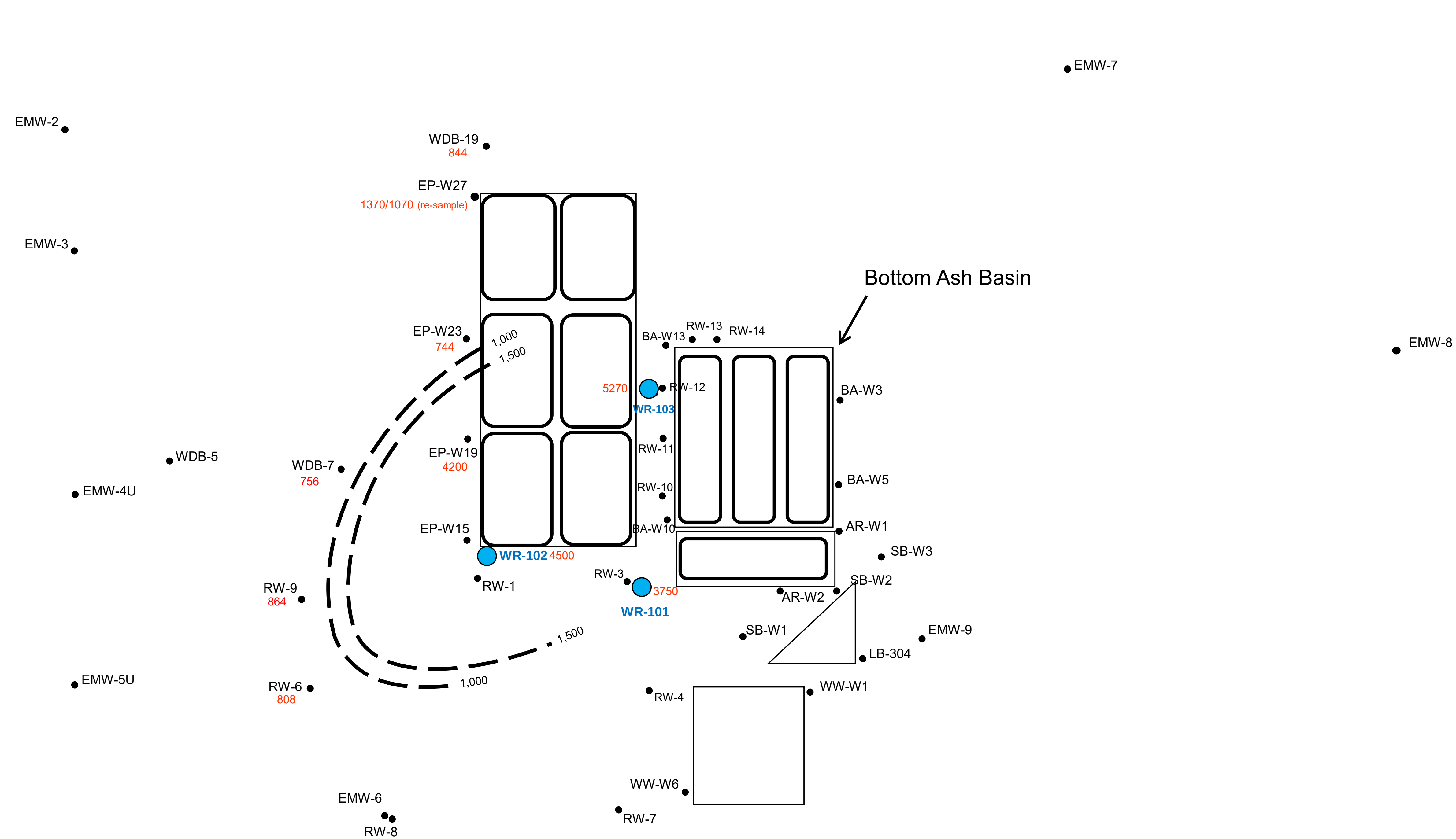
25 New Wells Installed, Developed, and Surveyed During Summer 2020 with April 2020 TDS Concentrations

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,

Figure 5 Assemblage. Figures Excerpted from IPSC's 2016 Corrective Action Plan Report associated with Compliance with Its Groundwater Discharge Permit

FIGURE 5-1.

Excerpted Figure 1 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



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850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 1 – GROUND WATER TDS ISO-CONCENTRATION MAP, APRIL 2016

LEGEND

- Monitoring Well Location
- Existing Recovery Well Location
- - 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours
- Concentration values in milligrams / liter (ppm)

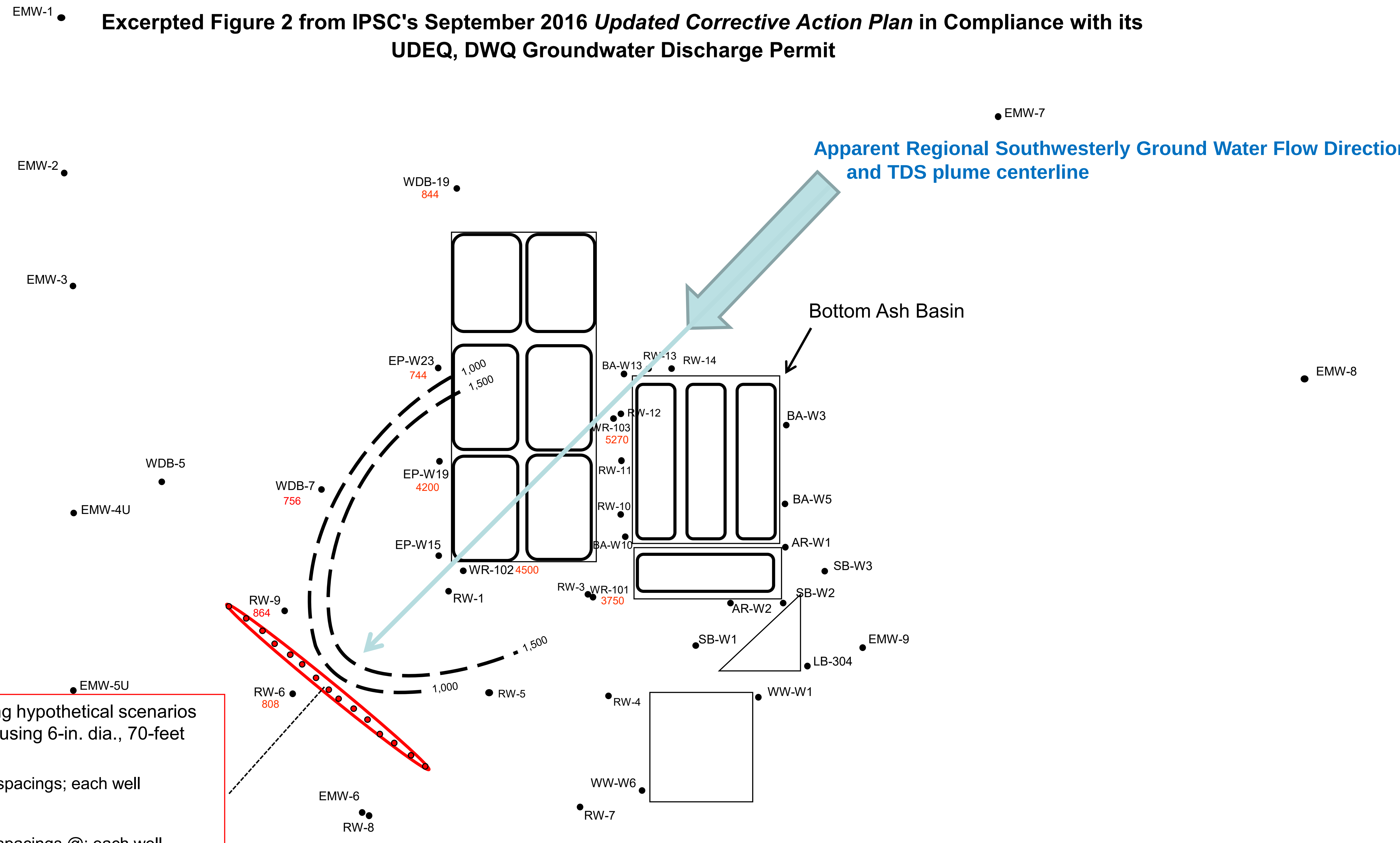
0 FEET 2000

SCALE

N

FIGURE 5-2.

Excerpted Figure 2 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



Model estimates the following hypothetical scenarios for intercepting TDS plume, using 6-in. dia., 70-feet deep recovery wells:

- 15 wells @ ~ 188-ft. lateral spacings; each well producing @ 15 gpm

to

- 19 wells @ ~ 146-ft. lateral spacings @; each well producing @ 10 gpm

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INTERMOUNTAIN GENERATING FACILITY

850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 2. Model-Simulated, Recovery Well Placement for TDS Plume Containment

LEGEND

● Monitoring Well Location

- 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours

Concentration values in milligrams / liter (ppm) ; April 2016

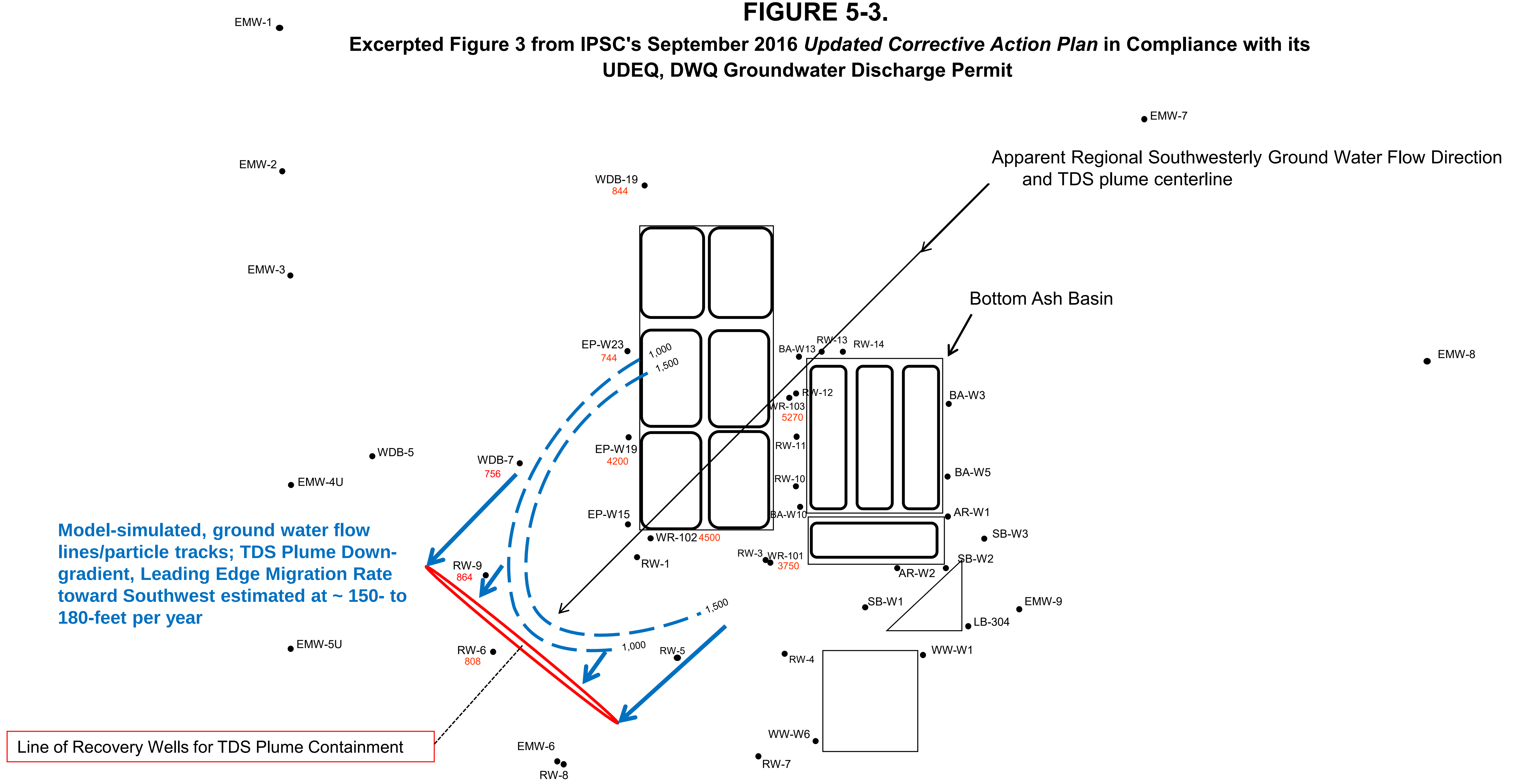
0 FEET 2000

SCALE

N

FIGURE 5-3.

Excerpted Figure 3 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



GROUND WATER TDS ISO-CONCENTRATION MAP, **APRIL 2016**

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INTERMOUNTAIN GENERATING FACILITY

850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 3. Model-Simulated, Ground Water Flow Paths, Particle-Tracking

LEGEND

● Monitoring Well Location

- 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours

Concentration values in milligrams / liter (ppm)

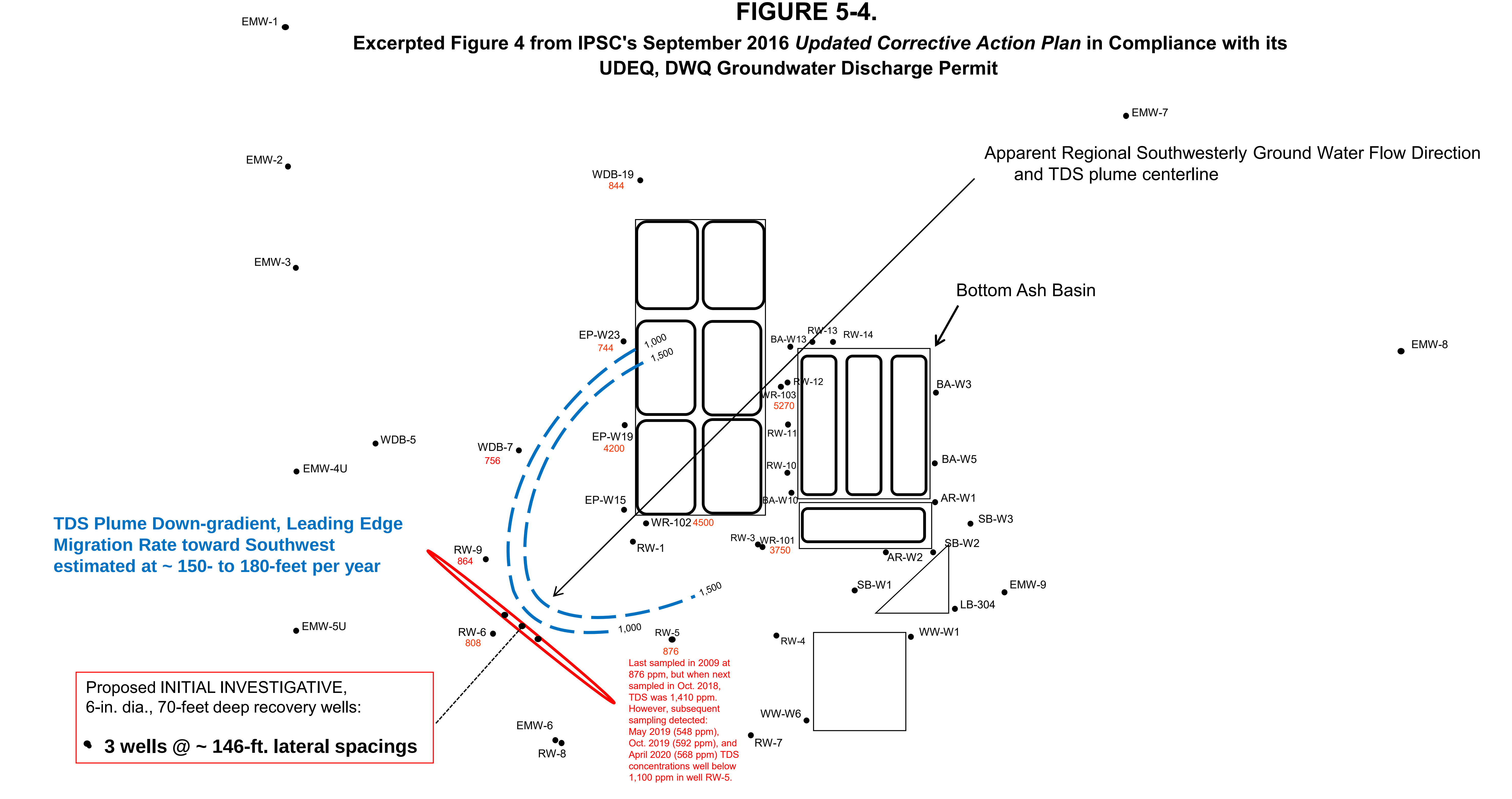
0 FEET 2000

SCALE

N

FIGURE 5-4.

Excerpted Figure 4 from IPSC's September 2016 *Updated Corrective Action Plan* in Compliance with its UDEQ, DWQ Groundwater Discharge Permit



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INTERMOUNTAIN GENERATING FACILITY

850 WEST BRUSH WELLMAN ROAD - DELTA, MILLARD COUNTY, UTAH

Figure 4. Proposed Preliminary Investigative, Recovery Well Locations

LEGEND

● Monitoring Well Location

- 5 - Total Dissolved Solids (TDS) Iso-Concentration Contours

Concentration values in milligrams / liter (ppm)

0 FEET 2000

SCALE

N

TABLE 1 GROUND WATER MONITORING WELL CONSTRUCTION DETAILS

Table 1
Well Construction Summary
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL)
Combustion By-Products Landfill Wells					
CLW-1	5/12/2015	4-inch PVC	65	55-65	4653.46
CLW-2	5/14/2015	4-inch PVC	80	70-80	4648.17
CLW-3	5/13/2015	4-inch PVC	80	70-80	4644.03
CLW-4	5/26/2015	4-inch PVC	82	72-82	4642.88
CLW-5	7/27/2015	4-inch PVC	82	72-82	4640.99
CLW-6	7/26/2015	4-inch PVC	88	78-88	4639.63
CLW-7	7/24/2015	4-inch PVC	72	52-72	4659.34
CLW-8	7/24/2015	4-inch PVC	72	62-72	4655.63
CLW-9	3/25/2018	4-inch PVC	97	87-97	4615.615
CL-U-1	7/23/2015	4-inch PVC	80	68-78	4657.48
CL-U-2	7/22/2015	4-inch PVC	80	70-80	4663.48
CL-U-3	3/27/2018	4-inch PVC	77	67-77	4665.367
Bottom Ash Basin Wells					
BAC-1	7/31/2015	4-inch PVC	70	60-70	4668.70
BAC-2	7/29/2015	4-inch PVC	65	55-65	4668.72
BAC-3	7/28/2015	4-inch PVC	72	52-72	4668.84
BAC-4	8/10/2015	4-inch PVC	75	55-75	4649.45
BAC-5	8/9/2015	4-inch PVC	68	58-68	4649.67
BAC-6	8/8/2015	4-inch PVC	65	55-65	4648.15
BAC-7	8/7/2015	4-inch PVC	67	57-68	4650.09
BAC-8	4/29/2019	6-inch PVC	77	52-77	4626.42
BAC-9	5/1/2019	6-inch PVC	77	52-77	4626.27
BAC-10	5/3/2019	6-inch PVC	87	62-87	4626.27
BAC-11	12/7/2019	6-inch PVC	75	50-75	4624.96
BAC-12	12/6/2019	6-inch PVC	78	53-78	4625.055
BAC-13	11/18/2019	6-inch PVC	90	65-90	4629.834
BAC-14	12/4/2019	6-inch PVC	78	53-78	4627.506
BAC-15	12/9/2019	6-inch PVC	75	50-75	4626.494
BAC-16	11/21/2019	6-inch PVC	89	64-89	4630.426

Table 1
Well Construction Summary
Intermountain Generating Facility
Delta, Utah

MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL)
BAC-17	12/10/2019	6-inch PVC	81	56-81	4629.648
BAC-18	5/8/2020	6-inch PVC	78	53-78	4621.504
BAC-19	5/9/2020	6-inch PVC	78	58-78	4615.62
BAC-20	5/9/202	6-inch PVC	78	53-78	4617.848
BAC-21	5/10/2020	6-inch PVC	88	61-88	4619.625
BAC-22	5/10/2020	6-inch PVC	78	53-78	4619.905
BAC-23	5/11/2020	6-inch PVC	78	53-78	4619.582
BAC-24	5/12/2020	6-inch PVC	76	51-76	4619.207
BAC-25	5/12/2020	6-inch PVC	78	53-78	4619.327
BAC-26	5/13/2020	6-inch PVC	78	53-78	4627.704
BAC-27	5/13/2020	6-inch PVC	78	53-78	4627.355
BAC-28	5/14/2020	6-inch PVC	78	53-78	4625.411
BAC-29	5/15/2020	6-inch PVC	78	53-78	4625.29
BAC-30	5/142020	6-inch PVC	78	53-78	4624.88
BAC-31	5/15/2020	6-inch PVC	78	53-78	4625.024
BAC-32	5/192020	6-inch PVC	78	53-78	4626.583
BAC-33	5/18/2020	6-inch PVC	78	53-78	4626.629
BAC-34	5/21/2020	6-inch PVC	78	53-78	4624.702
BAC-35	5/282020	6-inch PVC	78	53-78	4624.805
BAC-36	5/30/2020	6-inch PVC	78	53-78	4619.231
BAC-37	5/29/2020	6-inch PVC	78	53-78	4618.397
BAC-38	5/31/2020	6-inch PVC	78	53-78	4619.593
BA-U-1	7/24/2015	4-inch PVC	55	45-55	4665.73
BA-U-2	7/25/2015	4-inch PVC	70	60-70	4661.33

Table 1
Well Construction Summary
Intermountain Generating Facility
Delta, Utah

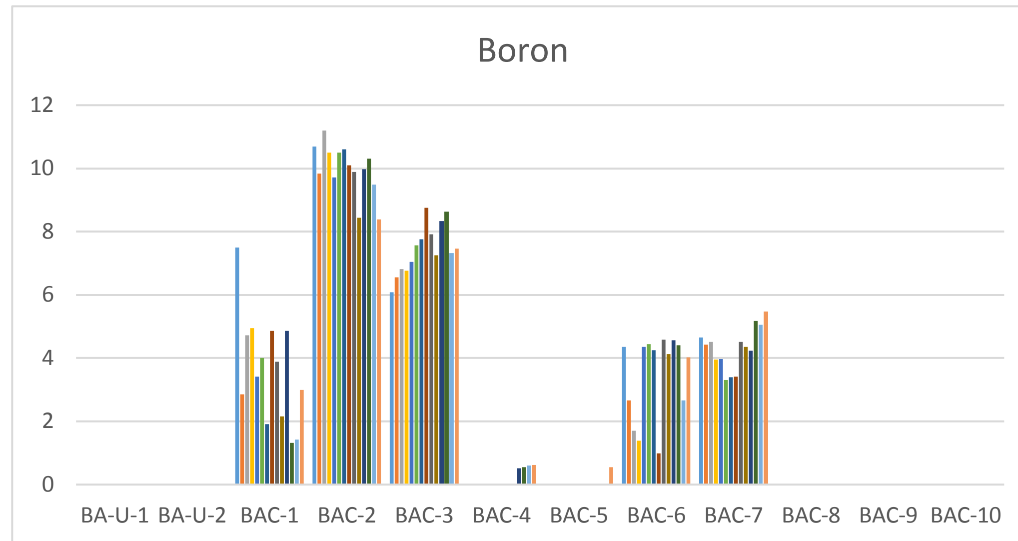
MONITOR WELL I.D.	DATE COMPLETED	WELL DIAMETER / MATERIAL	TOTAL DEPTH (feet BGS)	WELL SCREENING INTERVAL (feet BGS)	TOP OF PVC CASING ELEVATION (feet MSL)
Wastewater Basin Wells					
WWC-1	7/26/2015	4-inch PVC	60	48-58	4644.72
WWC-2	7/27/2015	4-inch PVC	70	60-70	4645.11
WWC-3	7/30/2015	4-inch PVC	65	55-65	4638.90
WWC-4	7/29/2015	4-inch PVC	75	65-75	4640.58
WWC-5	7/28/22015	4-inch PVC	74	64-74	4641.75
WWC-6	3/24/2018	4-inch PVC	87	67-77	4635.945
WWC-7	3/22/2018	4-inch PVC	87	77-87	4630.487
WWC-8	4/25/2019	6-inch PVC	96	71-96	4647.799
WWC-9	4/28/2019	6-inch PVC	87	62-87	4642.58
WWC-10	4/26/2019	6-inch PVC	87	62-87	4633.72
WWC-11	11/16/2019	6-inch PVC	90	65-90	4641.919
WWC-12	11/12/2019	6-inch PVC	90	65-90	4636.661
WWC-13	11/15/2019	6-inch PVC	90	65-90	4635.128
WWC-14	5/6/2020	6-inch PVC	85	60-85	4635.927
WWC-15	5/6/2020	6-inch PVC	88	63-88	4636.864
WWC-16	5/7/2020	6-inch PVC	88	63-88	4635.921
WWC-17	5/8/2020	6-inch PVC	88	63-88	4641.487
SI-U-1	8/12/2015	4-inch PVC	79	69-79	4664.59
WW-U-1	8/11/2015	4-inch PVC	70	60-70	4665.03
WW-U-2	8/11/2015	4-inch PVC	75	65-75	4665.46
Groundwater Discharge Permit Groundwater Recovery Wells					
WR-101	2/11/2007	6-inch PVC	66	46-66	4646.28
WR-102	3/3/2009	6-inch PVC	57	37-57	4637.62
WR-103	3/31/2009	6-inch PVC	55	35-55	4649.82

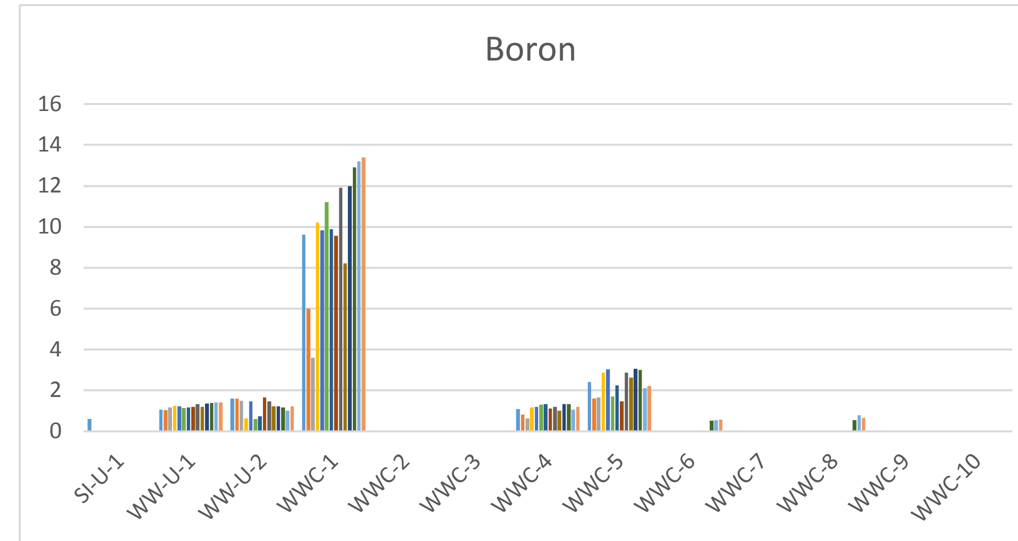
Below Ground Surface

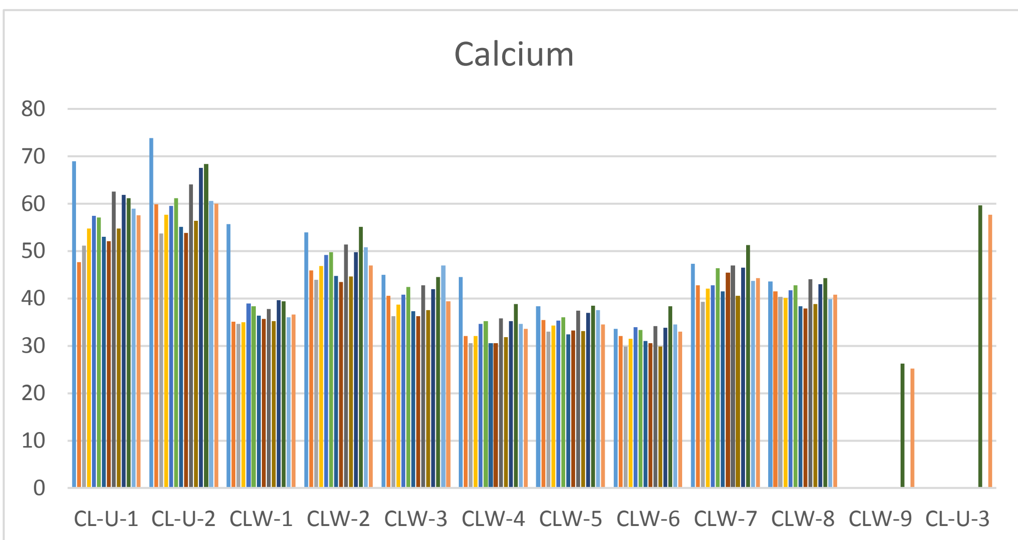
MSL = Mean Sea Level

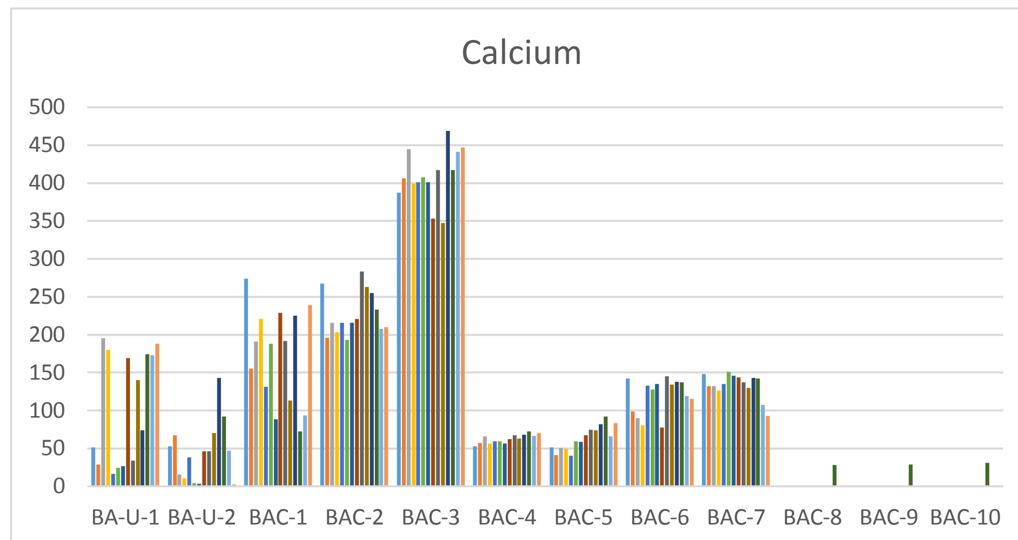
TABLE 2 GROUND WATER LEVEL MEASUREMENT AND WATER QUALITY ANALYTICAL RESULTS

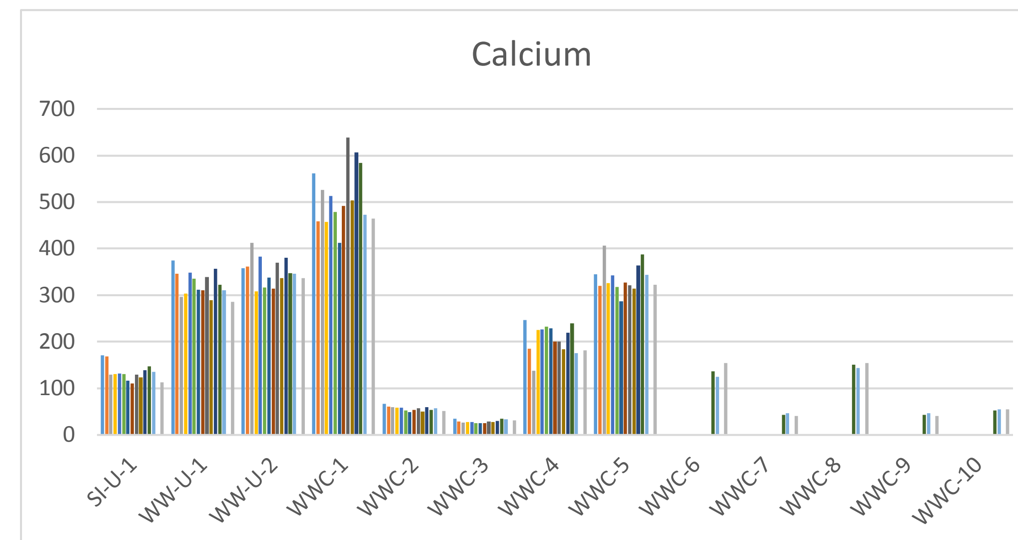
Appendix III (mg/L - pCi/L)

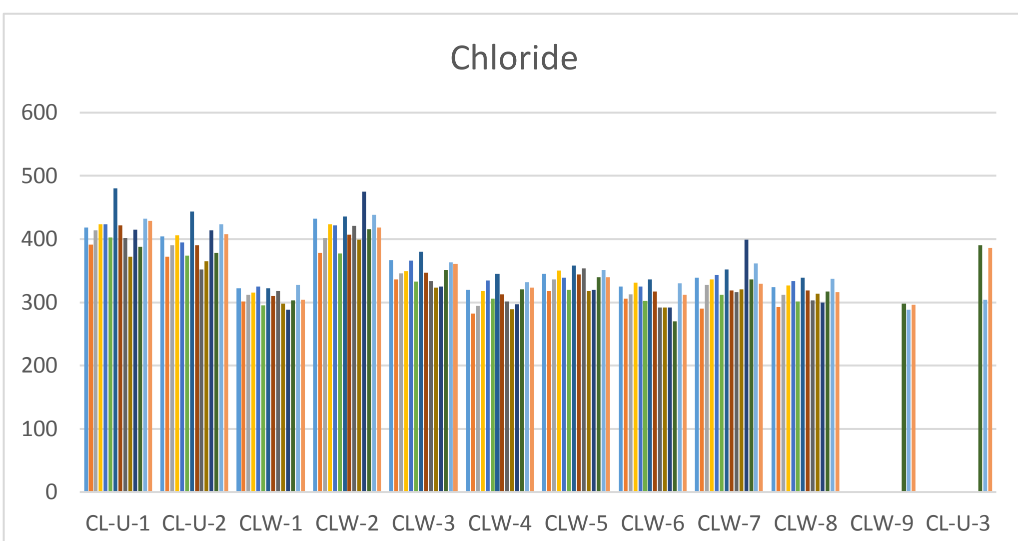


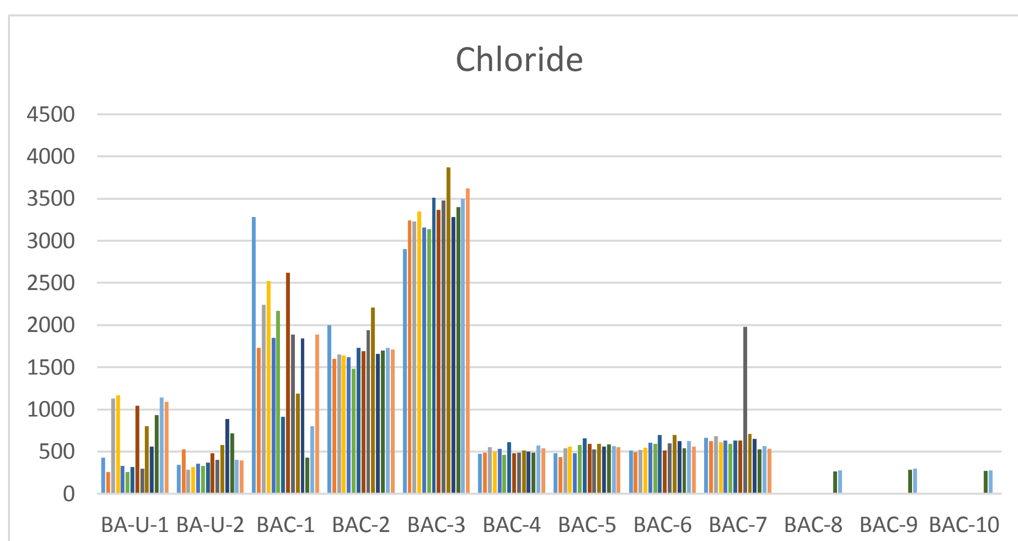


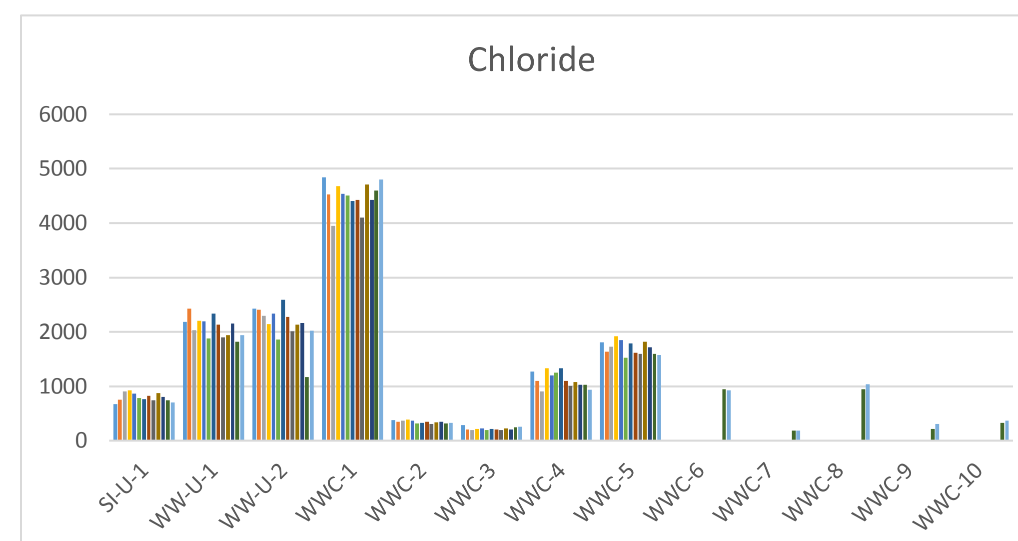


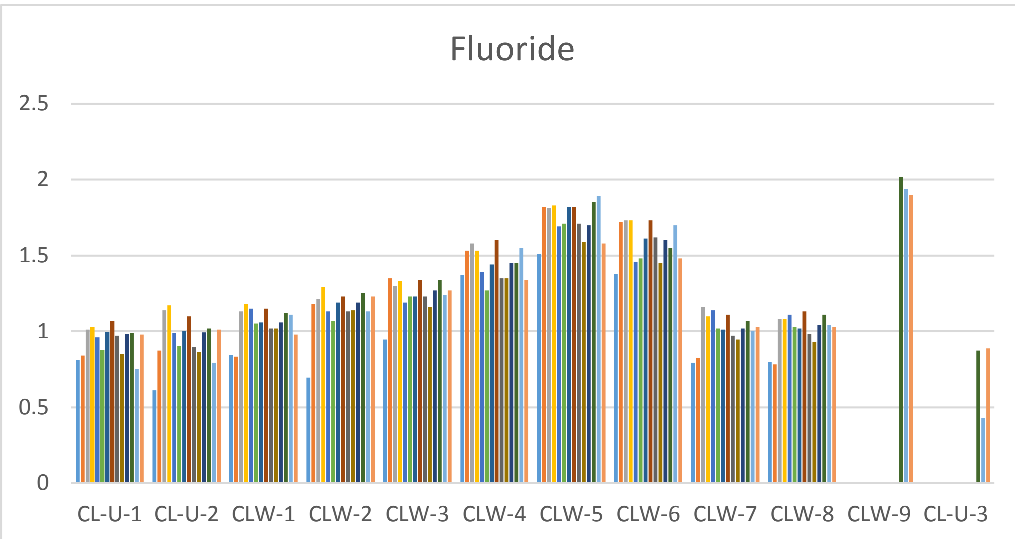


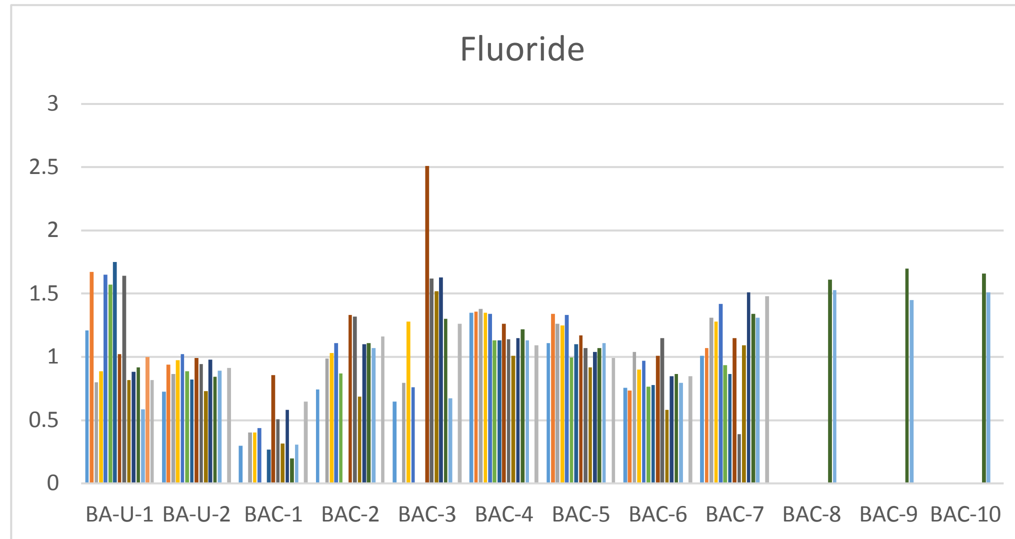


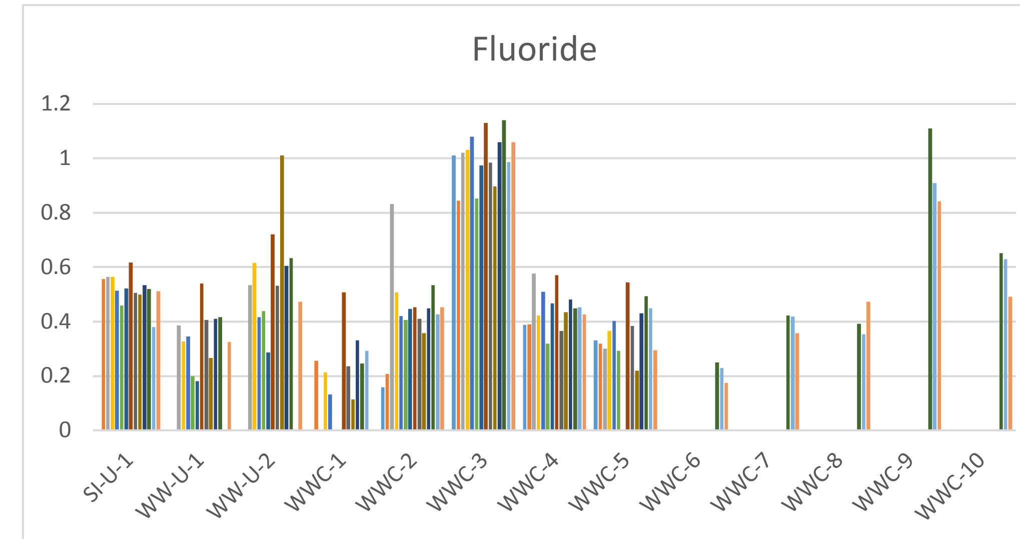


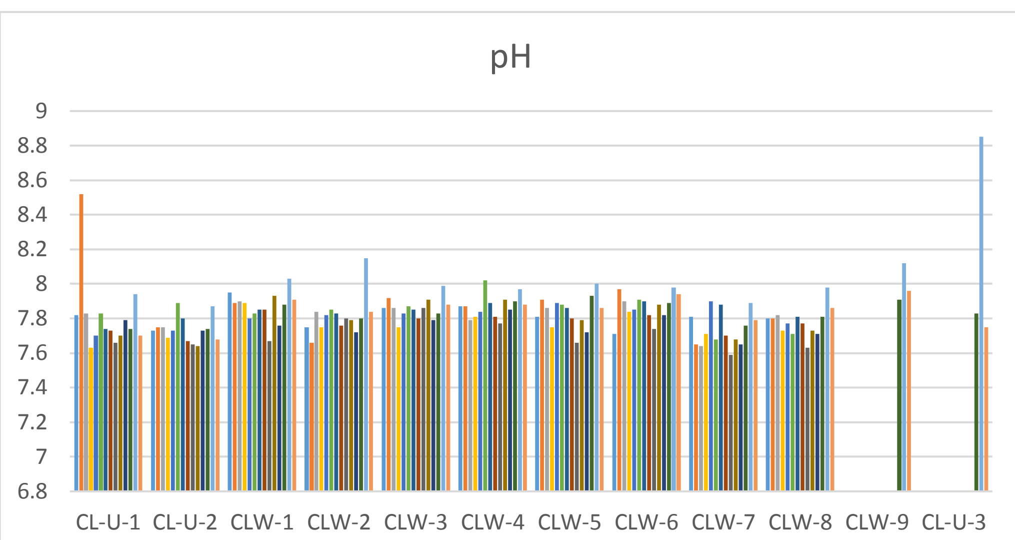


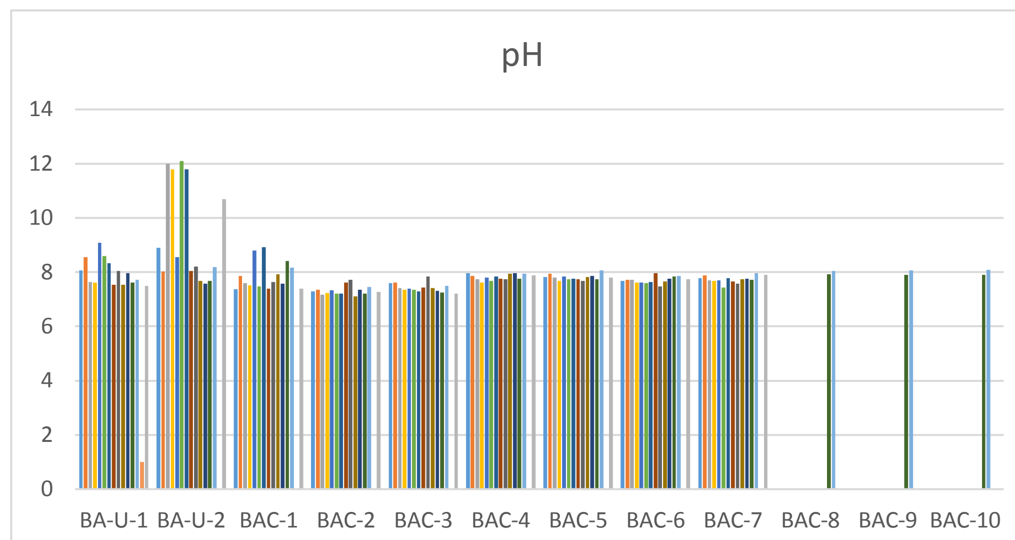


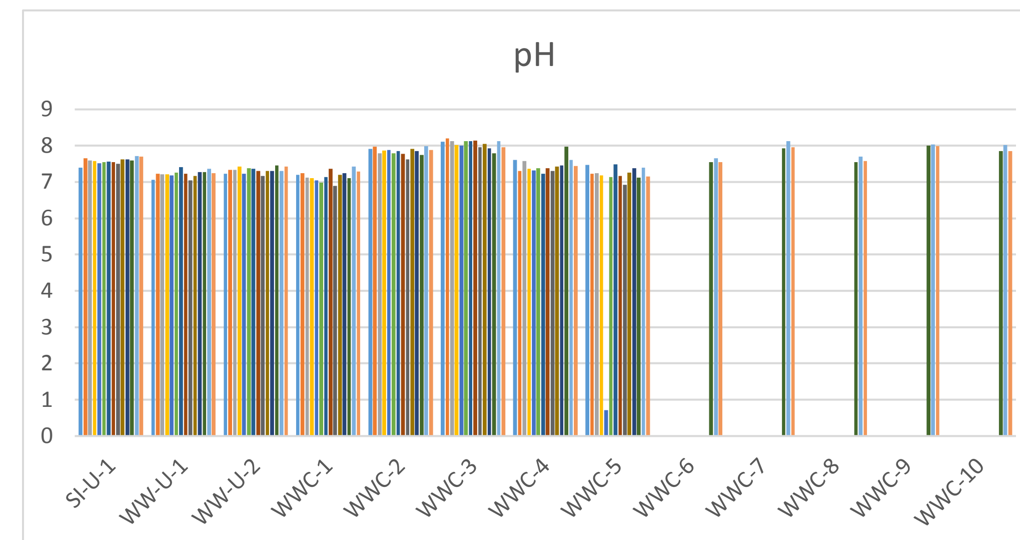

Fluoride
2.5
2
1.5
1
0.5
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

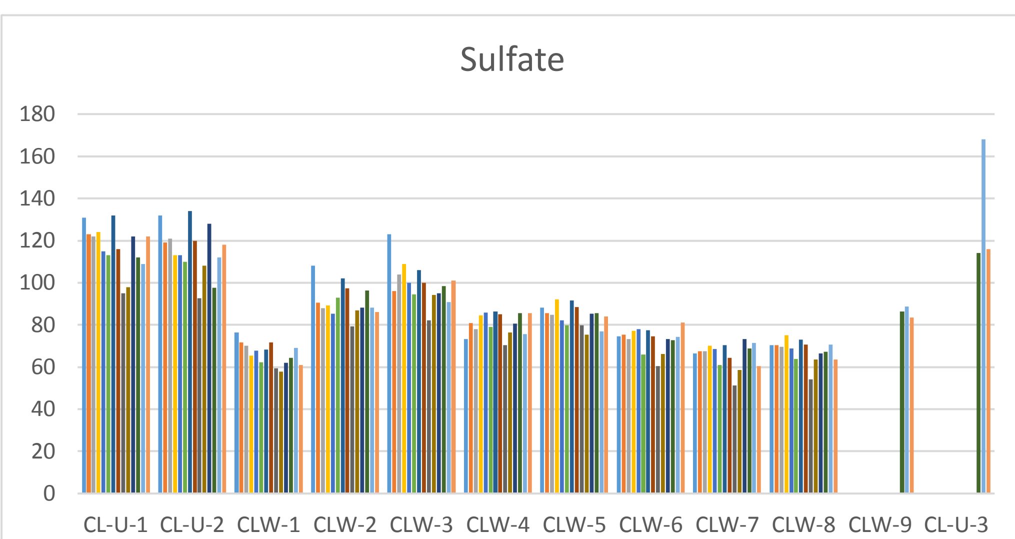

Fluoride
3
2.5
2
1.5
1
0.5
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

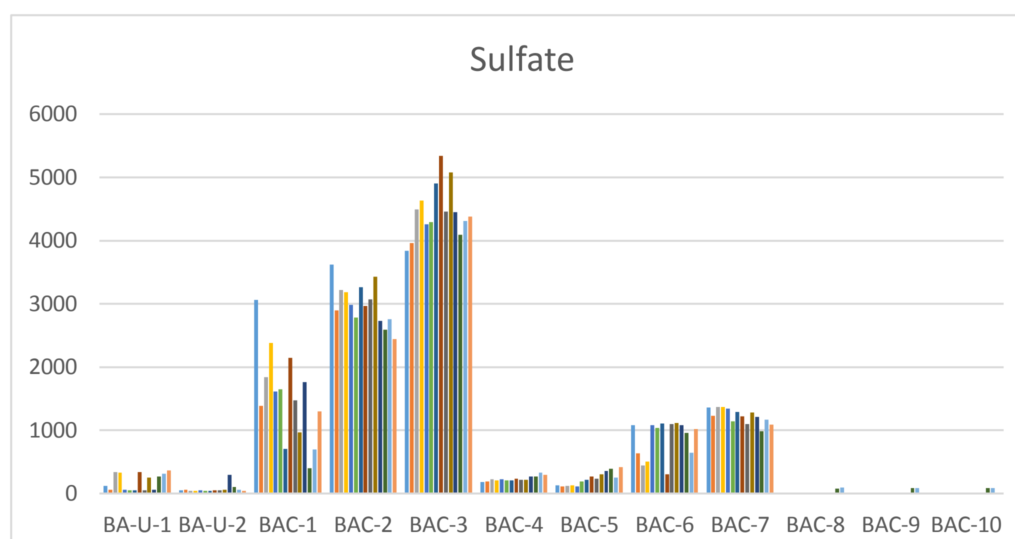

Fluoride
1.2
1
0.8
0.6
0.4
0.2
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

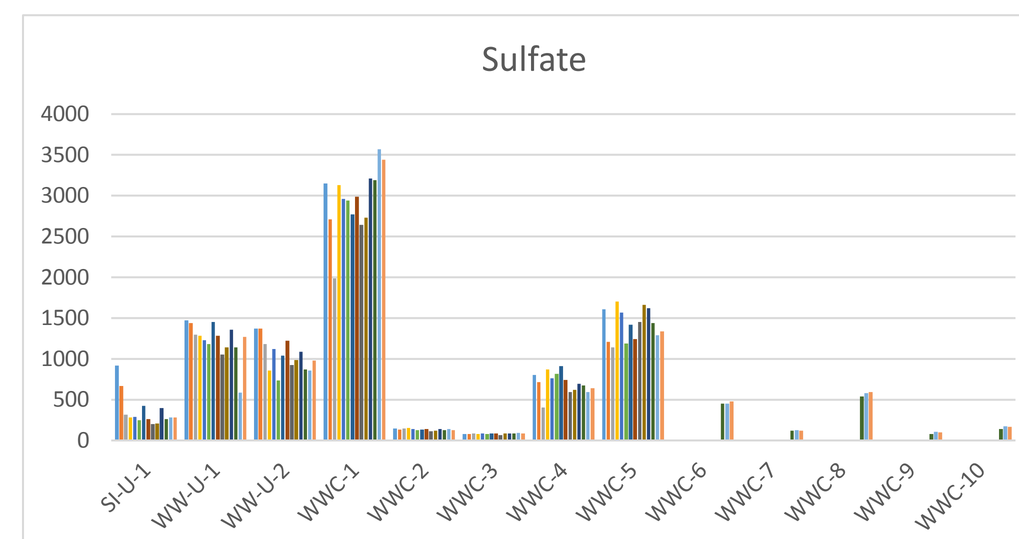

pH
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
6.8
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

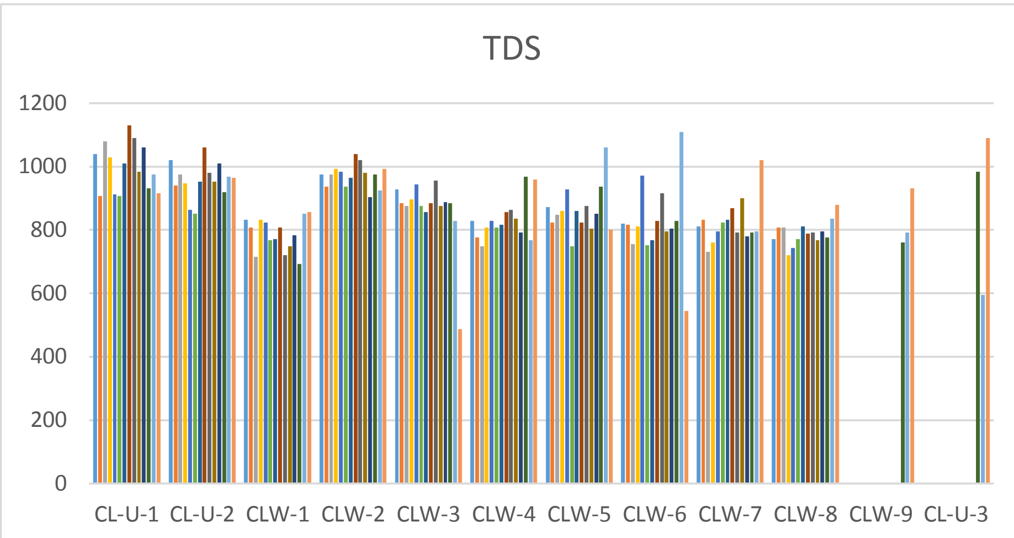

pH
14
12
10
8
6
4
2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10


pH
9
8
7
6
5
4
3
2
1
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10


Sulfate
180
160
140
120
100
80
60
40
20
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3


Sulfate
6000
5000
4000
3000
2000
1000
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10


Sulfate
4000
3500
3000
2500
2000
1500
1000
500
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10


TDS
1200
1000
800
600
400
200
0
CL-U-1
CL-U-2
CLW-1
CLW-2
CLW-3
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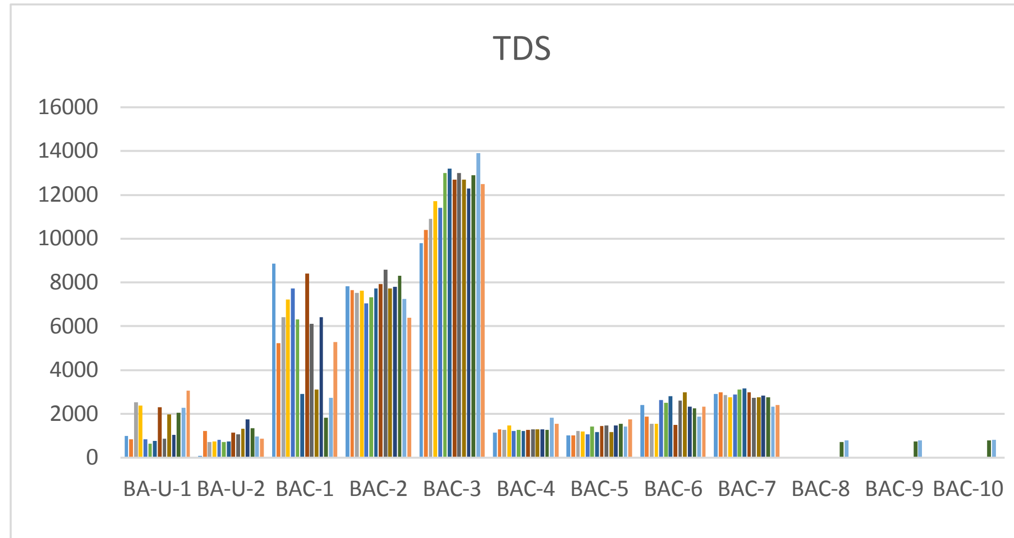
CLW-5
CLW-6
CLW-7
CLW-8
CLW-9
CL-U-3


TDS
16000
14000
12000
10000
8000
6000
4000
2000
0
BA-U-1
BA-U-2
BAC-1
BAC-2
BAC-3
BAC-4
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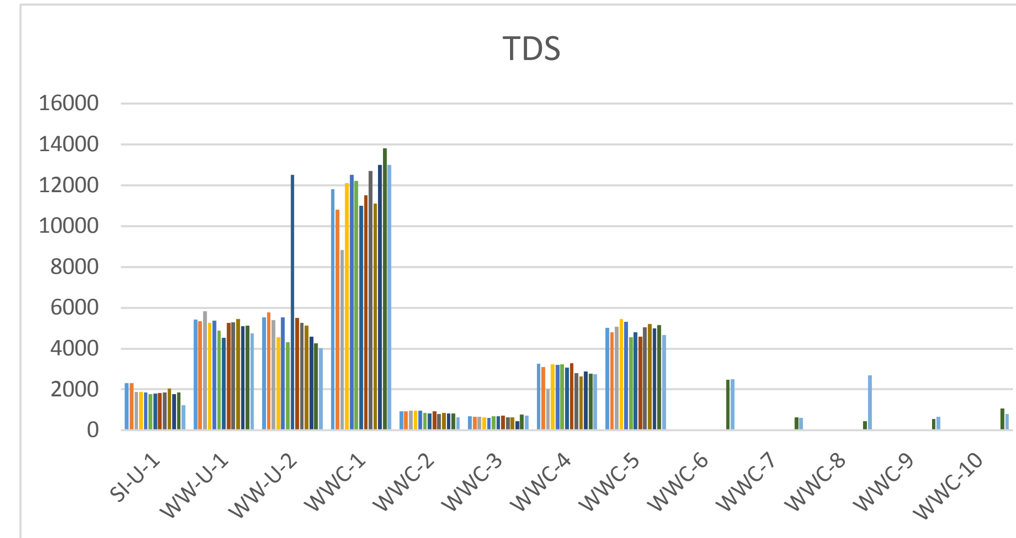
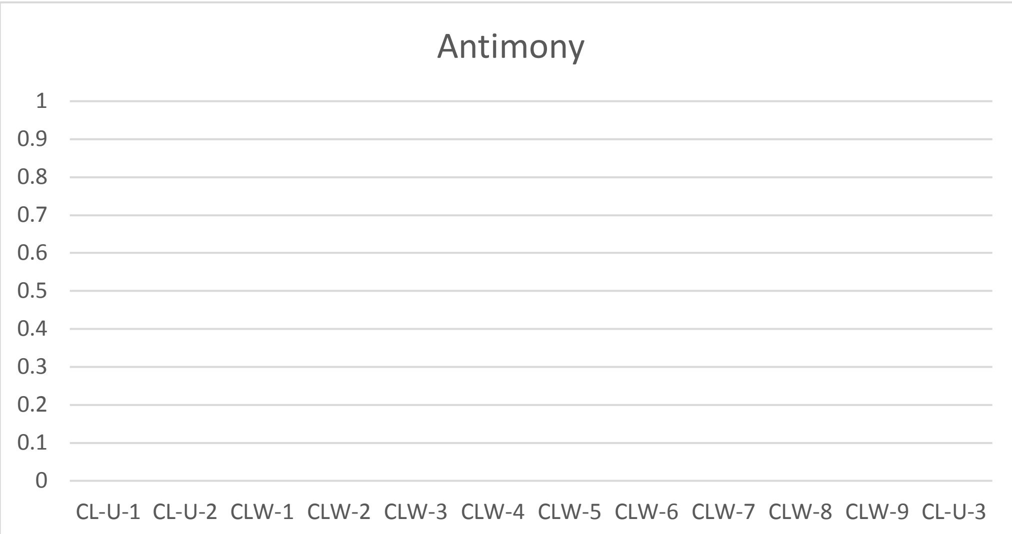
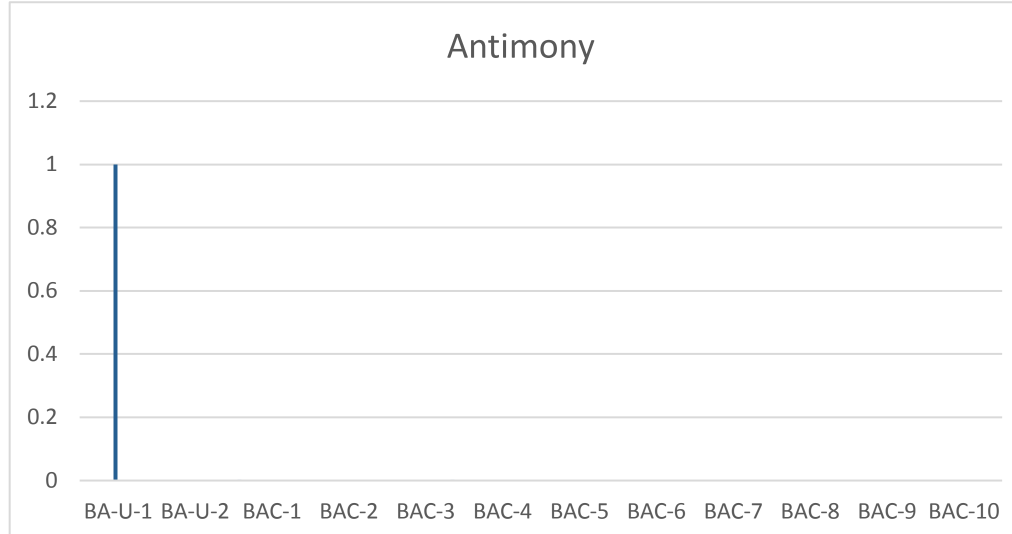
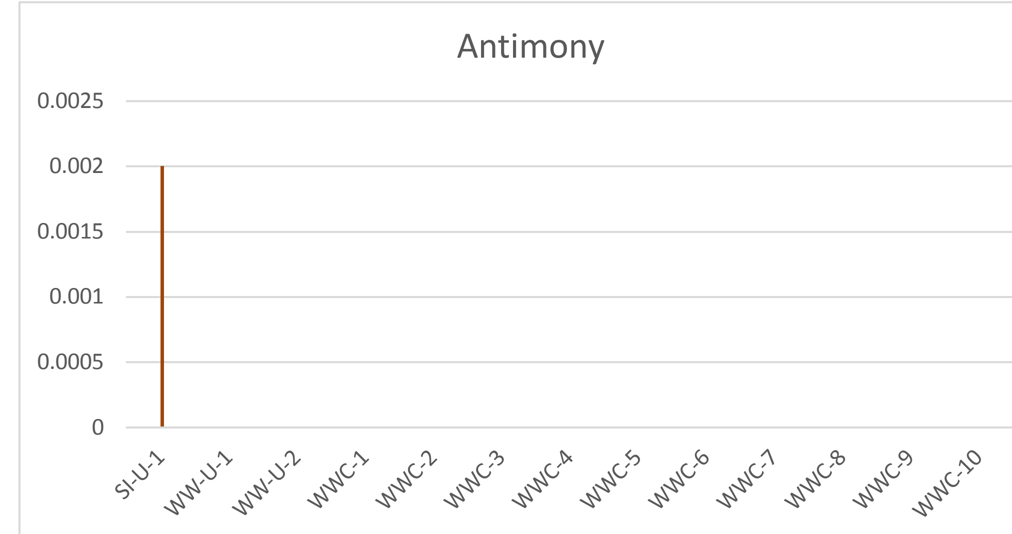
BAC-6
BAC-7
BAC-8
BAC-9
BAC-10

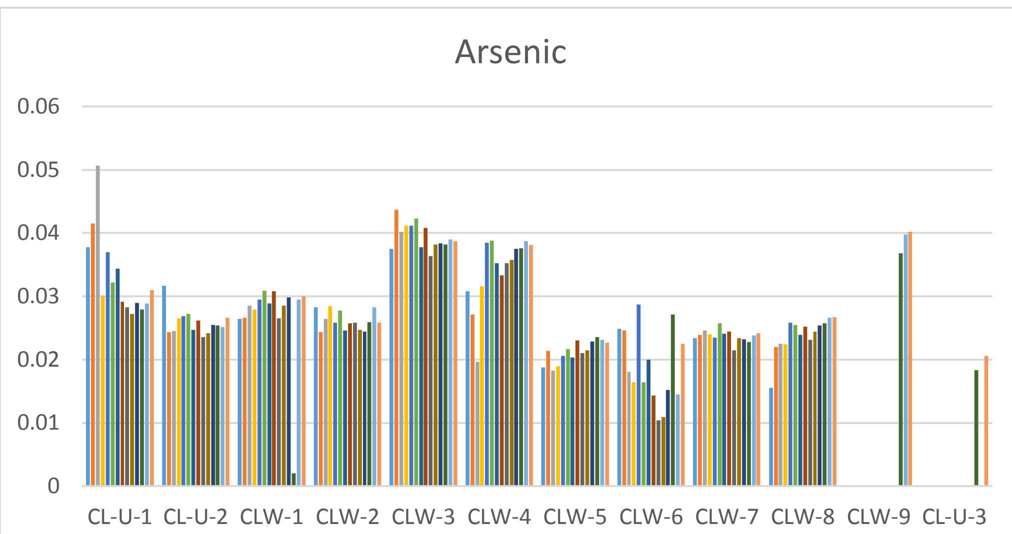

TDS
16000
14000
12000
10000
8000
6000
4000
2000
0
SI-U-1
WW-U-1
WW-U-2
WWC-1
WWC-2
WWC-3
WWC-4
WWC-5
WWC-6
WWC-7
WWC-8
WWC-9
WWC-10

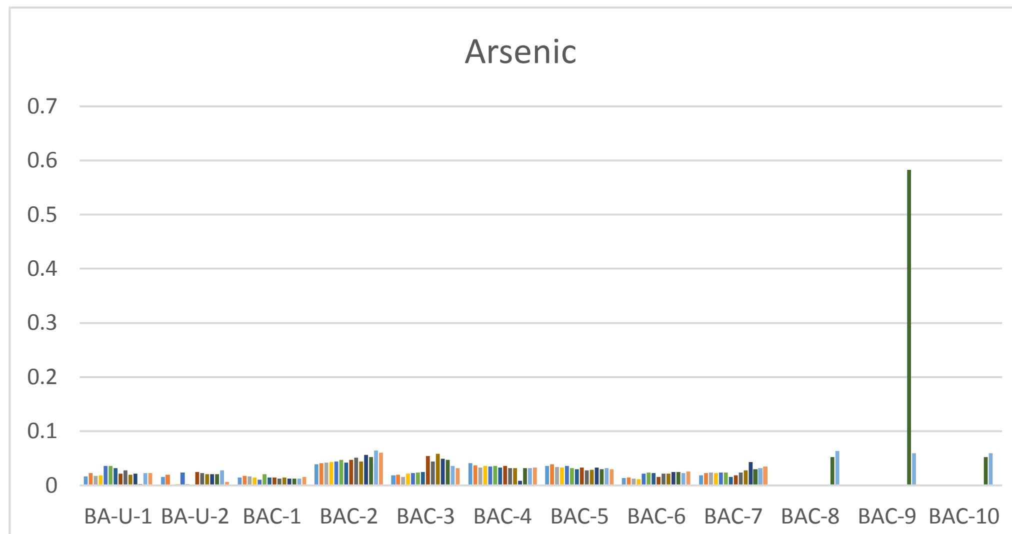
Appendix IV (mg/L - pCi/L)

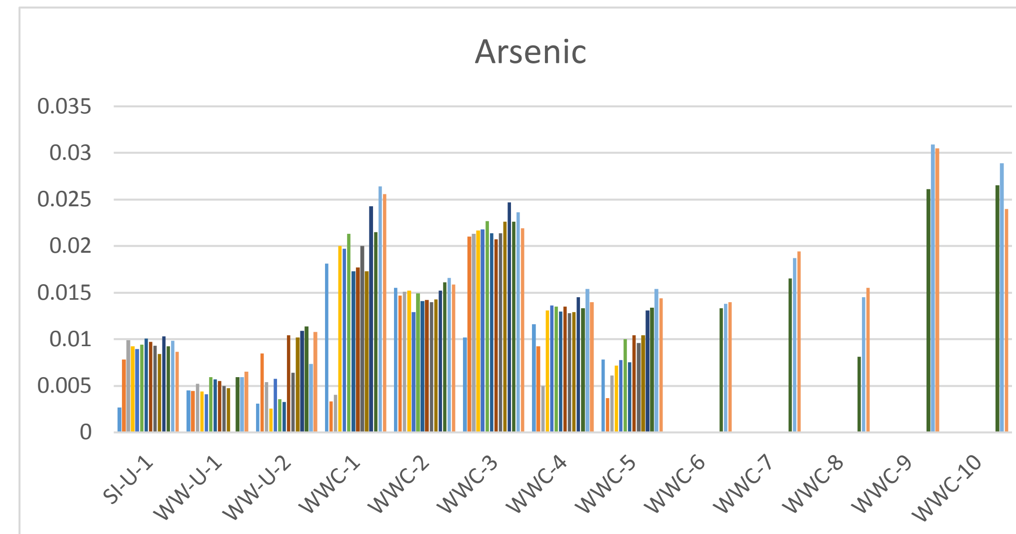


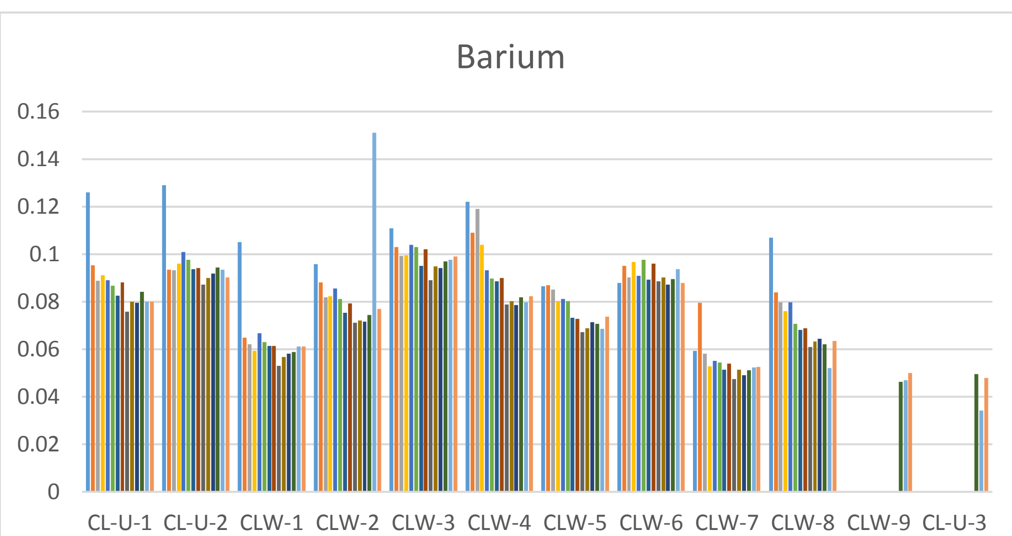


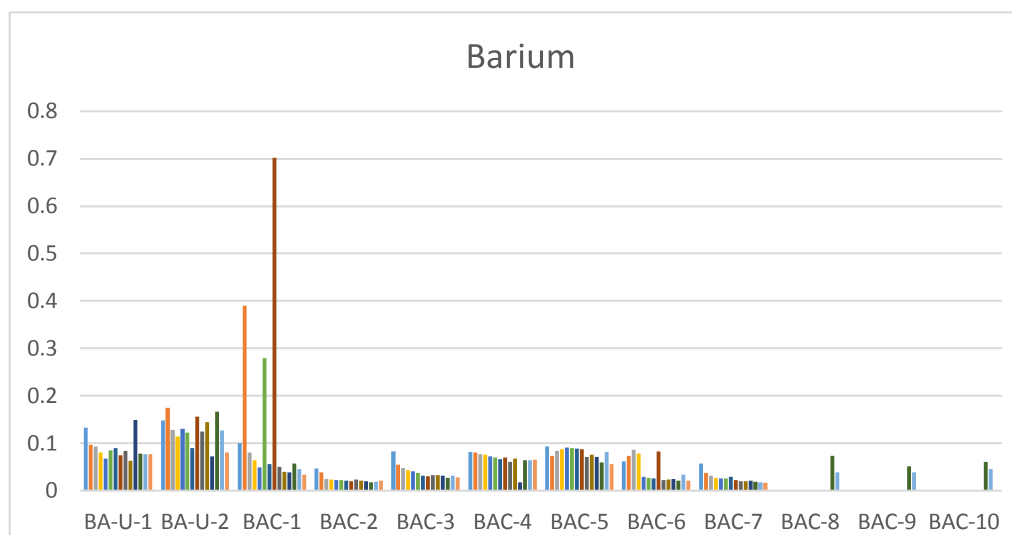


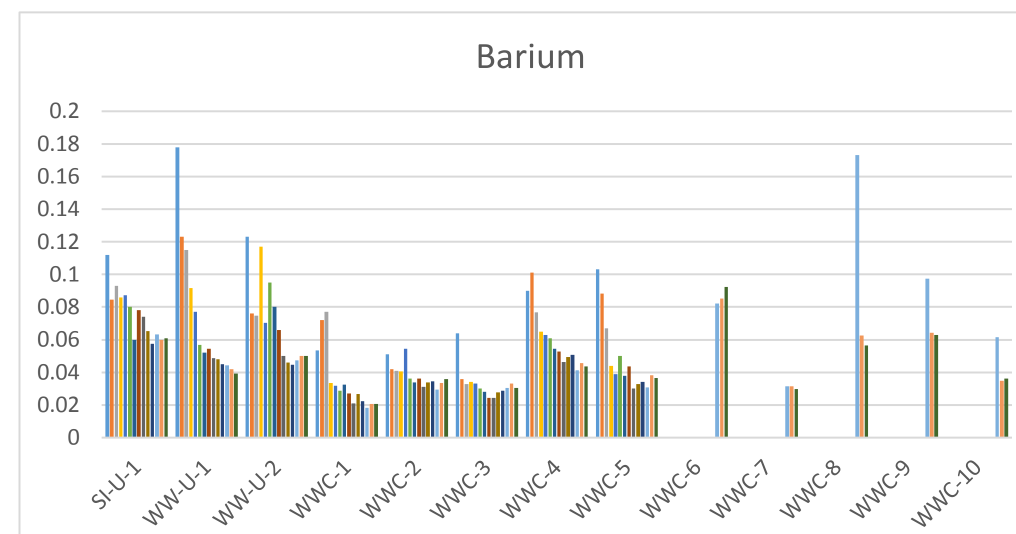


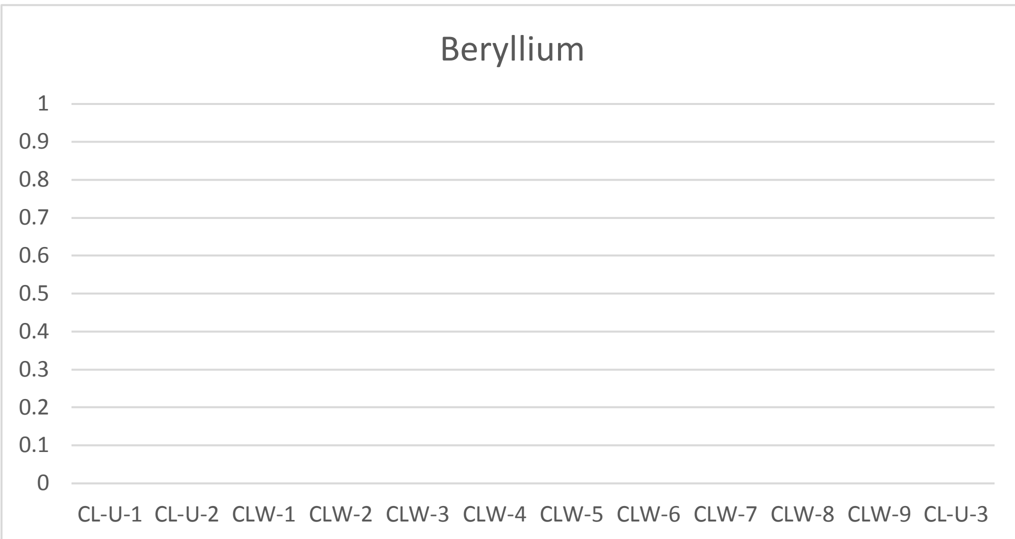




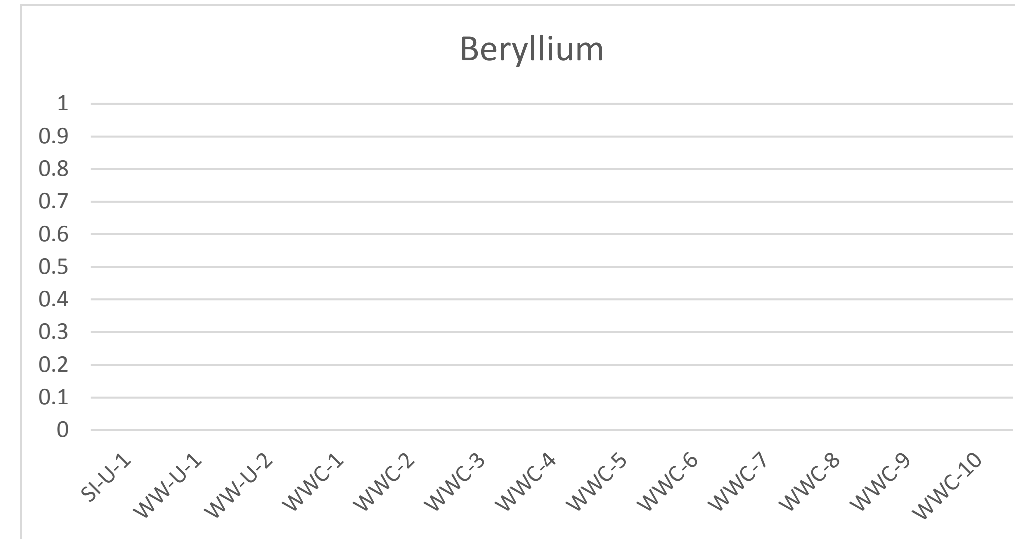


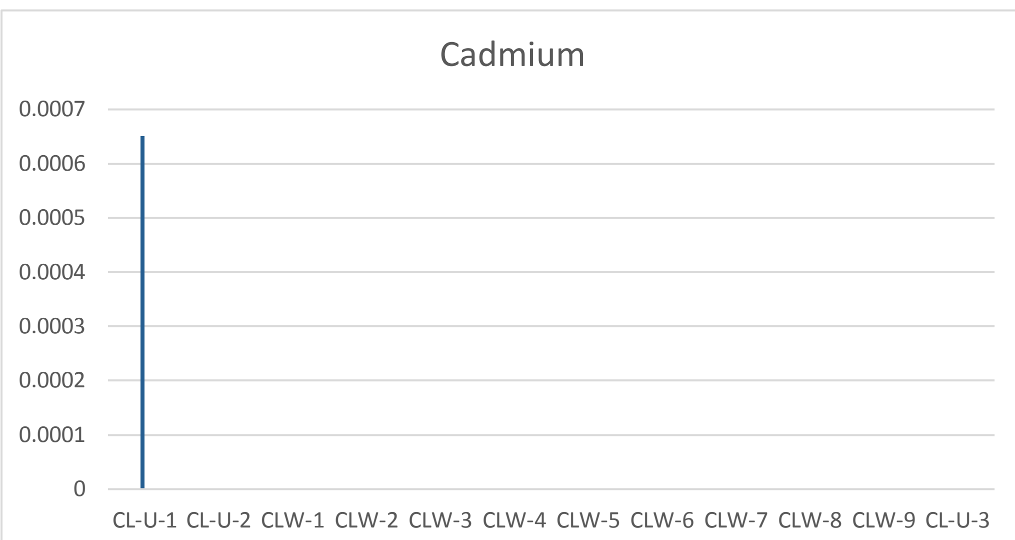




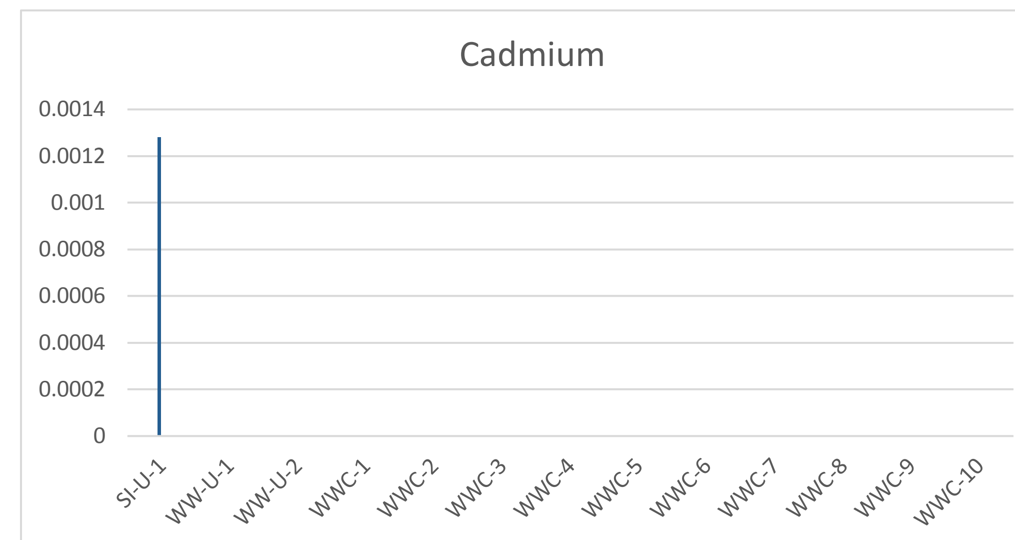

Beryllium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

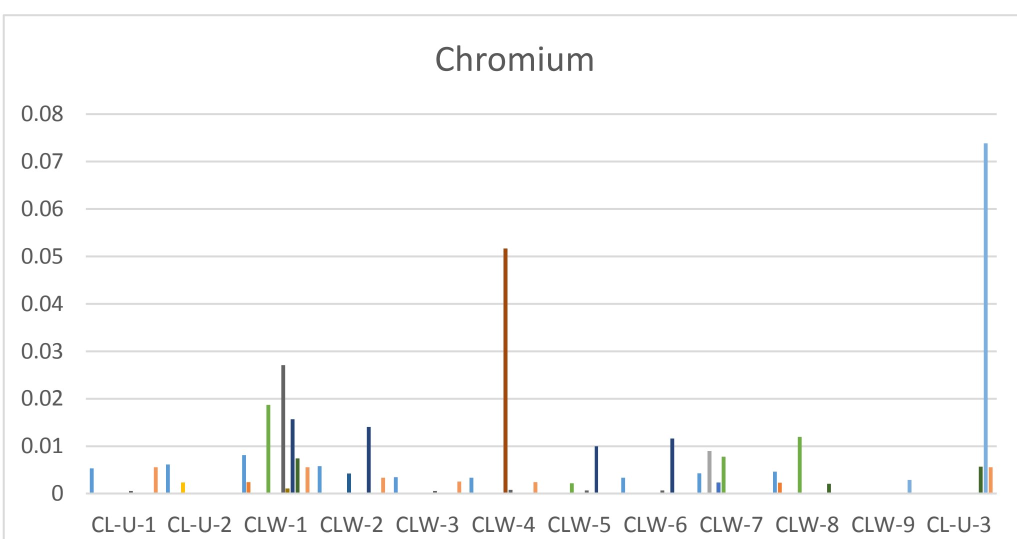

Beryllium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

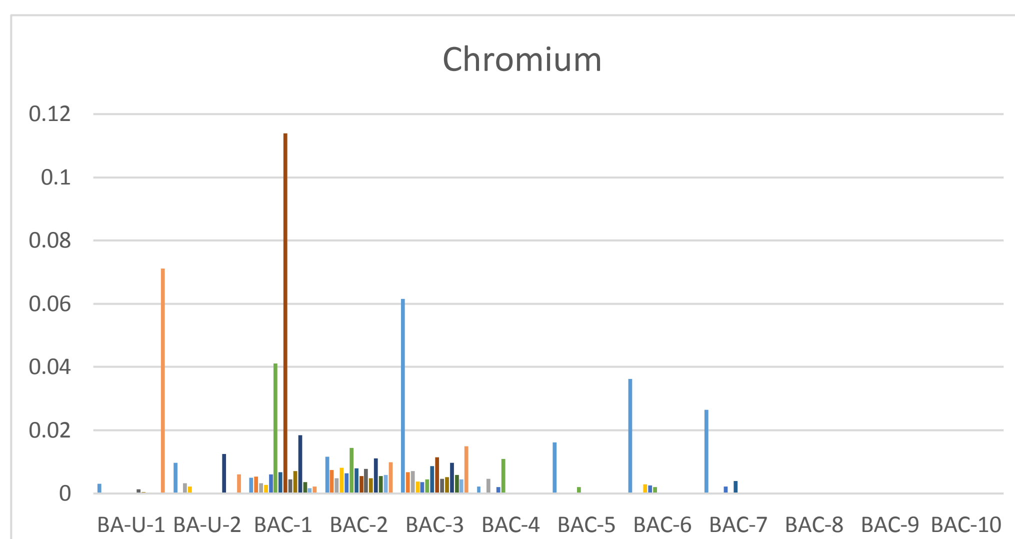

Beryllium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

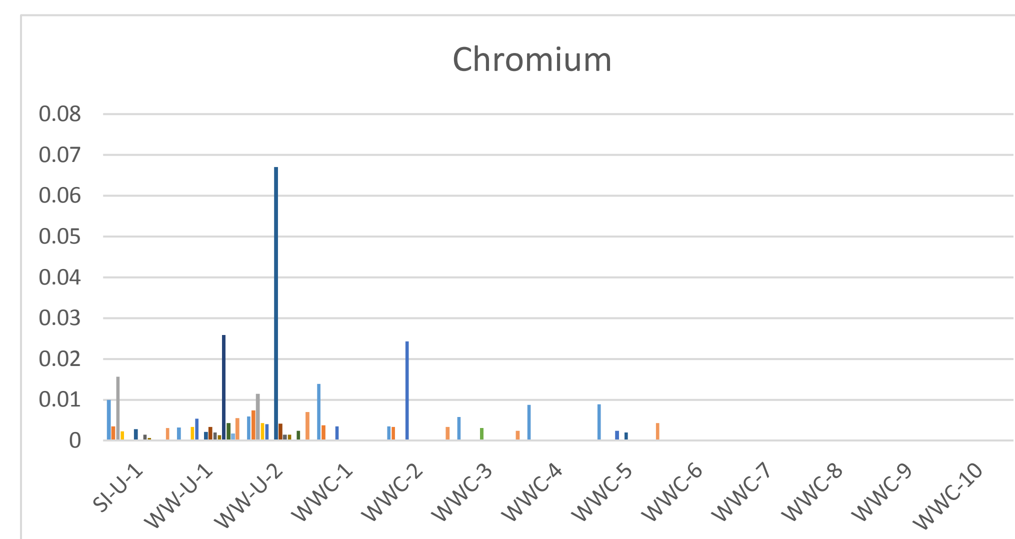

Cadmium
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

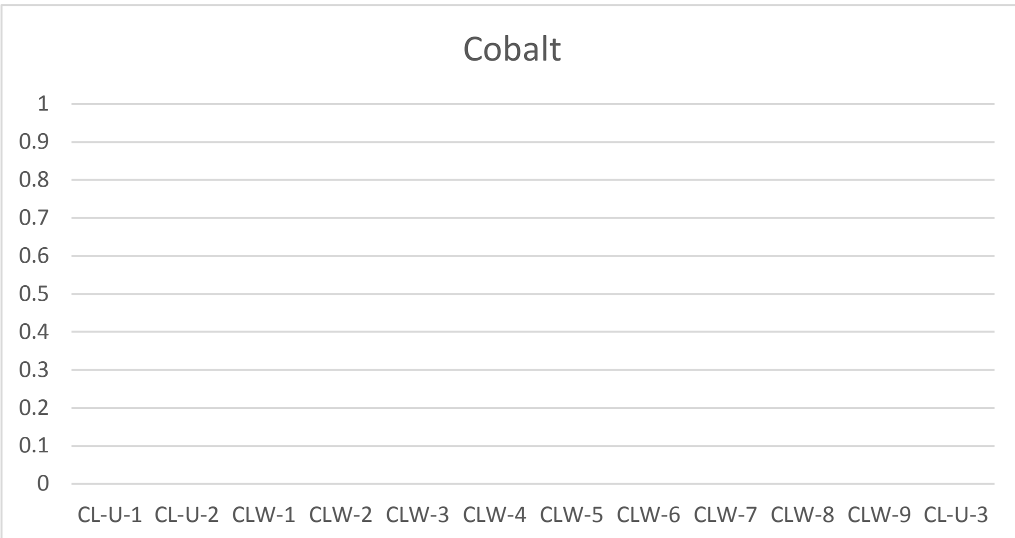

Cadmium
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

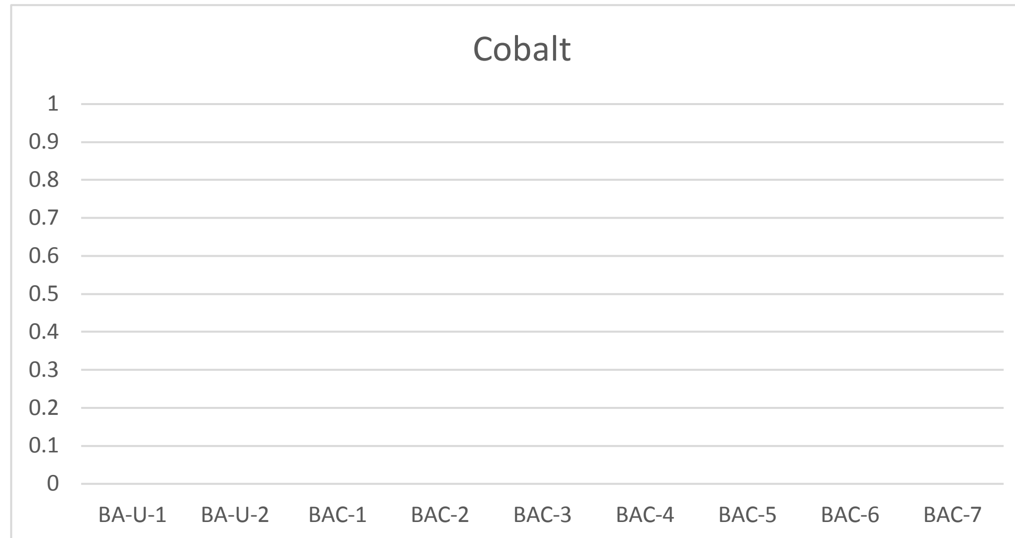

Cadmium
0.0014
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

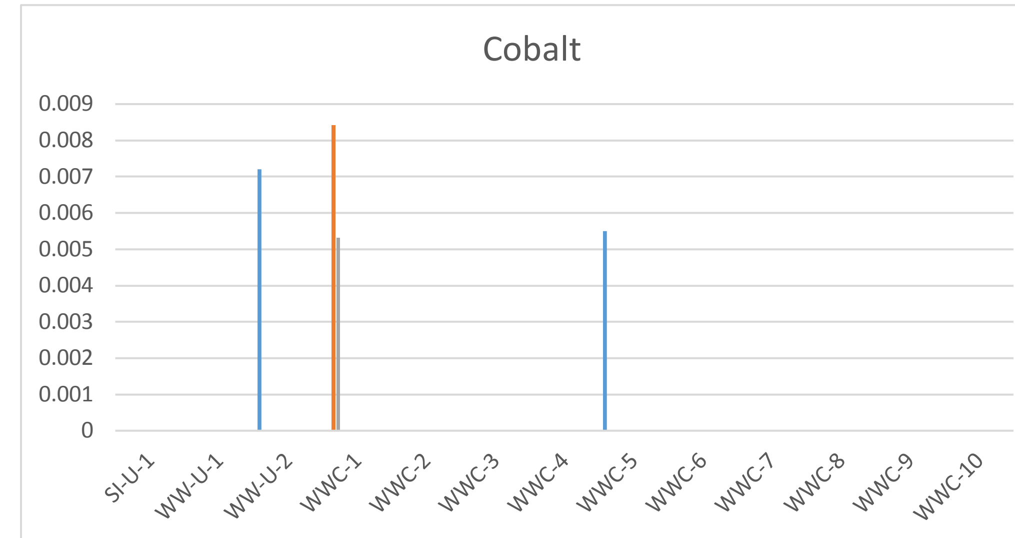

Chromium
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

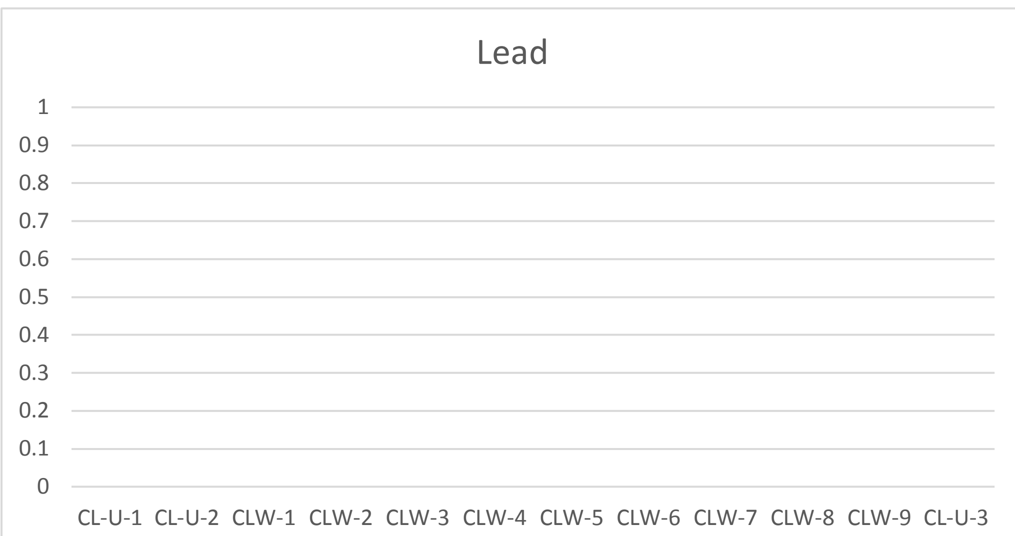

Chromium
0.12
0.1
0.08
0.06
0.04
0.02
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

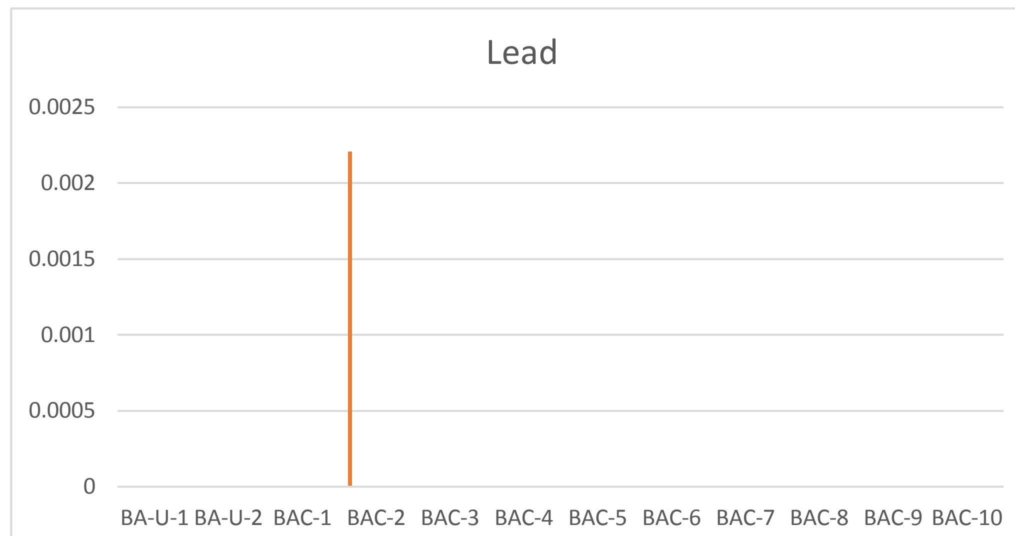

Chromium
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

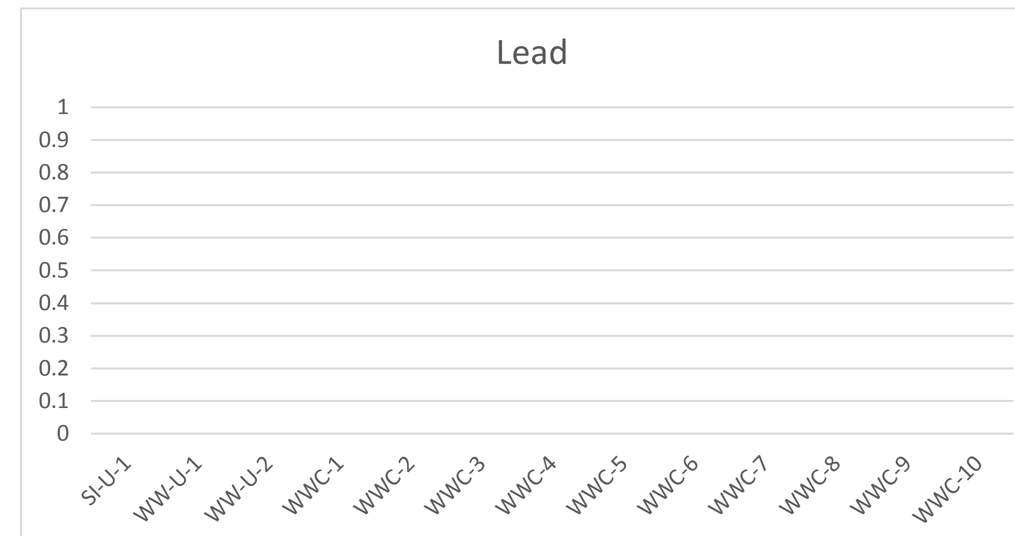

Cobalt
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

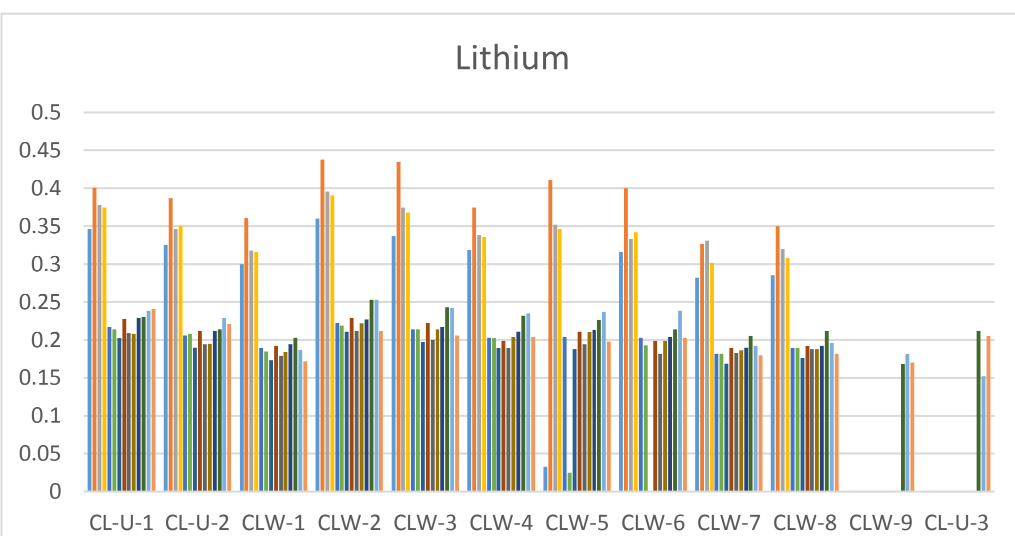

Cobalt
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7

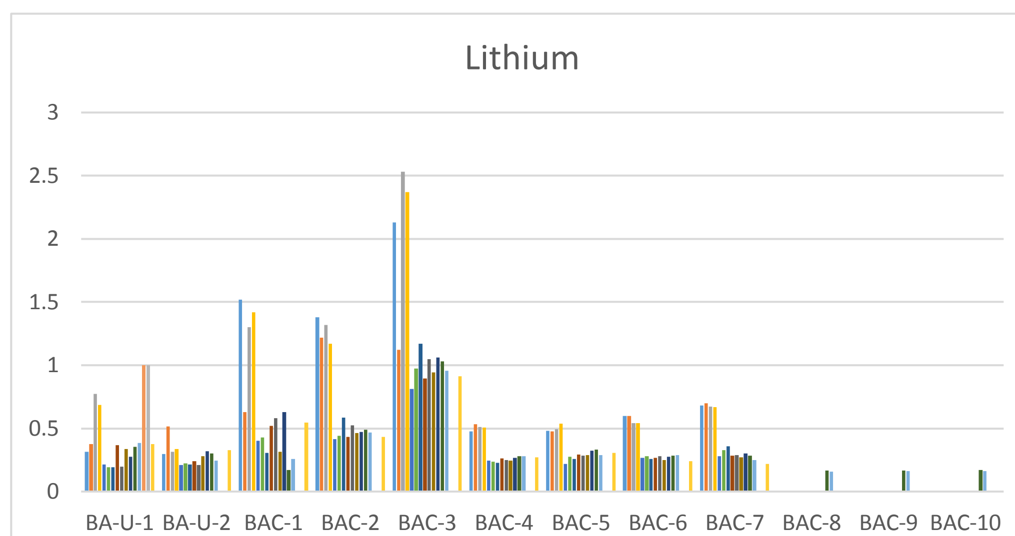

Cobalt
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

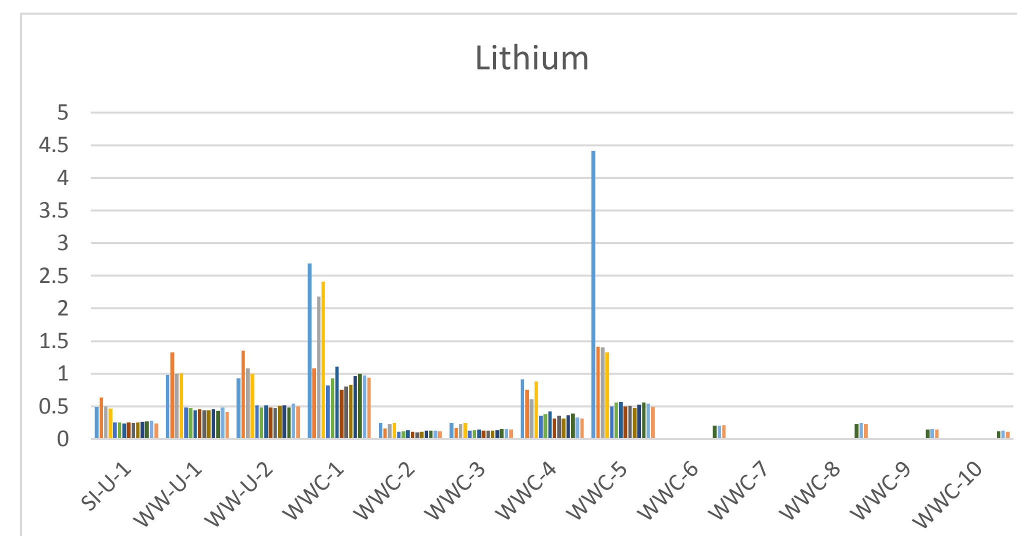

Lead
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

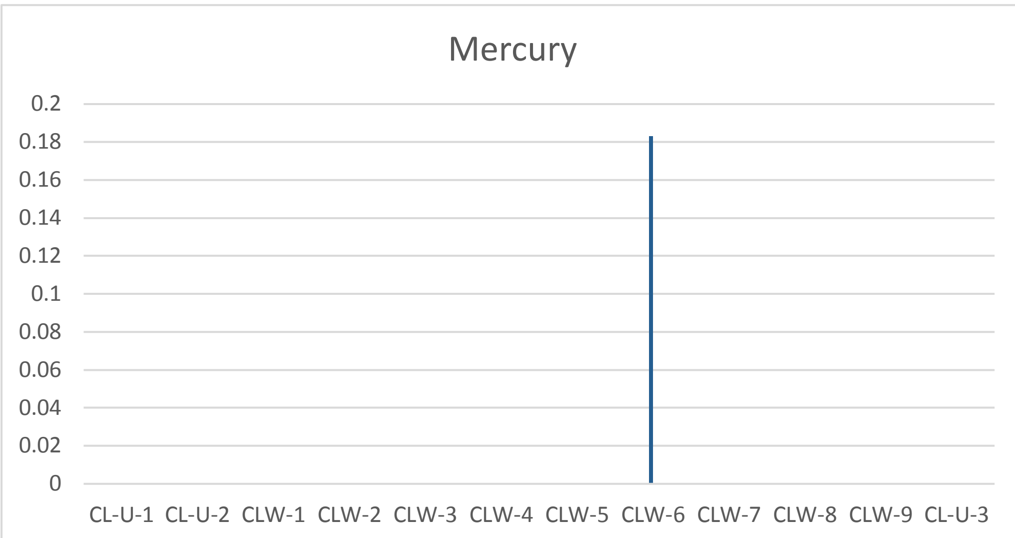

Lead
0.0025
0.002
0.0015
0.001
0.0005
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

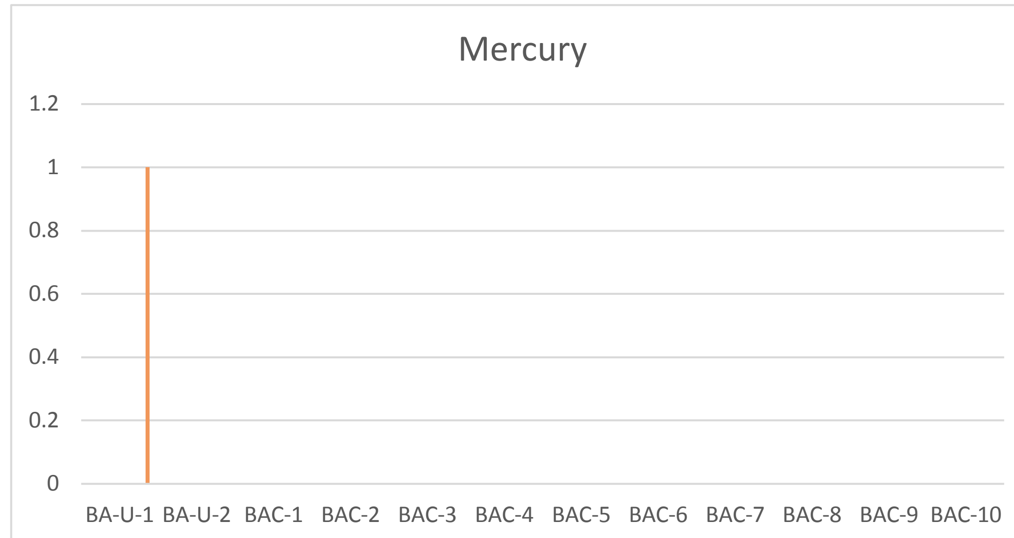

Lead
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

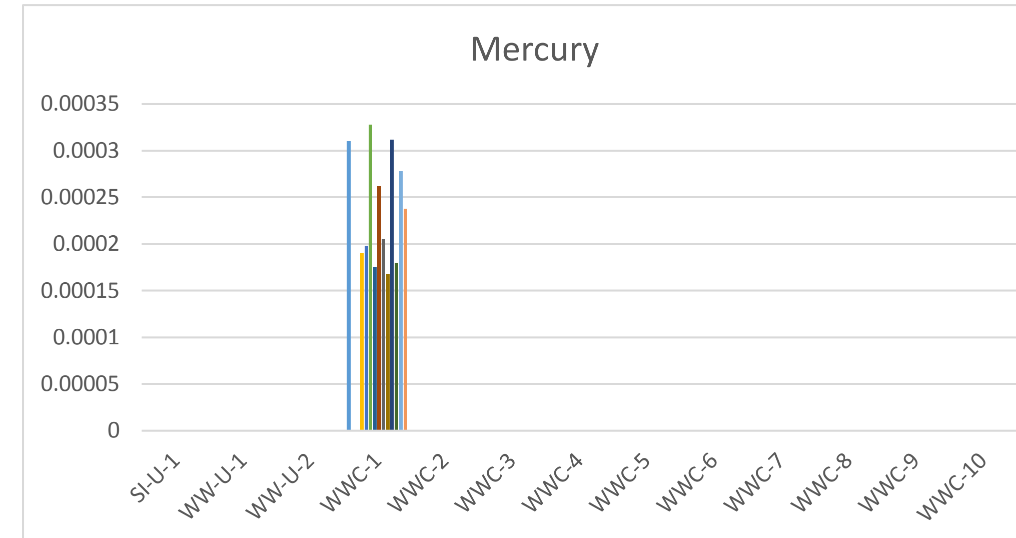

Lithium
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

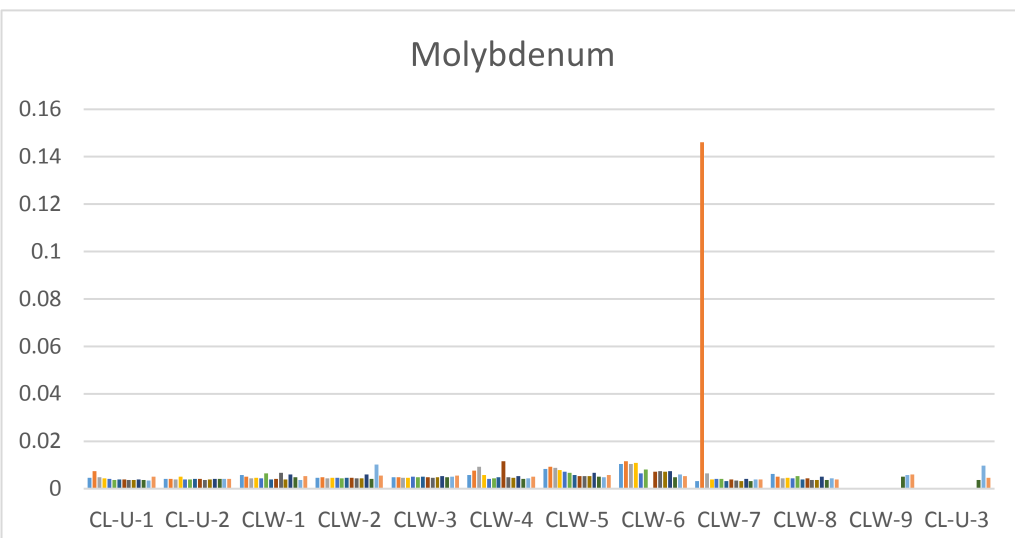

Lithium
3
2.5
2
1.5
1
0.5
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

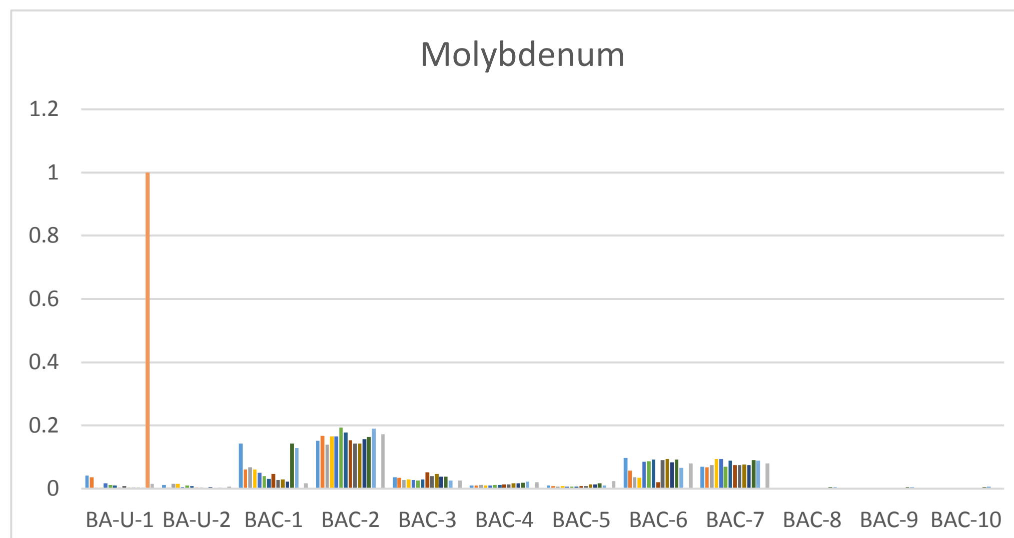

Lithium
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

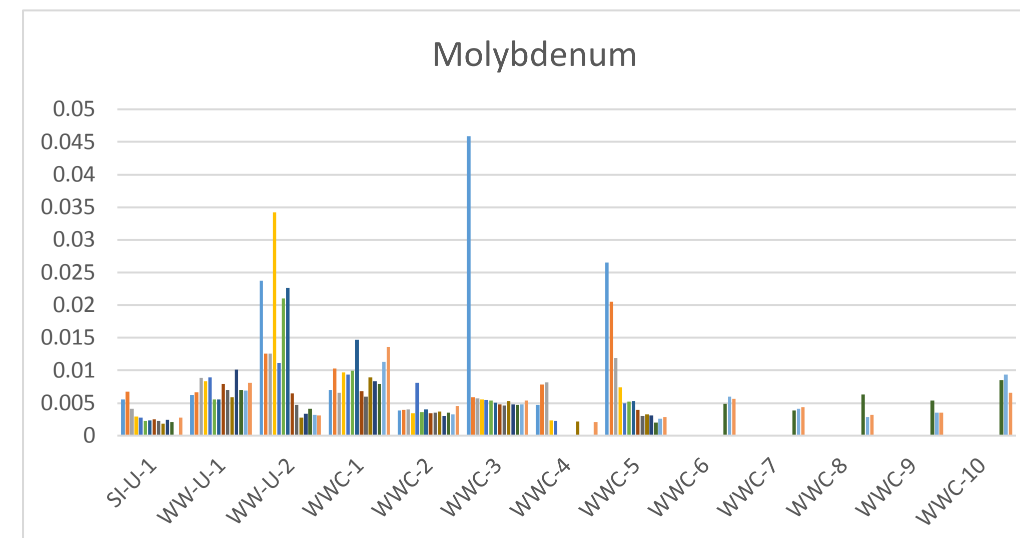

Mercury
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

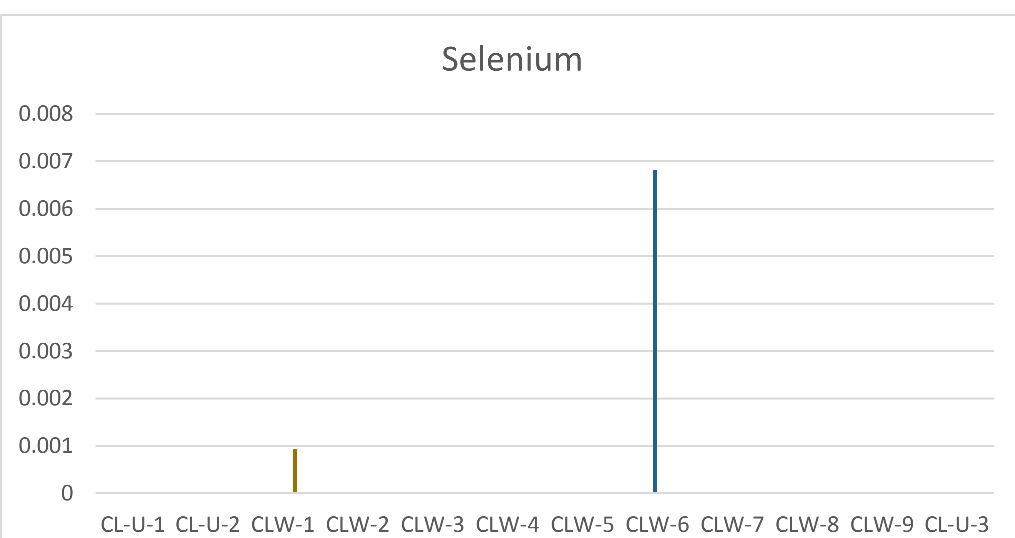

Mercury
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

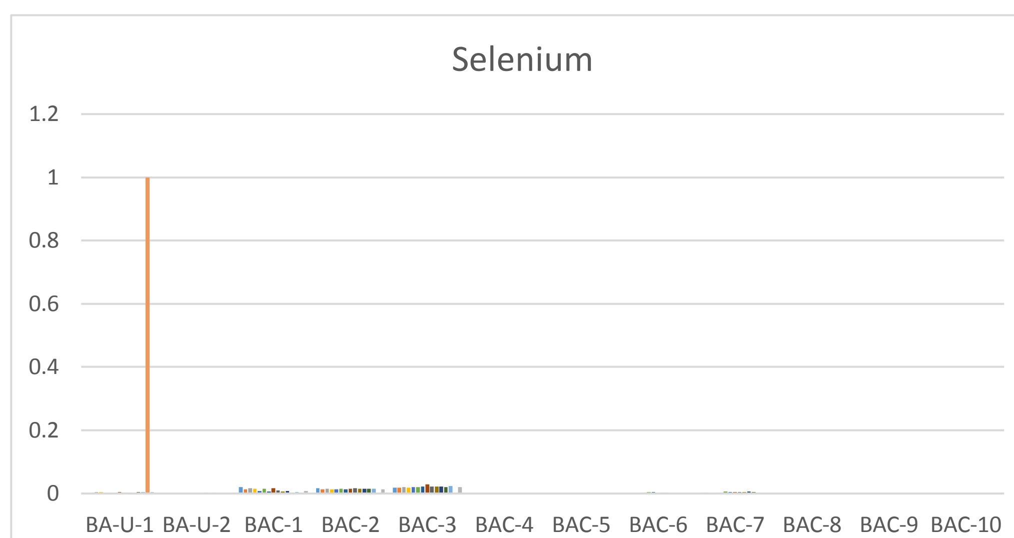

Mercury
0.00035
0.0003
0.00025
0.0002
0.00015
0.0001
0.00005
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

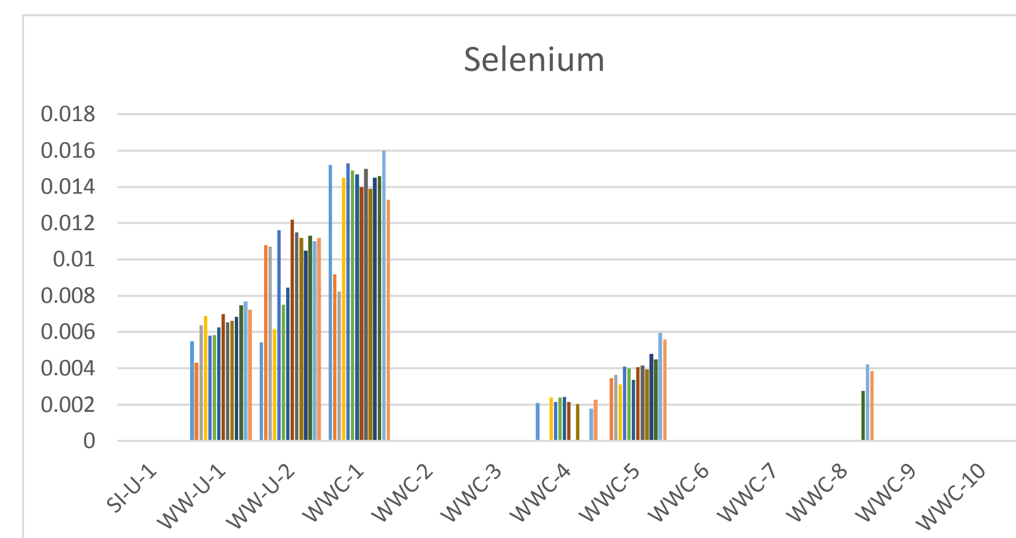

Molybdenum
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3


Molybdenum
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10


Molybdenum
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

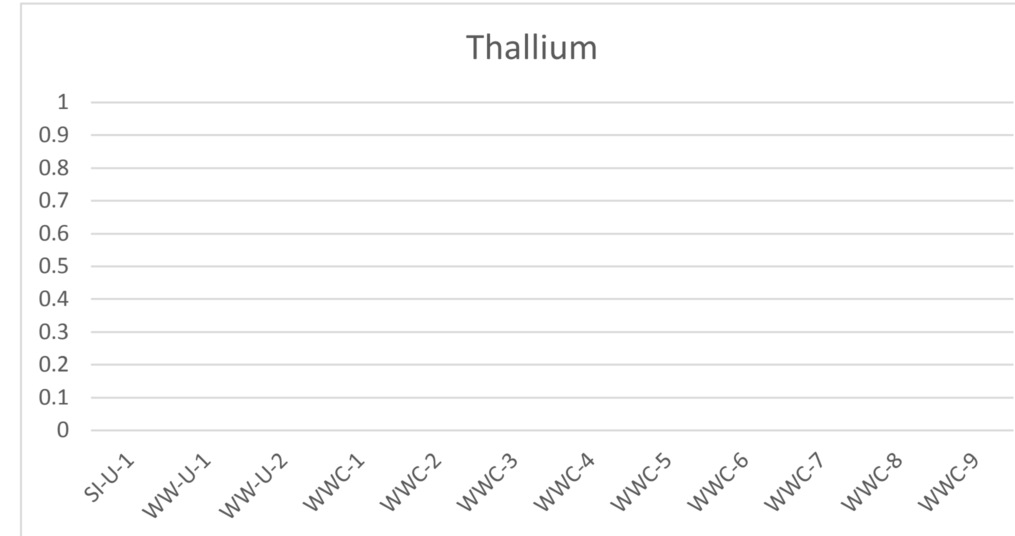

Selenium
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

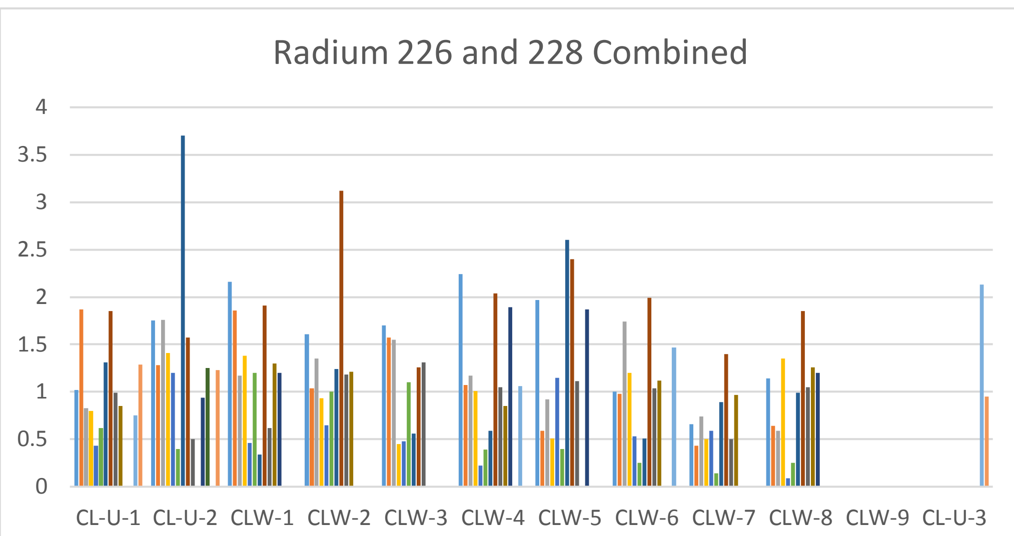

Selenium
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

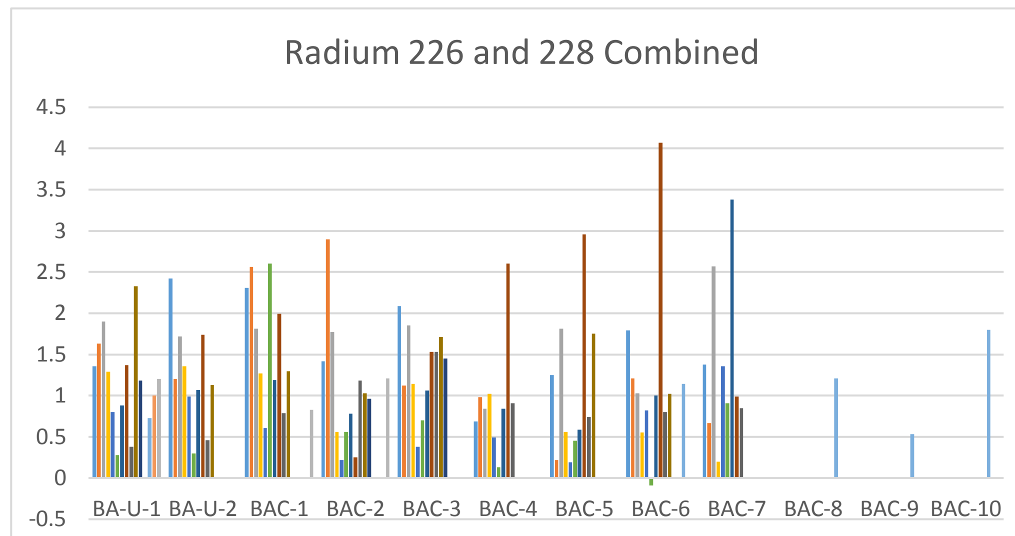

Selenium
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

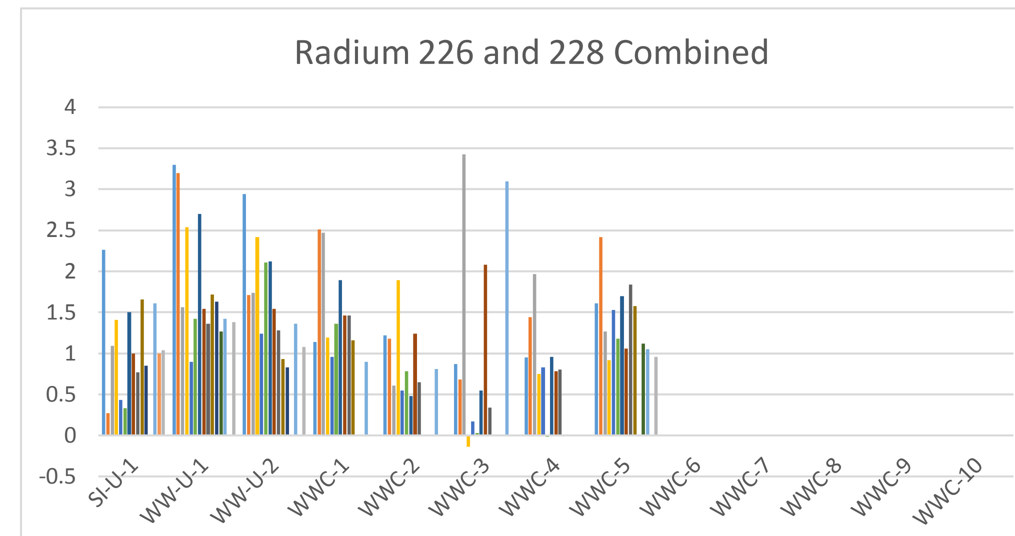

Thallium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CL-U-1
CL-U-2
CLW-1
CLW-2
CLW-3
CLW-4
CLW-5
CLW-6
CLW-7
CLW-8
CLW-9
CL-U-3


Thallium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
BA-U-1
BA-U-2
BAC-1
BAC-2
BAC-3
BAC-4
BAC-5
BAC-6
BAC-7
BAC-8
BAC-9
BAC-10


Thallium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
SI-U-1
WW-U-1
WW-U-2
WWC-1
WWC-2
WWC-3
WWC-4
WWC-5
WWC-6
WWC-7
WWC-8
WWC-9


Radium 226 and 228 Combined
4
3.5
3
2.5
2
1.5
1
0.5
0
CL-U-1
CL-U-2
CLW-1
CLW-2
CLW-3
CLW-4
CLW-5
CLW-6
CLW-7
CLW-8
CLW-9
CL-U-3


Radium 226 and 228 Combined
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
BA-U-1
BA-U-2
BAC-1
BAC-2
BAC-3
BAC-4
BAC-5
BAC-6
BAC-7
BAC-8
BAC-9
BAC-10


Radium 226 and 228 Combined
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
SI-U-1
WW-U-1
WW-U-2
WWC-1
WWC-2
WWC-3
WWC-4
WWC-5
WWC-6
WWC-7
WWC-8
WWC-9
WWC-10

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	33.23	12/7/2015	12:54
WW-U-2	23.42	12/7/2015	12:59
SI-U-1	32.47	12/7/2015	13:09
CL-U-1	32.02	12/7/2015	13:35
CL-U-2	37.55	12/7/2015	13:32
CL-W-1	31.05	12/7/2015	13:49
CL-W-2	33.14	12/7/2015	15:55
CL-W-3	31.54	12/7/2015	9:50
CL-W-4	30.56	12/7/2015	11:34
CL-W-5	29.76	12/7/2015	13:21
CL-W-6	28.71	12/7/2015	15:00
CL-W-7	35.23	12/7/2015	13:41
CL-W-8	32.37	12/7/2015	13:47
BA-U-1	39.21	12/7/2015	13:15
BA-U-2	33.26	12/7/2015	13:22
BAC-1	39.32	12/7/2015	16:58
BAC-2	51.38	12/7/2015	17:22
BAC-3	51.02	12/7/2015	17:34
BAC-4	35.35	12/7/2015	17:44
BAC-5	32.62	12/7/2015	17:47
BAC-6	29.76	12/7/2015	17:51
BAC-7	31.26	12/7/2015	17:54
WWC-1	21.16	12/7/2015	17:35
WWC-2	22.16	12/7/2015	17:40
WWC-3	16.42	12/7/2015	17:45
WWC-4	17.85	12/7/2015	17:50
WWC-5	18.78	12/7/2015	17:55

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	33.08	3/3/2016	10:23
WW-U-2	23.52	3/3/2016	9:21
SI-U-1	32.45	3/3/2016	10:27
CL-U-1	31.53	3/3/2016	9:33
CL-U-2	37.09	3/3/2016	9:31
CL-W-1	31.56	3/3/2016	10:36
CL-W-2	32.59	3/3/2016	10:34
CL-W-3	30.91	3/3/2016	13:05
CL-W-4	30.02	3/3/2016	13:02
CL-W-5	28.17	3/3/2016	13:00
CL-W-6	28.13	3/3/2016	12:57
CL-W-7	34.75	3/3/2016	10:40
CL-W-8	31.89	3/3/2016	10:38
BA-U-1	38.82	3/3/2016	9:27
BA-U-2	33.05	3/3/2016	9:24
BAC-1	39.85	3/3/2016	9:16
BAC-2	51.31	3/3/2016	9:11
BAC-3	51.29	3/3/2016	9:07
BAC-4	34.97	3/3/2016	8:59
BAC-5	32.07	3/3/2016	8:57
BAC-6	29.27	3/3/2016	8:55
BAC-7	29.78	3/3/2016	8:48
WWC-1	20.92	3/3/2016	10:21
WWC-2	21.79	3/3/2016	10:17
WWC-3	16.12	3/3/2016	10:12
WWC-4	17.56	3/3/2016	10:11
WWC-5	18.5	3/3/2016	10:09

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.2	6/24/2016	9:18
WW-U-2	24.21	6/24/2016	9:40
SI-U-1	32.93	6/24/2016	9:23
CL-U-1	31.88	6/24/2016	9:52
CL-U-2	37.41	6/24/2016	9:49
CL-W-1	30.67	6/24/2016	10:20
CL-W-2	32.49	6/24/2016	10:02
CL-W-3	30.78	6/24/2016	10:15
CL-W-4	29.86	6/24/2016	10:13
CL-W-5	27.97	6/24/2016	10:10
CL-W-6	27.9	6/24/2016	10:06
CL-W-7	34.98	6/24/2016	10:28
CL-W-8	32.07	6/24/2016	10:25
BA-U-1	39.13	6/24/2016	9:44
BA-U-2	33.49	6/24/2016	9:34
BAC-1	40.42	6/24/2016	11:40
BAC-2	51.38	6/24/2016	11:46
BAC-3	51.35	6/24/2016	11:52
BAC-4	34.85	6/24/2016	10:38
BAC-5	31.79	6/24/2016	10:41
BAC-6	28.86	6/24/2016	10:44
BAC-7	30.26	6/24/2016	10:47
WWC-1	21.47	6/24/2016	11:25
WWC-2	22.33	6/24/2016	11:22
WWC-3	16.63	6/24/2016	11:17
WWC-4	18.07	6/24/2016	11:14
WWC-5	19.03	6/24/2016	11:12

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.42	8/30/2016	9:22
WW-U-2	24.57	8/30/2016	9:27
SI-U-1	33.49	8/30/2016	9:41
CL-U-1	32.74	8/30/2016	16:16
CL-U-2	38.31	8/30/2016	16:17
CL-W-1	31.52	8/30/2016	16:28
CL-W-2	33.5	8/30/2016	16:31
CL-W-3	31.81	8/30/2016	16:34
CL-W-4	30.89	8/30/2016	16:38
CL-W-5	28.99	8/30/2016	16:39
CL-W-6	28.95	8/30/2016	16:43
CL-W-7	35.84	8/30/2016	16:23
CL-W-8	32.93	8/30/2016	16:25
BA-U-1	39.95	8/30/2016	10.:11
BA-U-2	34.24	8/30/2016	10:20
BAC-1	40.97	8/30/2016	11:42
BAC-2	52.1	8/30/2016	13:03
BAC-3	51.94	8/30/2016	14:40
BAC-4	35.68	8/30/2016	9:41
BAC-5	32.67	8/30/2016	9:36
BAC-6	29.64	8/30/2016	9:30
BAC-7	31.09	8/30/2016	8:33
WWC-1	22.4	8/30/2016	10:27
WWC-2	22.87	8/30/2016	10:31
WWC-3	17.17	8/30/2016	10:36
WWC-4	18.61	8/30/2016	10:39
WWC-5	19.6	8/30/2016	10:45

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.74	11/9/2016	13:36
WW-U-2	24.81	11/9/2016	13:39
SI-U-1	33.74	11/9/2016	13:42
CL-U-1	33.04	11/9/2016	13:56
CL-U-2	38.59	11/9/2016	13:54
CL-W-1	31.89	11/9/2016	14:07
CL-W-2	34.00	11/9/2016	14:10
CL-W-3	32.34	11/9/2016	14:15
CL-W-4	31.43	11/9/2016	14:18
CL-W-5	29.58	11/9/2016	14:19
CL-W-6	29.55	11/9/2016	14:20
CL-W-7	36.20	11/9/2016	14:03
CL-W-8	33.28	11/9/2016	14:06
BA-U-1	40.27	11/9/2016	13:49
BA-U-2	34.59	11/9/2016	13:47
BAC-1	41.51	11/9/2016	10:00
BAC-2	52.61	11/9/2016	10:02
BAC-3	52.10	11/9/2016	10:04
BAC-4	35.98	11/9/2016	14:36
BAC-5	32.90	11/9/2016	14:34
BAC-6	29.81	11/9/2016	14:31
BAC-7	30.92	11/9/2016	14:28
WWC-1	22.27	11/9/2016	13:28
WWC-2	23.22	11/9/2016	13:30
WWC-3	17.43	11/9/2016	13:23
WWC-4	18.88	11/9/2016	13:20
WWC-5	19.85	11/9/2016	13:18

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	33.88	3/30/2017	10:22
WW-U-2	22.19	3/30/2017	10:32
SI-U-1	32.89	3/30/2017	10:39
CL-U-1	31.99	3/30/2017	10:53
CL-U-2	37.56	3/30/2017	10:51
CL-W-1	32.84	3/30/2017	11:58
CL-W-2	32.72	3/30/2017	11:35
CL-W-3	31.08	3/30/2017	11:38
CL-W-4	30.25	3/30/2017	11:40
CL-W-5	28.41	3/30/2017	11:43
CL-W-6	28.40	3/30/2017	11:45
CL-W-7	35.15	3/30/2017	11:50
CL-W-8	32.04	3/30/2017	11:54
BA-U-1	39.29	3/30/2017	10:47
BA-U-2	33.67	3/30/2017	10:43
BAC-1	40.89	3/30/2017	12:23
BAC-2	51.32	3/30/2017	12:28
BAC-3	51.94	3/30/2017	12:33
BAC-4	34.73	3/30/2017	11:09
BAC-5	31.71	3/30/2017	11:07
BAC-6	28.74	3/30/2017	11:03
BAC-7	30.03	3/30/2017	11:01
WWC-1	18.91	3/30/2017	11:22
WWC-2	22.21	3/30/2017	11:27
WWC-3	16.53	3/30/2017	11:17
WWC-4	17.97	3/30/2017	11:20
WWC-5	17.94	3/30/2017	11:22

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.70	6/21/2017	8:10
WW-U-2	24.75	6/21/2017	8:19
SI-U-1	33.46	6/21/2017	8:24
CL-U-1	32.13	6/21/2017	8:42
CL-U-2	37.72	6/21/2017	8:38
CL-W-1	30.74	6/21/2017	9:24
CL-W-2	32.35	6/21/2017	9:27
CL-W-3	30.72	6/21/2017	9:29
CL-W-4	29.90	6/21/2017	9:32
CL-W-5	28.06	6/21/2017	9:34
CL-W-6	28.01	6/21/2017	9:36
CL-W-7	35.16	6/21/2017	9:20
CL-W-8	32.21	6/21/2017	9:22
BA-U-1	39.41	6/21/2017	8:32
BA-U-2	33.90	6/21/2017	8:29
BAC-1	41.29	6/21/2017	11:30
BAC-2	50.94	6/21/2017	11:36
BAC-3	51.14	6/21/2017	11:41
BAC-4	34.08	6/21/2017	9:50
BAC-5	30.98	6/21/2017	9:47
BAC-6	28.03	6/21/2017	9:46
BAC-7	29.30	6/21/2017	9:44
WWC-1	21.95	6/21/2017	13:16
WWC-2	22.74	6/21/2017	8:01
WWC-3	17.04	6/21/2017	11:51
WWC-4	18.48	6/21/2017	11:48
WWC-5	19.44	6/21/2017	11:46

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	35.43	10/4/2017	12:47
WW-U-2	25.49	10/5/2017	12:53
SI-U-1	34.28	10/6/2017	12:59
CL-U-1	33.25	10/7/2017	13:13
CL-U-2	38.81	10/8/2017	13:10
CL-W-1	31.80	10/9/2017	13:31
CL-W-2	33.60	10/10/2017	13:27
CL-W-3	31.93	10/11/2017	13:35
CL-W-4	31.09	10/12/2017	13:23
CL-W-5	29.26	10/13/2017	13:20
CL-W-6	29.26	10/14/2017	13:19
CL-W-7	36.23	10/15/2017	13:34
CL-W-8	33.28	10/16/2017	13:32
BA-U-1	40.42	10/17/2017	13:05
BA-U-2	34.85	10/18/2017	13:04
BAC-1	41.78	10/19/2017	13:16
BAC-2	52.03	10/20/2017	13:11
BAC-3	52.31	10/21/2017	13:07
BAC-4	35.29	10/22/2017	13:18
BAC-5	32.19	10/23/2017	13:22
BAC-6	29.24	10/24/2017	13:27
BAC-7	30.48	10/25/2017	13:33
WWC-1	22.69	10/26/2017	9:42
WWC-2	23.51	10/27/2017	13:43
WWC-3	17.80	10/28/2017	13:44
WWC-4	19.27	10/29/2017	13:42
WWC-5	20.26	10/30/2017	13:40

CCR Well Levels

Well	Depth	Date
WW-U-1	36.14	3/26/2018
WW-U-2	25.79	3/26/2018
SI-U-1	34.04	3/26/2018
CL-U-1	32.64	3/26/2018
CL-U-2	38.22	3/26/2018
CL-W-1	31.73	3/26/2018
CL-W-2	33.49	3/26/2018
CL-W-3	31.73	3/26/2018
CL-W-4	30.94	3/26/2018
CL-W-5	29.00	3/26/2018
CL-W-6	28.96	3/26/2018
CL-W-7	35.99	3/26/2018
CL-W-8	33.11	3/26/2018
BA-U-1	40.28	3/26/2018
BA-U-2	34.74	3/26/2018
BAC-1	42.05	3/26/2018
BAC-2	34.62	3/26/2018
BAC-3	52.76	3/26/2018
BAC-4	35.82	3/26/2018
BAC-5	33.28	3/26/2018
BAC-6	30.53	3/26/2018
BAC-7	31.88	3/26/2018
WWC-1	22.56	3/26/2018
WWC-2	23.31	3/26/2018
WWC-3	17.55	3/26/2018
WWC-4	19.04	3/26/2018
WWC-5	20.08	3/26/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.20	6/13/2018
WW-U-2	25.95	6/13/2018
SI-U-1	34.27	6/13/2018
CL-U-1	32.83	6/13/2018
CL-U-2	38.42	6/13/2018
CL-W-1	31.92	6/13/2018
CL-W-2	33.53	6/13/2018
CL-W-3	31.72	6/13/2018
CL-W-4	30.79	6/13/2018
CL-W-5	28.95	6/13/2018
CL-W-6	29.12	6/13/2018
CL-W-7	36.19	6/13/2018
CL-W-8	33.31	6/13/2018
BA-U-1	40.54	6/13/2018
BA-U-2	35.00	6/13/2018
BAC-1	42.29	6/13/2018
BAC-2	52.68	6/13/2018
BAC-3	53.92	6/13/2018
BAC-4	35.83	6/13/2018
BAC-5	33.32	6/13/2018
BAC-6	30.52	6/13/2018
BAC-7	31.83	6/13/2018
WWC-1	22.89	6/13/2018
WWC-2	23.64	6/13/2018
WWC-3	17.92	6/13/2018
WWC-4	19.34	6/13/2018
WWC-5	20.19	6/13/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.74	10/24/2018
WW-U-2	26.65	10/24/2018
SI-U-1	35.25	10/24/2018
CL-U-1	34.43	10/24/2018
CL-U-2	40.02	10/24/2018
CL-W-1	33.69	10/24/2018
CL-W-2	35.53	10/24/2018
CL-W-3	33.67	10/24/2018
CL-W-4	32.74	10/24/2018
CL-W-5	30.84	10/24/2018
CL-W-6	30.79	10/24/2018
CL-W-7	37.82	10/24/2018
CL-W-8	35.01	10/24/2018
BA-U-1	42.07	10/24/2018
BA-U-2	36.40	10/24/2018
BAC-1	43.46	10/24/2018
BAC-2	54.24	10/24/2018
BAC-3	54.22	10/24/2018
BAC-4	35.66	10/24/2018
BAC-5	35.70	10/24/2018
BAC-6	33.22	10/24/2018
BAC-7	34.85	10/24/2018
WWC-1	23.70	10/24/2018
WWC-2	24.48	10/24/2018
WWC-3	18.74	10/24/2018
WWC-4	20.22	10/24/2018
WWC-5	21.23	10/24/2018

Original CCR Wells
Appendix III and IV Constituents
America West COC #1

CCR Wells	Level	Date
WW-U-1	35.34	5/20/19
WW-U-2	25.90	5/20/19
SI-U-1	34.60	5/20/19
CL-U-1	33.35	5/20/19
CL-U-2	38.93	5/20/19
CL-W-1	32.93	5/20/19
CL-W-2	34.76	5/20/19
CL-W-3	32.86	5/20/19
CL-W-4	31.89	5/20/19
CL-W-5	29.99	5/20/19
CL-W-6	29.91	5/20/19
CL-W-7	36.94	5/20/19
CL-W-8	34.18	5/20/19
BA-U-1	41.22	5/20/19
BA-U-2	35.55	5/20/19
BAC-1	43.02	5/20/19
BAC-2	54.19	5/20/19
BAC-3	54.69	5/20/19
BAC-4	37.62	5/20/19
BAC-5	35.66	5/20/19
BAC-6	33.08	5/20/19
BAC-7	34.69	5/20/19
WWC-1	22.95	5/20/19
WWC-2	24.70	5/20/19
WWC-3	18.01	5/20/19
WWC-4	19.47	5/20/19
WWC-5	20.47	5/20/19

CCR New Wells
Appendix III and IV Constituents
America West COC #2

Investigative W	Level	Date
RW-4	19.85	5/20/19
RW-5	45.41	5/20/19
RW-7	13.80	5/20/19
WDB-19	28.00	5/20/19

New CCR Wells
Appendix III and IV Constituents
America West COC #1

Investigative W	Level	Date
CLW-9	18.37	5/20/19
WWC-6	35.74	5/20/19
WWC-7	17.47	5/20/19
WWC-8	27.06	5/20/19
WWC-9	23.80	5/20/19
WWC-10	17.80	5/20/19
BAC-8	45.65	5/20/19
BAC-9	46.70	5/20/19
BAC-10	47.21	5/20/19
CLU-3	41.49	5/20/19

Appendix IV - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226 and 228 combined

State Discharge Permit Wells
Chemtech COC #3

(All Constituents* - N	Level	Date
WR-101	54.61	5/20/19
WR-102	44.76	5/20/19
WR-103	47.30	5/20/19
EP-W-19	32.61	5/20/19

(TBS/Boron	Level	Date
RW-6	44.17	5/20/19
RW-9	42.91	5/20/19
WDB-7	41.72	5/20/19
EP-W-23	30.71	5/20/19
EP-W-27	28.92	5/20/19
WDB-19	28.00	5/20/19

* TDS, Boron, Chloride, Sulfate, Alkalinity, Sodium, Magnesium, Potassium, Calcium

Corrective Action Plan Well
Chemtech COC #4

(TDS)	Level	Date
RW-5	45.41	5/20/19

Appendix III - Boron, Calcium, Chloride, Fluoride, pH, Sulfate, TDS

Original CCR Wells
Appendix III and IV Constituents
America West COC #1

CCR Wells	Level	Date
WW-U-1	35.91	10/17/19
WW-U-2	26.64	10/17/19
SI-U-1	35.35	10/17/19
CL-U-1	34.52	10/17/19
CL-U-2	40.08	10/17/19
CL-W-1	33.81	10/17/19
CL-W-2	35.70	10/17/19
CL-W-3	33.85	10/17/19
CL-W-4	32.90	10/17/19
CL-W-5	31.02	10/17/19
CL-W-6	30.99	10/17/19
CL-W-7	37.98	10/17/19
CL-W-8	35.11	10/17/19
BA-U-1	42.09	10/17/19
BA-U-2	36.42	10/17/19
BAC-1	43.71	10/17/19
BAC-2	54.62	10/17/19
BAC-3	55.01	10/17/19
BAC-4	38.14	10/17/19
BAC-5	36.01	10/17/19
BAC-6	33.01	10/17/19
BAC-7	35.06	10/17/19
WWC-1	23.81	10/17/19
WWC-2	24.61	10/17/19
WWC-3	18.90	10/17/19
WWC-4	20.37	10/17/19
WWC-5	21.37	10/17/19

CCR New Wells
Appendix III and IV Constituents
America West COC #2

Investigative W	Level	Date
RW-4	20.69	10/17/19
RW-5	46.31	10/17/19
RW-7	14.74	10/17/19
WDB-19	29.11	10/17/19

New CCR Wells
Appendix III and IV Constituents
America West COC #1

Investigative W	Level	Date
CLW-9	36.97	10/17/19
WWC-6	19.57	10/17/19
WWC-7	19.20	10/17/19
WWC-8	28.15	10/17/19
WWC-9	24.86	10/17/19
WWC-10	19.40	10/17/19
BAC-8	46.07	10/17/19
BAC-9	47.18	10/17/19
BAC-10	47.80	10/17/19
CLU-3	42.49	10/17/19

Appendix IV - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226 and 228 combined

State Discharge Permit Wells
Chemtech COC #3

(All Constituents* - I	Level	Date
WR-101	54.60	10/17/19
WR-102	43.14	10/17/19
WR-103	45.40	10/17/19
EP-W-19	33.52	10/17/19

(TBS/Boron	Level	Date
RW-6	44.69	10/17/19
RW-9	43.16	10/17/19
WDB-7	42.55	10/17/19
EP-W-23	31.66	10/17/19
EP-W-27	29.89	10/17/19
WDB-19	29.11	10/17/19

* TDS, Boron, Chloride, Sulfate, Alkalinity, Sodium, Magnesium, Potassium, Calcium

Corrective Action Plan Well
Chemtech COC #4

(TDS)	Level	Date
RW-5	46.31	10/17/19

Appendix III - Boron, Calcium, Chloride, Fluoride, pH, Sulfate, TDS

Original CCR Wells
Appendix III and IV Constituents
America West COC #1

	Level	Date
WW-U-1	30.42	3/23/2020
WW-U-2	22.31	3/23/2020
SI-U-1	33.78	3/23/2020
CL-U-1	33.46	3/23/2020
CL-U-2	38.92	3/23/2020
CL-W-1	32.75	3/23/2020
CL-W-2	34.71	3/23/2020
CL-W-3	32.87	3/23/2020
CL-W-4	31.99	3/23/2020
CL-W-5	30.09	3/23/2020
CL-W-6	30.08	3/23/2020
CL-W-7	36.70	3/23/2020
CL-W-8	33.95	3/23/2020
BA-U-1	40.76	3/23/2020
BA-U-2	34.81	3/23/2020
BAC-1	41.89	3/23/2020
BAC-2	53.88	3/23/2020
BAC-3	54.42	3/23/2020
BAC-4	37.21	3/23/2020
BAC-5	35.05	3/23/2020
BAC-6	32.35	3/23/2020
BAC-7	33.95	3/23/2020
WWC-1	22.85	3/23/2020
WWC-2	23.80	3/23/2020
WWC-3	18.02	3/23/2020
WWC-4	19.42	3/23/2020
WWC-5	20.39	3/23/2020

Appendix IV - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226 and 228 combined

Investigative Wells
Appendix III and IV Constituents
America West COC #2

	Level	Date
RW-4	19.80	3/23/2020
RW-5	45.88	3/23/2020
RW-7	14.01	3/23/2020
WDB-19	28.19	3/23/2020
RW-1		3/23/2020
EPW-15	43.84	3/23/2020

New CCR Wells
Appendix III and IV Constituents
America West COC #1

	Level	Date
CLW-9	36.13	3/23/2020
WWC-6	18.48	3/23/2020
WWC-7	17.68	3/23/2020
WWC-8	27.11	3/23/2020
WWC-9	23.98	3/23/2020
WWC-10	17.92	3/23/2020
WWC-11	22.01	3/23/2020
WWC-12	19.59	3/23/2020
WWC-13	18.66	3/23/2020
~~BAC-8~~	46.08	3/23/2020
~~BAC-9~~	47.08	3/23/2020
~~BAC-10~~	47.60	3/23/2020
BAC-11	47.73	3/23/2020
BAC-12	48.07	3/23/2020
BAC-13	45.11	3/23/2020
BAC-14	46.62	3/23/2020
BAC-15	45.92	3/23/2020
BAC-16	47.19	3/23/2020
~~BAC-17~~	45.33	3/23/2020
CLU-3	41.32	3/23/2020

State Discharge Permit Wells
Chemtech COC #3

	Level	Date
WR-101	35.91	3/23/2020
WR-102	32.16	3/23/2020
WR-103	45.40	3/23/2020
EP-W-19	32.81	3/23/2020

(TBS/Boron	Level	Date
~~RW-6~~	44.55	3/23/2020
RW-9	43.32	3/23/2020
WDB-7	42.13	3/23/2020
EP-W-23	30.75	3/23/2020
EP-W-27	28.79	3/23/2020
WDB-19	28.19	3/23/2020

* TDS, Boron, Chloride, Sulfate, Alkalinity, Sodium, Magnesium, Potassium, Calcium

Corrective Action Plan Well
Chemtech COC #4

(TDS)	Level	Date
RW-5	45.88	3/23/2020

Appendix III - Boron, Calcium, Chloride, Fluoride, pH, Sulfate, TDS

Round 1 Detection Monitoring - December 2-10, 2015

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	68.9	418	0.813	7.82	131	1040	0	0.0378	0.126	0	0	0.00537	0	0	0.346	0	0.00459	0	0	0.52	0.5	1.02
CL-U-2	0	73.8	404	0.611	7.73	132	1020	0	0.0317	0.129	0	0	0.00613	0	0	0.325	0	0.00406	0	0	0.55	1.2	1.75
CLW-1	0	55.7	322	0.844	7.95	76.5	832	0	0.0264	0.105	0	0	0.00814	0	0	0.3	0	0.00574	0	0	0.56	1.6	2.16
CLW-2	0	53.9	432	0.695	7.75	108	976	0	0.0283	0.0957	0	0	0.00576	0	0	0.36	0	0.00472	0	0	0.51	1.1	1.61
CLW-3	0	45	367	0.948	7.86	123	928	0	0.0375	0.111	0	0	0.00346	0	0	0.337	0	0.00492	0	0	0.4	1.3	1.7
CLW-4	0	44.5	320	1.37	7.87	73.3	828	0	0.0308	0.122	0	0	0.00336	0	0	0.319	0	0.00584	0	0	0.34	1.9	2.24
CLW-5	0	38.4	345	1.51	7.81	88.3	872	0	0.0188	0.0864	0		0	0	0	0.0325	0	0.00841	0	0	0.37	1.6	1.97
CLW-6	0	33.6	325	1.38	7.71	74.5	820	0	0.0249	0.0879	0	0	0.00335	0	0	0.316	0	0.0104	0	0	0.37	0.63	1
CLW-7	0	47.3	339	0.792	7.81	66.4	812	0	0.0234	0.0593	0	0	0.00421	0	0	0.282	0	0.00331	0	0	0.14	0.52	0.66
CLW-8	0	43.6	324	0.797	7.8	70.5	772	0	0.0155	0.107	0	0	0.00463	0	0	0.285	0	0.00626	0	0	0.4	0.74	1.14
CLW-9																							
CL-U-3																							

Round 1

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	13.46	7.74	-42	1720	443	2.12	-
CL-U-2	14.72	6.92	-38	1750	604	2.6	-
CLW-1	14.84	7.69	-45	1490	383	2.28	0.952
CLW-2	9.95	7.86	-144	1810	99.6	1.76	1.16
CLW-3	11.24	7.95	-158	1740	128	1.9	1.11
CLW-4	14.9	7.95	-165	1540	25.1	1.67	0.98
CLW-5	15.12	7.96	-134	1620	46.4	1.6	1.04
CLW-6	15.3	8	-193	1550	30.8	0.98	0.998
CLW-7	16.38	7.54	8	1430	90.9	7.01	0.917
CLW-8	15.01	7.58	0	1530	11.3	2.09	0.976
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	51.4	430	1.21	8.06	121	984	0	0.0163	0.133	0	0	0.00305	0	0	0.313	0	0.0408	0	0	0.66	0.7	1.36
BA-U-2	0	53	343	0.727	8.9	48.9	82.4	0	0.0154	0.148	0	0	0.00971	0	0	0.297	0	0.0121	0	0	0.32	2.1	2.42
BAC-1	7.49	274	3280	0.299	7.37	3060	8860	0.00237	0.0146	0.1	0	0	0.00503	0.00605	0	1.52	0	0.143	0.0204	0	0.71	1.6	2.31
BAC-2	10.7	267	2000	0.741	7.29	3620	7820	0	0.0386	0.0472	0	0	0.0116	0	0	1.38	0	0.151	0.0164	0	0.48	0.94	1.42
BAC-3	6.09	387	2900	0.648	7.6	3840	9800	0	0.0191	0.0827	0	0	0.0615	0	0	2.13	0	0.0367	0.019	0	0.99	1.1	2.09
BAC-4	0	53	473	1.35	7.96	181	1150	0	0.0407	0.0821	0	0	0.0022	0	0	0.476	0	0.0104	0	0	0.19	0.5	0.69
BAC-5	0	51.1	483	1.11	7.83	129	1010	0	0.0357	0.0928	0	0	0.0161	0	0	0.479	0	0.00926	0	0	0.29	0.96	1.25
BAC-6	4.36	142	516	0.754	7.68	1080	2410	0	0.0134	0.0622	0	0	0.0363	0	0	0.599	0	0.0968	0	0	0.39	1.4	1.79
BAC-7	4.65	148	665	1.01	7.77	1360	2910	0	0.0191	0.0577	0	0	0.0264	0	0	0.681	0	0.0699	0.00276	0	0.46	0.92	1.38

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	14.56	7.93	-67	1590	106	2.51	-
BA-U-2	13.58	8.33	-85	1510	96.4	2.9	-
BAC-1	11.8	7.32	111	15100	54.8	1.84	9.35
BAC-2	15.7	7.12	79	11800	100	1.82	7.33
BAC-3	16.24	7.51	75	15000	34.2	1.36	9.28
BAC-4	14.36	7.93	12	2230	12.5	2.07	1.43
BAC-5	13.96	7.88	-18	2020	113	0.97	1.29
BAC-6	12.49	7.69	-157	3610	96.1	1.2	2.31
BAC-7	14.17	7.76	-96	4430	789	1.12	2.84

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0.594	171	667	0	7.4	918	2300	0	0.00266	0.112	0	0	0.0099	0	0	0.49	0	0.00554	0	0	0.56	1.7	2.26
WW-U-1	1.05	374	2180	0	7.06	1470	5430	0	0.00453	0.178	0	0	0.0032	0	0	0.983	0	0.00619	0.00549	0	1	2.3	3.3
WW-U-2	1.6	358	2430	0	7.23	1370	5540	0	0.00309	0.123	0	0	0.00582	0.0072	0	0.934	0	0.0237	0.00543	0	0.84	2.1	2.94
WWC-1	9.62	561	4840	0	7.19	3150	11800	0	0.0181	0.0536	0	0	0.0139	0	0	2.69	0.00031	0.00701	0.0152	0	0.31	0.83	1.14
WWC-2	0	66.5	381	0.158	7.91	147	940	0	0.0155	0.0511	0	0	0.00348	0	0	0.241	0	0.00383	0	0	0.12	1.1	1.22
WWC-3	0	34.5	284	1.01	8.11	82.2	688	0	0.0102	0.0638	0	0	0.00577	0	0	0.243	0	0.0459	0	0	0.32	0.55	0.87
WWC-4	1.09	247	1270	0.387	7.61	800	3250	0	0.0116	0.09	0	0	0.00877	0	0	0.909	0	0.00467	0.00207	0	0.5	0.45	0.95
WWC-5	2.4	345	1810	0.331	7.47	1610	5020	0	0.00783	0.103	0	0	0.00892	0.0055	0	4.41	0	0.0265	0	0	0.51	1.1	1.61
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	10.79	7.27	-14	3720	74	6.93	-
WW-U-1	13.11	7.01	2	7920	32.9	3.2	-
WW-U-2	12.59	7.23	-11	7920	93.4	5.09	-
WWC-1	14.94	7.06	15	1850	110	1.28	11.5
WWC-2	17.36	7.88	-44	1680	79.9	1.08	1.07
WWC-3	13.92	8.1	-249	1430	121	1.29	0.918
WWC-4	14.73	7.4	-20	5230	61.1	1.52	3.3
WWC-5	15.35	7.3	-122	7740	348	0.97	4.88
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 2 Detection Monitoring - February 23-March 8, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	47.7	391	0.839	8.52	123	908	0	0.0415	0.0953	0	0	0	0	0	0.401	0	0.00733	0	0	0.27	1.6	1.87
CL-U-2	0	59.9	372	0.873	7.75	119	940	0	0.0243	0.0934	0	0	0	0	0	0.387	0	0.00414	0	0	0.28	1	1.28
CLW-1	0	35.1	301	0.834	7.89	71.6	808	0	0.0266	0.0648	0	0	0.00235	0	0	0.361	0	0.00506	0	0	0.36	1.5	1.86
CLW-2	0	45.9	378	1.18	7.66	90.5	936	0	0.0243	0.0882	0	0	0	0	0	0.438	0	0.00481	0	0	0.51	0.53	1.04
CLW-3	0	40.5	336	1.35	7.92	96	884	0	0.0437	0.103	0	0	0	0	0	0.435	0	0.0049	0	0	0.47	1.1	1.57
CLW-4	0	32.1	282	1.53	7.87	80.9	776	0	0.0271	0.109	0	0	0	0	0	0.375	0	0.00762	0	0	0.37	0.7	1.07
CLW-5	0	35.4	318	1.82	7.91	85.7	824	0	0.0214	0.0869	0	0	0	0	0	0.411	0	0.00922	0	0	0.27	0.32	0.59
CLW-6	0	32.1	306	1.72	7.97	75.4	816	0	0.0246	0.095	0	0	0	0	0	0.4	0	0.0117	0	0	0.02	0.96	0.98
CLW-7	0	42.8	290	0.825	7.65	67.6	832	0	0.0239	0.0794	0	0	0	0	0	0.327	0	0.146	0	0	0.14	0.29	0.43
CLW-8	0	41.5	293	0.782	7.8	70.3	808	0	0.022	0.0839	0	0	0.00224	0	0	0.35	0	0.00499	0	0	0.32	0.32	0.64
CLW-9																							
CL-U-3																							

Round 2

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	14.18	8.74	-209	1750	4.3	2.15	1.12
CL-U-2	14.41	7.75	-89	1820	4.6	1.85	1.17
CLW-1	15.84	7.95	-60	1560	3.8	1.4	0.996
CLW-2	17.53	7.81	-137	1840	2	9.35	1.17
CLW-3	14.99	7.87	-203	1710	0	3.96	1.09
CLW-4	17.08	7.81	-211	1490	11.5	1.82	0.955
CLW-5	17.06	7.82	-168	1650	10.9	8.45	1.06
CLW-6	15.83	7.91	-194	1600	6.2	0.95	1.02
CLW-7	16.53	7.75	9	1560	3.5	2.67	0.996
CLW-8	15.86	7.81	-25	1560	8	1.92	0.996
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	28.7	258	1.67	8.55	64.2	852	0	0.023	0.0969	0	0	0	0	0	0.376	0	0.0359	0	0	0.33	1.3	1.63
BA-U-2	0	67.4	529	0.938	8.02	55.7	1230	0	0.0199	0.175	0	0	0	0	0	0.514	0	0.00298	0	0	0.2	1	1.2
BAC-1	2.85	155	1730	0	7.86	1390	5240	0	0.0174	0.39	0	0	0.00536	0	0	0.63	0	0.0607	0.0131	0	0.96	1.6	2.56
BAC-2	9.83	196	1600	0	7.35	2900	7640	0	0.0411	0.0385	0	0	0.00742	0	0.00221	1.22	0	0.167	0.0128	0	0.4	2.5	2.9
BAC-3	6.55	406	3240	0	7.62	3960	10400	0	0.0192	0.0553	0	0	0.00676	0	0	1.12	0	0.0337	0.0184	0	0.44	0.68	1.12
BAC-4	0	57.4	488	1.36	7.87	191	1290	0	0.0371	0.0806	0	0	0	0	0	0.532	0	0.0106	0	0	0.48	0.5	0.98
BAC-5	0	41.3	433	1.34	7.95	111	1010	0	0.0392	0.0736	0	0	0	0	0	0.476	0	0.00758	0	0	0.25	-0.03	0.22
BAC-6	2.67	98.4	491	0.734	7.72	636	1880	0	0.0144	0.0736	0	0	0	0	0	0.597	0	0.0569	0	0	0.61	0.6	1.21
BAC-7	4.43	132	623	1.07	7.89	1230	2980	0	0.0225	0.0372	0	0	0	0	0	0.699	0	0.0681	0.00274	0	0.16	0.51	0.67

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	13.53	8.63	5	1550	11.3	2.59	0.995
BA-U-2	15.78	7.94	-167	2240	19.7	1.06	1.44
BAC-1	17.51	8.16	39	6.5	10.7	3	4.11
BAC-2	16.74	7.2	322	9.96	3.2	2.59	6.26
BAC-3	14.4	7.36	29	1590	3.8	3.35	9.84
BAC-4	15.9	7.81	-55	2370	3.9	2.08	1.51
BAC-5	16.34	7.92	-23	1980	4	2.89	1.27
BAC-6	18.19	7.67	-8	2.94	0	1.73	1.88
BAC-7	14.22	7.9	-9	4560	3.9	2.46	2.92

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	168	752	0.557	7.65	665	2320	0	0.00781	0.0846	0	0	0.00346	0	0	0.634	0	0.00671	0	0	0.43	-0.16	0.27
WW-U-1	1.03	346	2430	0	7.23	1440	5330	0	0.00446	0.123	0	0	0	0	0	1.33	0	0.00669	0.00432	0	1	2.2	3.2
WW-U-2	1.59	362	2410	0	7.34	1370	5780	0	0.00846	0.0761	0	0	0.00735	0	0	1.35	0	0.0126	0.0108	0	0.51	1.2	1.71
WWC-1	6.01	458	4530	0.256	7.24	2710	10800	0	0.00331	0.072	0	0	0.00369	0.00842	0	1.08	0	0.0103	0.00919	0	0.91	1.6	2.51
WWC-2	0	61.3	352	0.208	7.97	131	932	0	0.0147	0.0421	0	0	0.00335	0	0	0.162	0	0.00391	0	0	0.18	1	1.18
WWC-3	0	29.2	203	0.845	8.2	78.5	660	0	0.021	0.0357	0	0	0	0	0	0.172	0	0.00593	0	0	0.16	0.52	0.68
WWC-4	0.826	185	1100	0.39	7.31	716	3100	0	0.00923	0.101	0	0	0	0	0	0.75	0	0.00783	0	0	0.6	0.84	1.44
WWC-5	1.59	320	1640	0.319	7.22	1210	4790	0	0.00371	0.0882	0	0	0	0	0	1.41	0	0.0205	0.00345	0	0.52	1.9	2.42
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	12.99	7.49	11	3790	7.4	1.37	2.42
WW-U-1	15.75	7.21	-117	8030	19.6	4.07	5.06
WW-U-2	14.5	7.34	-22	9240	12.9	2.4	5.82
WWC-1	15.29	7.11	-108	1400	11.8	7.82	8.62
WWC-2	14.19	7.75	-86	1720	9.1	2.37	1.1
WWC-3	15.63	8.1	-183	1190	2	1.36	0.759
WWC-4	15.58	7.37	-8	5004	4.7	1.61	3.18
WWC-5	15	7.22	19	7510	6.4	2	4.75
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 3 Detection Monitoring - June 6-15, 2016

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	51.2	414	1.01	7.83	122	1080	0	0.0507	0.0887	0	0	0	0	0	0.378	0	0.00491	0	0	0.11	0.72	0.83
CL-U-2	0	53.7	390	1.14	7.75	121	976	0	0.0245	0.0933	0	0	0	0	0	0.346	0	0.00391	0	0	0.26	1.5	1.76
CLW-1	0	34.6	312	1.13	7.9	70.1	716	0	0.0285	0.0621	0	0	0	0	0	0.318	0	0.00438	0	0	0.28	0.89	1.17
CLW-2	0	43.9	402	1.21	7.84	87.9	976	0	0.0264	0.0819	0	0	0	0	0	0.396	0	0.00427	0	0	0.25	1.1	1.35
CLW-3	0	36.2	346	1.3	7.86	104	876	0	0.0402	0.0992	0	0	0	0	0	0.375	0	0.00463	0	0	0.35	1.2	1.55
CLW-4	0	30.6	294	1.58	7.79	77.9	748	0	0.0196	0.119	0	0	0	0	0	0.338	0	0.0092	0	0	0.45	0.72	1.17
CLW-5	0	33	336	1.81	7.86	84.9	848	0	0.0182	0.0851	0	0	0	0	0	0.352	0	0.00868	0	0	0.27	0.65	0.92
CLW-6	0	29.8	313	1.73	7.9	73.2	756	0	0.0181	0.0901	0	0	0	0	0	0.333	0	0.0105	0	0	0.34	1.4	1.74
CLW-7	0	39.3	328	1.16	7.64	67.4	732	0	0.0246	0.0581	0	0	0.00891	0	0	0.331	0	0.00638	0	0	0.19	0.55	0.74
CLW-8	0	40.3	312	1.08	7.82	69.7	808	0	0.0225	0.0797	0	0	0	0	0	0.32	0	0.00435	0	0	0.27	0.32	0.59
CLW-9																							
CL-U-3																							

Round 3

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	18.94	8.04	-204	1910	22.6	1.2	1.22
CL-U-2	18.47	7.7	-136	1900	1	2.72	1.22
CLW-1	23.71	7.77	62	1550	0	1.34	0.99
CLW-2	22.15	7.66	-169	1840	0	1.31	1.17
CLW-3	20.8	7.71	-225	1720	0.8	1.8	1.1
CLW-4	19.51	7.8	-235	1480	0	4.39	0.95
CLW-5	21.24	7.77	-209	1570	11.5	4.22	1.01
CLW-6	18.81	7.87	-235	1600	0	1.7	1.02
CLW-7	16.73	7.62	66	1580	8.9	3.82	1.01
CLW-8	20.93	7.66	55	1510	0	12.58	0.966
CLW-9							
CL-U-3							

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	195	1130	0.801	7.63	339	2520	0	0.0177	0.0935	0	0	0	0	0	0.773	0	0.00317	0.00426	0	0.3	1.6	1.9
BA-U-2	0	15.9	284	0.865	12	40.6	720	0	0	0.128	0	0	0.0032	0	0	0.315	0	0.016	0	0	0.22	1.5	1.72
BAC-1	4.73	191	2240	0.402	7.59	1840	6420	0	0.0164	0.081	0	0	0.0033	0	0	1.3	0	0.0669	0.0168	0	0.51	1.3	1.81
BAC-2	11.2	216	1650	0.986	7.17	3220	7520	0	0.0416	0.0248	0	0	0.00488	0	0	1.32	0	0.14	0.0142	0	0.17	1.6	1.77
BAC-3	6.82	445	3230	0.794	7.42	4490	10900	0	0.0158	0.048	0	0	0.00707	0	0	2.53	0	0.0269	0.0198	0	0.25	1.6	1.85
BAC-4	0	66.1	551	1.38	7.73	223	1280	0	0.0334	0.0772	0	0	0.00461	0	0	0.509	0	0.0122	0	0	0.16	0.68	0.84
BAC-5	0	50.4	541	1.26	7.79	122	1220	0	0.0337	0.0839	0	0	0	0	0	0.494	0	0.00738	0	0	0.11	1.7	1.81
BAC-6	1.7	89.5	521	1.04	7.72	448	1560	0	0.0122	0.0859	0	0	0	0	0	0.542	0	0.0359	0	0	0.27	0.76	1.03
BAC-7	4.51	132	685	1.31	7.69	1370	2870	0	0.0234	0.0315	0	0	0	0	0	0.674	0	0.0749	0.00319	0	0.17	2.4	2.57

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.51	7.48	-114	4730	4.9	1.73	3.03
BA-U-2	20.17	11.9	-206	1980	5.1	4.04	1.26
BAC-1	20.91	7.43	-5	10.3	33.2	3.43	6.41
BAC-2	19.81	7.01	33	11.6	2	0.69	7.18
BAC-3	18.81	7.19	16	16.6	2.6	1.26	10.3
BAC-4	18.21	7.71	83	2490	2.6	3.05	1.59
BAC-5	18.58	7.75	51	2260	0	1320	1.45
BAC-6	20.42	7.7	50	2740	0.4	21.84	1.75
BAC-7	21.43	7.63	-7	4510	8	15.04	2.89

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	129	901	0.564	7.6	318	1880	0	0.00989	0.0929	0	0	0.0156	0	0	0.499	0	0.00411	0	0	0.45	0.64	1.09
WW-U-1	1.18	296	2030	0.386	7.21	1300	5820	0	0.0052	0.115	0	0	0	0	0	1	0	0.00888	0.00637	0	0.64	0.92	1.56
WW-U-2	1.49	412	2300	0.534	7.33	1180	5400	0	0.00538	0.0746	0	0	0.0114	0	0	1.08	0	0.0126	0.0107	0	0.64	1.1	1.74
WWC-1	3.59	526	3950	0	7.12	1990	8820	0	0.00401	0.077	0	0	0	0.00532	0	2.18	0	0.00653	0.00824	0	0.47	2	2.47
WWC-2	0	59.1	369	0.833	7.79	145	956	0	0.0151	0.0408	0	0	0	0	0	0.225	0	0.00402	0	0	0.22	0.39	0.61
WWC-3	0	26.4	197	1.02	8.12	85.6	664	0	0.0213	0.0328	0	0	0	0	0	0.23	0	0.00574	0	0	0.13	3.3	3.43
WWC-4	0.627	138	902	0.576	7.57	406	2010	0	0.00498	0.0768	0	0	0	0	0	0.606	0	0.0082	0	0	0.27	1.7	1.97
WWC-5	1.65	406	1730	0.3	7.24	1140	5060	0	0.00608	0.067	0	0	0	0	0	1.4	0	0.0119	0.00363	0	0.42	0.85	1.27
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	18	7.54	-69	3350	0.3	8.11	2.14
WW-U-1	22.73	7.15	34	7560	0	4.74	4.76
WW-U-2	18.42	7.25	-66	8820	25.9	1.6	5.56
WWC-1	18.38	6.9	62	14.7	1.6	1.86	9.13
WWC-2	18.22	7.74	-101	1.74	1.9	5.2	1.12
WWC-3	16.62	7.99	-168	1.2	0	0.59	0.765
WWC-4	16.85	7.43	-8	3.63	1.2	0.85	2.32
WWC-5	17.35	7.01	15	7.44	1	0.78	4.69
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 4 Detection Monitoring - August 22-September 1, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	54.8	424	1.03	7.63	124	1030	0	0.0301	0.0911	0	0	0	0	0	0.375	0	0.00428	0	0	0.36	0.44	0.8
CL-U-2	0	57.7	406	1.17	7.69	113	948	0	0.0265	0.0961	0	0	0.00227	0	0	0.351	0	0.00508	0	0	0.31	1.1	1.41
CLW-1	0	35	315	1.18	7.89	65.4	832	0	0.0279	0.0594	0	0	0	0	0	0.316	0	0.00454	0	0	0.52	0.86	1.38
CLW-2	0	46.8	424	1.29	7.75	89.2	992	0	0.0284	0.0823	0	0	0	0	0	0.391	0	0.00462	0	0	0.31	0.62	0.93
CLW-3	0	38.7	349	1.33	7.75	109	896	0	0.0412	0.0995	0	0	0	0	0	0.368	0	0.00472	0	0	0.3	0.15	0.45
CLW-4	0	32.1	318	1.53	7.81	84.5	808	0	0.0316	0.104	0	0	0	0	0	0.336	0	0.00577	0	0	0.39	0.62	1.01
CLW-5	0	34.3	350	1.83	7.75	92.1	860	0	0.0189	0.0803	0	0	0	0	0	0.346	0	0.00798	0	0	0.24	0.27	0.51
CLW-6	0	31.5	331	1.73	7.84	77.1	812	0	0.0164	0.0966	0	0	0	0	0	0.342	0	0.011	0	0	0.2	1	1.2
CLW-7	0	42.1	336	1.1	7.71	70	760	0	0.024	0.0529	0	0	0	0	0	0.302	0	0.00396	0	0	0.17	0.33	0.5
CLW-8	0	40.1	327	1.08	7.73	75	720	0	0.0224	0.0761	0	0	0	0	0	0.308	0	0.00459	0	0	0.35	1	1.35
CLW-9																							
CL-U-3																							

Round 4

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.53	7.66	-180	1.84	4.1	1.72	1.18
CL-U-2	19.27	7.65	-151	1.81	0	9.25	1.16
CLW-1	18.96	7.85	34	1.55	0	5.66	0.992
CLW-2	19.41	7.7	-177	1.81	0	10.68	1.16
CLW-3	19.1	7.74	-225	1.66	0	10.74	1.07
CLW-4	21.52	7.8	-244	1.54	0	5.07	0.985
CLW-5	20.36	7.74	-195	1.67	45.2	9.17	1.07
CLW-6	18.53	7.79	-235	1.61	0	4.22	1.03
CLW-7	19.86	7.62	-71	1.57	0.01	12.06	1.01
CLW-8	20.81	7.7	-78	1.53	0	5.02	0.976
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	180	1170	0.888	7.62	327	2390	0	0.0191	0.0802	0	0	0	0	0	0.684	0	0.00386	0.00384	0	0.45	0.84	1.29
BA-U-2	0	10.4	317	0.975	11.8	39.9	748	0	0.00225	0.114	0	0	0.00216	0	0	0.337	0	0.0147	0	0	0.26	1.1	1.36
BAC-1	4.95	221	2520	0.401	7.52	2380	7210	0	0.0146	0.0643	0	0	0.0028	0	0	1.42	0	0.0603	0.0148	0	0.63	0.64	1.27
BAC-2	10.5	203	1640	1.03	7.22	3180	7620	0	0.0431	0.0237	0	0	0.0081	0	0	1.17	0	0.166	0.0136	0	0.33	0.23	0.56
BAC-3	6.77	399	3350	1.28	7.36	4630	11700	0	0.0213	0.0436	0	0	0.00386	0	0	2.37	0	0.0294	0.019	0	0.38	0.76	1.14
BAC-4	0	56.1	498	1.35	7.62	210	1460	0	0.0358	0.0757	0	0	0	0	0	0.508	0	0.0103	0	0	0.19	0.83	1.02
BAC-5	0	49.4	561	1.25	7.68	127	1200	0	0.0331	0.0879	0	0	0	0	0	0.538	0	0.0077	0	0	0.1	0.46	0.56
BAC-6	1.38	80.2	546	0.901	7.61	502	1540	0	0.0115	0.0781	0	0.000677	0.00283	0	0	0.54	0	0.034	0	0	0.31	0.24	0.55
BAC-7	3.96	126	612	1.28	7.68	1370	2770	0	0.0232	0.0274	0	0	0	0	0	0.669	0	0.0942	0.00257	0	0.37	-0.17	0.2

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	20.11	7.46	-160	4.24	0	3.38	2.72
BA-U-2	17.77	11.83	-224	2.11	9.1	8.94	1.35
BAC-1	22.39	7.33	10	11.8	8.7	2.54	7.3
BAC-2	21.36	7.04	0	10200	0	2.17	6.33
BAC-3	22.52	7.22	34	15.4	0	2.18	9.58
BAC-4	19.45	7.62	-94	2350	0	11.45	1.51
BAC-5	19.21	7.62	-96	2340	0	10.71	1.5
BAC-6	19.95	7.59	9	2650	0	24.99	1.7
BAC-7	19.38	7.56	-77	4270	0	2.75	2.73

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	131	922	0.564	7.57	281	1880	0	0.00926	0.0858	0	0	0.00217	0	0	0.467	0	0.00295	0	0	0.45	0.96	1.41
WW-U-1	1.25	304	2200	0.327	7.21	1280	5270	0	0.00439	0.0916	0	0	0.00337	0	0	1.01	0	0.00835	0.00689	0	0.54	2	2.54
WW-U-2	0.641	308	2140	0.614	7.42	854	4550	0	0.00258	0.117	0	0	0.00424	0	0	0.994	0	0.0342	0.00617	0	0.82	1.6	2.42
WWC-1	10.2	457	4680	0.213	7.11	3130	12100	0	0.02	0.0335	0	0	0	0	0	2.41	0.00019	0.00966	0.0145	0	0.33	0.86	1.19
WWC-2	0	57.9	389	0.508	7.86	151	960	0	0.0152	0.0406	0	0	0	0	0	0.243	0	0.0034	0	0	0.69	1.2	1.89
WWC-3	0	27.3	220	1.03	8.02	78	628	0	0.0217	0.0342	0	0	0	0	0	0.241	0	0.00559	0	0	0.2	-0.34	-0.14
WWC-4	1.17	225	1330	0.422	7.37	868	3230	0	0.0131	0.065	0	0	0	0	0	0.879	0	0.00237	0.00238	0	0.27	0.48	0.75
WWC-5	2.87	326	1920	0.366	7.18	1700	5440	0	0.00717	0.0439	0	0	0	0	0	1.33	0	0.00742	0.00312	0	0.41	0.51	0.92
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	21.31	7.57	-21	3.25	1.6	14.7	2.08
WW-U-1	20.96	7.12	34	8.06	10.9	3.52	5.08
WW-U-2	19.51	7.41	-63	7.34	4.7	8.24	4.62
WWC-1	20.69	6.94	-34	18400	0	0.54	11.4
WWC-2	17.91	7.64	-153	1720	2.6	3.57	1.1
WWC-3	17.39	7.97	-176	1200	0	0.54	0.766
WWC-4	17.14	7.22	-68	5320	0	2.25	3.35
WWC-5	17.85	7.01	-89	7790	0.9	0.59	4.91
WWC-6							
WWC-7							

Round 5 Detection Monitoring - October 17-26, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.4	424	0.959	7.7	115	912	0	0.037	0.089	0	0	0	0	0	0.217	0	0.00404	0	0	0.25	0.18	0.43
CL-U-2	0	59.5	395	0.99	7.73	113	864	0	0.0269	0.101	0	0	0	0	0	0.206	0	0.00401	0	0	0.36	0.84	1.2
CLW-1	0	38.9	325	1.15	7.8	67.8	824	0	0.0295	0.0668	0	0	0	0	0	0.189	0	0.0043	0	0	0.27	0.19	0.46
CLW-2	0	49.2	422	1.13	7.82	85.3	984	0	0.0258	0.0855	0	0	0	0	0	0.223	0	0.00456	0	0	0.31	0.34	0.65
CLW-3	0	40.8	366	1.19	7.83	100	944	0	0.0412	0.104	0	0	0	0	0	0.214	0	0.00508	0	0	0.35	0.13	0.48
CLW-4	0	34.6	335	1.39	7.84	85.9	828	0	0.0385	0.0932	0	0	0	0	0	0.203	0	0.00414	0	0	0.59	-0.37	0.22
CLW-5	0	35.3	339	1.69	7.89	82.1	928	0	0.0206	0.0812	0	0	0	0	0	0.204	0	0.00723	0	0	0.31	0.84	1.15
CLW-6	0	33.9	325	1.46	7.85	77.9	972	0	0.0287	0.0908	0	0	0	0	0	0.203	0	0.00638	0	0	0.35	0.18	0.53
CLW-7	0	42.8	343	1.14	7.9	68.6	796	0	0.0235	0.0551	0	0	0.00234	0	0	0.182	0	0.00413	0	0	0.27	0.32	0.59
CLW-8	0	41.7	334	1.11	7.77	68.9	744	0	0.0258	0.0797	0	0	0	0	0	0.189	0	0.00428	0	0	0.37	-0.28	0.09
CLW-9																							
CL-U-3																							

Round 5

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.15	7.72	-195	1900	0.7	2.79	1.22
CL-U-2	16.89	7.67	-102	1820	0.4	0.82	1.17
CLW-1	16.85	7.77	-50	1520	2	1.57	0.974
CLW-2	17.05	7.76	-202	1900	0.4	3.82	1.21
CLW-3	15.28	7.75	-231	1720	1.8	1.29	1.1
CLW-4	14.67	7.78	-235	1620	7	1.4	1.04
CLW-5	17.4	7.71	-209	1690	8.1	1.41	1.08
CLW-6	15.85	7.83	-249	1620	1.1	1.72	1.04
CLW-7	17.42	7.7	-73	564	0	13.65	0.361
CLW-8	17.18	7.7	-100	1530	2.2	1.03	0.978
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	16.7	327	1.65	9.08	60.2	832	0	0.0362	0.0679	0	0	0	0	0	0.215	0	0.0163	0	0	0.67	0.13	0.8
BA-U-2	0	38.1	357	1.02	8.56	51.9	824	0	0.0234	0.131	0	0	0	0	0	0.21	0	0.00449	0	0	0.57	0.42	0.99
BAC-1	3.42	131	1850	0.437	8.8	1610	7720	0	0.0103	0.049	0	0	0.00612	0	0	0.402	0	0.0498	0.00852	0	0.34	0.27	0.61
BAC-2	9.71	216	1620	1.11	7.34	2980	7040	0	0.0444	0.0228	0	0	0.00644	0	0	0.414	0	0.165	0.0131	0	0.25	-0.03	0.22
BAC-3	7.04	401	3160	0.76	7.39	4260	11400	0	0.0226	0.0404	0	0	0.00362	0	0	0.812	0	0.0275	0.0195	0	0.24	0.14	0.38
BAC-4	0	59.2	534	1.34	7.8	222	1230	0	0.0352	0.0723	0	0	0.00212	0	0	0.243	0	0.00992	0	0	0.09	0.4	0.49
BAC-5	0	40.5	479	1.33	7.85	110	1070	0	0.0359	0.0909	0	0	0	0	0	0.219	0	0.00715	0	0	0.2	-0.01	0.19
BAC-6	4.35	133	606	0.97	7.61	1080	2620	0	0.022	0.0287	0	0	0.00257	0	0	0.266	0	0.0858	0.00369	0	0.13	0.69	0.82
BAC-7	3.97	135	628	1.42	7.69	1340	2880	0	0.0241	0.026	0	0	0.00217	0	0	0.279	0	0.0944	0.00279	0	0.26	1.1	1.36

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.41	9.07	6	1660	3.2	1.88	1.06
BA-U-2	16.67	8.77	-318	1600	1.7	1.76	1.03
BAC-1	18.66	7.57	-144	8800	7.7	0.55	6.19
BAC-2	19.51	7.01	-2	10200	0.6	0.46	6.34
BAC-3	18.63	7.15	2	16700	20	4.99	10.4
BAC-4	16.35	7.72	-120	0.859	3	4.2	0.55
BAC-5	16.43	7.85	-64	726	1.4	12.41	0.464
BAC-6	16.07	7.62	-86	1370	11.4	1.77	0.879
BAC-7	16.64	7.59	-67	1560	4.6	12.42	0.998

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	132	863	0.514	7.52	286	1850	0	0.00895	0.0871	0	0	0	0	0	0.254	0	0.00276	0	0	0.32	0.11	0.43
WW-U-1	1.23	348	2190	0.346	7.18	1230	5370	0	0.0041	0.0771	0	0	0.00538	0	0	0.479	0	0.00891	0.00579	0	0.73	0.17	0.9
WW-U-2	1.47	383	2340	0.416	7.22	1120	5540	0	0.00573	0.0704	0	0	0.00396	0	0	0.512	0	0.0111	0.0116	0	0.78	0.46	1.24
WWC-1	9.83	513	4540	0.133	7.04	2960	12500	0	0.0197	0.0317	0	0	0.00348	0	0	0.819	0.000198	0.00936	0.0153	0	0.23	0.73	0.96
WWC-2	0	58.5	369	0.42	7.88	140	960	0	0.0129	0.0543	0	0	0.0243	0	0	0.112	0	0.00809	0	0	0.1	0.45	0.55
WWC-3	0	27.7	224	1.08	8.01	86.1	612	0	0.0218	0.0332	0	0	0	0	0	0.123	0	0.00543	0	0	0.07	0.1	0.17
WWC-4	1.19	227	1200	0.509	7.32	763	3200	0	0.0136	0.0629	0	0	0	0	0	0.351	0	0.00222	0.00216	0	0.08	0.75	0.83
WWC-5	3.02	343	1850	0.401	0.71	1570	5300	0	0.00778	0.0389	0	0	0.00238	0	0	0.497	0	0.00498	0.0041	0	0.43	1.1	1.53
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.62	7.47	-22	3370	1	9	2.16
WW-U-1	17.72	6.99	7	8330	3	1.89	5.25
WW-U-2	17.84	7.19	-10	8400	2.6	1.89	5.29
WWC-1	15.78	6.93	-22	18600	0	0.51	11.6
WWC-2	15.91	7.75	-210	1680	6	1.08	1.07
WWC-3	16.26	7.94	-166	1210	0	0.24	0.772
WWC-4	16.51	7.22	-41	5140	0.2	1.09	3.24
WWC-5	15.83	7.02	-87	7930	0.2	0.37	4.99
WWC-6							
WWC-7							

Round 6 Detection Monitoring - March 20-30, 2017

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.1	403	0.876	7.83	113	908	0	0.0322	0.0867	0	0	0	0	0	0.214	0	0.00365	0	0	0.62	0.22	0.62
CL-U-2	0	61.2	374	0.903	7.89	110	852	0	0.0272	0.0976	0	0	0	0	0	0.208	0	0.00386	0	0	0.4	0.39	0.4
CLW-1	0	38.4	295	1.05	7.83	62.4	768	0	0.0309	0.0631	0	0	0.0187	0	0	0.185	0	0.00654	0	0	0.41	0.78	1.2
CLW-2	0	49.7	377	1.07	7.85	92.9	936	0	0.0277	0.0811	0	0	0	0	0	0.219	0	0.00437	0	0	0.31	0.72	1
CLW-3	0	42.4	333	1.23	7.87	94.4	876	0	0.0423	0.103	0	0	0	0	0	0.214	0	0.00473	0	0	0.35	0.7	1.1
CLW-4	0	35.2	306	1.27	8.02	79.1	808	0	0.0388	0.0898	0	0	0	0	0	0.202	0	0.00439	0	0	0.39	0.12	0.39
CLW-5	0	36	320	1.71	7.88	79.9	748	0	0.0216	0.0801	0	0	0.00214	0	0	0.025	0	0.00666	0	0	0.4	0.38	0.4
CLW-6	0	33.4	302	1.48	7.91	66	752	0	0.0164	0.0976	0	0	0	0	0	0.193	0	0.00805	0	0	0.25	-0.35	0.25
CLW-7	0	46.4	312	1.02	7.68	61	824	0	0.0257	0.0545	0	0	0.00772	0	0	0.182	0	0.00425	0	0	0.14	0.18	0.14
CLW-8	0	42.8	301	1.03	7.71	63.8	772	0	0.0255	0.0707	0	0	0.012	0	0	0.189	0	0.00526	0	0	0.25	0.29	0.25
CLW-9																							
CL-U-3																							

Round 6

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.27	7.52	-194	957	4.2	2.53	0.613
CL-U-2	15.81	7.48	-139	929	0	10.45	0.598
CLW-1	14.45	7.6	-173	1540	0	5.98	0.984
CLW-2	16.63	7.58	-221	950	0	9.29	0.609
CLW-3	16.58	7.66	-235	840	0	10.64	0.539
CLW-4	16.67	7.68	-253	785	0	2.14	0.502
CLW-5	16.63	7.6	-222	834	0	2.29	0.534
CLW-6	15.51	7.65	-245	790	0	8.85	0.505
CLW-7	15.48	7.52	-150	1600	0	1.94	1.02
CLW-8	15.08	7.57	-159	1550	0	1.55	0.991
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	24.5	259	1.57	8.59	48.8	648	0	0.0359	0.0856	0	0	0	0	0	0.193	0	0.0124	0	0	0.28	0.15	0.28
BA-U-2	0	3.76	328	0.886	12.1	39.2	728	0	0.00254	0.122	0	0	0	0	0	0.221	0	0.00986	0	0	0.3	0.47	0.3
BAC-1	4.01	188	2170	0	7.47	1650	6320	0	0.0202	0.279	0	0	0.0412	0	0	0.429	0	0.0391	0.0152	0	1.1	1.5	2.6
BAC-2	10.5	193	1480	0.871	7.2	2780	7320	0	0.0469	0.022	0	0	0.0145	0	0	0.44	0	0.194	0.0144	0	0.34	0.22	0.56
BAC-3	7.57	408	3140	0	7.36	4290	13000	0	0.0239	0.0376	0	0	0.00447	0	0	0.974	0	0.026	0.0211	0	0.2	0.5	0.7
BAC-4	0	59	461	1.13	7.68	206	1260	0	0.0362	0.0705	0	0	0.011	0	0	0.237	0	0.012	0	0	0.13	0.18	0.13
BAC-5	0	59.5	576	0.994	7.73	190	1430	0	0.032	0.0893	0	0	0.00204	0	0	0.277	0	0.00666	0	0	0.21	0.24	0.45
BAC-6	4.44	128	594	0.763	7.6	1040	2500	0	0.0237	0.0269	0	0	0.00205	0	0	0.28	0	0.0873	0.0045	0	0.12	-0.21	-0.09
BAC-7	3.31	151	591	0.936	7.43	1140	3120	0	0.0237	0.0253	0	0	0	0	0	0.327	0	0.0702	0.007	0	0.21	0.7	0.91

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.08	8.22	55	783	1.8	6.02	0.501
BA-U-2	17.77	11.71	-250	2120	1.9	7.87	1.36
BAC-1	16.44	7.24	-131	9640	11.2	2.14	6.07
BAC-2	15.89	6.86	-53	10400	0.1	0.6	6.44
BAC-3	15.61	7.1	-44	18000	3.4	0.5	11.2
BAC-4	14.42	7.58	-165	2400	0	2.76	1.53
BAC-5	15.18	7.53	-155	2550	0.1	0.57	1.63
BAC-6	16.07	7.42	-115	4030	0	0.32	2.58
BAC-7	16.54	7.34	-124	4780	1.5	0.38	3.06

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	131	785	0.458	7.54	247	1760	0	0.00941	0.08	0	0	0	0	0	0.25	0	0.00227	0	0	0.33	0.24	0.33
WW-U-1	1.15	336	1880	0.2	7.26	1180	4890	0	0.00593	0.0568	0	0	0	0	0	0.477	0	0.00558	0.00583	0	0.53	0.89	1.42
WW-U-2	0.6	317	1860	0.438	7.38	734	4300	0	0.00355	0.095	0	0	0	0	0	0.479	0	0.021	0.00749	0	0.51	1.6	2.11
WWC-1	11.2	479	4510	0	6.98	2940	12200	0	0.0213	0.0288	0	0	0	0	0	0.932	0.000328	0.00995	0.0149	0	0.26	1.1	1.36
WWC-2	0	52	318	0.405	7.79	125	856	0	0.0149	0.0361	0	0	0	0	0	0.122	0	0.00357	0	0	0.17	0.61	0.78
WWC-3	0	25.7	195	0.852	8.13	76	680	0	0.0227	0.0302	0	0	0.00309	0	0	0.137	0	0.00537	0	0	0.24	-0.21	0.03
WWC-4	1.3	233	1250	0.319	7.38	819	3230	0	0.0135	0.061	0	0	0	0	0	0.382	0	0	0.00239	0	0.18	-0.2	-0.02
WWC-5	1.72	318	1520	0.292	7.13	1190	4560	0	0.01	0.0501	0	0	0	0	0	0.555	0	0.00523	0.00399	0	0.23	0.95	1.18
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.03	7.37	-45	3340	1.1	8.42	2.14
WW-U-1	18.15	6.96	-57	7980	11.5	1.02	5.02
WW-U-2	17.03	7.29	-15	7470	2.3	1.36	4.71
WWC-1	15.08	6.74	-32	19700	0.3	1.8	12.2
WWC-2	15.4	7.75	-134	1650	1	0.44	1.06
WWC-3	15.31	8.09	207	1230	1.2	0.22	0.784
WWC-4	15.85	7.18	-70	5390	0.5	3.15	3.39
WWC-5	16.2	6.84	-61	7180	0	0.62	4.52
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 7 Detection Monitoring - June 5-21, 2017

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	0	53	480	0.996	7.74	132	1010	0	0.0344	0.0826	0	0.00065	0	0	0	0.202	0	0.00402	0	0	0.36	0.95	1.31
CL-U-2	0	55.1	444	1	7.8	134	952	0	0.0247	0.0938	0	0	0	0	0	0.19	0	0.00408	0	0	2.7	1	3.7
CLW-1	0	36.4	322	1.06	7.85	68.2	772	0	0.0289	0.0615	0	0	0	0	0	0.173	0	0.00389	0	0	0.2	0.14	0.34
CLW-2	0	44.7	436	1.19	7.83	102	964	0	0.0246	0.0754	0	0	0.00411	0	0	0.211	0	0.00461	0	0	0.24	1	1.24
CLW-3	0	37.3	380	1.23	7.85	106	856	0	0.0378	0.0951	0	0	0	0	0	0.197	0	0.00498	0	0	0.27	0.29	0.56
CLW-4	0	30.6	345	1.44	7.89	86.3	816	0	0.0352	0.0885	0	0	0	0	0	0.189	0	0.00481	0	0	0.29	0.3	0.59
CLW-5	0	32.4	358	1.82	7.86	91.6	860	0	0.0203	0.0732	0	0	0	0	0	0.188	0	0.00572	0	0	1.4	1.2	2.6
CLW-6	0	31	336	1.61	7.9	77.5	768	0	0.02	0.0893	0	0	0	0	0	0	0.183	0	0.0068	0	0.01	0.5	0.51
CLW-7	0	41.5	352	1.01	7.88	70.4	832	0	0.0241	0.0514	0	0	0	0	0	0.169	0	0.0033	0	0	0.14	0.75	0.89
CLW-8	0	38.4	339	1.02	7.81	73.1	812	0	0.0239	0.0681	0	0	0	0	0	0.176	0	0.00391	0	0	0.18	0.81	0.99
CLW-9																							
CL-U-3																							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	0	26.3	317	1.75	8.32	52.9	776	0	0.0323	0.0901	0	0	0	0	0	0.191	0	0.0109	0	0	0.15	0.73	0.88
BA-U-2	0	3.58	366	0.821	11.8	39.6	748	0	0	0.0899	0	0	0	0	0	0.215	0	0.0086	0	0	0.09	0.98	1.07
BAC-1	1.91	88.7	914	0.266	8.92	702	2920	0	0.0145	0.0563	0	0	0.00666	0	0	0.305	0	0.0317	0.00643	0	0.2	0.99	1.19
BAC-2	10.6	216	1730	0	7.21	3260	7720	0	0.042	0.0211	0	0	0.00799	0	0	0.586	0	0.177	0.0138	0	0.14	0.64	0.78
BAC-3	7.76	401	3510	0	7.29	4900	13200	0	0.0251	0.0316	0	0	0.00858	0	0	1.17	0	0.0292	0.0212	0	0.3	0.76	1.06
BAC-4	0	56.1	612	1.13	7.84	212	1220	0	0.0329	0.0666	0	0	0	0	0	0.228	0	0.0113	0	0	0.37	0.47	0.84
BAC-5	0	58.3	654	1.1	7.76	217	1180	0	0.0297	0.0881	0	0	0	0	0	0.259	0	0.00728	0	0	0.31	0.28	0.59
BAC-6	4.25	135	697	0.779	7.63	1110	2810	0	0.0229	0.0256	0	0	0	0	0	0.257	0	0.0921	0.00414	0	0.24	0.76	1
BAC-7	3.4	146	632	0.864	7.78	1290	3170	0	0.0154	0.0288	0	0	0.00398	0	0	0.36	0	0.0888	0.00457	0	2.5	0.88	3.38

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	0	116	763	0.522	7.56	427	1800	0	0.0101	0.0599	0	0.00128	0.00274	0	0	0.235	0	0.00233	0	0	0.2	1.3	1.5
WW-U-1	1.18	312	2340	0.181	7.41	1450	4540	0	0.00568	0.0521	0	0	0.00212	0	0	0.441	0	0.00556	0.00625	0	1.2	1.5	2.7
WW-U-2	0.741	338	2590	0.287	7.36	1040	12500	0	0.00325	0.0803	0	0	0.067	0	0	0.512	0	0.0226	0.00846	0	0.52	1.6	2.12
WWC-1	9.88	413	4410	0	7.14	2770	11000	0	0.0173	0.0326	0	0	0	0	0	1.11	0.000175	0.0147	0.0147	0	0.39	1.5	1.89
WWC-2	0	49.5	326	0.447	7.85	134	832	0	0.0141	0.0339	0	0	0	0	0	0.138	0	0.00405	0	0	0.24	0.24	0.48
WWC-3	0	25.9	220	0.974	8.12	84.3	696	0	0.0214	0.0281	0	0	0	0	0	0.146	0	0.00504	0	0	0.1	0.45	0.55
WWC-4	1.33	229	1330	0.466	7.22	912	3060	0	0.013	0.0545	0	0	0	0	0	0.421	0	0	0.00241	0	0.22	0.74	0.96
WWC-5	2.25	287	1790	0	7.49	1420	4810	0	0.00753	0.0379	0	0	0.00202	0	0	0.567	0	0.00531	0.00336	0	0.2	1.5	1.7
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Round 7

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	16.35	7.59	-206	1920	0	1.51	1.23
CL-U-2	15.98	7.5	-177	1860	0	1.62	1.19
CLW-1	18.47	7.79	-160	768	0	0.9	0.491
CLW-2	16.77	7.73	-210	945	0	1.52	0.605
CLW-3	17.35	7.78	-246	879	0	213	0.562
CLW-4	17.86	7.75	-252	1580	0	4.35	1.01
CLW-5	18.97	7.66	-232	1680	0	2.65	1.08
CLW-6	16.95	7.75	-258	1590	0	5.1	1.02
CLW-7	18.07	7.7	-131	805	0	2.21	0.516
CLW-8	17.59	7.74	-130	776	0	1.58	0.497
CLW-9							
CL-U-3							

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	18.46	8.13	-138	1500	0	2.32	0.963
BA-U-2	19.9	11.43	-301	1870	0	0.58	1.2
BAC-1	22.57	9.92	-118	5180	15.6	2.32	3.27
BAC-2	19.02	7.09	-80	10900	2.2	0.84	6.76
BAC-3	18.87	7.1	-69	17800	3.2	1.02	11
BAC-4	17.01	7.62	-158	2380	0	1.61	1.52
BAC-5	17.31	7.69	-131	2560	0	2.62	1.64
BAC-6	19.46	7.59	-128	3900	35.2	0.85	2.5
BAC-7	17.97	7.5	-147	4610	2.9	1.16	2.95

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	17.96	7.27	-138	3170	0	0.57	2.03
WW-U-1	18.63	6.87	-32	8050	0	1	5.07
WW-U-2	18.21	7.22	-161	7610	0	0.91	4.79
WWC-1	16.96	6.95	-34	15200	0.1	0.67	9.48
WWC-2	16.11	7.72	-169	1500	1.3	0.94	0.96
WWC-3	16.94	7.99	-194	1210	0.7	0.63	0.773
WWC-4	16.15	7.16	-73	5.48	0.5	0.6	3.46
WWC-5	16.54	7.01	-42	7225	0.9	0.76	4.57
WWC-6							
WWC-7							

Round 8 Detection Monitoring - September 25-October 4, 2017

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	52.1	422	1.07	7.73	116	1130	0	0.0291	0.088	0	0	0	0	0	0.228	0	0.00398	0	0	0.25	1.6	1.85
CL-U-2	0	53.8	390	1.1	7.67	120	1060	0	0.0262	0.0941	0	0	0	0	0	0.212	0	0.00415	0	0	0.17	1.4	1.57
CLW-1	0	35.7	310	1.15	7.85	71.7	808	0	0.0308	0.0614	0	0	0	0	0	0.192	0	0.00407	0	0	0.21	1.7	1.91
CLW-2	0	43.5	407	1.23	7.76	97.3	1040	0	0.0257	0.0793	0	0	0	0	0	0.229	0	0.00467	0	0	0.12	3	3.12
CLW-3	0	36.2	347	1.34	7.8	100	884	0	0.0408	0.102	0	0	0	0	0	0.223	0	0.00474	0	0	0.16	1.1	1.26
CLW-4	0	30.5	313	1.6	7.81	85.1	856	0	0.0333	0.09	0	0	0.0516	0	0	0.199	0	0.0115	0	0	0.24	1.8	2.04
CLW-5	0	33.2	344	1.82	7.8	88.5	824	0	0.023	0.0727	0	0	0	0	0	0.211	0	0.0052	0	0	0.2	2.2	2.4
CLW-6	0	30.5	317	1.73	7.82	74.5	828	0	0.0143	0.0961	0	0	0	0	0	0.199	0	0.00721	0	0	0.29	1.7	1.99
CLW-7	0	45.5	319	1.11	7.7	64.5	868	0	0.0244	0.0539	0	0	0	0	0	0.189	0	0.00389	0	0	0.45	0.95	1.4
CLW-8	0	37.9	319	1.13	7.77	70.6	788	0	0.0252	0.0689	0	0	0	0	0	0.192	0	0.00431	0	0	0.25	1.6	1.85
CLW-9																							
CL-U-3																							

Round 8

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.07	7.45	-199	1930	0.4	0.56	1.24
CL-U-2	15.67	7.43	-176	1880	0.8	0.58	1.2
CLW-1	20.49	7.68	-172	1.48	0	0.41	0.949
CLW-2	16.63	7.63	-199	1880	0.7	0.64	1.2
CLW-3	16.82	7.59	-251	1750	1.5	2.9	1.12
CLW-4	17.63	7.56	-269	1620	1.6	1.56	1.03
CLW-5	17.21	7.71	-244	1690	3.7	1.12	1.09
CLW-6	15.97	7.75	-259	1.6	2.3	3.3	1.02
CLW-7	16.72	7.59	-147	1640	0	0.86	1.05
CLW-8	18.26	7.65	-145	1.53	1.1	1.89	0.975
CLW-9							
CL-U-3							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	169	1040	1.02	7.53	343	2310	0	0.0215	0.0745	0	0	0	0	0	0.368	0	0.00296	0.00375	0	0.07	1.3	1.37
BA-U-2	0	46.3	479	0.993	8.04	53.7	1140	0	0.0249	0.156	0	0	0	0	0	0.241	0	0.00294	0	0	0.24	1.5	1.74
BAC-1	4.86	229	2620	0.854	7.4	2150	8400	0	0.0148	0.702	0	0	0.114	0.00461	0	0.52	0	0.0467	0.0174	0	0.39	1.6	1.99
BAC-2	10.1	221	1690	1.33	7.62	2970	7940	0	0.0469	0.0202	0	0	0.00547	0	0	0.431	0	0.154	0.0149	0	0.11	0.14	0.25
BAC-3	8.76	353	3370	2.51	7.43	5340	12700	0	0.054	0.0306	0	0	0.0114	0	0	0.897	0	0.0525	0.0287	0	0.23	1.3	1.53
BAC-4	0	62.4	482	1.26	7.76	231	1280	0	0.0359	0.0703	0	0	0	0	0	0.262	0	0.0139	0	0	0.1	2.5	2.6
BAC-5	0	67.5	593	1.17	7.74	269	1450	0	0.0325	0.0877	0	0	0	0	0	0.294	0	0.00838	0	0	0.26	2.7	2.96
BAC-6	0.978	77.2	516	1.01	7.97	301	1510	0	0.0156	0.0833	0	0	0	0	0	0.265	0	0.0213	0	0	0.27	3.8	4.07
BAC-7	3.41	144	633	1.15	7.65	1220	2990	0	0.0191	0.0223	0	0	0	0	0	0.285	0	0.074	0.00446	0	0.15	0.84	0.99

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.04	7.21	-166	4300	1.7	0.78	2.75
BA-U-2	16.58	8.07	-272	2030	0	1.63	1.3
BAC-1	15.36	6.93	-28	7170	1	0.54	4.52
BAC-2	16.95	6.92	-20	11500	2	0.9	7.11
BAC-3	16.87	7.07	-102	18.7	43.3	0.94	11.6
BAC-4	16.67	7.68	-148	2470	1.1	0.62	1.58
BAC-5	16.66	7.71	-140	2740	0.8	1.12	1.75
BAC-6	17.02	7.83	-47	2610	0.9	2.54	1.67
BAC-7	15.97	7.45	-121	4500	3.3	2.56	2.88

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	110	820	0.618	7.55	263	1810	0.002	0.00969	0.0783	0	0	0	0	0	0.257	0	0.00251	0	0	0.44	0.56	1
WW-U-1	1.2	311	2130	0.539	7.23	1280	5260	0	0.0055	0.0545	0	0	0.003309	0	0	0.459	0	0.00792	0.00697	0	0.34	1.2	1.54
WW-U-2	1.66	314	2280	0.721	7.31	1220	5510	0	0.0104	0.0659	0	0	0.00415	0	0	0.485	0	0.00647	0.0122	0	0.24	1.3	1.54
WWC-1	9.55	492	4430	0.507	7.37	2990	11500	0	0.0177	0.0272	0	0	0	0	0	0.755	0.000262	0.0068	0.014	0	0.26	1.2	1.46
WWC-2	0	53.6	347	0.452	7.78	137	936	0	0.0142	0.0361	0	0	0	0	0	0.112	0	0.00341	0	0	0.04	1.2	1.24
WWC-3	0	25.3	207	1.13	8.14	84	704	0	0.0207	0.0242	0	0	0	0	0	0.127	0	0.00477	0	0	0.08	2	2.08
WWC-4	1.11	201	1100	0.57	7.38	744	3280	0	0.0135	0.0529	0	0	0	0	0	0.313	0	0	0.00214	0	0.38	0.4	0.78
WWC-5	1.48	327	1620	0.544	7.16	1240	4590	0	0.0104	0.0438	0	0	0	0	0	0.496	0	0.00395	0.00407	0	0.41	0.65	1.06
WWC-6																							
WWC-7																							

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.02	7.36	-123	3490	0	1.25	2.24
WW-U-1	16.41	6.96	-135	8820	0.7	1.56	5.56
WW-U-2	16.68	7.09	-34	9.23	0.6	3.75	5.82
WWC-1	16.21	6.78	48	18900	0.8	1.92	11.7
WWC-2	16.38	7.64	-110	1740	1	2.87	1.12
WWC-3	15.49	8.16	-207	1220	1.3	0.45	0.781
WWC-4	16.11	7.17	-77	4980	1.2	0.46	3.19
WWC-5	15.42	6.94	-31	7180	1.3	0.53	4.52
WWC-6							
WWC-7							

Results below reporting limit are recorded as 0.

Round 9 Assessment Monitoring - March 26-30, 2018

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	62.6	402	0.971	7.66	94.9	1090	0	0.0283	0.0758	0	0	0.000529	0	0	0.209	0	0.00359	0	0	0.18	0.81	0.99
CL-U-2	0	64.1	352	0.895	7.65	92.7	980	0	0.0236	0.0873	0	0	0	0	0	0.194	0	0.00376	0	0	0.34	0.16	0.5
CLW-1	0	37.8	318	1.02	7.67	59.5	720	0	0.0265	0.053	0	0	0.0271	0	0	0.179	0	0.0068	0	0	0.09	0.53	0.62
CLW-2	0	51.4	421	1.13	7.8	79.4	1020	0	0.0258	0.0711	0	0	0	0	0	0.212	0	0.00439	0	0	0.24	0.94	1.18
CLW-3	0	42.8	334	1.23	7.86	82.3	956	0	0.0364	0.089	0	0	0.000505	0	0	0.2	0	0.00464	0	0	0.37	0.94	1.31
CLW-4	0	35.8	301	1.35	7.77	70.4	864	0	0.0352	0.0788	0	0	0.000762	0	0	0.189	0	0.00477	0	0	0.46	0.59	1.05
CLW-5	0	37.4	354	1.71	7.66	79.9	876	0	0.021	0.0671	0	0	0.000712	0	0	0.194	0	0.0054	0	0	0.15	0.96	1.11
CLW-6	0	34.2	292	1.62	7.74	60.4	916	0	0.0104	0.0885	0	0	0.000612	0	0	0.182	0	0.00729	0	0	0.56	0.48	1.04
CLW-7	0	47	316	0.972	7.59	51.3	792	0	0.0215	0.0475	0		0	0	0	0.183	0	0.00341	0	0	0.28	0.22	0.5
CLW-8	0	44.1	303	0.981	7.63	54.2	792	0	0.0231	0.0609	0	0	0	0	0	0.188	0	0.00376	0	0	0.25	0.8	1.05
CLW-9																							
CL-U-3																							

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	33.5	296	1.64	8.05	50.7	872	0	0.0276	0.0837	0	0	0.00126	0	0	0.199	0	0.00914	0.0022	0	0.07	0.31	0.38
BA-U-2	0	46.2	399	0.943	8.2	46.9	1080	0	0.0227	0.125	0	0	0	0	0	0.209	0	0.00311	0.000691	0	0.12	0.34	0.46
BAC-1	3.88	192	1890	0.507	7.63	1470	6120	0.00138	0.0127	0.0501	0	0	0.00451	0	0	0.581	0	0.028	0.00924	0	0.31	0.48	0.79
BAC-2	9.89	283	1940	1.32	7.72	3070	8590	0	0.0508	0.0238	0	0	0.00777	0	0	0.524	0	0.142	0.0173	0	0.29	0.89	1.18
BAC-3	7.91	417	3480	1.62	7.84	4460	13000	0	0.0441	0.0331	0	0	0.00468	0	0	1.05	0	0.0396	0.0228	0	0.28	1.25	1.53
BAC-4	0	67.4	489	1.14	7.74	221	1300	0	0.0316	0.0605	0	0	0	0	0	0.249	0	0.0143	0	0	0.1	0.81	0.91
BAC-5	0	74.8	524	1.07	7.68	234	1480	0	0.0275	0.0706	0	0	0	0	0	0.284	0	0.00915	0	0	0.24	0.5	0.74
BAC-6	4.58	145	595	1.15	7.48	1100	2600	0	0.0214	0.0227	0	0	0	0	0	0.28	0	0.0898	0.00249	0	0.08	0.72	0.8
BAC-7	4.51	137	1980	0.388	7.57	1100	2730	0	0.0235	0.0195	0	0	0	0	0	0.288	0	0.0752	0.0048	0	0.14	0.71	0.85

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	129	739	0.506	7.5	201	1840	0	0.00929	0.0741	0	0	0.00137	0	0	0.241	0	0.00227	0	0	0.04	0.73	0.77
WW-U-1	1.34	339	1900	0.406	7.05	1050	5280	0	0.005	0.0486	0	0	0.00193	0	0	0.436	0	0.00702	0.00653	0	0.45	0.91	1.36
WW-U-2	1.47	370	2010	0.532	7.16	925	5260	0	0.00642	0.0499	0	0	0.00144	0	0	0.475	0	0.00467	0.0115	0	0.34	0.94	1.28
WWC-1	11.9	638	4100	0.236	6.89	2640	12700	0	0.02	0.0209	0	0	0	0	0	0.805	0.000205	0.00596	0.015	0	0.25	1.21	1.46
WWC-2	0	57.2	308	0.41	7.62	111	784	0	0.014	0.031	0	0	0	0	0	0.104	0	0.00356	0	0	0.1	0.55	0.65
WWC-3	0	28.9	200	0.985	7.96	67.8	628	0	0.0214	0.0245	0	0	0	0	0	0.131	0	0.00464	0	0	0.07	0.27	0.34
WWC-4	1.19	200	1010	0.365	7.3	593	2790	0	0.0128	0.0463	0	0	0	0	0	0.355	0	0	0	0	0.22	0.58	0.8
WWC-5	2.86	321	1600	0.384	6.92	1450	5030	0	0.0096	0.0302	0	0	0	0	0	0.511	0	0.00301	0.00415	0	0.2	1.64	1.84
WWC-6																							
WWC-7																							

Results below reporting limit are recorded as 0.

Round 9

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	14.91	7.28	-193	1940	0.6	0.54	1.24
CL-U-2	14.84	7.24	-174	1890	0.2	0.67	1.21
CLW-1	16.76	7.7	-186	1530	0.2	0.7	0.98
CLW-2	15.47	7.6	-204	1880	0.4	0.96	1.22
CLW-3	16.64	7.49	-236	1720	0	1.61	1.1
CLW-4	16.15	7.51	-259	1610	0	2.2	1.03
CLW-5	16.46	7.43	-239	1720	3	1	1.1
CLW-6	15.56	7.47	-250	1600	0.1	3.61	1.03
CLW-7	18.88	7.52	-123	1570	0	1.89	1
CLW-8	18.47	7.58	-129	1520	0	0.45	0.973
CLW-9							
CL-U-3							

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	15.13	7.78	-33	1600	0.6	3.82	1.02
BA-U-2	16.14	8.65	-281	1750	0.2	0.25	1.12
BAC-1	16.99	7.23	-189	9190	8.1	0.52	5.79
BAC-2	15.94	6.82	-77	12000	1.2	0.51	7.44
BAC-3	15.37	7.03	-82	18900	5	3.65	11.7
BAC-4	15.79	7.47	-150	2500	0.5	0.7	1.6
BAC-5	18.41	7.47	-149	2570	0.5	3.97	1.63
BAC-6	19.15	7.32	-92	3810	0.5	0.55	2440
BAC-7	19.26	7.4	-101	4190	3	3.14	2.68

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.11	7.56	-31	3240	0	0.71	2.07
WW-U-1	16.35	7.11	-75	8010	0.7	0.4	5.03
WW-U-2	16.11	7.27	-10	8450	0.2	0.47	5.32
WWC-1	16.03	6.65	-17	19900	0	2.51	12.4
WWC-2	15.75	7.52	-124	1650	0.4	0.55	1.05
WWC-3	14.89	7.81	-190	1250	1.1	0.79	0.8
WWC-4	16.17	7.26	-64	4600	2.3	0.37	2.92
WWC-5	17.27	7.02	-36	7300	0	0.34	4.6
WWC-6							
WWC-7							

Round 10 Assessment Monitoring - June 4-13, 2018

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	54.7	372	0.853	7.7	98	984	0	0.0272	0.0799	0	0	0	0	0	0.208	0	0.00361	0	0	0.18	0.67	0.85
CL-U-2	0	56.4	365	0.862	7.64	108	952	0	0.0242	0.09	0	0	0	0	0	0.195	0	0.0038	0	0	-0.02	0.67	0
CLW-1	0	35.2	298	1.02	7.93	57.8	748	0	0.0285	0.0568	0	0	0.00102	0	0	0.184	0	0.00388	0.000928	0	0.29	1.01	1.3
CLW-2	0	44.6	399	1.14	7.79	86.8	980	0	0.0247	0.072	0	0	0	0	0	0.222	0	0.00433	0	0	0.25	0.96	1.21
CLW-3	0	37.5	323	1.16	7.91	94.2	876	0	0.0382	0.0948	0	0	0	0	0	0.214	0	0.00483	0	0	0.18	0.55	0
CLW-4	0	31.8	289	1.35	7.91	76.4	836	0	0.0358	0.0801	0	0	0	0	0	0.204	0	0.00459	0	0	0.13	0.85	0.85
CLW-5	0	33.1	318	1.59	7.79	75.3	804	0	0.0215	0.0689	0	0	0	0	0	0.21	0	0.00519	0	0	0.11	0.76	0
CLW-6	0	29.9	292	1.45	7.88	66.3	796	0	0.0109	0.0902	0	0	0	0	0	0.199	0	0.00711	0	0	0.27	0.85	1.12
CLW-7	0	40.6	321	0.945	7.68	58.6	900	0	0.0234	0.0514	0	0	0	0	0	0.186	0	0.00329	0	0	0.16	0.97	0.97
CLW-8	0	38.8	314	0.933	7.73	63.5	768	0	0.0244	0.0632	0	0	0	0	0	0.188	0	0.00359	0	0	0.18	1.26	1.26
CLW-9																							
CL-U-3																							

Round 10

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.54	7.56	-196	1888	1.7	0.39	1.2
CL-U-2	17.81	7.55	-171	1830	0.7	2.53	1.17
CLW-1	19.97	7.67	-159	1480	2.1	4.08	9.45
CLW-2	17.54	7.63	-220	1830	4.5	0.63	1.18
CLW-3	17.95	7.73	-260	1680	5.5	1.57	1.07
CLW-4	17.85	7.73	-278	1570	2.8	1.64	1
CLW-5	17.16	7.72	-276	1660	8.2	1.29	1.07
CLW-6	17.86	7.83	-280	1570	8	2.56	1.01
CLW-7	17.32	7.6	-150	1610	15.7	3.84	1.03
CLW-8	17.1	7.61	-194	1550	2	0.73	0.985
CLW-9							
CL-U-3							

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	140	799	0.818	7.54	254	1970	0	0.0199	0.0636	0	0	0.000506	0	0	0.337	0	0.00279	0.00324	0	0.39	1.94	2.33
BA-U-2	0	70.1	578	0.73	7.68	63.5	1330	0	0.0208	0.145	0	0	0	0	0	0.279	0	0.00215	0.00201	0	0.16	1.13	1.13
BAC-1	2.16	113	1190	0.315	7.92	971	3120	0.00158	0.0141	0.0393	0	0	0.00714	0	0	0.314	0	0.0288	0.00694	0	0.24	1.06	1.3
BAC-2	8.44	263	2210	0.684	7.1	3430	7720	0	0.0445	0.021	0	0	0.00483	0	0	0.463	0	0.143	0.0154	0	0.12	1.03	1.03
BAC-3	7.26	347	3870	1.52	7.42	5080	12700	0	0.0588	0.0327	0	0	0.00511	0	0	0.944	0	0.0467	0.0229	0	0.27	1.44	1.71
BAC-4	0	62.8	510	1.01	7.95	221	1290	0	0.0322	0.0672	0	0	0	0	0	0.247	0	0.0165	0	0	0.06	0.92	0
BAC-5	0	73.5	591	0.916	7.82	302	1180	0	0.0292	0.0763	0	0	0	0	0	0.288	0	0.0128	0	0	0.19	1.56	1.75
BAC-6	4.12	134	694	0.582	7.65	1120	2980	0	0.0217	0.0235	0	0	0	0	0	0.25	0	0.0938	0.00229	0	0.14	1.02	1.02
BAC-7	4.36	130	709	1.09	7.74	1280	2760	0	0.0275	0.0204	0	0	0	0	0	0.269	0	0.0757	0.00541	0	0.06	0.87	0

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	19.26	7.41	-163	3640	1	0.46	2.33
BA-U-2	18.16	7.63	-187	2370	2.1	1.31	1.51
BAC-1	17.87	8.86	-418	6480	53.2	2.95	4.04
BAC-2	16.94	6.98	-63	12400	2.3	4.29	7.68
BAC-3	17.19	7.16	-356	18300	15.2	0.87	11.4
BAC-4	17.11	7.64	-149	2500	1.5	0.75	1.6
BAC-5	17.63	7.61	-126	2850	1.2	0.65	1.83
BAC-6	17.58	7.51	-112	4210	0	0.51	2.63
BAC-7	17.32	7.6	-127	4440	0	0.56	2.84

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	123	873	0.499	7.62	209	2040	0	0.00839	0.0653	0	0	0.000602	0	0	0.254	0	0.00182	0	0	0.32	1.34	1.66
WW-U-1	1.19	289	1940	0.265	7.17	1140	5450	0	0.00477	0.0479	0	0	0.00124	0	0	0.443	0	0.00591	0.00663	0	0.23	1.49	1.72
WW-U-2	1.23	337	2130	1.01	7.3	985	5120	0	0.0102	0.0459	0	0	0.00137	0	0	0.508	0	0.00277	0.0112	0	0.05	0.93	0.93
WWC-1	8.22	504	4710	0.114	7.2	2730	11100	0	0.0173	0.0268	0	0	0	0	0	0.831	0.000168	0.00896	0.0139	0	0.25	1.16	1.16
WWC-2	0	50	340	0.358	7.91	119	852	0	0.0143	0.0338	0	0	0	0	0	0.11	0	0.00372	0	0	0.08	0.27	0
WWC-3	0	27.3	230	0.897	8.05	88.4	644	0	0.0226	0.0278	0	0	0	0	0	0.125	0	0.00527	0	0	-0.03	0.15	0
WWC-4	0.998	184	1080	0.435	7.43	620	2640	0	0.0129	0.0495	0	0	0	0	0	0.309	0	0.00215	0.00201	0	0.28	0.35	0
WWC-5	2.64	314	1820	0.219	7.26	1660	5200	0	0.0104	0.0327	0	0	0	0	0	0.472	0	0.00324	0.00395	0	0.1	1.58	1.58
WWC-6																							
WDB-7																							

Results below reporting limit are recorded as 0.

Date	6/7/2018												0.006	0.015	0.04		0.1		
Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:							*0.001*	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	18.38	7.39	-108	3510	1.7	0.79	2.25
WW-U-1	21.81	6.92	-77	8180	0.1	0.51	5.14
WW-U-2	18.76	7.09	-16	8130	7.6	1.06	5.12
WWC-1	16.92	6.94	-84	15600	1.5	4.48	9.65
WWC-2	17.4	7.75	-163	1570	1.2	0.4	1
WWC-3	17.01	7.89	-191	1220	2.6	0.42	0.782
WWC-4	18.39	7.27	-106	4320	2.4	1.17	2.77
WWC-5	15.81	6.98	-84	7740	0.8	0.58	4.88
WWC-6							
WWC-7							

Date

Round 11 (all results ppm) Assessment Monitoring - October 8-18, 2018

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	0	61.9	415	0.981	7.79	122	1060	0	0.029	0.0796	0	0	0	0	0	0.229	0	0.00383	0	0	0.09	0.32	0
CL-U-2	0	67.5	414	0.995	7.73	128	1010	0	0.0255	0.0919	0	0	0	0	0	0.212	0	0.00408	0	0	0.12	0.94	0.94
CLW-1	0	39.6	288	1.06	7.76	61.9	784	0	0.0298	0.0582	0	0	0.0157	0	0	0.194	0	0.00589	0	0	0.11	1.2	1.2
CLW-2	0	49.7	475	1.19	7.72	88.1	904	0	0.0244	0.0716	0	0	0.014	0	0	0.227	0	0.00593	0	0	0.17	0.39	0
CLW-3	0	42	325	1.27	7.79	95	888	0	0.0384	0.0941	0	0	0	0	0	0.217	0	0.0052	0	0	0.33	0.68	0
CLW-4	0	35.2	297	1.45	7.85	80.7	792	0	0.0375	0.0786	0	0	0	0	0	0.211	0	0.00525	0	0	1.89	0.65	1.89
CLW-5	0	36.9	320	1.7	7.72	85.3	852	0	0.0229	0.0714	0	0	0.00999	0	0	0.213	0	0.00679	0	0	1.87	0.17	1.87
CLW-6	0	33.8	292	1.6	7.82	73.3	804	0	0.0152	0.0873	0	0	0.0116	0	0	0.204	0	0.00746	0	0	0.18	0.41	0
CLW-7	0	46.5	399	1.02	7.65	73.2	780	0	0.0232	0.0491	0	0	0	0	0	0.19	0	0.00416	0	0	0.05	0.07	0
CLW-8	0	43	300	1.04	7.71	66.5	796	0	0.0254	0.0643	0	0	0	0	0	0.192	0	0.00503	0	0	0.19	1.2	1.2
CLW-9																							
CL-U-3																							

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	0	73.9	561	0.881	7.97	62.2	1050	0	0.0216	0.149	0	0	0	0	0	0.276	0	0.00237	0	0	0.44	0.74	1.18
BA-U-2	0	143	885	0.977	7.58	298	1750	0	0.0209	0.0728	0	0	0.0125	0	0	0.321	0	0.00574	0	0	0.22	0.62	0
BAC-1	4.87	225	1840	0.582	7.57	1760	6420	0	0.0129	0.0391	0	0	0.0184	0	0	0.629	0	0.0232	0.00818	0	0.45	0.88	0
BAC-2	9.98	255	1660	1.1	7.35	2730	7800	0	0.0565	0.0204	0	0	0.0111	0	0	0.472	0	0.156	0.0157	0	0.08	0.96	0.96
BAC-3	8.33	469	3280	1.63	7.31	4450	12300	0	0.0496	0.0317	0	0	0.00968	0	0	1.06	0	0.038	0.022	0	0.39	1.06	1.45
BAC-4	0.523	68.1	501	1.15	7.96	273	1300	0	0.00882	0.0171	0	0	0	0	0	0.267	0	0.017	0	0	-0.16	0.48	0
BAC-5	0	82.2	557	1.04	7.86	353	1460	0	0.0325	0.0714	0	0	0	0	0	0.323	0	0.0134	0	0	0.26	0.81	0
BAC-6	4.57	138	624	0.847	7.75	1080	2340	0	0.0248	0.0245	0	0	0	0	0	0.276	0	0.0842	0	0	0.17	1.02	0
BAC-7	4.24	143	649	1.51	7.75	1210	2830	0	0.0434	0.0214	0	0	0	0	0	0.303	0	0.075	0.00579	0	0.19	0.71	0

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	0	139	805	0.533	7.63	394	1760	0	0.0103	0.0575	0	0	0	0	0	0.265	0	0.00241	0	0	0.07	0.85	0.85
WW-U-1	1.36	357	2150	0.41	7.28	1360	5090	0	0	0.0449	0	0	0.0258	0	0	0.456	0	0.0101	0.00682	0	0.43	1.2	1.63
WW-U-2	1.23	380	2160	0.604	7.31	1090	4570	0	0.0109	0.0446	0	0	0	0	0	0.519	0	0.00338	0.0105	0	0.14	0.83	0.83
WWC-1	12	607	4430	0.331	7.25	3210	13000	0	0.0243	0.0223	0	0	0	0	0	0.964	0.000312	0.00835	0.0145	0	0.15	1.2	0
WWC-2	0	59.5	344	0.448	7.85	139	832	0	0.0152	0.0344	0	0	0	0	0	0.124	0	0.00304	0	0	0.17	0.03	0
WWC-3	0	29.7	209	1.06	7.92	84.2	436	0	0.0247	0.0289	0	0	0	0	0	0.139	0	0.00482	0	0	0	0.76	0
WWC-4	1.34	219	1030	0.481	7.46	692	2880	0	0.0145	0.0507	0	0	0	0	0	0.36	0	0	0	0	0.03	0.8	0
WWC-5	3.07	364	1720	0.431	7.38	1620	5000	0	0.0131	0.034	0	0	0	0	0	0.523	0	0.0031	0.00478	0	0.2	-0.56	0
WWC-6																							
WDB-7																							

Results below reporting limit are recorded as 0.

Date Oct. 2018

Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
	0.001	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Round 11

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	17.4	7.85	-132	1800	40.9	0.61	1.15
CL-U-2	18.15	7.83	-97	1770	0	3.95	1.13
CLW-1	17.83	7.93	-114	1490	0	1.48	0.951
CLW-2	16.04	7.84	-184	1850	0.6	2.72	1.18
CLW-3	17.52	7.98	-178	1660	3.6	3.1	1.06
CLW-4	18.53	8.02	-192	1530	7.2	1.63	0.983
CLW-5	21	7.94	-175	1640	0	1.29	1.05
CLW-6	16.49	8.02	-210	1560	0	2.23	1
CLW-7	17.12	7.83	-81	1560	2.4	2.97	1
CLW-8	17.05	7.91	-130	1510	0	1.37	0.963
CLW-9							
CL-U-3							

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	16.4	7.71	-41	3010	0	0.7	1.94
BA-U-2	18.72	8.31	-138	2010	0	0.56	1.28
BAC-1	16.12	7.43	-228	9840	77.8	0.85	6.2
BAC-2	16.79	7.15	-22	11200	2.5	1.3	6.93
BAC-3	16.79	7.31	42	18300	7	5.15	11.3
BAC-4	15.08	7.77	-69	2500	0.2	0.61	1.6
BAC-5	16.95	7.88	-43	2860	0	0.52	1.83
BAC-6	17.13	7.74	-35	3970	0	0.49	2.54
BAC-7	17	7.76	-71	4420	1.9	0.48	2.84

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	17.1	7.65	-6	3290	0	0.58	2.11
WW-U-1	16.29	7.25	-7	8350	0.6	0.87	5.27
WW-U-2	16.41	7.44	55	7730	0	1.5	4.87
WWC-1	16.6	7.11	40	19600	0	4.49	12.1
WWC-2	17.73	7.91	-84	1600	2.1	0.62	1.03
WWC-3	16.97	8.12	-179	1190	0.2	0.56	0.759
WWC-4	16.27	7.4	-32	4780	0.7	0.54	3.06
WWC-5	15.76	7.16	-11	7580	1	3.51	4.77
WWC-6	15.05	7.63	-148	3550	1.8	0.7	2.27
WWC-7	15.18	8.07	-195	1510	8.4	0.65	0.967

Date

Round 12 (all results ppm) Assessment Monitoring - April 4 - May 15, 2019

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	61.1	388	0.989	7.74	112	932	0	0.0279	0.0841	0	0	0	0	0	0.231	0	0.0036	0	0	0.13	0.4	0
CL-U-2	0	68.4	378	1.02	7.74	97.6	920	0	0.0254	0.0943	0	0	0	0	0	0.214	0	0.00405	0	0	0.31	0.94	1.25
CLW-1	0	39.4	303	1.12	7.88	64.5	692	0	0.002	0.0589	0	0	0.00742	0	0	0.203	0	0.00481	0	0	0	0.41	0
CLW-2	0	55.1	416	1.25	7.8	96.4	976	0	0.0259	0.0743	0	0	0	0	0	0.253	0	0.00423	0	0	0.21	0.75	0
CLW-3	0	44.5	351	1.34	7.83	98.4	884	0	0.0382	0.0970	0	0	0	0	0	0.243	0	0.00488	0	0	0.16	0.49	0
CLW-4	0	38.8	321	1.45	7.90	85.5	968	0	0.0376	0.0819	0	0	0	0	0	0.232	0	0.00425	0	0	0.47	0.54	0
CLW-5	0	38.5	340	1.85	7.93	85.6	936	0	0.0236	0.0707	0	0	0	0	0	0.226	0	0.00515	0	0	0.14	0.28	0
CLW-6	0	38.4	270	1.55	7.89	72.8	828	0	0.0271	0.0896	0	0	0	0	0	0.214	0	0.00478	0	0	0.2	0.78	0
CLW-7	0	51.3	336	1.07	7.76	68.9	792	0	0.0228	0.0511	0	0	0	0	0	0.205	0	0.00323	0	0	-0.09	0.54	0
CLW-8	0	44.3	317	1.11	7.81	67.2	776	0	0.0257	0.0621	0	0	0.00200	0	0	0.212	0	0.00358	0	0	0.27	0.22	0
CLW-9	0	26.2	298	2.02	7.91	86.4	760	0	0.0368	0.0462	0	0	0	0	0	0.168	0	0.00518	0	0	0.21	0.21	0
CL-U-3	0	59.6	390	0.872	7.83	114	984	0	0.0183	0.0495	0	0	0.00565	0	0	0.212	0	0.00372	0	0	0	0.48	0

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	174	934	0.919	7.61	271	2050	0	0.002	0.0776	0	0	0	0	0	0.354	0	0.00312	0.00458	0	0	0.4	0
BA-U-2	0	91.8	718	0.844	7.68	102	1350	0	0.0211	0.1670	0	0	0	0	0	0.300	0	0.0022	0.00234	0	0.18	0.62	0
BAC-1	1.31	72.4	431	0.197	8.42	404	1830	0	0.0121	0.0567	0	0	0.00359	0	0	0.172	0	0.142	0.00278	0	0.28	0.09	0
BAC-2	10.3	233	1700	1.11	7.2	2590	8310	0	0.0519	0.0180	0	0	0.00556	0	0	0.491	0	0.163	0.0145	0	0.17	0.48	0
BAC-3	8.64	417	3400	1.3	7.24	4090	12900	0	0.0472	0.0272	0	0	0.00593	0	0	1.030	0.000105	0.0388	0.0206	0	0.17	0.77	0
BAC-4	0.553	72.4	488	1.22	7.76	269	1270	0	0.0319	0.0641	0	0	0	0	0	0.281	0	0.0196	0	0	0.16	0.58	0
BAC-5	0	91.8	585	1.07	7.73	393	1540	0	0.0294	0.0594	0	0	0	0	0	0.334	0	0.0168	0	0	-0.1	0.27	0
BAC-6	4.4	137	536	0.866	7.84	963	2260	0	0.0248	0.0206	0	0	0	0	0	0.283	0	0.0923	0	0	-0.09	-0.38	0
BAC-7	5.17	142	529	1.34	7.72	985	2760	0	0.0298	0.0184	0	0	0	0	0	0.284	0	0.0908	0.00388	0	0.09	0.34	0
BAC-8	0	27.8	266	1.61	7.92	81.1	708	0	0.0519	0.0732	0	0	0	0	0	0.165	0	0.0055	0	0	0.31	0.41	0
BAC-9	0	28.4	283	1.7	7.91	82.6	736	0	0.583	0.051	0	0	0	0	0	0.167	0	0.00451	0	0	0.06	0.53	0
BAC-10	0	31.1	273	1.66	7.91	85	788	0	0.0527	0.0612	0	0	0	0	0	0.171	0	0.00567	0	0	0.15	0.5	0

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	147	744	0.519	7.59	263	1840	0	0.00927	0.0634	0	0	0	0	0	0.271	0	0.00206	0	0	0.27	0.59	0
WW-U-1	1.39	323	1820	0.416	7.27	1140	5120	0	0.00592	0.0442	0	0	0.00432	0	0	0.431	0	0.00702	0.00748	0	0.38	0.89	1.27
WW-U-2	1.16	347	1170	0.633	7.45	872	4270	0	0.0114	0.0473	0	0	0.00237	0	0	0.484	0	0.00411	0.0113	0	0.19	0.54	0
WWC-1	12.9	584	4600	0.245	7.1	3190	13800	0	0.0215	0.0183	0	0	0	0	0	1.000	0.00018	0.00794	0.0146	0	0.13	0.82	0
WWC-2	0	54.2	316	0.534	7.75	128	824	0	0.0161	0.0296	0	0	0	0	0	0.128	0	0.00348	0	0	-0.06	0.5	0
WWC-3	0	35.3	244	1.14	7.79	86	764	0	0.0226	0.0306	0	0	0	0	0	0.151	0	0.00471	0	0	0.06	0.38	0
WWC-4	1.34	240	1030	0.449	7.97	673	2780	0	0.0133	0.0412	0	0	0	0	0	0.388	0	0	0	0	-0.03	0.56	0
WWC-5	3	388	1600	0.493	7.12	1440	5160	0	0.0134	0.0309	0	0	0	0	0	0.557	0	0.00203	0.00448	0	0.18	1.12	1.12
WWC-6	0.535	137	943	0.25	7.54	451	2470	0	0.0133	0.0822	0	0	0	0	0	0.204	0	0.00484	0	0	0.48	0.81	0
WWC-7	0	42.8	187	0.422	7.93	119	640	0	0.0165	0.0314	0	0	0	0	0	0	0	0.00386	0	0	0.16	0.18	0
WWC-8	0.561	151	943	0.391	7.54	537	440	0	0.0081	0.173	0	0	0	0	0	0.23	0	0.00632	0.00274	0	0.29	0.68	0
WWC-9	0	42.6	212	1.11	8.01	78.2	560	0	0.0261	0.0973	0	0	0	0	0	0.147	0	0.00538	0	0	0.16	0.27	0
WWC-10	0	52.3	328	0.651	7.85	141	1070	0	0.0265	0.0615	0	0	0	0	0	0.115	0	0.00854	0	0	0.13	0.49	0

Results below reporting limit are recorded as 0.

Date Oct. 2018

Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
	0.001	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Round 12

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	15.92	7.84	-138	1880	1.6	0.42	1.2
CL-U-2	15.68	7.81	-119	1820	4.7	0.6	1.17
CLW-1	15.59	7.68	-68	1540	0.9	2.06	0.984
CLW-2	15.77	7.86	-187	1870	1.7	1.5	1.2
CLW-3	15.45	7.93	-201	1720	2.1	1.37	1.1
CLW-4	15.51	7.97	-203	1610	12.7	1.55	1.03
CLW-5	15.07	7.94	-214	1.69	3.8	3.03	1.08
CLW-6	16.62	8.04	-225	1570	1.1	1.54	1
CLW-7	16.75	7.76	-79	1630	0.5	0.91	1.05
CLW-8	16.41	7.82	-99	1570	0.07	1.7	1.01
CLW-9	15.39	7.98	-184	1550	3.6	0.83	0.993
CL-U-3	15.07	7.55	-197	1830	0.3	2.51	1.17

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.39	7.67	-60	3720	1.1	0.31	2.38
BA-U-2	16.57	7.81	-97	2710	2	0.38	1.74
BAC-1	19.56	8.75	-282	1340	22.8	1.17	0.852
BAC-2	18.83	7.25	-39	5370	2.2	1.1	3.38
BAC-3	17.57	7.34	-11	8.95	1.1	1.61	5.64
BAC-4	15.14	7.6	-57	2600	0	1.94	1.66
BAC-5	15.26	7.68	-62	2960	0	2.03	1.9
BAC-6	15.21	7.63	-44	3880	0	1.48	2.48
BAC-7	15.95	7.74	-71	4210	0	1.37	2.7
BAC-8	17.34	7.98	-91	1490	3.9	1.21	0.954
BAC-9	16.49	8.02	-69	1460	1.6	0.96	0.937
BAC-10	17.35	8	-80	1500	2.9	0.94	0.963

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.23	7.68	-37	3470	1.9	0.36	2.22
WW-U-1	16.64	7.24	-17	8020	0	0.41	5.05
WW-U-2	17.11	7.41	-8	7650	1.1	0.51	4.82
WWC-1	16.68	7.13	2	9830	0	1.37	6.19
WWC-2	15.94	8.03	-95	1550	2.9	1.56	0.989
WWC-3	16.07	8.01	-144	1310	0	2.09	0.841
WWC-4	15.29	7.38	-19	4910	0	1.4	3.14
WWC-5	15.41	7.16	-6	7900	0.5	1.67	4.98
WWC-6	15.12	7.59	-62	4040	1.6	0.72	2.59
WWC-7	14.7	8.01	-200	1120	7.6	2.26	0.718
WWC-8	17.02	7.76	-113	3990	22.2	1.66	2.55
WWC-9	16.66	7.89	-91	1.53	13	1.32	0.985
WWC-10	15.91	8.12	-152	1700	9.8	1.42	1.09

Assessment	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
RW-4	0.798	61.8	633	0.919	7.78	247	1660	0	0.0295	0.0823	0	0	0.00278	0	0	0.235	0	0.00365	0	0	0.11	0.11	0
RW-5	0	30.8	165	0.563	8.01	109	548	0	0.027	0.0244	0	0	0	0	0	0	0	0.00393	0	0	-0.15	0.47	0
RW-7	0	44	333	0.626	7.87	127	920	0	0.0203	0.0311	0	0	0	0	0	0.132	0	0.00399	0	0	0.2	0.16	0

Assessment	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
RW-4							
RW-5							
RW-7							
WDB-19							

Round 13 (all results ppm) Assessment Monitoring - September 23 - October 15, 2019

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	58.9	432	0.753	7.94	109	976	0	0.0289	0.0799	0	0	0	0	0	0.239	0	0.0035	0	0	0.03	0.75	0.75
CL-U-2	0	60.6	424	0.792	7.87	112	968	0	0.0251	0.0935	0	0	0	0	0	0.229	0	0.00412	0	0	0.03	0.57	0
CLW-1	0	36	328	1.11	8.03	69.1	852	0	0.0295	0.0612	0	0	0	0	0	0.187	0	0.00357	0	0	0.29	0.38	0
CLW-2	0	50.8	438	1.13	8.15	88.1	924	0	0.0283	0.1510	0	0	0	0	0	0.253	0	0.0102	0	0	0.08	0.56	0
CLW-3	0	47	363	1.24	7.99	90.8	828	0	0.039	0.0976	0	0	0	0	0	0.242	0	0.00504	0	0	0.6	0.43	0
CLW-4	0	34.6	332	1.55	7.97	75.6	768	0	0.0387	0.0797	0	0	0	0	0	0.235	0	0.00441	0	0	0.22	1.06	1.06
CLW-5	0	37.5	351	1.89	8	76.9	1060	0	0.0231	0.0685	0	0	0	0	0	0.237	0	0.00479	0	0	0.25	0.44	0
CLW-6	0	34.5	330	1.7	7.98	74.4	1110	0	0.0145	0.0936	0	0	0	0	0	0.239	0	0.00607	0	0	0.42	1.05	1.47
CLW-7	0	43.7	362	1	7.89	71.4	796	0	0.0238	0.0523	0	0	0	0	0	0.192	0	0.00402	0	0	0.12	-0.03	0
CLW-8	0	39.9	337	1.04	7.98	70.7	836	0	0.0266	0.0521	0	0	0.00000	0	0	0.196	0	0.00449	0	0	-0.05	0.32	0
CLW-9	0	26.9	288	1.94	8.12	88.7	792	0	0.0398	0.0469	0	0	0.00287	0	0	0.181	0	0.00573	0	0	0.36	0.02	0
CL-U-3	0	64.6	304	0.429	8.85	168	596	0	0	0.0342	0	0	0.0738	0	0	0.152	0	0.00964	0	0	2.13	0.21	2.13

Round 13 — Field Results

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	15.85	7.75	-159	777	0	1.62	0.497
CL-U-2	15.96	7.7	-158	743	0	1.01	0.476
CLW-1	15.83	7.73	-48	1480	1.3	2.01	0.948
CLW-2	16.6	7.79	-191	760	0	2	0.488
CLW-3	17.14	7.84	-215	1730	0.5	1.43	1.11
CLW-4	16.47	7.88	-233	1600	2.7	1.61	1.03
CLW-5	17.05	7.83	-220	1700	1.9	1.84	1.09
CLW-6	16.65	7.7	-229	1590	1.6	2.69	1.02
CLW-7	17.74	7.76	-57	1580	0.6	1.24	1.01
CLW-8	16.37	7.81	-36	1520	1	1.51	0.969
CLW-9	16.03	7.72	-299	1610	0.2	7.56	1.03
CL-U-3	16.1	9.08	-76	503	0	1.84	0.322

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	173	1140	0.587	7.71	314	2290	0	0.0223	0.0770	0	0	0	0	0	0.385	0	0.00302	0.00502	0	0.16	0.73	0.73
BA-U-2	0	47.1	400	0.893	8.18	56.6	972	0	0.0283	0.1270	0	0	0	0	0	0.247	0	0.00332	0	0	0.26	0.7	0
BAC-1	1.43	93.7	801	0.307	8.16	701	2730	0	0.0126	0.0460	0	0	0.00163	0	0	0.259	0	0.128	0.00436	0	0	0.14	0
BAC-2	9.49	208	1730	1.07	7.45	2760	7240	0	0.0647	0.0192	0	0	0.0058	0	0	0.466	0.00028	0.19	0.0145	0	0.12	0.39	0
BAC-3	7.32	441	3500	0.675	7.49	4310	13900	0.0027	0.0356	0.0321	0	0	0.00449	0	0	0.957	0	0.0255	0.0236	0	0	0.45	0
BAC-4	0.606	66.7	573	1.13	7.95	330	1820	0	0.0322	0.0637	0	0	0	0	0	0.279	0	0.0218	0	0	0.15	0.16	0
BAC-5	0	66.2	568	1.11	8.07	250	1410	0	0.0321	0.0814	0	0	0	0	0	0.289	0	0.00941	0	0	0.25	0.36	0
BAC-6	2.66	119	625	0.796	7.86	646	1870	0	0.0223	0.0338	0	0	0	0	0	0.288	0	0.0651	0.00273	0	0.31	0.83	1.14
BAC-7	5.06	107	566	1.31	7.96	1170	2320	0	0.0314	0.0174	0	0	0	0	0	0.248	0	0.0887	0.00276	0	0.04	0.22	0
BAC-8	0	23.2	280	1.53	8.05	95.5	784	0	0.0639	0.0389	0	0	0	0	0	0.156	0	0.00545	0	0	0.03	1.21	1.21
BAC-9	0	27.1	299	1.45	8.06	87.6	788	0	0.0593	0.0388	0	0	0	0	0	0.16	0	0.00483	0	0	0.09	0	0.53
BAC-10	0	25.7	280	1.51	8.09	87.4	808	0	0.0595	0.045	0	0	0	0	0	0.16	0	0.00584	0	0	0.8	1	1.8

Field Results

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.68	7.47	-58	1610	0	1.29	1.03
BA-U-2	16.37	8.94	-255	1550	1.4	0.8	0.99
BAC-1	17.09	7.98	-50	3950	1.32	3.4	2.53
BAC-2	16.92	7.19	28	10600	3.3	2.45	6.59
BAC-3	17.34	7.1	20	16700	2	0.61	10.4
BAC-4	16.73	7.81	-57	2570	0.6	1.18	1.64
BAC-5	17.52	7.84	-50	2540	0.4	1.33	1.63
BAC-6	16.78	7.74	-52	2670	0.7	0.87	1.71
BAC-7	17.16	7.83	-156	4000	3.1	0.86	2.56
BAC-8	15.03	7.65	-41	1540	0.2	5.45	0.989
BAC-9	15.03	7.68	-23	1560	0.3	1.2	0.993
BAC-10	14.98	7.65	-31	1560	0.1	1.15	0.999

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	136	824	0.38	7.71	281	1850	0	0.00981	0.0599	0	0	0	0	0	0.277	0	0	0	0	0.19	1.61	1.61
WW-U-1	1.41	311	1010	0	7.37	588	5720	0	0.00594	0.0419	0	0	0.00166	0	0	0.485	0	0.00689	0.0077	0	-0.08	1.42	1.42
WW-U-2	1.02	346	2020	0	7.3	855	4400	0	0.00735	0.0499	0	0	0	0	0	0.54	0	0.00317	0.011	0	-0.2	1.36	1.36
WWC-1	13.2	473	4940	0.292	7.42	3570	14900	0	0.0264	0.0205	0	0	0	0	0	0.974	0.000278	0.0113	0.016	0	0.23	0.9	0.9
WWC-2	0	57.6	349	0.427	7.99	141	876	0	0.0166	0.0336	0	0	0	0	0	0.126	0	0.00327	0	0	-0.15	0.81	0.81
WWC-3	0	33.3	262	0.986	8.13	95.3	776	0	0.0236	0.0331	0	0	0	0	0	0.151	0	0.00477	0	0	3.1	0.58	3.1
WWC-4	1.06	176	968	0.453	7.61	594	3080	0	0.0154	0.0456	0	0	0	0	0	0.329	0	0	0.00177	0	0.72	0.57	0
WWC-5	2.11	344	1530	0.448	7.39	1290	4740	0	0.0154	0.0382	0	0	0	0	0	0.538	0	0.00256	0.00596	0	0.26	1.05	1.05
WWC-6	0.548	125	855	0.23	7.66	451	2340	0	0.0138	0.0852	0	0	0	0	0	0.204	0	0.00595	0	0	0.034	0.41	0
WWC-7	0	46.7	186	0.418	8.12	129	652	0	0.0187	0.0316	0	0	0	0	0	0	0	0.00414	0	0	0.14	0.21	0
WWC-8	0.803	144	1230	0.353	7.7	579	3670	0	0.0145	0.0627	0	0	0	0	0	0.246	0	0.00284	0.00422	0	0.05	0.42	0
WWC-9	0	47.1	309	0.909	8.04	107	780	0	0.0309	0.0643	0	0	0	0	0	0.153	0	0.00351	0	0	0.14	0.05	0
WWC-10	0	54.4	380	0.629	8.02	177	988	0	0.0289	0.0347	0	0	0	0	0	0.125	0	0.00932	0	0	0.03	0.14	0

Field Results

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.51	7.63	-12	3290	0.1	0.78	2.11
WW-U-1	16.11	7.19	14	8000	2.8	1.93	5.04
WW-U-2	16.06	7.38	22	7390	0.6	1.32	4.66
WWC-1	15.13	6.79	36	1910	0	3.67	11.8
WWC-2	14.82	7.31	-29	1720	0.3	0.47	1.1
WWC-3	15.96	7.72	-244	1420	0	0.2	0.909
WWC-4	14.38	7.21	-34	4460	0	2.35	2.86
WWC-5	16.43	6.92	13	7170	0	0.21	4.52
WWC-6	14.67	7.23	-190	3970	0.3	1.64	2.54
WWC-7	14.97	7.79	-200	1150	1.7	0.28	0.736
WWC-8	15.01	7.23	-60	4920	0.6	0.32	3.15
WWC-9	15.26	7.79	-96	1540	1.4	1.72	0.99
WWC-10	14.48	7.49	-132	1880	0.6	5.51	

Results below reporting limit are recorded as 0.

Date Oct. 2018

Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
	0.001	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Assessment	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
RW-4	0.664	65.5	661	0.758	7.97	292	2280	0	0.0313	0.0880	0	0	0	0	0	0.247	0	0.00314	0	0	-0.11	0.77	0
RW-5	0	28.9	457	0.625	8.19	121	592	0	0.0337	0.0253	0	0	0	0	0	0	0	0.00482	0	0.664	0.08	0.61	0
RW-7	0	47.5	318	0.626	8.35	137	832	0	0.0223	0.0327	0	0	0	0	0	0.148	0	0.0047	0	0	3.1	0.25	3.1
WDB-19	0	33.4	306	1.3	8.23	65.6	824	0	0.0302	0.0476	0	0	0	0	0	0.214	0	0.00675	0	0	0.21	0.87	0.87

Assessment	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
RW-4	15.2	7.49	-27	2940	0.2	0.27	1.89
RW-5	14.88	7.83	-42	1120	0.3	1.84	0.718
RW-7	15.32	7.65	-132	1610	0	0.55	1.03
WDB-19	17.02	7.89	-201	1610	1.3	4.54	1.03

Assessment 4 - January 7/8, 2020

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
Bottom Ash	**Boron**	**Calcium**	**Chloride**	**Fluoride**	**pH**	**Sulfate**	**TDS**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Lead**	**Lithium**	**Mercury**	**Molybdenum**	**Selenium**	**Thallium**	**Radium 226**	**Radium 228**	**Radium 226 and 228 combined**
BAC-11	0	72.6	727	0.824	8.06	141	1680	0	0.0321	0.1250	0	0	0	0	0	0.236	0	0.00366	0	0			
BAC-12	0	31.2	228	1.12	8.26	77.7	940	0	0.0331	0.2220	0	0	0	0	0	0.322	0	0.00526	0	0			
BAC-13	0.604	107	1040	0.699	7.63	302	2160	0	0.0223	0.1020	0	0	0	0	0	0.281	0	0.0045	0	0			
BAC-14	0.555	160	1160	0.538	8.29	527	2540	0	0.0296	0.0606	0	0	0	0	0	0.34	0	0.00201	0	0			
BAC-15	0	25.2	284	1.49	8.12	85.2	880	0	0.059	0.0506	0	0	0	0	0	0.155	0	0.00733	0	0			
BAC-16	0	22.5	331	1.69	8.1	84.7	940	0	0.0851	0.0363	0	0	0	0	0	0.167	0	0.00591	0	0			
BAC-17	0	25.1	135	0.644	8.41	104	420	0	0.032	0.0618	0	0	0	0	0	0	0	0.00497	0	0			
Waste Water	**Boron**	**Calcium**	**Chloride**	**Fluoride**	**pH**	**Sulfate**	**TDS**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Lead**	**Lithium**	**Mercury**	**Molybdenum**	**Selenium**	**Thallium**	**Radium 226**	**Radium 228**	**Radium 226 and 228 combined**
WWC-11	0	4.85	132	0.35	11.2	72.1	740	0	0.00231	0.0762	0	0	0.00246	0	0	0.196	0	0.0119	0	0			
WWC-12	0	53.8	367	0.377	8.96	140	1080	0	0.0264	0.0583	0	0	0	0	0	0.117	0	0.00444	0	0			
WWC-13	0	56.3	349	0.34	8.78	131	820	0	0.019	0.0589	0	0	0	0	0	0.109	0	0.00442	0	0			

Results below reporting limit are recorded as 0.

Date Oct. 2018

Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:

Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
0.001	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Assessment 4

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
Bottom Ash	**Temp**	**pH**	**REDOX**	**Conductance**	**Turbidity (NTUs)**	**DO**	**TDS**
BAC-11	14.74	7.56	-9	2770	0.7	8	1.77
BAC-12	14.53	7.87	-219	1250	0.9	0.24	0.802
BAC-13	14.66	7.39	-36	3900	2.7	2.59	2.5
BAC-14	14.4	7.37	10	4310	1	0.84	2.76
BAC-15	14.39	7.78	-5	1530	1.1	3.61	0.982
BAC-16	14.71	7.79	-46	1730	0.3	1.82	1.11
BAC-17	15.42	8.12	-252	920	2.9	0.33	0.589
Waste Water	**Temp**	**pH**	**REDOX**	**Conductance**	**Turbidity (NTUs)**	**DO**	**TDS**
WWC-11	13.28	11.3	-488	1350	10.9	1	0.861
WWC-12	13.91	9.19	-295	1610	10.1	0.74	1.03
WWC-13	14.29	8.85	-277	1590	4.9	0.74	1.02

Round 14 (all results ppm) Assessment Monitoring - March 25 - April 9, 2020

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	0	57.6	429	0.979	7.70	122	916	0	0.0310	0.0800	0	0	0.00551	0	0	0.241	0	0.00505	0	0	0.36	0.93	1.29
CL-U-2	0	60.0	408	1.01	7.68	118	964	0	0.0266	0.0901	0	0	0	0	0	0.221	0	0.00404	0	0	0.09	1.23	1.23
CLW-1	0	36.6	304	0.979	7.91	61.0	856	0	0.0300	0.0612	0	0	0.00551	0	0	0.172	0	0.00527	0	0	0.25	0.12	0
CLW-2	0	47.0	418	1.23	7.84	86.0	992	0	0.0258	0.0770	0	0	0.00337	0	0	0.212	0	0.00556	0	0	0.03	0.54	0
CLW-3	0	39.4	361	1.27	7.88	101	488	0	0.0387	0.0991	0	0	0.00251	0	0	0.206	0	0.00560	0	0	0.20	-0.04	0
CLW-4	0	33.6	323	1.34	7.88	85.5	960	0	0.0381	0.0822	0	0	0.00245	0	0	0.204	0	0.00508	0	0	-0.03	0.47	0
CLW-5	0	34.5	340	1.58	7.86	83.9	800	0	0.0227	0.0737	0	0	0	0	0	0.198	0	0.00585	0	0	0.15	0.62	0
CLW-6	0	33.0	312	1.48	7.94	81.2	544	0	0.0225	0.0878	0	0	0	0	0	0.203	0	0.00540	0	0	0.43	-0.06	0
CLW-7	0	44.3	329	1.03	7.79	60.5	1020	0	0.0242	0.0526	0	0	0	0	0	0.180	0	0.00392	0	0	0.20	-0.08	0
CLW-8	0	40.8	316	1.03	7.86	63.7	880	0	0.0267	0.0634	0	0	0	0	0	0.182	0	0.00400	0	0	0.12	0.12	0
CLW-9	0	25.2	296	1.90	7.96	83.5	932	0	0.0402	0.0499	0	0	0	0	0	0.170	0	0.00597	0	0	0.15	0.32	0
CL-U-3	0	57.7	386	0.889	7.75	116	1090	0	0.0206	0.0478	0	0	0.00553	0	0	0.205	0	0.00467	0	0	-0.06	0.95	0.95

Round 13

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
Round 13	14.31	7.53	-172	1970	1.0	0.46	1.26
CL-U-2	14.47	7.47	-132	1890	1.1	4.72	1.21
CLW-1	15.51	7.45	-110	1500	0.3	0.40	0.96
CLW-2	15.46	7.59	-189	1950	1.0	0.14	1.25
CLW-3	15.26	7.66	-230	1760	1.0	0.16	1.13
CLW-4	15.25	7.67	-237	1650	3.3	0.17	1.06
CLW-5	15.20	7.57	-234	1730	7.5	0.40	1.11
CLW-6	14.63	7.57	-236	1650	0.9	0.26	1.06
CLW-7	16.02	7.45	-97	1610	0.2	0.24	1.03
CLW-8	16.24	7.47	-106	1540	6.0	0.37	0.98
CLW-9	13.95	7.72	-276	1590	1.9	6.57	1.02
CL-U-3	14.31	7.51	-210	1870	1.7	5.53	1.20

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	0	188	1090	0.817	7.50	367	3050	0	0.0226	0.0774	0	0	0.0711	0	0	0.375	0	0.0152	0.00519	0	0.28	1.20	1.2
BA-U-2	0	2.47	395	0.912	10.70	42.7	872	0	0.00683	0.0804	0	0	0.00611	0	0	0.327	0	0.00629	0	0	-0.03	0.70	0
BAC-1	3.00	239	1890	0.645	7.39	1300	5270	0	0.0154	0.0340	0	0	0.00219	0	0	0.547	0	0.0170	0.00791	0	0.09	0.83	0.83
BAC-2	8.38	210	1710	1.16	7.27	2440	6380	0	0.0609	0.0206	0	0	0.00986	0	0	0.431	0.000192	0.172	0.0128	0	0.33	1.21	1.21
BAC-3	7.47	447	3620	1.26	7.21	4380	12500	0	0.0321	0.0284	0	0	0.0150	0	0	0.913	0	0.0251	0.0204	0	0.16	0.51	0
BAC-4	0.613	70.5	541	1.09	7.89	295	1540	0	0.0330	0.0649	0	0	0	0	0	0.272	0	0.0211	0	0	-0.06	0.17	0
BAC-5	0.547	83.5	552	0.991	7.79	416	1760	0	0.0297	0.0560	0	0	0	0	0	0.306	0	0.0242	0	0	0.03	0.22	0
BAC-6	4.02	115	560	0.847	7.74	1020	2340	0	0.0255	0.0215	0	0	0	0	0	0.242	0	0.0805	0	0	0.14	0.52	0
BAC-7	5.48	92.6	532	1.48	7.91	1090	2400	0	0.0350	0.0168	0	0	0	0	0	0.218	0	0.0805	0.00202	0	0.21	0.25	0
BAC-8																							
BAC-9																							
BAC-10																							
BAC-11	0	84.4	676	0.984	7.71	147	1100	0	0.0312	0.116	0	0	0	0	0	0.244	0	0.00345	0	0	0.36	0.09	0
BAC-12	0	25.9	210	1.24	7.99	71.7	360	0	0.0423	0.0938	0	0	0	0	0	0.132	0	0.00479	0	0	0.23	0.18	0
BAC-13	0.604	115	929	0.957	7.50	276	46400	0	0.0329	0.0773	0	0	0	0	0	0.285	0	0.00250	0	0	0.35	0.55	0
BAC-14	0.565	158	940	0.972	7.53	432	1180	0	0.0359	0.0542	0	0	0	0	0	0.321	0	0.00222	0	0	0.03	0.08	0
BAC-15	0	25.5	267	1.66	7.90	77.9	4600	0	0.0588	0.0423	0	0	0	0	0	0.156	0	0.00705	0	0	0.22	0.00	0
BAC-16	0	24.0	310	1.79	7.93	77.5	4620	0	0.0856	0.0364	0	0	0	0	0	0.171	0	0.00633	0	0	0.23	0.29	0
BAC-17																							

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	15.43	7.22	-203	4340	5.7	0.20	2.78
BA-U-2	15.98	10.31	-330	469	0.0	0.35	0.305
BAC-1	17.25	7.20	-60	8060	2.4	0.32	5.09
BAC-2	16.70	7.16	-30	10100	8.1	5.44	6.26
BAC-3	16.05	7.18	-5	16500	3.7	0.50	10.2
BAC-4	15.70	7.53	-107	2600	0.0	0.18	1.67
BAC-5	15.76	7.51	-74	2900	0.2	0.16	1.86
BAC-6	16.17	7.49	-63	3540	0.9	0.33	2.26
BAC-7	15.35	7.66	-115	3840	1.9	2.47	2.46
BAC-8							
BAC-9							
BAC-10							
BAC-11	15.03	7.41	12	2980	7.1	7.33	1.91
BAC-12	14.93	7.75	-152	1280	1.4	6.36	0.821
BAC-13	14.46	7.28	-47	3850	1.1	6.99	2.47
BAC-14	14.81	7.20	4230	22	2.0	4.84	2.7
BAC-15	14.67	7.72	-45	1550	1.5	7.69	0.99
BAC-16	14.41	7.71	-64	1710	0.5	7.76	1.1
BAC-17							

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0	113	699	0.511	7.70	279	1230	0	0.00865	0.0609	0	0	0.00305	0	0	0.239	0	0.00280	0	0	0.20	1.04	1.04
WW-U-1	1.42	286	1940	0.324	7.24	1270	4740	0	0.00653	0.0391	0	0	0.00544	0	0	0.412	0	0.00811	0.00724	0	0.21	1.38	1.38
WW-U-2	1.23	337	2020	0.473	7.42	981	4020	0	0.0108	0.0502	0	0	0.00696	0	0	0.498	0	0.00309	0.0112	0	0	1.08	1.08
WWC-1	13.4	464	4800	0	7.29	3440	13000	0	0.0256	0.0207	0	0	0	0	0	0.936	0.000238	0.0136	0.0133	0	0.32	0.36	0
WWC-2	0	51.7	322	0.452	7.88	124	644	0	0.0159	0.0357	0	0	0.00332	0	0	0.119	0	0.00455	0	0	0.24	-0.15	0
WWC-3	0	31.8	254	1.06	7.96	85.8	712	0	0.0219	0.0304	0	0	0.00240	0	0	0.142	0	0.00536	0	0	-0.08	0.19	0
WWC-4	1.20	182	935	0.426	7.44	638	2730	0	0.0140	0.0437	0	0	0	0	0	0.314	0	0.00207	0.00228	0	0.47	0.27	0
WWC-5	2.23	322	1580	0.295	7.15	1340	4670	0	0.0144	0.0367	0	0	0.00432	0	0	0.487	0	0.00283	0.00560	0	0.04	0.96	0.96
WWC-6	0.589	154	925	0.175	7.55	480	2490	0	0.0140	0.0925	0	0	0	0	0	0.213	0	0.00566	0	0	0.60	0.13	0
WWC-7	0	41.0	186	0.357	7.96	122	596	0	0.0194	0.0297	0	0	0	0	0	0	0	0.0044	0	0	0.11	0.17	0
WWC-8	0.652	154	1040	0.472	7.58	593	2700	0	0.0155	0.0564	0	0	0	0	0	0.229	0	0.00322	0.00385	0	0.18	0.18	0
WWC-9	0	40.5	302	0.843	7.99	98.8	652	0	0.0305	0.0629	0	0	0	0	0	0.147	0	0.00350	0	0	0.13	0.09	0
WWC-10	0	55.2	369	0.491	7.85	164	804	0	0.0240	0.0361	0	0	0	0	0	0.107	0	0.00656	0	0	0.03	0.40	0
WWC-11	0	34.9	197	0.467	8.64	97.8	280	0	0.00470	0.150	0	0	0	0	0	0	0	0.00718	0	0	0.21	0.48	0
WWC-12	0	77.1	382	0.453	8.85	143	320	0	0.0428	0.0761	0	0	0.00414	0	0	0.111	0	0.00423	0	0	0.03	0.42	0
WWC-13	0	66.4	350	0.389	7.94	138	360	0	0.0207	0.0450	0	0	0	0	0	0.103	0	0.00382	0	0	0.15	0.24	0

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.33	7.30	3	789	0.0	3.90	0.505
WW-U-1	15.39	7.01	-38	3910	1.2	0.17	2.5
WW-U-2	13.24	7.19	-19	3800	0.7	1.02	2.43
WWC-1	14.71	6.90	-20	19400	2.8	0.31	12.0
WWC-2	13.47	7.59	-97	1690	12.8	0.54	1.08
WWC-3	14.65	7.67	-154	1430	1.1	0.17	0.916
WWC-4	14.61	7.13	-12	4750	1.4	0.40	3.04
WWC-5	13.45	6.81	-15	7240	2.8	1.09	4.56
WWC-6	12.59	7.24	-179	4390	1.5	1.21	2.81
WWC-7	13.36	7.54	-191	1150	1.9	4.72	0.738
WWC-8	14.61	7.27	-60	4680	0.8	0.25	2.99
WWC-9	14.20	7.61	-23	1590	3.8	0.22	1.02
WWC-10	15.12	7.70	-135	1830	1.2	5.35	1.17
WWC-11	14.21	8.05	-305	1170	13.8	6.12	0.745
WWC-12	13.44	7.98	-267	1830	29.5	0.27	1.17
WWC-13	13.45	7.69	-173	1700	3.1	6.94	1.09

Results below reporting limit are recorded as 0.

Date Oct. 2018

	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
Results below laboratory *Reporting Limit* (RL) are recorded as 0. *RLs* as follows:	*0.001*	*0.002*	*0.002*	*0.002*	*0.005*	*0.002*	*0.004*	*0.002*	*0.1*	*0.00015*	*0.002*	*0.002*	*0.002*

Assessment	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
RW-4	0.709	77	676	0.831	7.78	305.0	1760	0	0.0264	0.0890	0	0	0	0	0	0.262	0	0.00292	0	0	0	0.66	0
RW-5	0	29.6	179	0.627	8.14	115	568	0	0.0306	0.0258	0	0	0	0	0	0	0	0.00466	0	0	0.07	0.4	0
RW-7	0	45.0	361	0.564	7.92	133	676	0	0.0206	0.0317	0	0	0	0	0	0.142	0	0.00442	0	0	-0.07	0.58	0
WDB-19	0	33.6	333	1.44	7.89	78.0	968	0	0.0294	0.0481	0	0	0	0	0	0.224	0	0.00429	0	0	0.18	0.25	0
RW-1																							
EPW-15	0.521	174	1220	0.614	7.56	314	2750	0	0.0209	0.0465	0	0	0.00220	0.00782	0	0.341	0	0.00206	0	0	0.12	1.08	1.08

Assessment	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
RW-4	14.38	7.47	-26	3080	0.8	6.51	1.97
RW-5	14.84	7.80	-129	1100	1.4	7.86	0.711
RW-7	14.93	7.67	-78	1670	1.4	0.23	1.07
WDB-19	15.03	7.59	-180	1700	2.0	0.21	1.09
RW-1							
EPW-15	18.47	7.27	-12	4710	6.0	0.37	3.02

Appendix A Historical Groundwater Flow and TDS Concentration Maps, Excerpted from Semi-Annual Assessment Monitoring Reports

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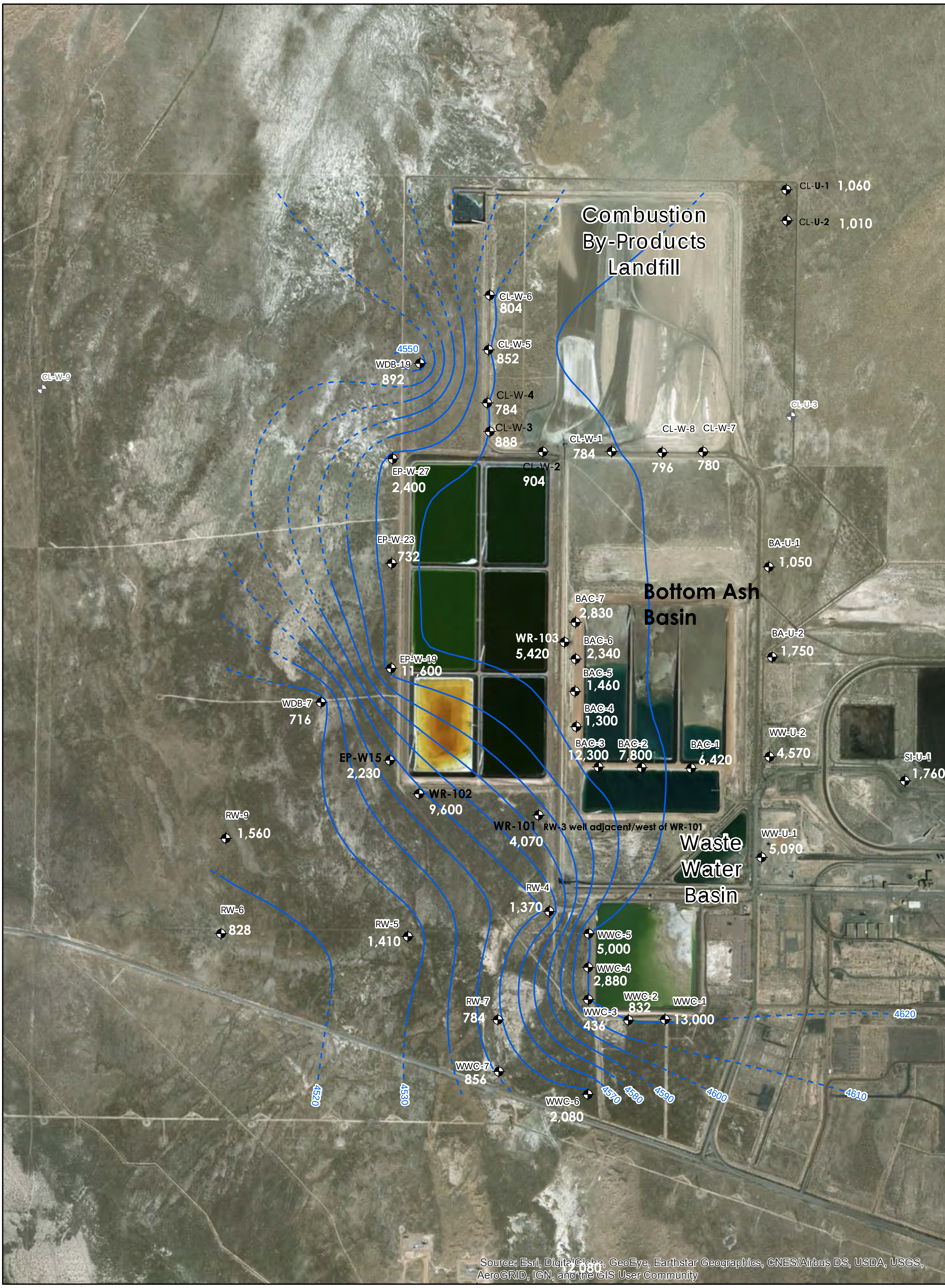

LEGEND:

MONITORING WELL TDS Concentration (milligrams per Liter; i.e., ppm)

GROUND WATER CONTOUR

NOTE:

1) DATA COLLECTED OCTOBER 2018
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

N

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR:
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

OCTOBER 2018
TDS Concentrations
Superimposed atop
Oct. 2018 Potentiometric Map

FIGURE: **7**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203709098	JR	ALL		11/21/18

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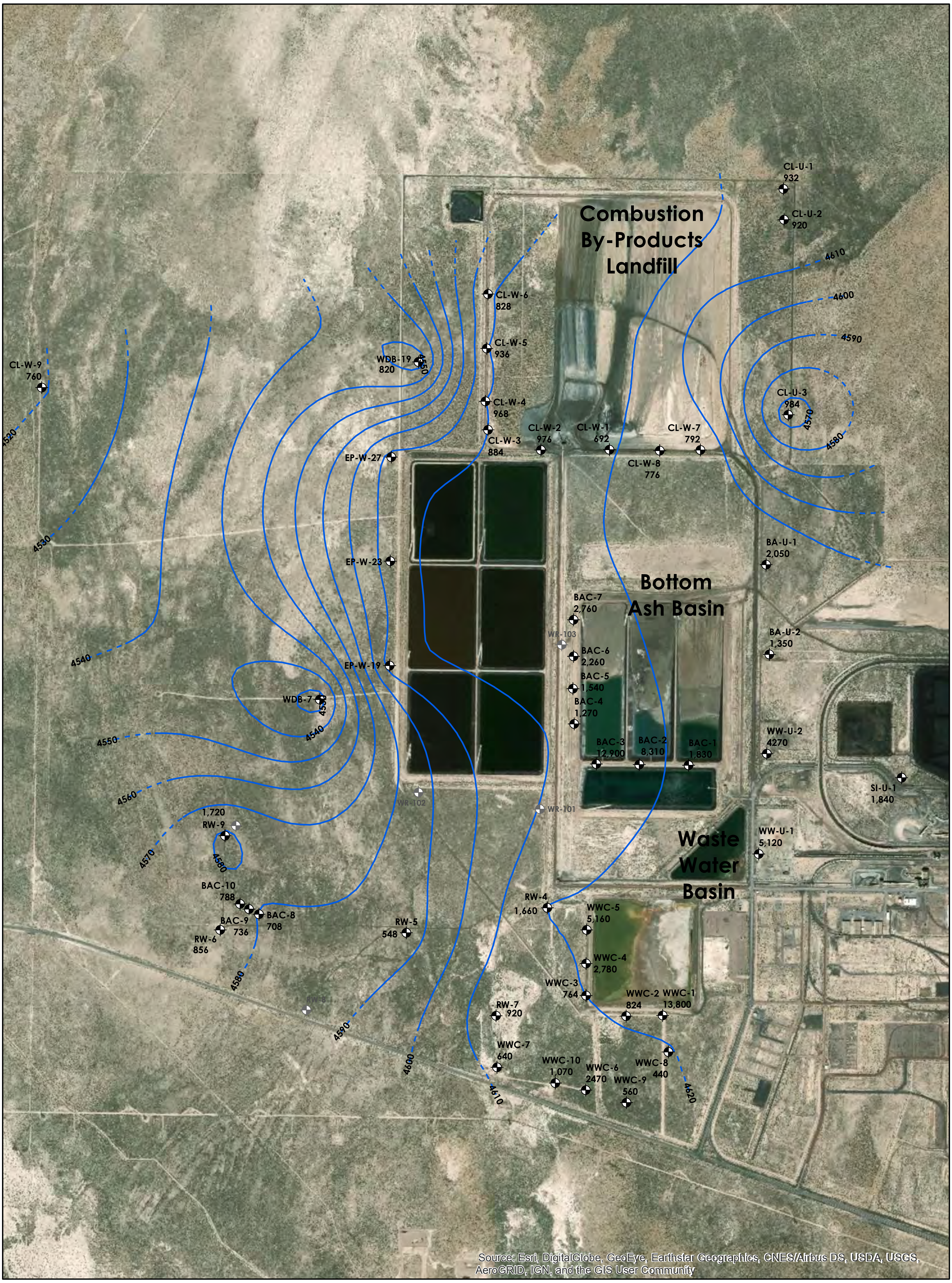

LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING
- 718 TDS RESULT (parts per million-ppm)
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED SPRING 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

0 1,300 2,600 Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH	SPRING 2019 TDS RESULTS	FIGURE: 5
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL
APPROVED BY:	DATE: 12/18/19	

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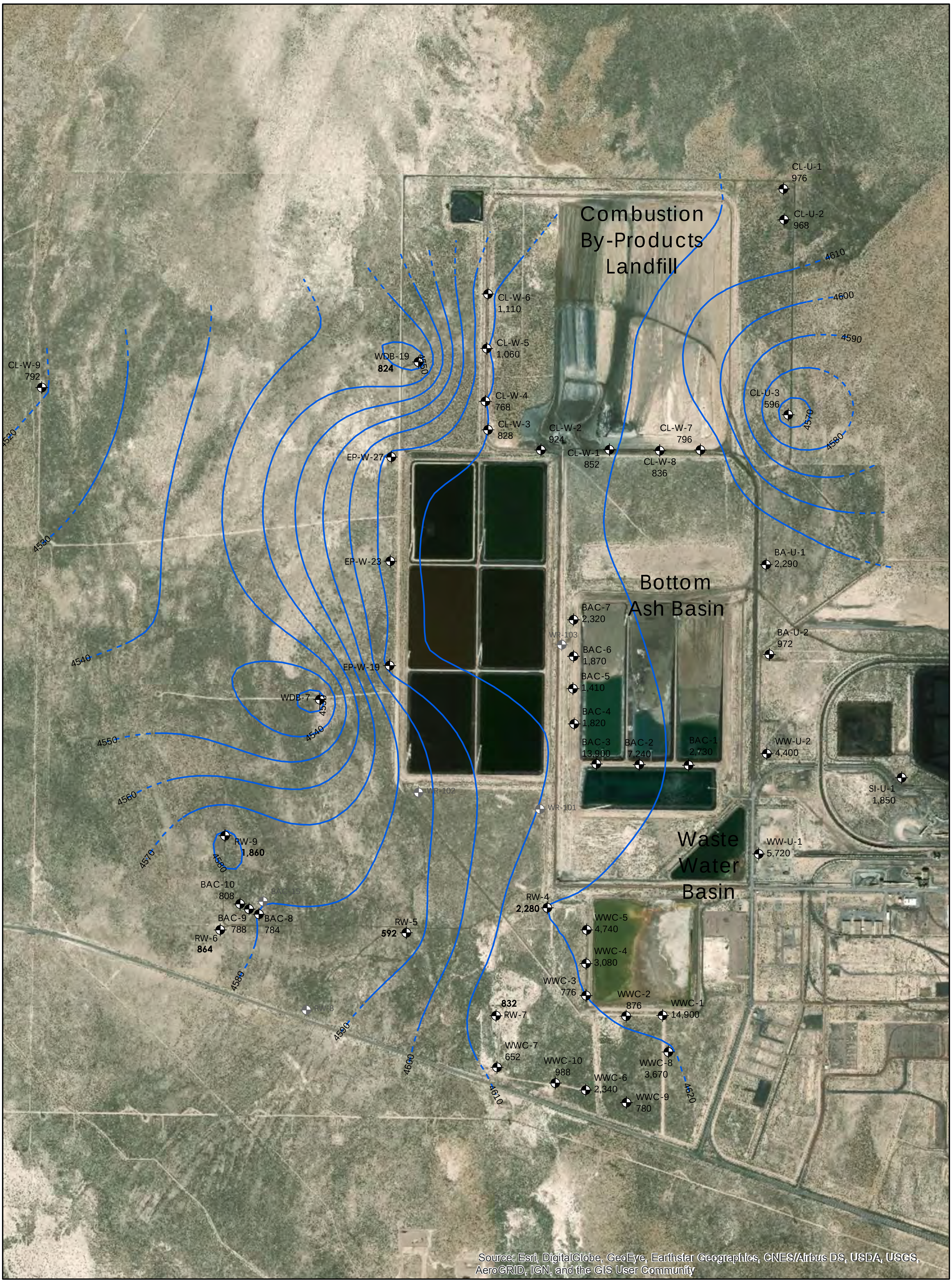


LEGEND:

- MONITORING WELL (GREYED WHEN NOT USED FOR CONTOURING)
- 718 TDS RESULT (parts per million-ppm)
- GROUNDWATER CONTOUR

NOTE:

1) DATA COLLECTED FALL 2019
2) ALL ELEVATIONS ARE FEET ABOVE MEAN SEA LEVEL

N

0 1,300 2,600
Feet
1 in = 1,350 ft

Stantec

FOR: INTERMOUNTAIN POWER SERVICE CORP. INTERMOUNTAIN GENERATION FACILITY DELTA, UTAH		FALL 2019 TDS RESULTS		FIGURE: 6
JOB NUMBER: 203709098	DRAWN BY: CK	CHECKED BY: ALL	APPROVED BY:	DATE: 12/18/19

Appendix B Drilling Logs and Well Schematic Diagrams

Boring Logs

IPSC

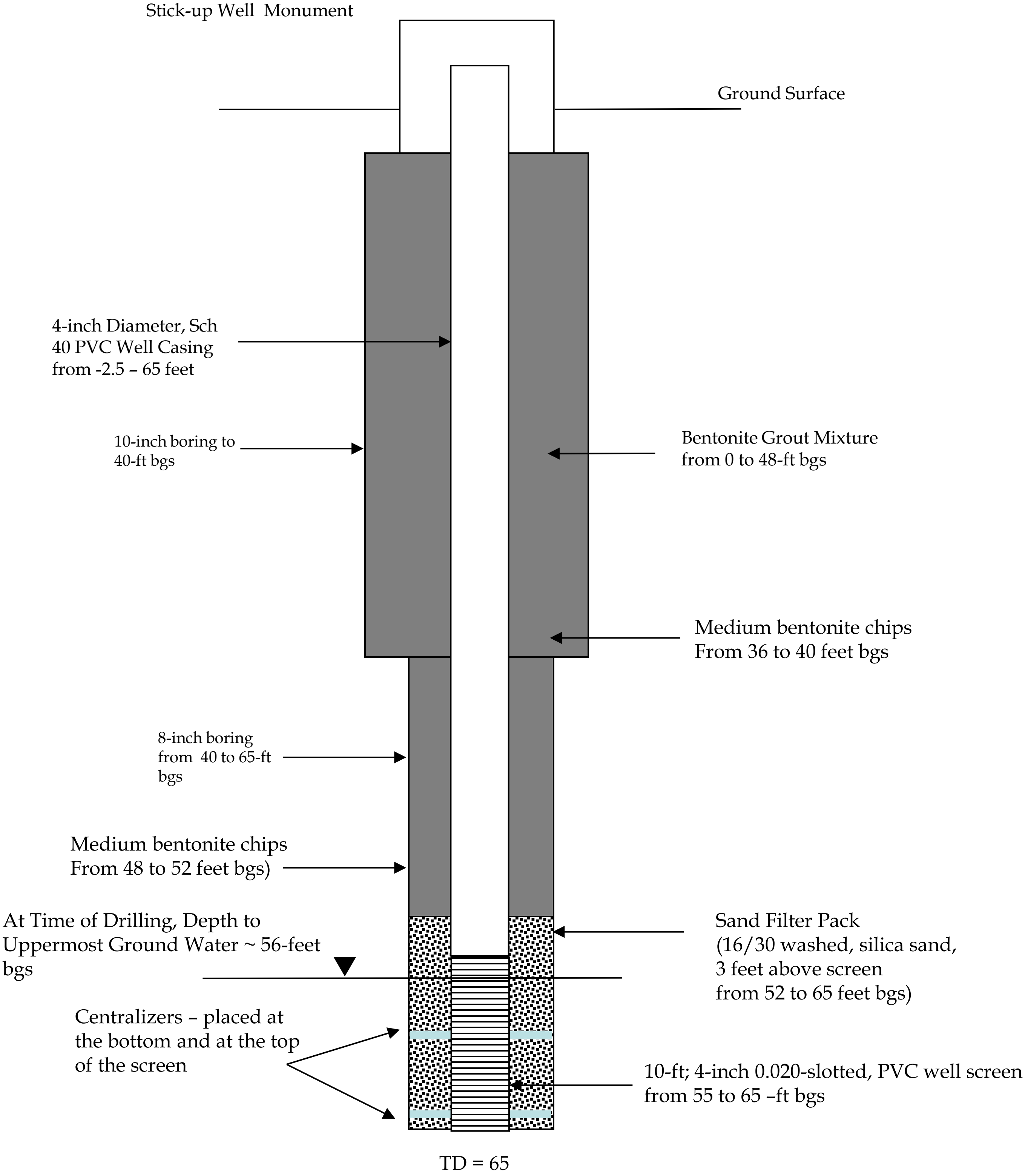
Delta, Utah

CLW-1

Interval (feet)	Drilling Method	Sample Description
		5/11/2015
0-3	10" Sonic	Brown fine grained Sand with gravel, dry
3-6	10" Sonic	Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-8	10" Sonic	Light Brown fine grained Sand
8-11.5	10" Sonic	Grayish white fine grained Sand, gravels present, rounded, dry
11.5-13.5	10" Sonic	Tan SILT with clay matrix, slightly moist
13.5-17	10" Sonic	Grayish Tan CLAY with small amount of silt present, slightly moist
17-23	10" Sonic	Grayish Tan SILT with fine grain sand present, trace amounts of clay, slightly moist
23-27	10" Sonic	Tannish Gray CLAY, denser, dry
27-32	10" Sonic	Tan CLAY, slightly moist
32-35	10" Sonic	Tan CLAY, denser material, slightly moist
		5/12/2015
35-48	10" Sonic to 40 feet	Tannish gray CLAY, moist
48-51	8" Sonic	Tannish gray CLAY, moist, softer
51-52	8" Sonic	Orangish, Brown, black fine grained Sand, moist
52-54	8" Sonic	Orangish, Brown , Red CLAY, slightly moist
54-56	8" Sonic	Orangish Brown CLAY with a fine grained sand matrix, slightly moist
56-62	8" Sonic	Light Brown fine grained Sand, saturated
62-63	8" Sonic	Light Brown CLAY, slightly moist
63-63.5	8" Sonic	Fine to medium grained Sand, slightly moist
63.5-64	8" Sonic	Light Brown CLAY, dry to slightly moist
64-65	8" Sonic	Light Brown fine grained Sand with clay matrix, moist

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec	ISPC– CB LANDFILL AREA DELTA, UTAH		
	Figure 1 – CLW-1 Schematic		
			Date Drawn
	Design by	Drawn by	Scale	Last Revision Date

Boring Logs

IPSC

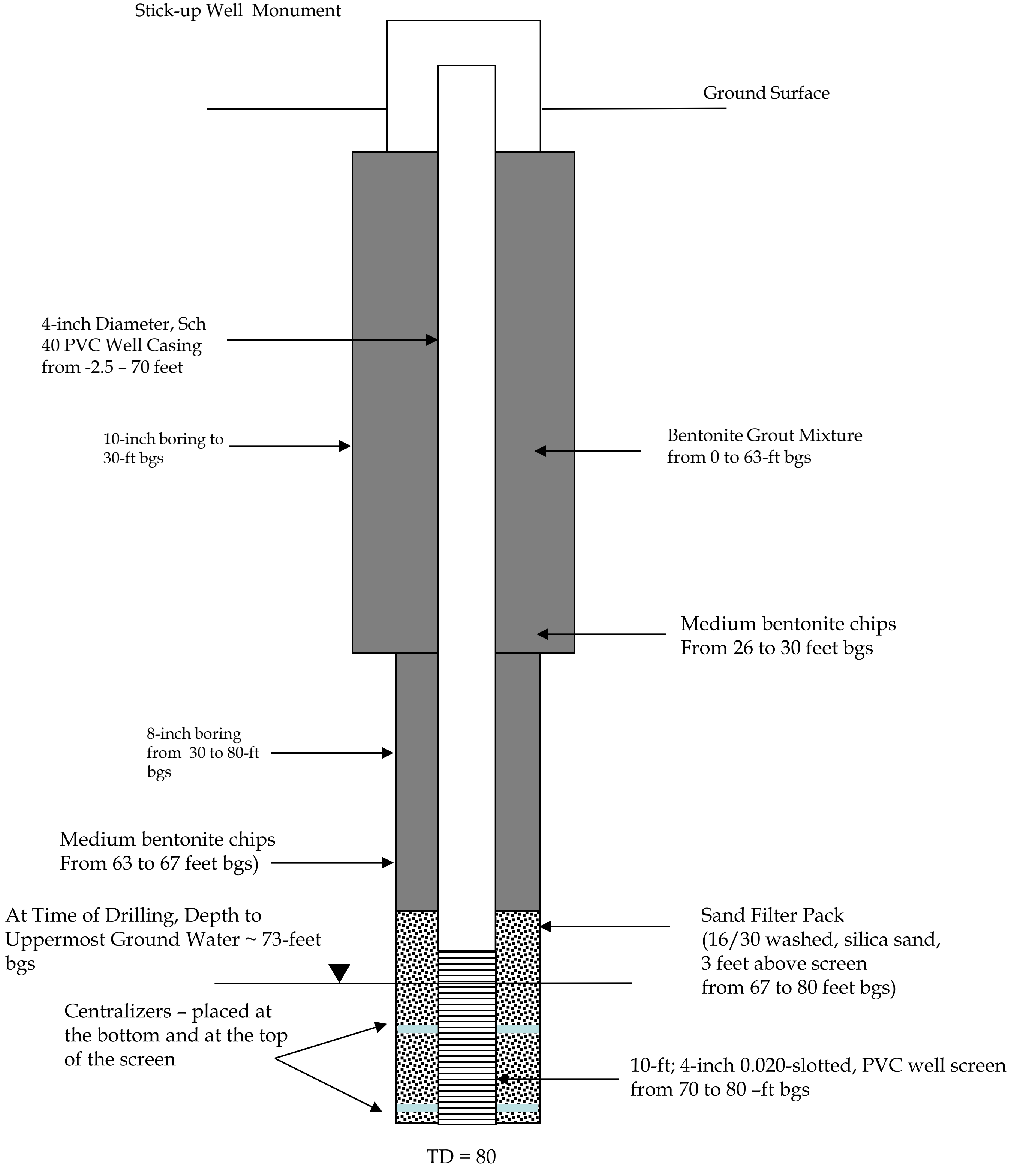
Delta, Utah

CLW-2

Interval (feet)	Drilling Method	Sample Description
		5/14/2015
0-8	10" Sonic	Brown fine grained Sand, clay present with gravel, dry
8-10	10" Sonic	Light to Dark Brown medium to course grained SAND, gravel present, dry
10-17	10" Sonic	Light Brown to Brown clayey SILT, slightly moist
17-25	10" Sonic	Light Brown Silty CLAY, moist
25-46	10" Sonic to 30 feet	Brown CLAY, slightly moist, from 40 to 45 feet transitioned to a Tan to Light Gray color
46-46.5	8" Sonic	Very moist to saturated zone, very soft clay , very sticky
46.5-50	8" Sonic	Light Gray CLAY, moist
50-51	8" Sonic	Tan to Light Gray with Orange zones, CLAY, slightly moist
51-51.5	8" Sonic	Very moist zone, CLAY
62	8" Sonic	Transitioning to a Orangish Red CLAY, Slightly moist
66-66.5	8" Sonic	Moist zone, transitioning from an Orangish Red to a Brown CLAY
66.5-73	8" Sonic	Reddish brown fine grained Sand with a clay matrix, very moist
73-80	8" Sonic	Brown fine gained Sand, trace amounts of clay, saturated.

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec	ISPC– CB LANDFILL AREA DELTA, UTAH			
	Figure 1 – CLW-2 Schematic			
				Date Drawn
	Design by	Drawn by	Scale	Last Revision Date

Boring Logs

IPSC

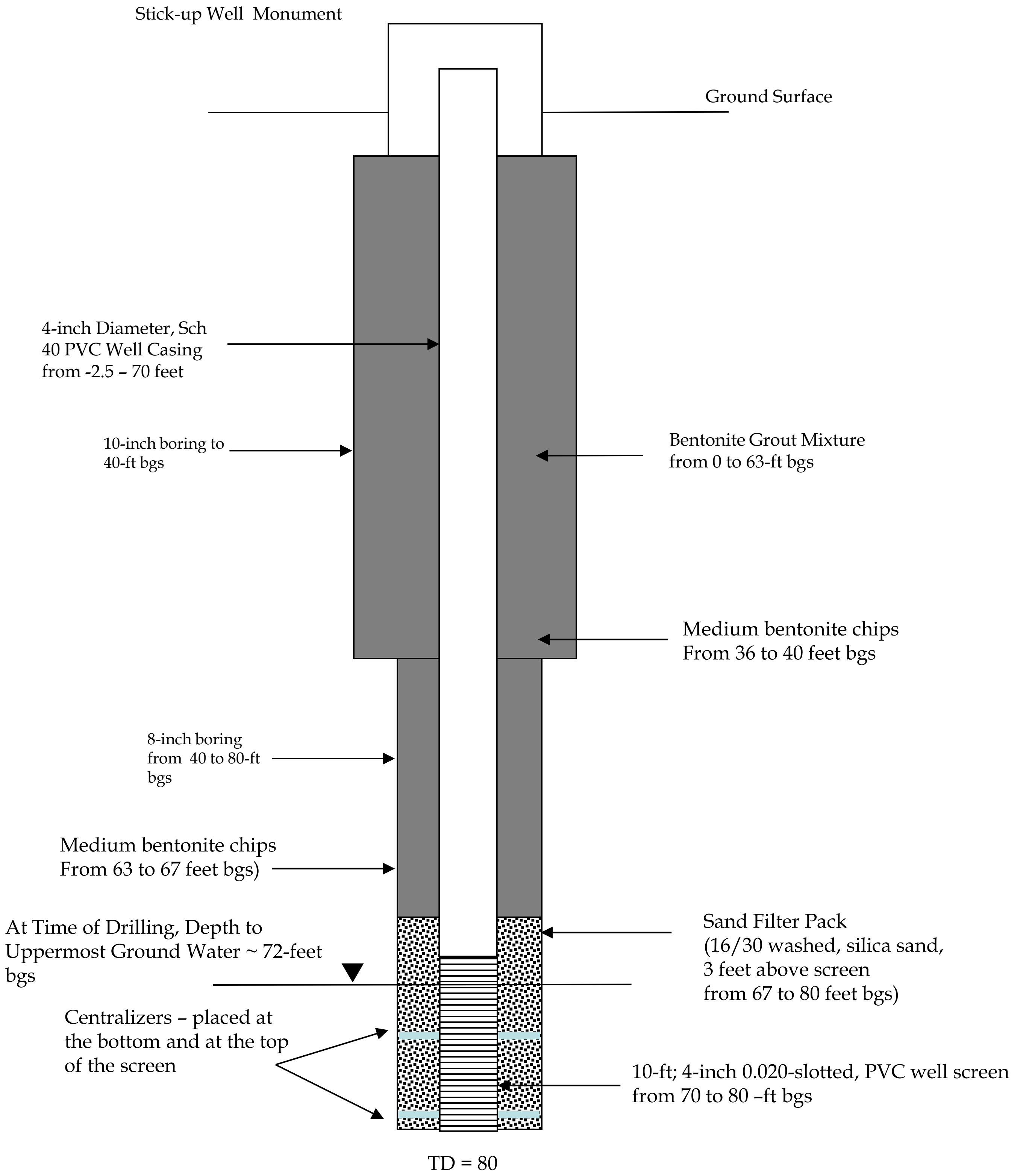
Delta, Utah

CLW-3

Interval (feet)	Drilling Method	Drill Time	Sample Description
			5/13/2015
0-3	10" Sonic		Brown fine grained Sand , clay present with gravel, dry
3-6	10" Sonic		Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-11	10" Sonic		Grayish White fine grained Sand, gravels present, rounded, dry
11-13	10" Sonic		Brownish Orange SILT, with fine grained sand present, soft
13-16	10" Sonic		Tannish Gray SILT with a clay present, very moist, sticky
16-21	10" Sonic		Tannish Gray SILT with a clay matrix, very moist, sticky
21-24	10" Sonic		Light Gray CLAY, with silt present, very moist
24-33	10" Sonic		Light Gray to Orange CLAY, with silt present, slightly moist
32-40	10" Sonic to 40 feet		Tan CLAY, denser material, slightly moist
40-66	8" Sonic		Tan to Light Brown CLAY, slightly moist to Dry
63	8" Sonic		Transiting into a Darker Gray CLAY, Moist
66-72	8" Sonic		Very moist to saturated, clay very plastic, firm and sticky
72-73	8" Sonic		Dark Gray fine to medium grained Sand, saturated
73-74	8" Sonic		Dark Gray CLAY, sticky firm, very moist
74-80	8" Sonic		Dark Gray fine to medium grained Sand, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

Figure 1 – CLW-3 Schematic

Design by	Drawn by	Scale	Date Drawn	Last Revision Date

Boring Logs

IPSC

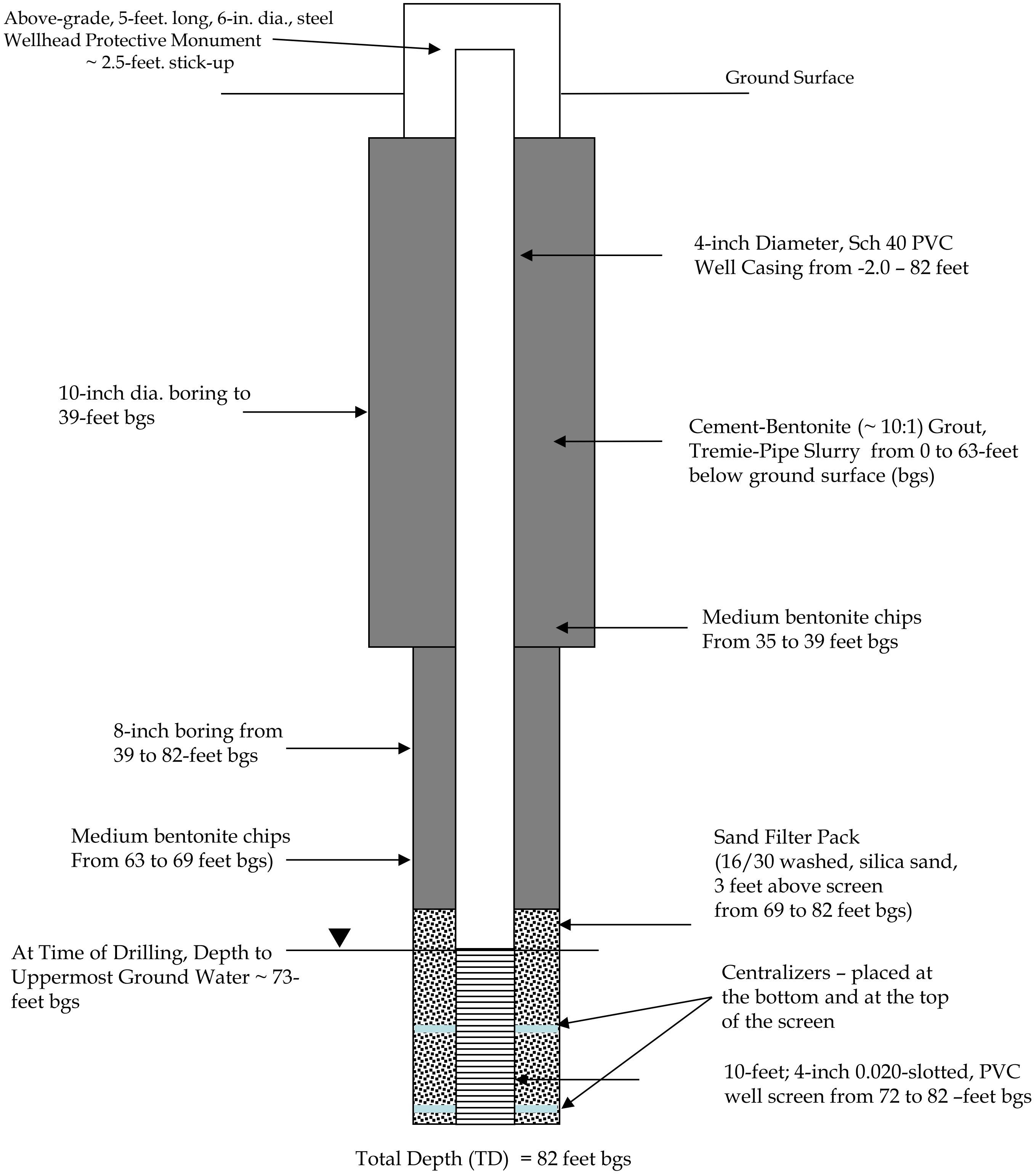
Delta, Utah

CLW-4

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-2	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
2-5	10" Sonic	Light Brown fine grained Sands, dry
5-11	10" Sonic	Light Brown to gray fine grained SAND, dry to slightly moist
11-13	10" Sonic	Light Brown silty CLAY, slightly moist, good plasticity
13-14	10" Sonic	Light Brown fine grained SAND, with clays present, poor plasticity, dry
14-16	10" Sonic	Light Brown clayey SILT, dry
16-18	10" Sonic	Light Brown to Brown silty CLAY, slightly moist, good plasticity
18-21	10" Sonic	Light Brown to Gray silty CLAY, slightly moist to moist, good plasticity
21-24	10" Sonic	Brownish Gray CLAY, moist, high plascity
34-32	10" Sonic	Browninsh Gray CLAY, moist to very moist, high plasticity
32-53	10" Sonic to 39 feet	Brownish Gray CLAY, dencer, slightly moist,
		44 - thin layer of brownish orange fine grained sand
		47 - transitioning into a gray clay
		49 - thin layer of brownish orange fine grained sand
53-55	8" Sonic	Brownish Gray CLAY, dense, very plastic, slightly moist
55-73	8" Sonic	Brown CLAY, very plastic, slightly moist
73-82	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



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ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-4 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15 / Last Revision Date

Boring Logs

IPSC

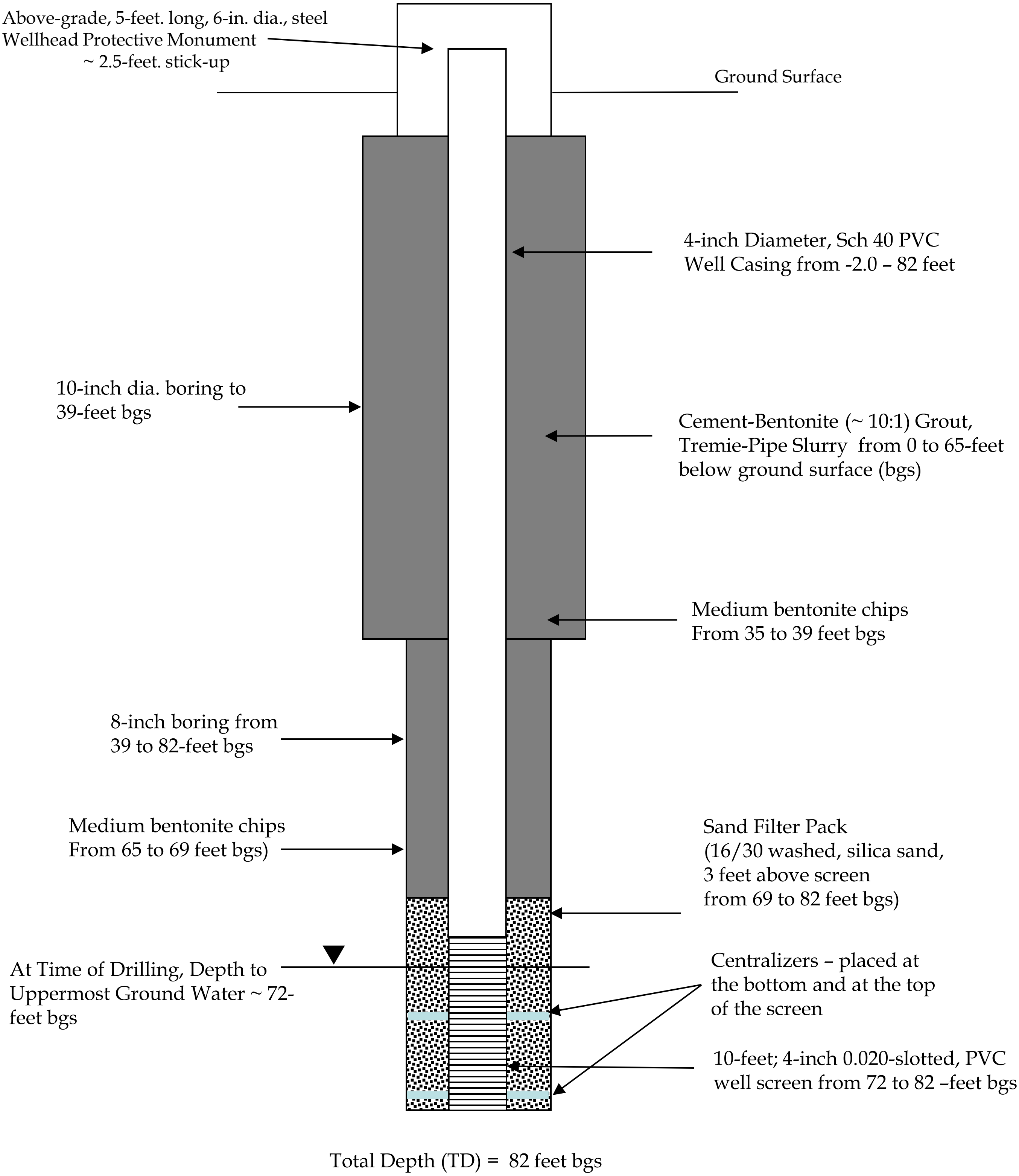
Delta, Utah

CLW-5

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-4	10" Sonic	Gravels with medium to fine grand sands, moist
4-7.5	10" Sonic	Light Brown sitly CLAY, slightly moist, good plasticity
7.5-10	10" Sonic	Light Brown fine to medium grained SAND, dry
10-12	10" Sonic	Light Brown to Gray fine to medium grained SAND, gravels present, slightly moist
12-13	10" Sonic	Light Brown clayey SILT, slightly moist,
13-15	10" Sonic	Brown fine to medium grained SAND, wht clays and silts, slightly moist
		7/27/2015
15-22	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
22-32	10" Sonic	Light Brown CLAY, moistgood plasticity
32-38	10" Sonic	Brown CLAY, slightly moist, high plasticity
38-40	10" Sonic to 39 feet	Light Gray CLAY, slightly moist, hight plasticity
40-44	8" Sonic	Light Brown to Brown CLAY, slightly moist, high plasticity
44-52	8" Sonic	Light Gray CLAY, hight plasticity, slighly moist
52-53	8" Sonic	Brown CLAY, high plasticity, slightly moist
53-55	8" Sonic	Gray CLAY, high plasticity, slightly moist
55-72	8" Sonic	Gray CLAY, high plasticity, moist
72-74	8" Sonic	Gray fine grained SAND, with clay matrix, moist to saturated
74-75	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
75-78	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated
78-80	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
80-82	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



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ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-5 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

IPSC

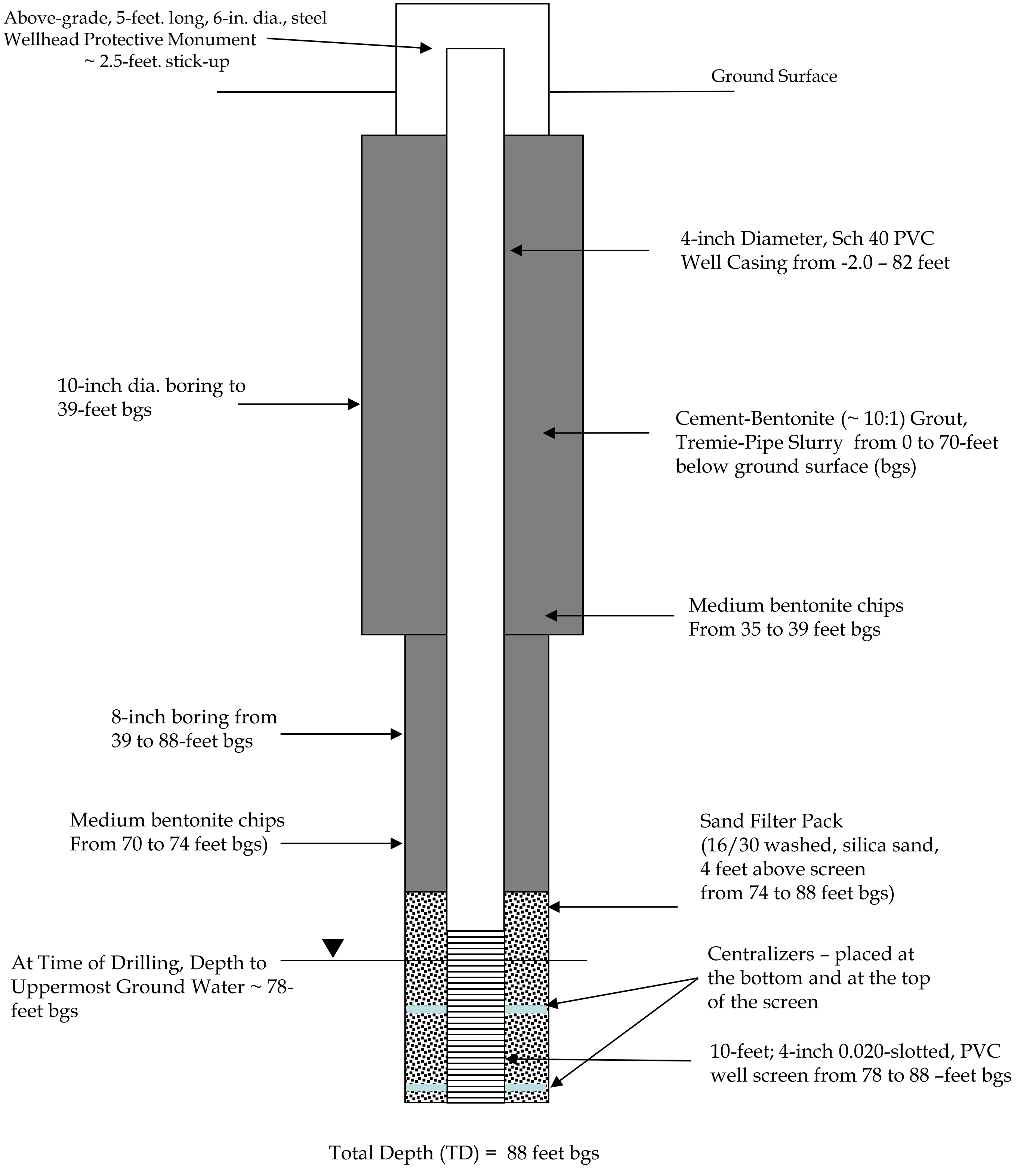
Delta, Utah

CLW-6

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown silty fine grained SAND, dry
5-7	10" Sonic	Light Brown fine grained sandy SILT, dry
7-12	10" Sonic	Light Brown fine to medium grained SAND, dry
12-15	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
15-21	10" Sonic	Light Brown to Brown clayey SILT, slightly moist, poor plasticity
21-22	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
21-23		Light Brown to Brown clayey SILT, slightly moist, poor plasticity
23-32	10" Sonic	Light Brown CLAY, moist, sticky, high plasticity
32-38	10" Sonic	Light Brown to Gray CLAY, moist, high plasticity
38-47	10" Sonic	Light Gray to Gray CLAY, slightly moist, high plasticity
47-55	10" Sonic to 39 feet	Transitioned to a Brownish gray CLAY, high plasticity, slight moist
55-72	8" Sonic	Brown CLAY, high plasticity, slightly moist
		58 - 58.5 very moist to saturated, 59 - slightly moist
72-78	8" Sonic	Gray CLAY, very moist, high plasticity
78-82	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
82-84	8" Sonic	Gray CLAY, high plasticity, very moist
84-85	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
85-88	8" Sonic	Gray CLAY, high plasticity, very moist

TD = 88; PVC 4-inch screen from 78 to 88; PVC 4-inch riser from -2.5 to 78

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



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ISPC– CB LANDFILL AREA

DELTA, UTAH

CLW-6 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

IPSC

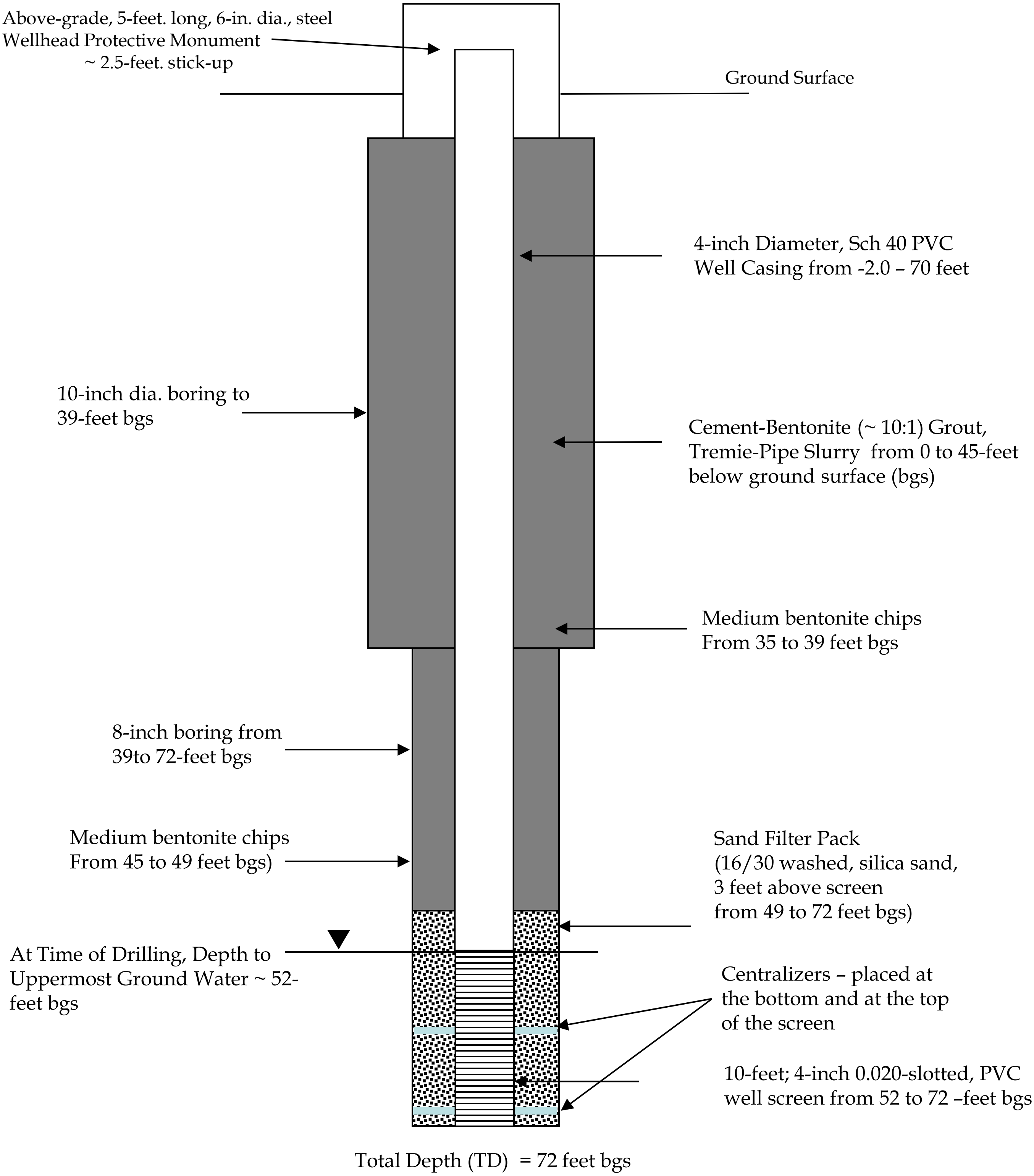
Delta, Utah

CLW-7

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-8	10" Sonic	Light Brown fine grained Sands with silts and gravel, angular, Dry
8-12	10" Sonic	Light Brown fine grained Sands with silts and clay, No gravel, Dry
12-15	10" Sonic	Tan SILT with a clay matrix, Dry
15-17	10" Sonic	Light Brown to Gray CLAY, medium plasticity, silty present, Dry
17-22	10" Sonic	Light Brown Clayey SILT, slightly moist
22-24	10" Sonic	Light Brown to Grayish silty CLAY, Dry
24-32	10" Sonic	Light Brown to Grayish CLAY, Brown silts and fine grained sands present, , Dry
32-40	10" Sonic to 39 feet	Light Brown CLAY, slightly moist, became denser at 35 feet
40-43	8" Sonic	Light Brown to Grayish CLAY, very dense, slightly moist
43-48	8" Sonic	Gray CLAY, slightly moist, some layers of a brown fine grained sand present every 3 to 4 inches alone the core
48-50	8" Sonic	Gray CLAY, slightly moist, some Iron Oxide present
50-51.5	8" Sonic	Brown fine to medium grained SANDS, saturated
51.5-58	8" Sonic	Brown CLAY, moist to slightly moist
58-58.5	8" Sonic	Brown fine grained SANDS, with a clay matrix, saturated
58.5-61	8" Sonic	Brown CLAY, moist to slightly moist
61-68	8" Sonic	Brown fine to medium grained SANDS, saturated
68-70	8" Sonic	Brown CLAY, moist to slightly moist
70-72	8" Sonic	Brown fine to medium grained SANDS, saturated

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



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ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-7 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15 Last Revision Date

Boring Logs

IPSC

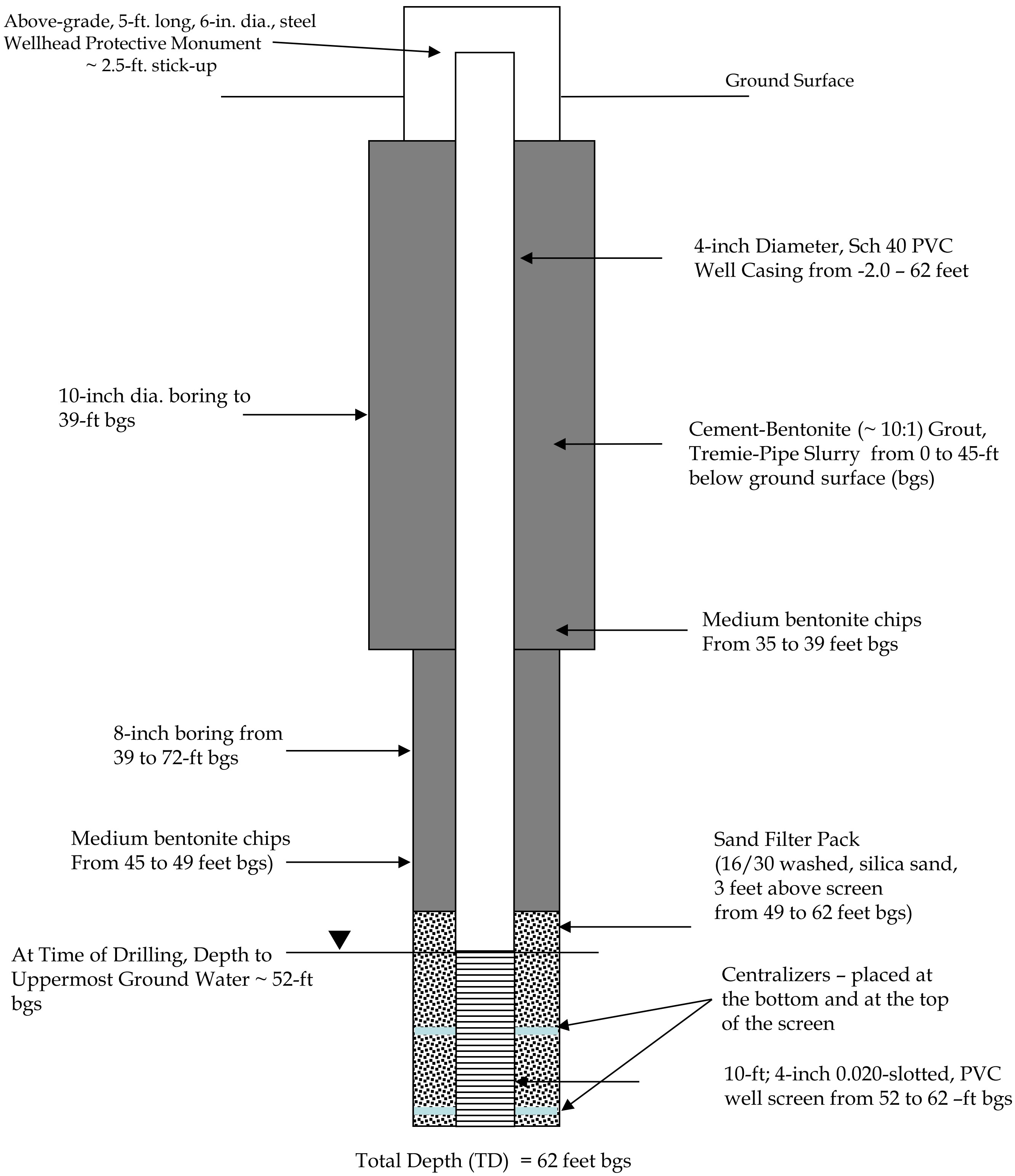
Delta, Utah

CLW-8

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown fine grained Sands, slightly moist
5-7	10" Sonic	Tannish white fine grained Sand, with smooth, rounded pebbles, slightly moist
7-10	10" Sonic	Tannish white silty, fine grained Sand, slightly moist
10-13	10" Sonic	Tan SILT with a clay matrix, slightly most, slightly plastic
13-15	10" Sonic	Tan Clayey SILT, dry, plastic
15-18	10" Sonic	Light Brown to tan silty CLAY, slightly moist, good plasticity
18-24	10" Sonic	Light Brown CLAY with silts present, slightly moist, good plasticity
24-32	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
32-37	10" Sonic	Brown CLAY, dence, dry to slihgtly moist, very plastic
37-52	10" Sonic to 39 feet	Transitioned fomrthe Brown CLAY to a Gray CLAY, with interbeds of brown fine gran sand layers, highly plastic, slihglty moist
52-62	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 62; PVC 4-inch screen from 52 to 62; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



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ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-8 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15 Last Revision Date

Boring Logs

IPSC

Delta, Utah

CL-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/22/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	SAND with silt:
2-2.5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
2.5-5	8" Sonic	SM	Silty SAND:
5-6	8" Sonic	CL	CLAY:
6-7.5	8" Sonic	SM/ML	Silty SAND/Sandy SILT with clay:
7.5-10	8" Sonic	CH	CLAY:
10-11	8" Sonic		CLAY:
11-12.5	8" Sonic		CLAY:
12.5-13.5	8" Sonic		CLAY:
13.5-15	8" Sonic	ML	Sandy SILT:
15-16.5	8" Sonic	SP/SM	SAND with silt:
16.5-17.5	8" Sonic	SM	Silty SAND:
17.5-20	8" Sonic	SP	SAND:
20-21	8" Sonic		SAND:
21-22	8" Sonic	ML	Sandy SILT:
22-23	8" Sonic	SP	SAND:
23-24	8" Sonic	ML	Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26	8" Sonic	ML	Sandy SILT:
26-28	8" Sonic		Sandy SILT:
28-30	8" Sonic		SILT with clay:
30-32	8" Sonic		Sandy SILT:
32-34	8" Sonic	SP	SAND:
34-35	8" Sonic	ML	Sandy SILT with clay:
35-40	8" Sonic	CL	CLAY:
40-42	8" Sonic	ML	SILT with clay:
42-45	8" Sonic	CH	CLAY:
45-55	8" Sonic		CLAY:
55-65	8" Sonic		CLAY:
7/23/2015			
65-66.5	8" Sonic	CH	Sandy CLAY:
66.5-67.5	8" Sonic	SP/SM	SAND with silt:
67.5-72.5	8" Sonic		SAND with silt:
72.5-73.5	8" Sonic	SP	SAND:
73.5-75	8" Sonic	SC	Clayey SAND:
75-76.5	8" Sonic	SW	SAND:
76.5-79	8" Sonic	SP	SAND:
79-80	8" Sonic	CH	CLAY:

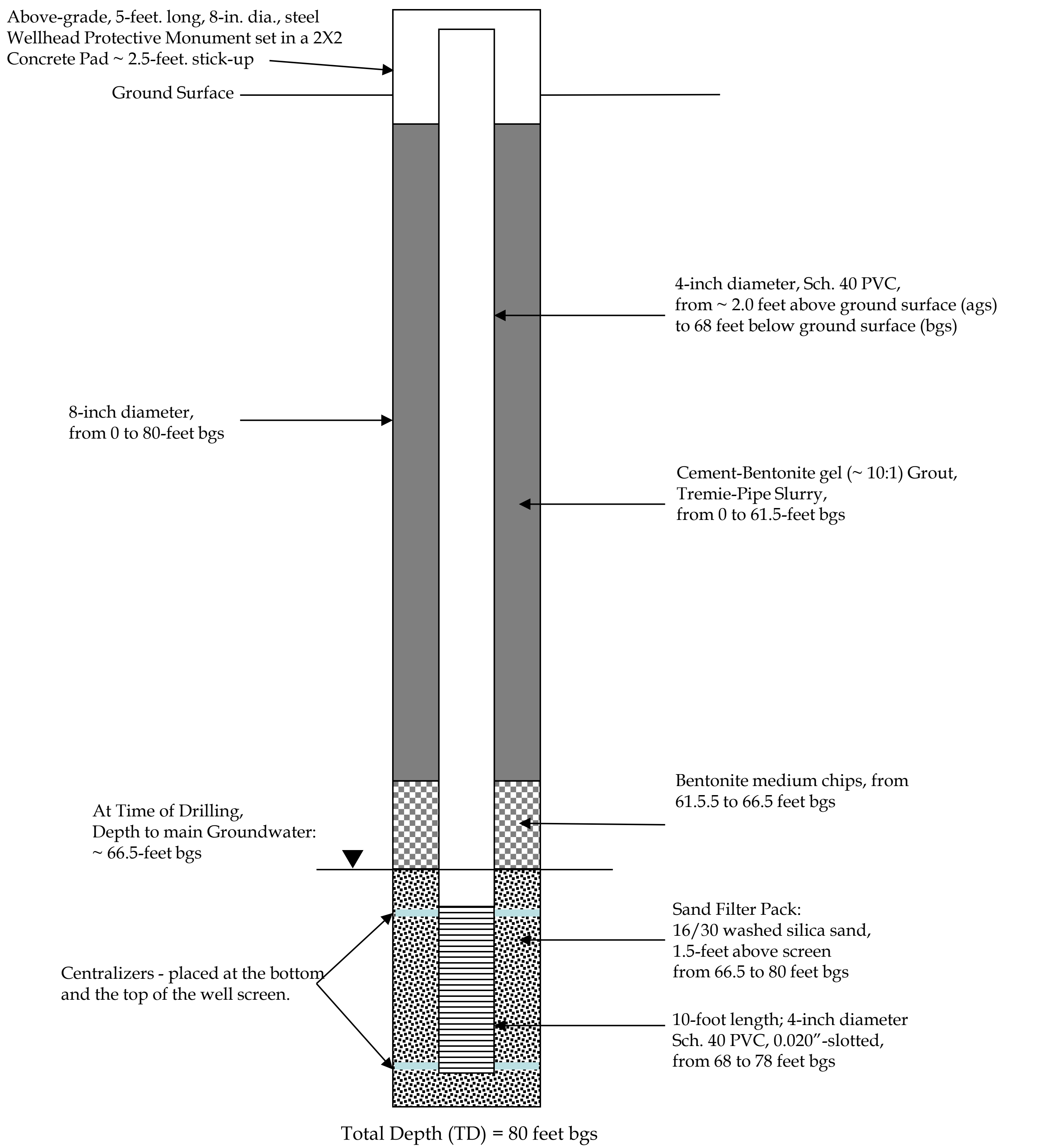
TD = 80'; PVC 4-inch screen from 68 to 78; PVC 4-inch riser from -2.5 to 68

Drilling Method: Guspech GS24-300RS 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



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IPSC – COMBUSTION BYPRODUCT LANDFILL AREA

DELTA, UTAH

Well CL-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/23/15 / Last Revision Date

Boring Logs

IPSC

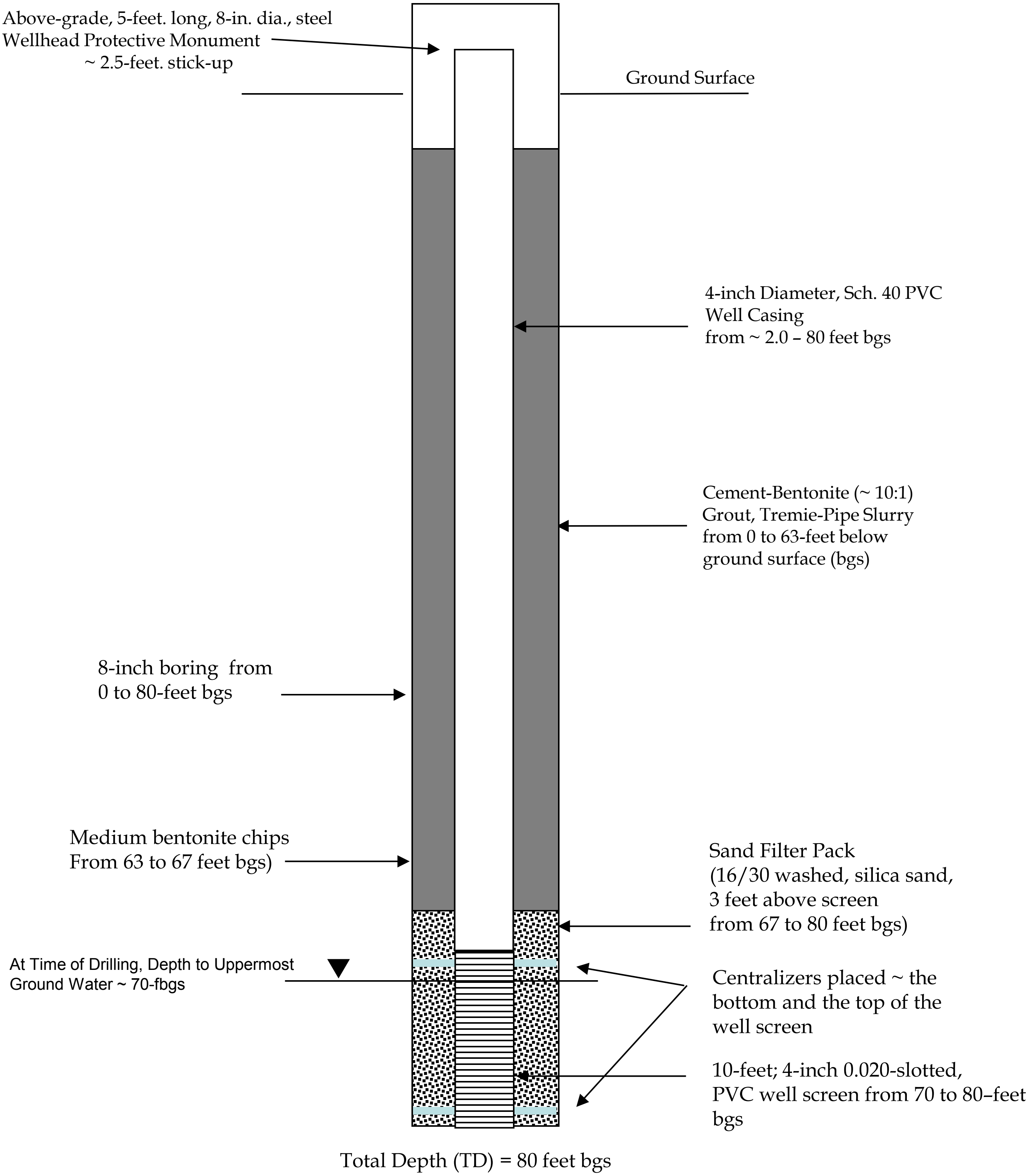
Delta, Utah

CLU-2

Interval (feet)	Drilling Method	Sample Description
		7/22/2015
0-6	8" Sonic	Light Brown fine grained SAND with silt, dry
6-7.5	8" Sonic	Light Brown to Tan CLAY with silt, slightly moist
7.5-13	8" Sonic	Light Brown fine grained SAND with silt, dry
13-16	8" Sonic	Brown fine grained SAND with clayey matrix, slightly moist, some plasticity
16-24	8" Sonic	Light Brown fine grained SAND, dry
24-35	8" Sonic	Light Brown clayey SILT, dry
35-44	8" Sonic	Light Brown Silty CLAY, dry, good plasticity
44-48	8" Sonic	Gray Clayey SILT, dry, slightly plastic
48-49	8" Sonic	Brownish Orange CLAY, with a silty matrix, dry, good plasticity
49-60	8" Sonic	Brownish Orange CLAY, slightly moist
	8" Sonic	53-55 soil becomes slightly moist and Iron Oxide present
	8" Sonic	57-61 soil is dry
61-67	8" Sonic	Brownish Gray CLAY, at 61 feet very moist, very plastic
67-70	8" Sonic	Gray CLAY, moist, very plastic
70-75	8" Sonic	Gray fine to medium grained SAND, saturated, nonplastic
75-77	8" Sonic	Greenish Gray to Brown Clay fine grained SAND with a CLAY matrix, saturated
77-80	8" Sonic	Brownish Gray, fine to medium grained SAND, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



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IPSC– CB LANDFILL AREA
DELTA, UTAH

Well CLU-2 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15 / Last Revision Date

Boring Logs

ISPC

Delta, Utah

CL-U-3

Interval (feet)	Drilling Method	USCS	Sample Description
3/26/2018			
0-2	8" Sonic	SW	Sand, silt and clay
2-14	8" Sonic	SP	Sand, poorly graded, dry
14-17	8" Sonic	MH	Silt, dry
17-18	8" Sonic	MH	Silt with trace clay, dry
18-27.5	8" Sonic	MH	Silt, dry
27.5-37	8" Sonic	CH	Clay, silt stringers every 3-10", red mottling, moist
37-48	8" Sonic	CH	Clay, distance between silt stringers increasing to 10-18"
48-57	8" Sonic	CH	Clay, massively bedded
57-64	8" Sonic	CH	Clay, massively bedded
64-65	8" Sonic	SP	Sand, medium-grain, saturated
65-66	8" Sonic	MH	Silt, saturated
66-67	8" Sonic	SP	Sand, saturated
67-74	8" Sonic	SP	Sand, saturated
74-75	8" Sonic	CH	Clay
75-77	8" Sonic	SP	Sand, saturated

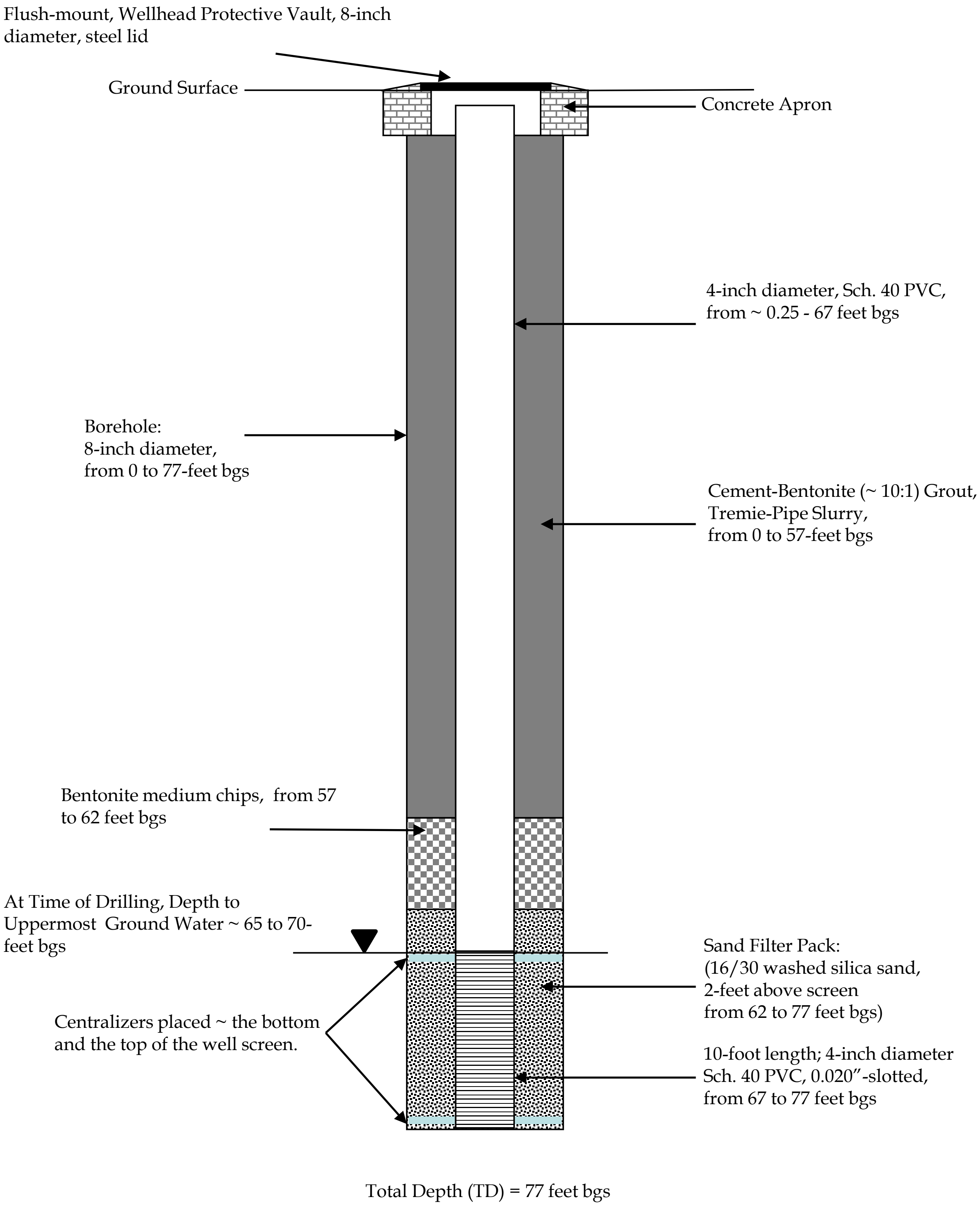
TD = 77; screen 67-77; sand 62-7; plug 57-62; grout to surface; centralizers 66.5 and 76.5

Drilling Method: Sonic

Drilling Company - Cascade Drilling

Driller - David Donnely

Geologist - Tom Fendler



Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA DELTA, UTAH			
Well CL-U-3 Schematic			
			Date Drawn 10/24/18
			Last Revision Date
Design by	Drawn by JR	Scale	

Boring Logs

ISPC

Delta, Utah

BAC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/31/2015			
0-0.75	8" Sonic	Concrete	Surface - concrete soil mixture
0.75-2.5	8" Sonic	SM	Silty SAND:
2.5-3.25	8" Sonic		Silty SAND:
3.25-5	8" Sonic	SP/SM	SAND with silt:
5-12.5	8" Sonic		SAND with silt:
12.5-13.5	8" Sonic		SAND with silt:
13.5-14.5	8" Sonic	ML	Sandy SILT:
14.5-15	8" Sonic		Sandy SILT:
15-17.5	8" Sonic	SP	SAND:
17.5-19	8" Sonic	SP/SW	SAND:
19-20	8" Sonic	SP/SM	SAND with silt:
20-21.5	8" Sonic	SP	SAND:
21.5-22.5	8" Sonic	ML	Sandy SILT:
22.5-24	8" Sonic		Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26.75	8" Sonic	SM	Silty SAND:
26.75-27.5	8" Sonic	SP	SAND:
27.5-28.5	8" Sonic		SAND:
28.5-30	8" Sonic	SM	Silty SAND:
30-31.5	8" Sonic	SP	SAND:
31.5-32.25	8" Sonic	SM	Silty SAND:
32.25-33.75	8" Sonic	SP/SM	SAND with silt:
33.75-35	8" Sonic	SM	Silty SAND:
35-36	8" Sonic	SP/SM	SAND with silt:
36-37.5	8" Sonic	SM	Silty SAND:
37.5-38	8" Sonic	SP/SM	SAND with silt:
38-38.5	8" Sonic	SM	Silty SAND:
38.5-40	8" Sonic	ML	Sandy SILT:
40-42.5	8" Sonic	SC	Clayey SAND:
42.5-43.5	8" Sonic	CL	Sandy CLAY:
43.5-44.5	8" Sonic		Sandy CLAY:
44.5-45	8" Sonic		Sandy CLAY:
45-46	8" Sonic		Sandy CLAY:
46-47	8" Sonic		Sandy CLAY:
47-47.75	8" Sonic	SW	SAND:
47.75-48.5	8" Sonic	CH	Sandy CLAY:
48.5-50	8" Sonic		Sandy CLAY:
50-51.5	8" Sonic		CLAY:
51.5-53.5	8" Sonic		Sandy CLAY:
53.5-56	8" Sonic		CLAY:
56-57.5	8" Sonic		Sandy CLAY:
57.5-58	8" Sonic	SC	Clayey SAND:
58-59.5	8" Sonic	CH	CLAY:
59.5-60	8" Sonic	SC	Clayey SAND:
60-64.5	8" Sonic	SM	Silty SAND with clay:
64.5-65.5	8" Sonic	SC	Clayey SAND:
65.5-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic	SW	SAND:

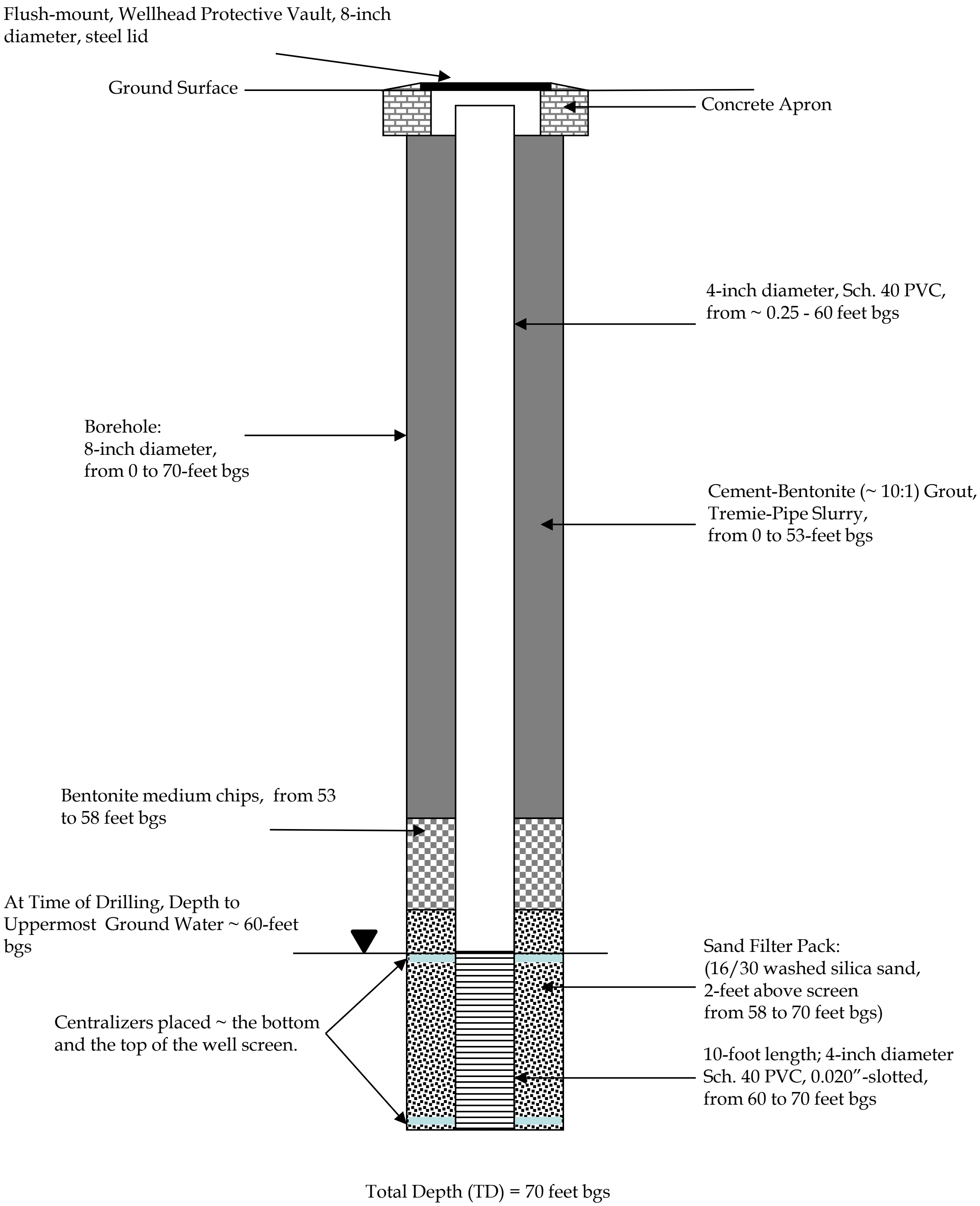
TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from 0 to 60

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA
DELTA, UTAH

Well BAC-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/31/15
			Last Revision Date

Boring Logs

IPSC

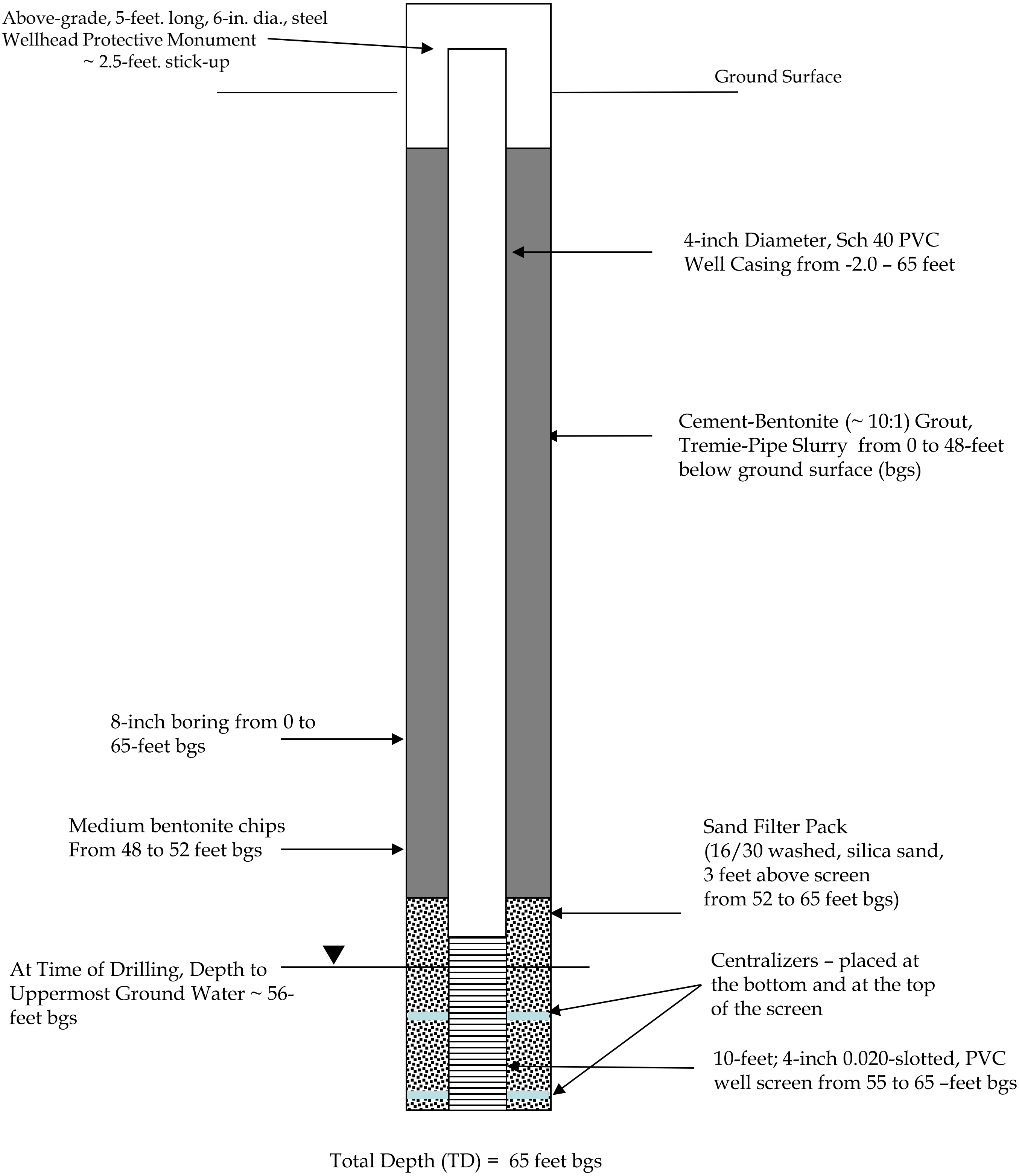
Delta, Utah

BAC-2

Interval (feet)	Drilling Method	Sample Description
		7/29/2015
0-6	8" Sonic	Light Brown fine grained Sand, gravels, dry
6-12	8" Sonic	Light Brown fine grained SAND, moist
12-18	8" Sonic	Light Brown fine to medium grained sand, dry
18-23	8" Sonic	Light Brown fine to medium grained sand, with a clay matrix, dry
23-24	8" Sonic	Light Brown fine to medium grained sand, very moist, trace amount of clay
24-26	8" Sonic	Brown fine to medium grained sand, slightly moist
26-30	8" Sonic	Brown fine to medium grained sand, with gravels present, slightly moist
30-33	8" Sonic	Light Brown fine grained sand, slightly moist
33-34	8" Sonic	Light Brown CLAY, very moist, high plasticity
34-36	8" Sonic	Light Brown fine grained sand, with a clay matrix, moist
36-38	8" Sonic	Light Brown Silty CLAY, moderately plastic, slightly moist
38-40	8" Sonic	Brownish Red silty CLAY, good plasticity, slightly moist
40-41	8" Sonic	Brown fine grained SAND, saturated
41-42	8" Sonic	Brown SILT with a clay matrix, slightly moist
42-52	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist
52-55	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist, very dense
55-56	8" Sonic	Brown fine grained SAND with a clay matrix very moist to saturated
56-57	8" Sonic	Reddish brown CLAY, high plasticity, slightly moist to moist
57-65	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec	IPSC – BOTTOM ASH SURFACE IMPOUNDMENT DELTA, UTAH		
	BAC-2 Schematic		
			Date Drawn 9/1/15
			Last Revision Date
Design by	Drawn by TH	Scale	

Boring Logs

IPSC

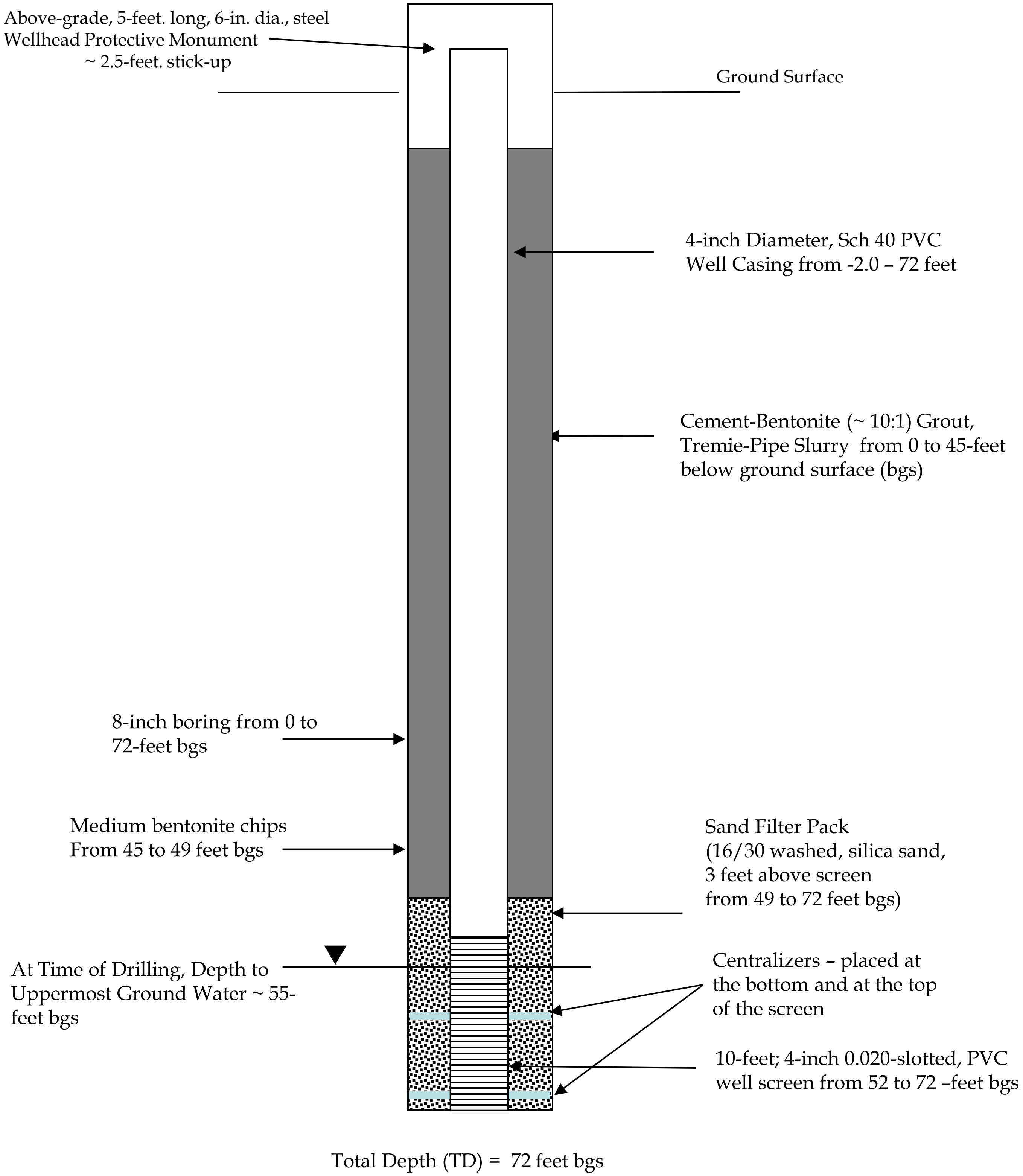
Delta, Utah

BAC-3

Interval (feet)	Drilling Method	Sample Description
		7/28/2015
0-8.5	8" Sonic	Light Brown fine grained Sand, dry
8.5-11	8" Sonic	Light Brown fine to medium grained SAND, moist
11-14	8" Sonic	Light Brown fine grained sand, with a clay matrix, dry
14-17	8" Sonic	Gravels with fine to medium grained SAND, slightly moist
17-20	8" Sonic	Brown fine grained sand, slightly moist
20-22	8" Sonic	Brown fine to medium grained sand, with a clay matrix, slightly moist
22-26	8" Sonic	Brown fine to medium grained sand, with a clay matrix, moist
26-30	8" Sonic	Brown fine grained sand, moist
30-43	8" Sonic	Light Brown CLAY, slightly moist to moist, high plasticity
		30-33 Silty CLAY, poor plasticity
		33-35 Silty CLAY, moderately plastic
		35-43 very little silt present, high plasticity
43-45	8" Sonic	Transitioned to a Reddish Brown CLAY, dry, high plasticity
45-50	8" Sonic	Transitioned to a Brown CLAY, dry, high plasticity
50-55	8" Sonic	Light Brown CLAY, moist, high plasticity
55-58	8" Sonic	Light Brown fine grained SAND, with a clay matrix, slightly moist to moist
58-72	8" Sonic	Light Brown CLAY, with a sandy matrix medium to poor plasticity, moist

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



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ISPC– BOTTOM ASH SURFACE IMPOUNDMENT

DELTA, UTAH

BAC-3 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Log

ISPC

Delta, Utah

BAC-4

Interval (feet)	Drilling Method	USCS	Sample Description
8/10/2015			
0-0.5	8' Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8' Sonic	SP/SM	SAND with silt:
2.5-5	8' Sonic	SP	SAND:
5-9	8' Sonic		SAND:
9-10	8' Sonic	SP/SM	SAND with silt:
10-15	8' Sonic	SP	SAND:
15-17.5	8' Sonic	SP/SM	SAND with silt:
17.5-19	8' Sonic		SAND with silt:
19-2	8' Sonic	SC	Clayey SAND:
20-21	8' Sonic		Clayey SAND:
21-22	8' Sonic	CL	Sandy CLAY:
22-22.5	8' Sonic	ML	Sandy SILT:
22.5-25	8' Sonic	CL	Sandy CLAY:
25-32.5	8' Sonic	CH	CLAY:
32.5-33.75	8' Sonic	SP	SAND:
33.75-35	8' Sonic	SM	Silty SAND:
35-36.5	8' Sonic	SP/SM	SAND with silt:
36.5-37.5	8' Sonic		SAND with silt:
37.5-38	8' Sonic	SM	Silty SAND:
38-38.75	8' Sonic	CH	Sandy CLAY:
38.75-39	8' Sonic	SP/SM	SAND with silt:
39-40	8' Sonic	CH	Sandy CLAY:
40-42.5	8' Sonic	ML	Sandy SILT with clay:
42.5-43.5	8' Sonic	SM	Silty SAND and clay:
43.5-45	8' Sonic	CH	CLAY:
45-47.5	8' Sonic		CLAY:
47.5-48.5	8' Sonic		CLAY:
48.5-50	8' Sonic	ML	Clayey SILT with sand:
50-51.25	8' Sonic		Clayey SILT:
51.25-52.5	8' Sonic	CH	CLAY:
52.5-55	8' Sonic	SC	Clayey SAND:
55-56.5	8' Sonic	SM	Silty SAND:
56.5-57	8' Sonic	ML	Clayey SILT with sand:
57-57.5	8' Sonic	CH	CLAY:
57.5-58.5	8' Sonic		CLAY:
58.5-59.5	8' Sonic	ML	Clayey SILT with sand:
59.5-61	8' Sonic		Clayey SILT with sand:
61-64	8' Sonic		Clayey SILT with sand:
64-65	8' Sonic		Clayey SILT with sand:
65-65.5	8' Sonic	SM	Silty SAND:
65.5-67	8' Sonic	CL	Silty CLAY:
67-67.5	8' Sonic	ML	Clayey SILT:
67.5-69	8' Sonic	CH	CLAY:
69-69.5	8' Sonic		CLAY:
69.5-70	8' Sonic		CLAY:
70-72.5	8' Sonic	ML	Sandy SILT with clay:
72.5-74	8' Sonic	CH	Silty CLAY:
74-75	8' Sonic	SM	Silty SAND:

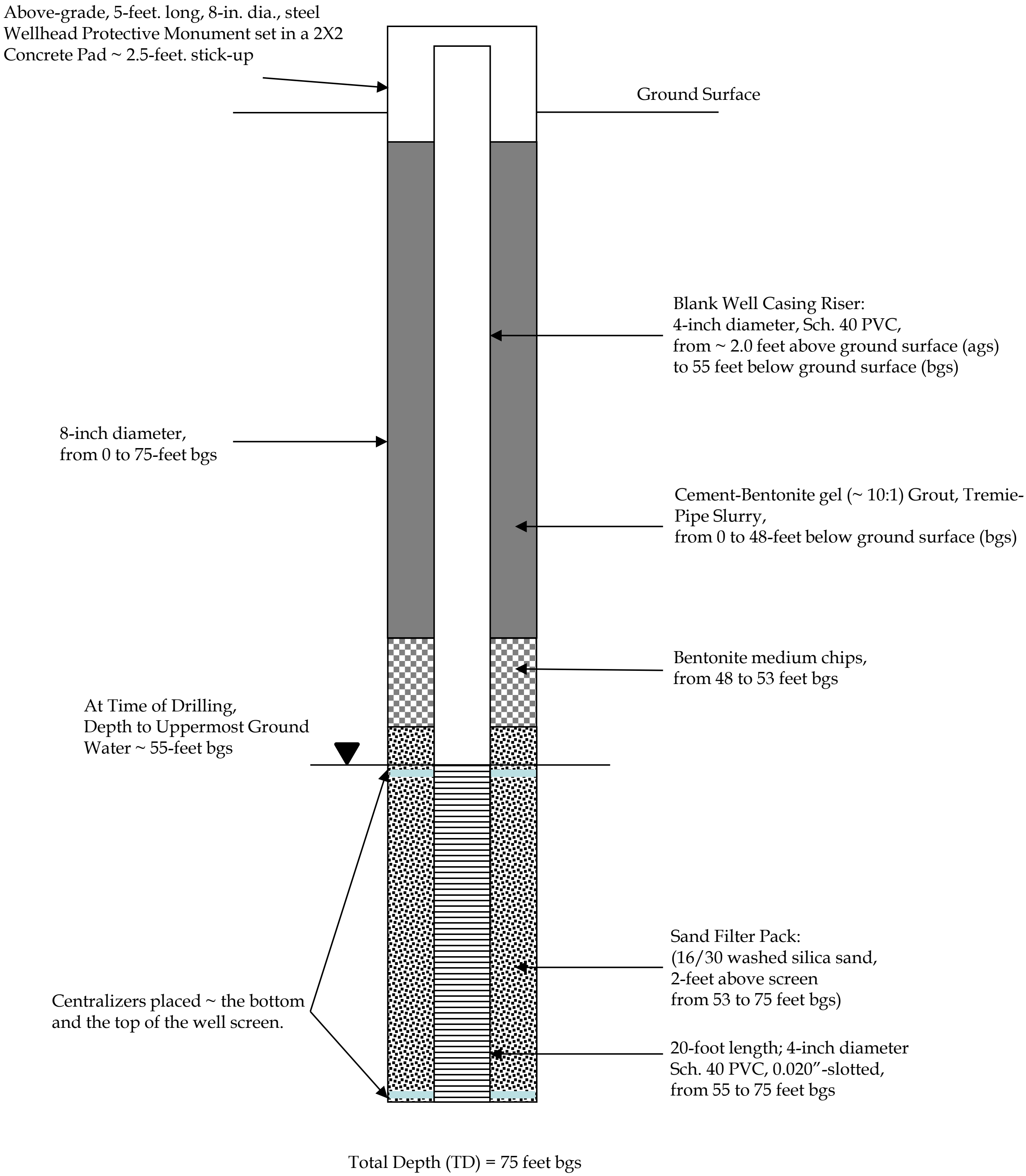
TD = 75'; PVC 4-inch screen from 55 to 75; PVC 4-inch riser from -2.5 to 55

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

Well BAC-4 Schematic

Date Drawn	8/10/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	

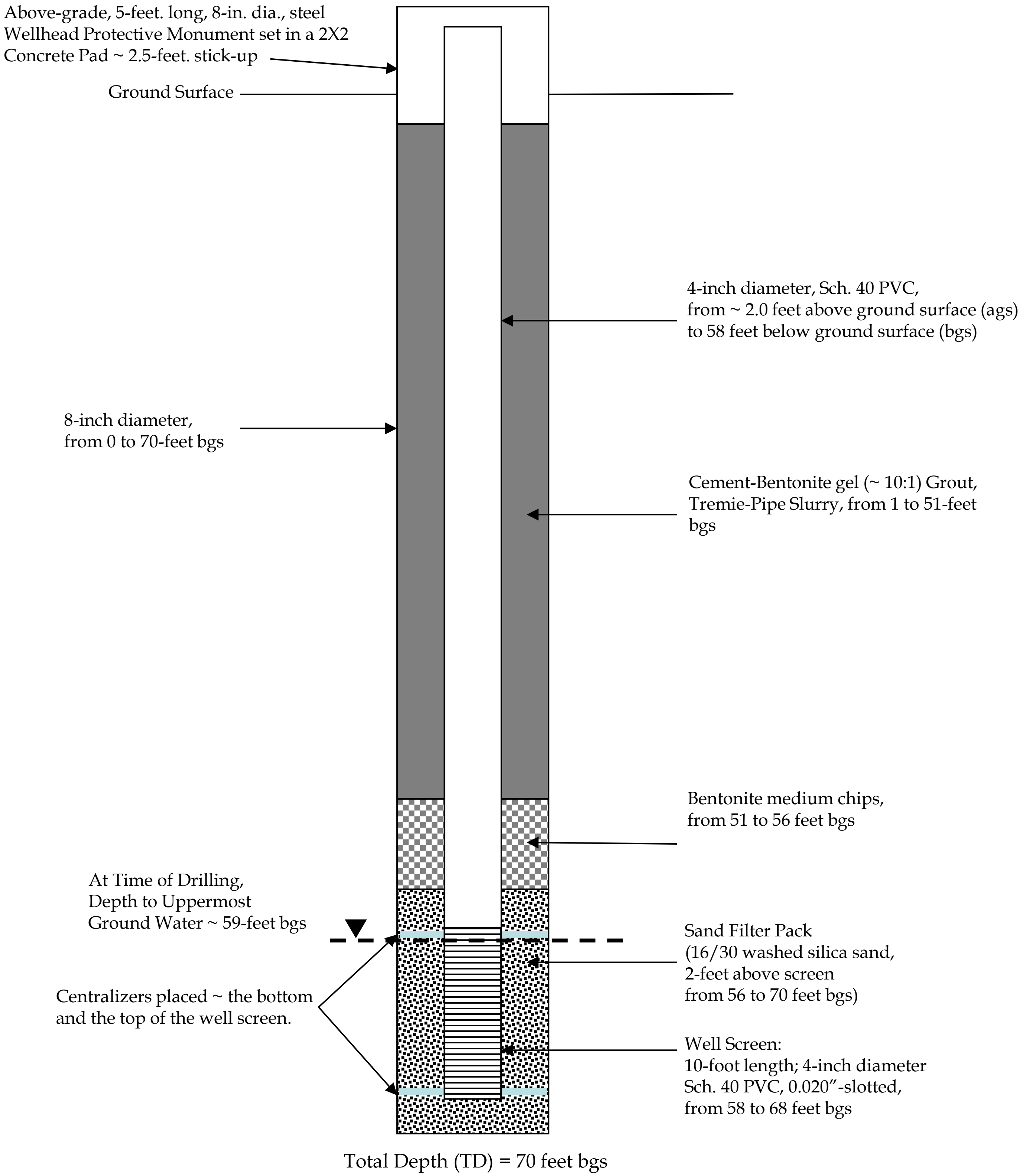
Boring Logs
ISPC
Delta, Utah

BAC-5

Interval (feet)	Drilling Method	USCS	Sample Description
8/9/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-3	8" Sonic	SP	SAND:
3-6.5	8" Sonic		SAND:
6.5-10	8" Sonic		SAND:
10-12.5	8" Sonic		SAND:
12.5-15	8" Sonic	SP/SM	SAND with silt:
15-19	8" Sonic	SM	Silty SAND:
19-19.5	8" Sonic	SC	Clayey SAND:
19.5-20	8" Sonic	SP/SM	SAND with silt:
20-22.5	8" Sonic	CL	Sandy CLAY:
22.5-23.75	8" Sonic		Sandy CLAY:
23.75-25	8" Sonic		Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic	CL/CH	CLAY:
32.5-33.5	8" Sonic	SP	SAND:
33.5-35	8" Sonic		SAND:
35-36	8" Sonic	SC	Clayey SAND:
36-37.5	8" Sonic	ML	Sandy SILT:
37.5-38.5	8" Sonic		Sandy SILT:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-44.25	8" Sonic		Silty SAND with clay:
44.25-45	8" Sonic	CH	CLAY:
45-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50.75	8" Sonic	SM	Silty SAND:
50.75-52.5	8" Sonic	CH	CLAY:
52.5-53.5	8" Sonic		CLAY:
53.5-55.5	8" Sonic	SP	SAND:
55.5-57.5	8" Sonic	CH	CLAY:
57.5-59	8" Sonic		CLAY:
59-60	8" Sonic	SM	Silty SAND with clay:
60-62.5	8" Sonic	SP	SAND:
62.5-63	8" Sonic	SC	Clayey SAND:
63-65	8" Sonic	SP	SAND:
65-65.75	8" Sonic	SC	Clayey SAND:
65.75-66.5	8" Sonic	CH	CLAY:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-69	8" Sonic	CH	CLAY:
69-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 58 to 68; PVC 4-inch riser from -2.5 to 58
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT

DELTA, UTAH

Well BAC-5 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/09/15
			Last Revision Date

Boring Logs

ISPC

Delta, Utah

BAC-6

Interval (feet)	Drilling Method	USCS	Sample Description
8/8/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-5	8" Sonic	SP	SAND:
5-6.5	8" Sonic	SP/SM	SAND with silt:
6.5-7.5	8" Sonic	SP	SAND:
7.5-10	8" Sonic		SAND:
10-13.5	8" Sonic		SAND:
13.5-15	8" Sonic	SM	Silty SAND:
15-16	8" Sonic	SP	SAND:
16-17.5	8" Sonic	SM	Silty SAND:
17.5-18.25	8" Sonic	SP/SM	SAND with silt:
18.25-18.75	8" Sonic	CL	Sandy CLAY:
18.75-20	8" Sonic	SC	Clayey SAND:
20-21.5	8" Sonic	CH	Sandy CLAY:
21.5-23	8" Sonic	SM	Silty SAND:
23-25	8" Sonic	CL	CLAY:
25-27.5	8" Sonic	CH	CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic		CLAY:
32.5-33.5	8" Sonic		CLAY:
33.5-35	8" Sonic	SW	SAND:
35-36	8" Sonic	SM	Silty SAND:
36-37.5	8" Sonic	SP/SM	SAND with silt:
37.5-38.5	8" Sonic	CH	CLAY:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-43.5	8" Sonic	CH	Sandy CLAY:
43.5-45	8" Sonic		CLAY:
45-45.5	8" Sonic	SC	Clayey SAND:
45.5-47.5	8" Sonic	CH	CLAY:
47.5-48	8" Sonic	SP	SAND:
48-49.5	8" Sonic	SM	Silty SAND with clay:
49.5-50	8" Sonic	CH	Sandy CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic		CLAY:
55-56	8" Sonic	SM	Silty SAND:
56-60	8" Sonic	SW	SAND:
60-61	8" Sonic		SAND:
61-62.5	8" Sonic	CH	Sandy CLAY:
62.5-63.5	8" Sonic		CLAY:
63.5-65	8" Sonic	SC	Clayey SAND:

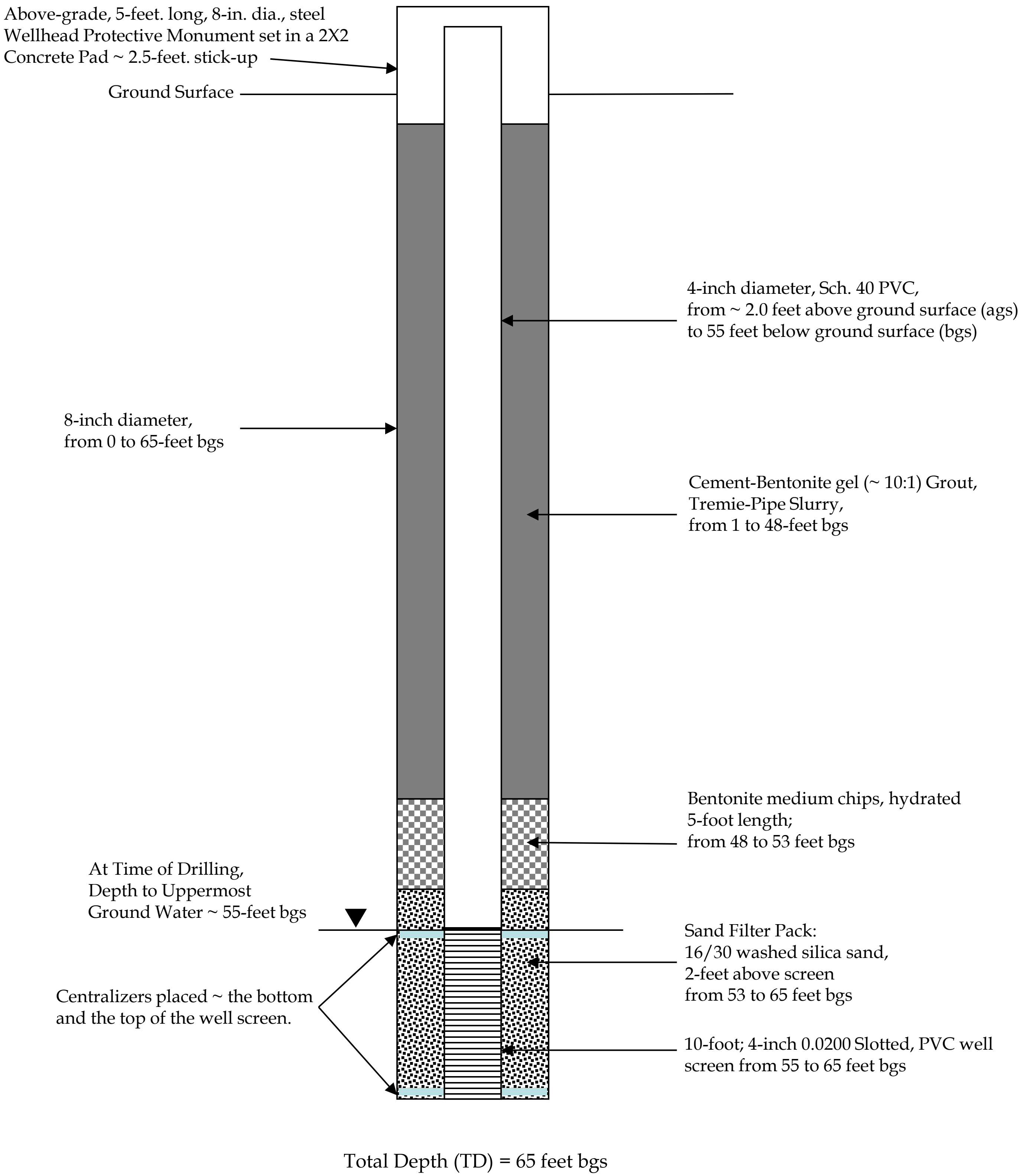
TD = 65'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

Well BAC-6 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/08/15	Last Revision Date

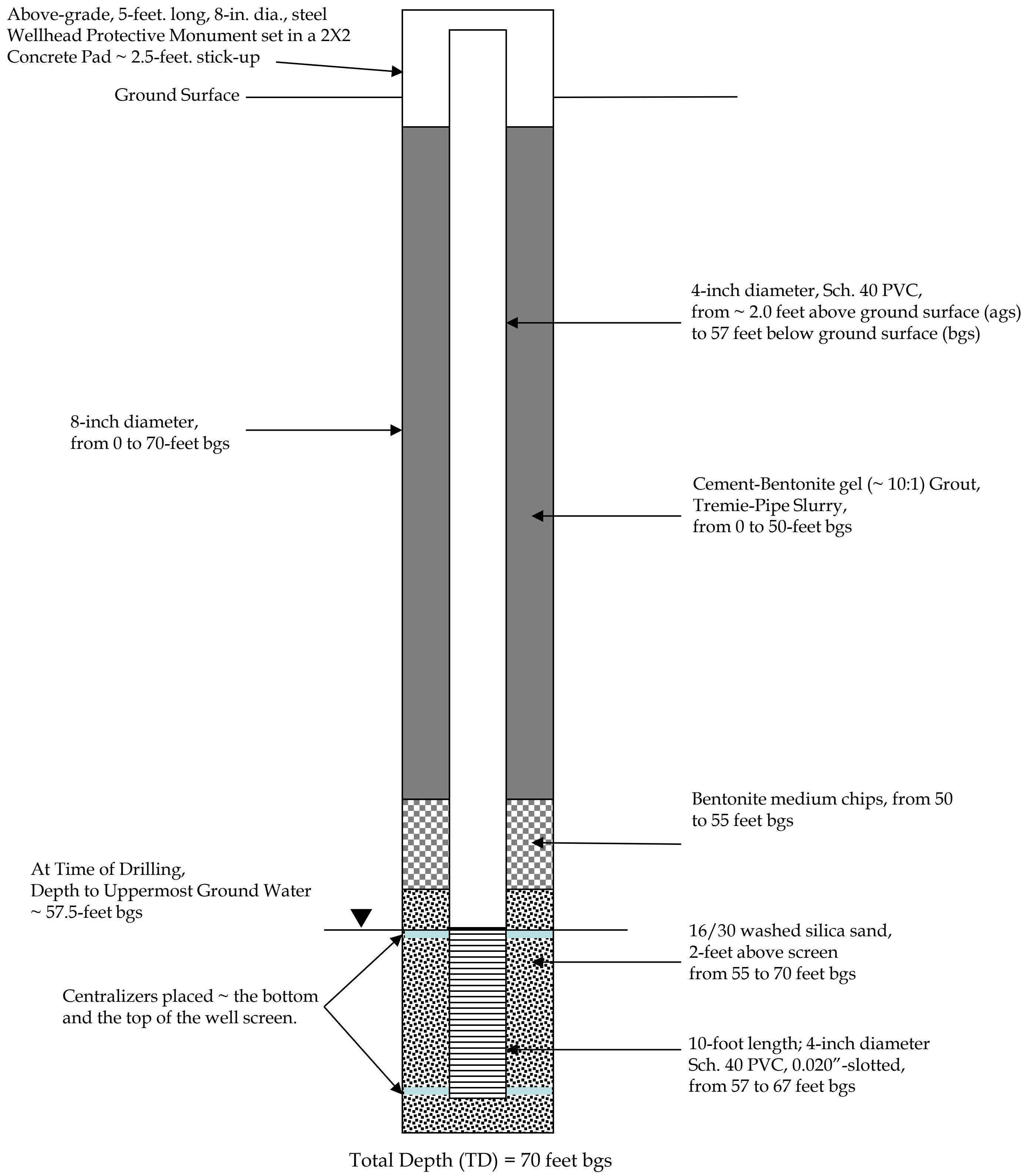
Boring Logs
ISPC
Delta, Utah

BAC-7

Interval (feet)	Drilling Method	USCS	Sample Description
8/7/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	Gravelly SAND:
2-2.5	8" Sonic	SP	Gravelly SAND:
2.5-5	8" Sonic		SAND:
5-7	8" Sonic		SAND:
7-8.5	8" Sonic		SAND:
8.5-9	8" Sonic	SP/SM	SAND with silt:
9-9.5	8" Sonic	SP	SAND:
9.5-11	8" Sonic	SP/SM	SAND with silt:
11-13	8" Sonic		SAND with silt:
13-17	8" Sonic	SM	Silty SAND:
17-18.5	8" Sonic		Silty SAND:
18.5-19	8" Sonic	ML	Sandy SILT:
19-20.25	8" Sonic	SP/SM	SAND with silt:
20.25-22	8" Sonic	CL	Sandy CLAY:
22-24	8" Sonic		Sandy CLAY:
24-25	8" Sonic	SC	Clayey SAND:
25-27.5	8" Sonic	CH	CLAY:
27.5-36.5	8" Sonic		CLAY:
36.5-40	8" Sonic	SP	SAND:
40-41.25	8" Sonic		SAND:
41.25-43.75	8" Sonic	SP/SM	SAND with silt:
43.75-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50	8" Sonic	SM	Silty SAND:
50-57.5	8" Sonic	CH	CLAY:
57.5-60	8" Sonic	SW	SAND:
60-62.5	8" Sonic		SAND:
62.5-64	8" Sonic	SP	SAND:
64-65	8" Sonic	CH	CLAY:
65-66.25	8" Sonic		Sandy CLAY:
66.25-67.5	8" Sonic		CLAY:
67.5-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 57 to 67; PVC 4-inch riser from -2.5 to 57
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT

DELTA, UTAH

Well BAC-7 Schematic

Date Drawn	8/07/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	

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Project Name: Intermountain Power Service Corporation

Boring Monitor Well: BAC-8

Project No.: 203709098

Completion Date: 2019-04-29

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 67 feet

Depth to Water at Drilling (static at 24 hours): 45.59 feet

BAC-8

Interval (feet)	Description
0 - 1	Light brown fine-grained sand with clay, dry
1 - 13	Light brown clay with silt, dry
13 - 17	Light brown fine-grained sand with clay, dry
17 - 18	Light brown clay with sand, moist
18 - 19	Medium brown sand, saturated
19 - 21	Light brown clay with sand, moist
21 - 27	Light brown clay with sand, dry
27 - 28	Brown with red clay, moist
28 - 31	Brown clay, moist
31 - 34	Gray clay, moist
34 - 43	Brown clay, moist
43 - 56	Medium brown medium-grained sand, moist
56 – 56.5	Medium brown medium-grained sand with pebbles, moist
56.5 - 57	Medium brown medium-grained sand, moist
57 - 63	Brown clay, moist
63 - 65	Medium brown fine-grained sand, moist
65 – 66.5	Brown clay, moist
66.5 - 67	Medium brown fine-grained sand, moist
67 - 68	Medium brown fine-grained sand, saturated
68 - 69.5	Medium brown fine-grained sand
69.5 - 77	Red and brown clay

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-52.62 feet

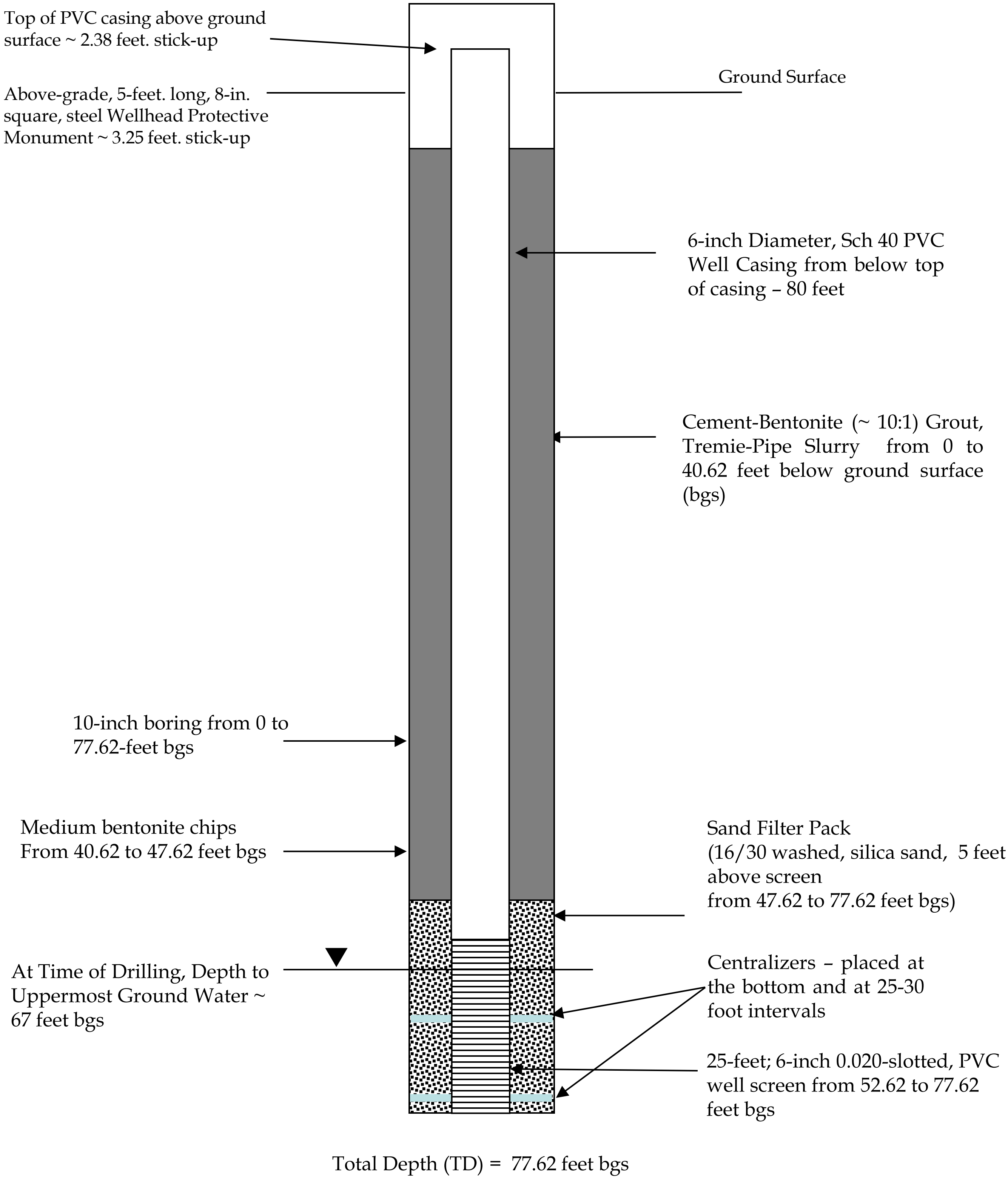
Screen (6 inch, 0.02 slotted, PVC): 52.62-77.62 feet

Sand Pack: 16/30 sand, 47.62-77.62 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 40.62-47.62 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA



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ISPC BOTTOM ASH SURFACE IMPOUNDMENT

DELTA, UTAH

BAC-8 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

Project Name: Intermountain Power Service Corporation
Boring Monitor Well: BAC-9

Project No.: 203709098
Completion Date: 2019-05-1

Drilling Firm: Cascade
Boring Method: Sonic
Boring Diameter: 10 inches

Driller: Ryan Miller
Logged by: John Russell
Depth to Water at Drilling: 60 feet
Depth to Water at Drilling (static at 24 hours): 44.82 feet

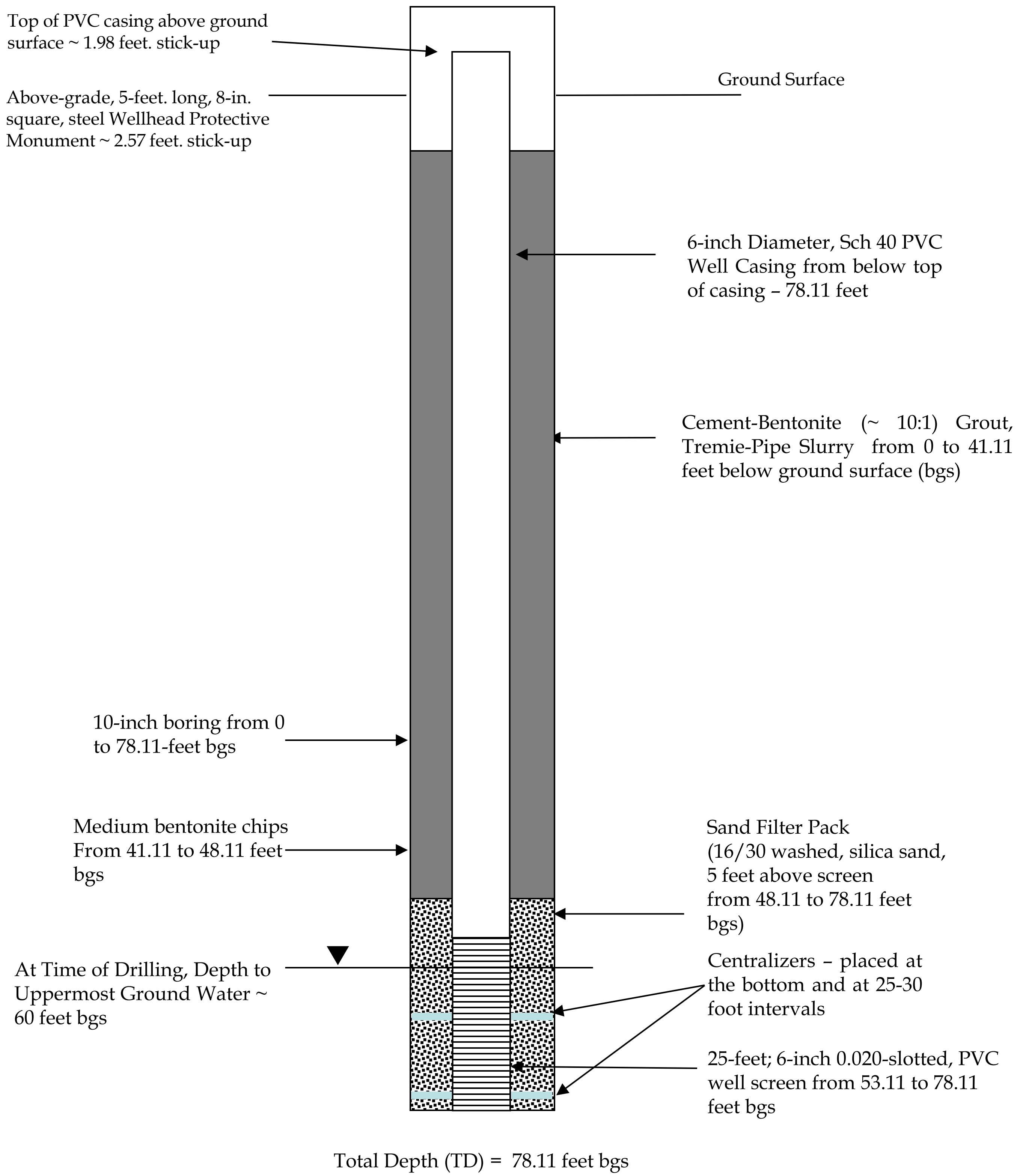
BAC-9

Interval (feet)	Description
0 - 10	Light gray to brown silt with clay to clay with silt, dry
10 - 20	Light gray to brown silt, dry
20 - 30	Light brown silt, dry
30 - 44	Light brown silt, dry
44 - 50	Medium brown clay, dry
50 - 54	Light brown silt to clay with silt, moist
54 – 54.5	Medium brown silt with clay, moist
54.5 - 60	Light brown clay with silt, moist
60 - 77	Medium brown silt with clay and silt stringers, saturated

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up
Casing, solid (6-inch PVC): 0-53.11 feet
Screen (6 inch, 0.02 slotted, PVC): 53.11-78.11 feet
Sand Pack: 16/30 sand, 48.11-78.11 feet
Bentonite Seal: Hydrolyzed bentonite pellet seal 41.11-48.11 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA
Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

BAC-9 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: BAC-10

Project No.: 203709098

Completion Date: 2019-05-3

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 69 feet

Depth to Water at Drilling (static at 24 hours): 63.1 feet

BAC-10

Interval (feet)	Description
0 - 1	Light brown silt, dry
1 - 3	Light brown silt with clay, dry
3 - 14	Light brown clay with silt, dry
14 - 17	Light brown fine-grained sand, dry
17 - 19	Light brown fine-grained sand with clay, moist
19 - 21	Light brown fine-grained sand with clay, moist
21 - 23	Light brown fine-grained sand, moist
23 - 25	Light brown fine-grained sand with clay, moist
25 - 26	Light brown fine-grained sand, moist
26 - 27	Light brown fine-grained sand with clay, moist
27 - 28	Light brown fine-grained sand, moist to moist
27 - 34	Light brown fine-grained sand, moist
34 – 34.5	Light brown silt with clay, dry
34.5 – 40.5	Red brown clay, dry
40.5 - 41	Medium brown medium grained sand, moist to moist
41 - 45	Medium brown clay, moist
45 - 46	Medium brown sand, moist to moist
46 - 48	Medium brown clay, moist
48 – 56.5	Red brown clay, moist
56.5 - 57	Gray clay, moist
57 - 62	Light brown clay, moist to moist
62 - 63	Medium brown medium grained sand, moist
63 - 64	Medium brown medium grained sand with clay, moist
64 - 69	Red, brown, and gray clay, moist
69 – 69.5	Medium brown sand, saturated
69.5 - 77	Red, brown, and gray clay
77 - 79	Medium brown clay with sand
79 - 81	Medium brown clay
81 - 85	Medium brown clay with sand

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85 - 87	Medium brown clay, moist

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-62.95 feet

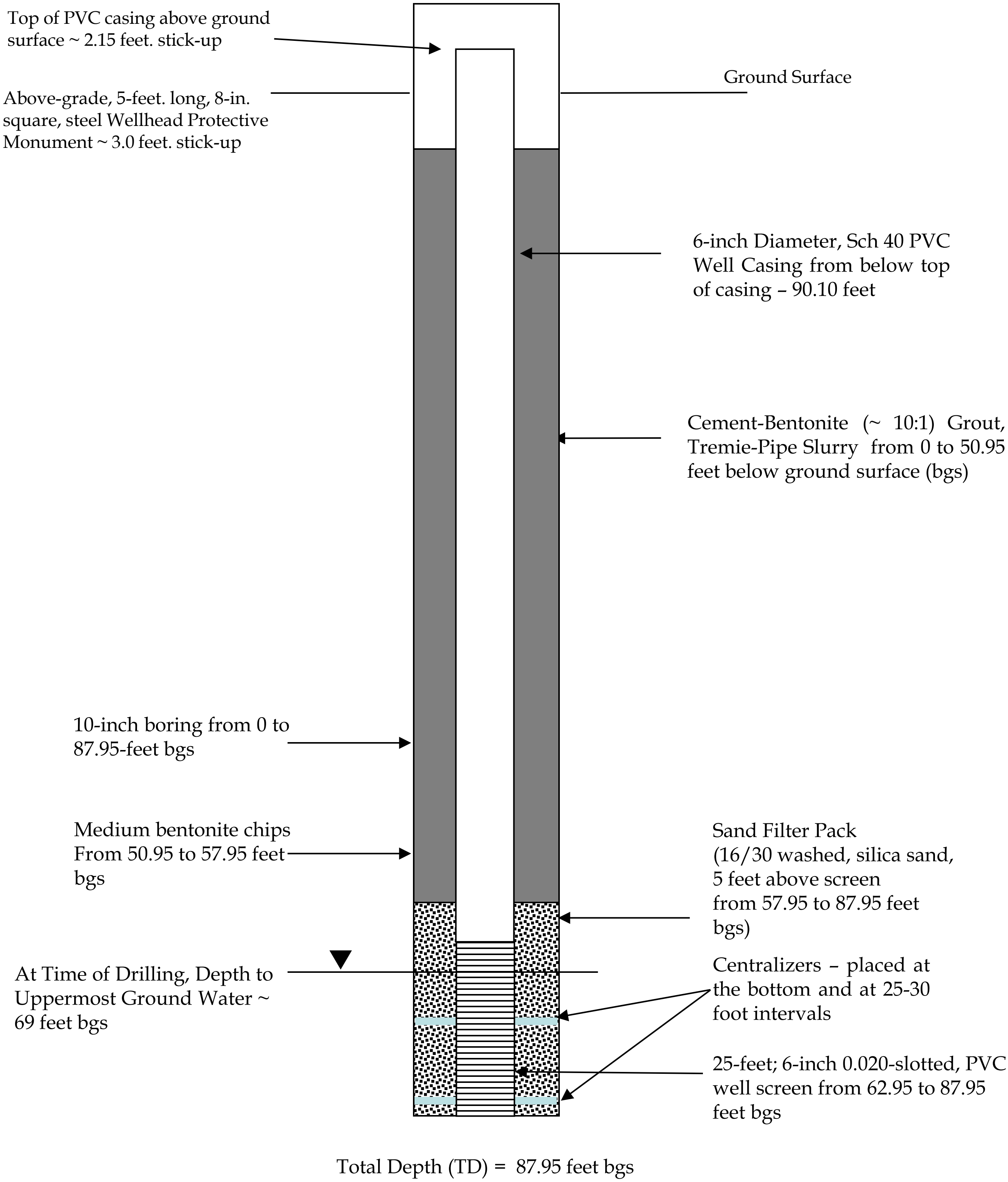
Screen (6 inch, 0.02 slotted, PVC): 62.95-87.95 feet

Sand Pack: 16/30 sand, 57.95-87.95 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 50.95-57.95 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

BAC-10 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

MONITORNG WELL ID:	**BAC-11**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

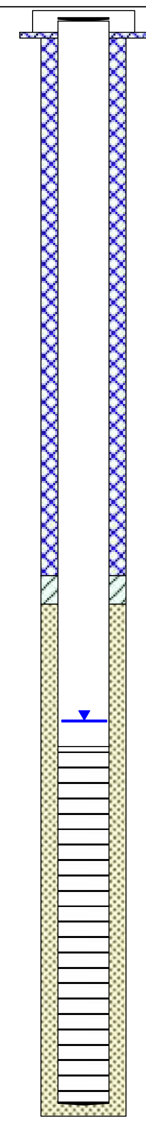
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 48.21
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/6/2019	DATE FINISHED: 12/7/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Fill
1	Poorly Graded Sand with Silt (SP-SM), fine grained sand 100%, loose, soft, dry, very pale brown (10 YR 7/3).
7.5	Clay with Sand (CL), low plasticity, soft to medium density, moist, light brownish gray (10 YR 6/2).
9	Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, loose, medium dense, moist, light brownish gray (10 YR 6/2); clay are low plasticity, medium dense.
17.5	Clay (CL), medium plasticity, medium dense, cohesive, moist, light brownish gray (10 YR 6/2), mottled with brownish yellow (10 YR 6/8).
30	Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, moist, light yellowish brown (10 YR 6/4); clay low plasticity, soft, non cohesive.
32	Same as above, becoming brown (10 YR 5/3).
38.5	Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
50	Poorly Graded Sand (SP), fine to medium grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
55	Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
58	Clay with Sand (CL), low plasticity, soft, wet, pale brown (10 YR 6/3).
60	Well Graded Sand (SW), fine to coarse Sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel, subrounded.
65.2	Same as above, increase in coarse grained sand between 65.2 to 65.8 ft bgs.
65.8	Same as 60 ft bgs.
74	Clay (CL), medium plasticity, medium dense, moist, cohesive, light yellowish brown (10 YR 6/4).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 76 ft bgs., and 4 inches from 76 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 50 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 76 ft bgs.

50 to 75 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

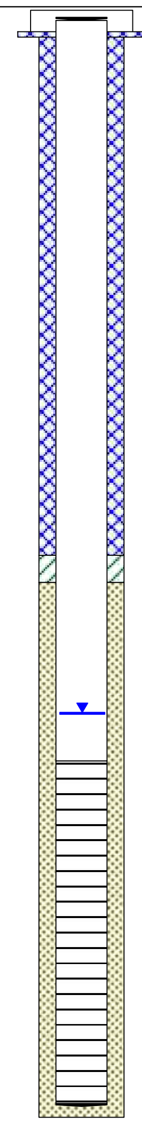
Stantec

MONITORNG WELL ID:	**BAC-12**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.):	81	GROUNDWATER LEVEL (ft. btoc.):	49.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED:	12/4/2019	DATE FINISHED:	12/6/2019
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly Graded Sand with Silt (SP-SM), fine grained sand 95%, loose, soft, dry, pale brown (10 YR 6/3).
5		
10		Clay (CL), medium plasticity, medium dense, moist, cohesive, light brownish gray (10 YR 6/2).
		Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, dry, light brownish gray (10 YR 6/2); clay 10%, low plasticity, soft.
15		
20		Clay (CL), medium plasticity, medium dense, moist, cohesive, very pale brown (10 YR 7/3), mottled with brownish yellow (10 YR 6/8).
25		Poorly Graded Sand with Silt (SP-SM), loose, soft, dry, pale brown (10 YR 6/3).
30		Well Graded Sand with Gravel (SW), fine to coarse sand 85%, loose, soft, dry, light brownish gray (10 YR 6/2), gravel 15%, small, subangular to subrounded, assorted matrix.
		Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, moist, pale brown (10 YR 6/3), 5% clay.
35		
40		Clay with Sand (CL), medium plasticity, medium dense, moist, light yellowish brown (10 YR 6/3).
		Clay (CL), medium plasticity, stiff, moist, cohesive, pale brown (10 YR 6/2).
45		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Clay (CL), Same as 39.5 ft bgs.
		Clay with Sand (CL), Same as 38.5 ft bgs.
50		Clay (CL), Same as 41.5 ft bgs.
		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
55		Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3), mottled with yellowish brown (10 YR 5/6).
		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
60		Well Graded Sand (SW) fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), trace gravel.
65		Clay with Sand (CL), low to medium plasticity, medium dense, wet, non cohesive, brown (10 YR 5/3), mottled with light brownish gray (10 YR 6/2).
70		Well Graded Sand with Clay (SW-SC), fine grained sand 90%, loose, soft, wet, brown (10 YR 5/3): clay 10%, low plasticity, non cohesive.
75		Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3).
80		
		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

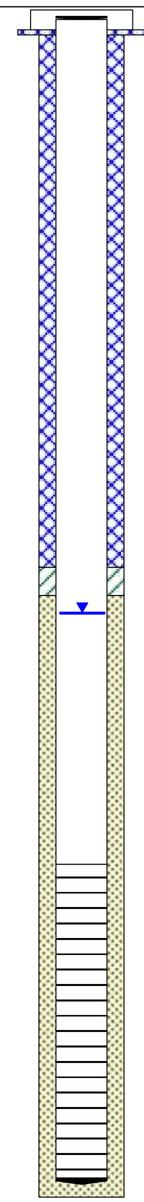
MONITORNG WELL ID:	**BAC-13**		
CLIENT:	Intermountain Power Service Corporation		
PROJECT:	Monitoring Well Installation		
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment		

INTERMOUNTAIN POWER SERVICE CORP. | Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 45.38
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/16/2019	DATE FINISHED: 11/18/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt and Gravel (SP-SM), fine grained sand 85%, silts 10%, trace gravel 5%, loose, dry, light gray (10 YR 7/2).
5	Same as above, becoming dense, consolidated.
	Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
10	Same as above, no gravel, sand 100%.
	Clay with Sand (CL), low plasticity, dry to moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
15	Same as above, moist.
	Same as above, medium plasticity.
20	Poorly Graded Sand (SP), fine grained sand 100%, loose, dry, dark brown (10 YR 3/3), thinly bedded.
	Clay with Sand (CL), low plasticity, moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
35	Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
	Poorly Graded Sand (SP), medium grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
40	Clay (CL), medium plasticity, medium dense, moist, brownish yellow (10 YR 6/6).
	Clay with Sand (CL), low plasticity, soft density, wet, non cohesive, light yellowish brown (10 YR 6/4).
45	Clay (CL), medium plasticity, medium dense, moist, cohesive, brownish yellow (10 YR 6/6), with mottled clay, brownish yellow (10 YR 6/8).
55	Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, non cohesive, brown (10 YR 6/3).
60	Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
	Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, brown (10 YR 6/3).
65	Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
	Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
70	Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
	Poorly Graded Sand (SP), medium grained sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel 5%, rounded to subrounded, assorted matrix.
85	Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
	Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, brown gray (10 YR 5/3).
90	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 42 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 42 to 44 ft bgs.

Filter pack sand 44 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID:	**BAC-14**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 81 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.81
	10 inch sonic core barrel 0 to 78 ft bgs.	DATE STARTED: 11/21/2019	DATE FINISHED: 12/4/2019
		LOGGED BY: Michael Ward	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Well Graded Sand (SW), fine to coarse sand 95%, loose, soft, dry, yellowish brown (10 YR 5/4); 5% gravel, subrounded, small.

Well Graded Sand with Clay (SW-SC), fine to coarse sand 95%, medium dense, dry, light gray (10 YR 7/4).

Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry to moist, very pale brown (10 YR 7/3).

Clay (CL), medium plasticity, medium dense, moist, cohesive, pale brown (10 YR 6/3), with trace mottled clay, brownish yellow (10 YR 6/8).

Poorly Graded Sand (SP), fine sand 100%, loose, soft, light brownish gray (10 YR 6/2).

Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, light brownish gray (10 YR 6/2); clay 10% low plasticity, soft, non cohesive.

Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).

Poorly Graded Sand (SP), fine sand 100%, loose, soft, moist to wet, brown (10 YR 5/4).

Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).

Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, brown (10 YR 5/3); clay 10% low plasticity.

Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).

Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).

Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).

Poorly Graded Sand with Clay (SP-SC), fine sand 85%, loose medium dense, wet, brown (10 YR 5/3); clay 15% low plasticity, non cohesive, light yellowish brown (10 YR 6/4).

Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).

Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).

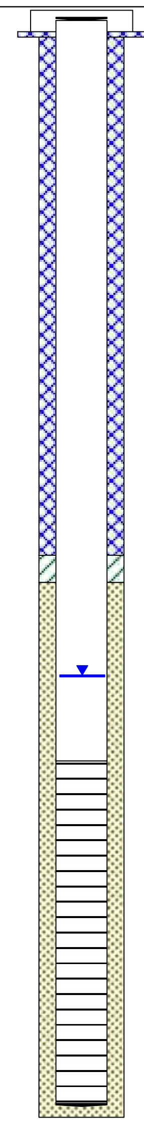
Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).

Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, wet, brown (10 YR 5/3); clay 10%, low plasticity, soft, non cohesive.

Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).

Clay (CL), medium plasticity, medium to stiff, moist, brown (10 YR 5/3).

End of borehole at 81 ft bgs. Installed monitoring well per scope of work.



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

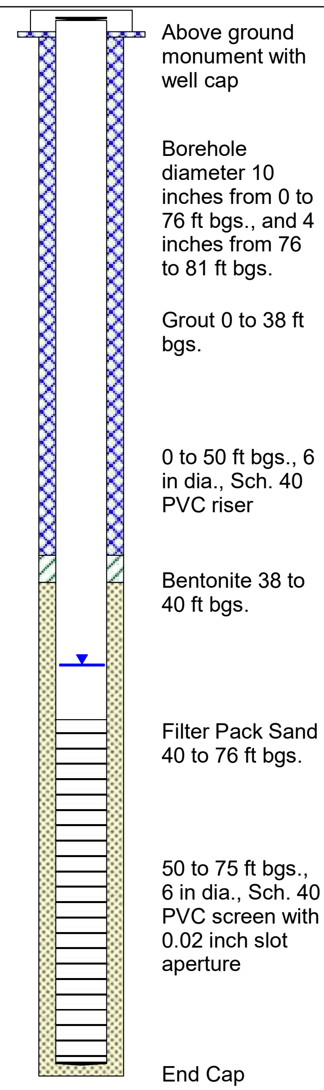
MONITORNG WELL ID:	**BAC-15**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.03
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/7/2019	DATE FINISHED: 12/9/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Fill
		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, very pale brown (10 YR 7/3), trace gravel, subrounded.
5		Clay (CL), medium plasticity, medium dense, cohesive, dry, light brownish gray (10 YR 6/2), trace white (10 YR 8/1), trace calcium carbonate between clay layering, effervesces with HCL.
10		
15		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, light gray (10 YR 7/1), trace clay at depth.
20		Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, soft to medium dense, dry, pale brown (10 YR 6/3), clay low plasticity, medium dense.
25		
		Clay (CL), medium plasticity, medium dense, cohesive, moist, pale brown (10 YR 6/3).
30		Same as above, becoming light yellowish brown (10 YR 6/4).
35		Clay with Sand (CL), low plasticity, soft, non cohesive, light yellowish brown (10 YR 6/4).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
40		
45		Well Graded Sand with Gravel (SW), fine to coarse sand 90%, loose, soft, wet, brown (10 YR 5/3), gravel 10%, subrounded.
50		
		Same as above, with trace black staining.
55		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/6).
		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
60		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3)
		Same as above, with some clay.
65		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
		Same as above, color change to yellowish brown (10 YR 6/4).
70		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
		Same as above, with mottled yellowish red (5 YR 5/6).
75		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
80		Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
		Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3).
		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-16**		
CLIENT:	Intermountain Power Service Corporation		
PROJECT:	Monitoring Well Installation		
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment		

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 47.45
		DATE STARTED: 11/18/2019	DATE FINISHED: 11/21/2019
		LOGGED BY: Michael Ward	

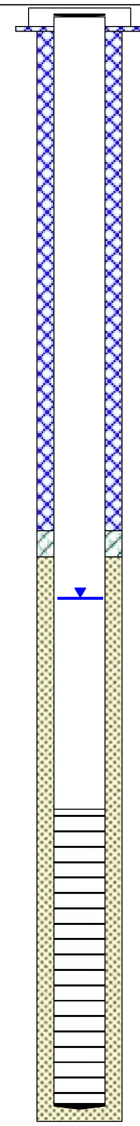
DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100

LITHOLOGICAL DESCRIPTION

- Fill.
- Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
- No core retrieved from sonic core barrel.
- Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
- Well Graded Sand (SW), fine to coarse grained sand 95%, loose, soft, light brownish gray (10 YR 6/2), trace gravel 5%, subrounded, small.
- Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
- Clay (CL).
- Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry, non cohesive, pale brown (10 YR 6/3).
- Poorly Graded Sand (SP), fine grained 100%, loose to medium dense, dry, light gray (10 YR 7/1).
- Clay (CL), medium plasticity, medium density, moist, light yellowish brown (10 YR 6/4), with some interfingering clay, brownish yellow (10 YR 6/8).
- Clay with Sand (CL).
- Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
- Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
- Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
- Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
- Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, brown (10 YR 5/3), with trace interfingering clay 5%, yellowish red (5 YR5/6).
- Well Graded Sand (SW), fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), 2% gravel, small, subrounded.
- Clay with Sand (CL), low to medium plasticity, soft to medium density, wet, light brownish gray (10 YR 6/2).
- Clay (CL), medium plasticity, medium to stiff, cohesive, moist, light yellowish gray (10 YR 6/2).
- Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
- Clay (CL), medium plasticity, stiff, cohesive, moist to wet, brown (10 YR 5/3).
- Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
- Clay (CL), same as 73 ft bgs.
- Poorly Graded Sand (SP), same as 82 ft bgs.
- Clay (CL), same as 73 ft bgs.
- Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
- Clay (CL), same as 73 ft bgs., with mottled interbedded clay, yellowish red (5 YR 5/6).
- End of borehole at 91 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



- Above ground monument with well cap
- Grout 0 to 42 ft bgs.
- Borehole diameter 10 inches from 0 to 91 ft bgs.
- 0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser
- Bentonite 42 to 44 ft bgs.
- Filter Pack Sand 44 to 91 ft bgs.
- 64 to 89 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture
- End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

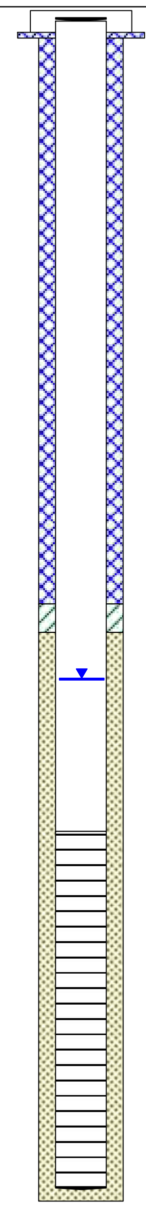
MONITORNG WELL ID:	**BAC-17**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 82	GROUNDWATER LEVEL (ft. btoc.): 45.3
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/12/9/2019	DATE FINISHED: 12/10/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM
0		Well Graded Sand with Silt (SW-SM), fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), fine silts, trace calcium carbonate.	Above ground monument with well cap
5		Well Graded Sand (SW), fine to coarse sand 100%, loose, soft, pale brown (10 YR 6/3).	
10			Borehole diameter 10 inches from 0 to 81 ft bgs.
15			
20		Well Graded Sand with Gravel and Clay (SW-SC), loose, soft, fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), clay low plasticity, soft, gravel, small, subrounded.	Grout 0 to 40 ft bgs.
		Well Graded Sand (SW), fine to coarse 98%, loose, soft, light yellowish brown (10 YR 6/4), gravel 2%, small, subrounded.	
25			
30		Clay (CL), low plasticity, soft, wet, very pale brown (10 YR 7/3), perched groundwater.	
		Clay with Sand (CL), low plasticity, soft, moist, light yellowish brown (10 YR 6/4).	0 to 56 ft bgs., 6 in dia., Sch. 40 PVC riser
35			
40		Clay (CL), medium plasticity, medium dense, cohesive, brown (10 YR 5/3), mottled with some reddish yellow (5 YR 6/6).	Bentonite 40 to 42 ft bgs.
45			
50			Filter Pack Sand 42 to 81 ft bgs.
55			
		Clay with Sand (CL), low plasticity, soft, wet non cohesive, brown (10 YR 5/3).	
60		Poorly Graded Sand with Clay (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), with trace gravel 2%, subrounded, small.	56 to 81 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture
65			
		Poorly Graded Sand with Clay (SP-SC), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), clay, medium plasticity, soft to low density, non cohesive, light yellowish brown (10 YR 5/4).	
70			
		Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).	
75		Poorly Graded Sand with Clay (SP-SC), fine grained sand, loose, soft, wet, brown (10 YR 5/3), clay are low plasticity, soft.	
		Clay with Sand (CL), low to medium plasticity, soft, wet, cohesive, brown (10 YR 5/3).	
80		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).	End Cap
		End of borehole at 81 ft bgs. Installed monitoring well per scope of work.	
85			



Notes: bgs. = below ground surface
dia. = diameter
ft = feet
Sch. = Schedule
YR = Yellow-Red

MONITORNG WELL ID: **BAC-18**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

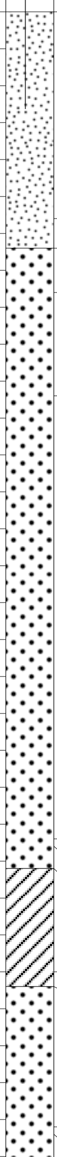
SITE LOCATION: Down Gradient North

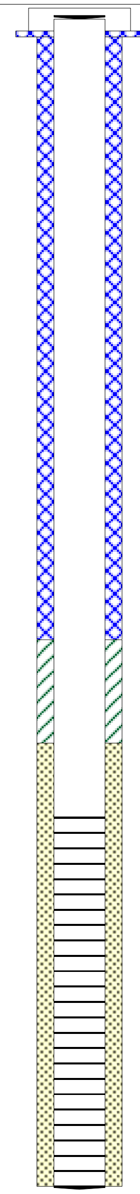
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/8/2020	DATE FINISHED: 5/9/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM
0		Poorly graded Sand with Silt (SP), light brown, dry	Above ground monument with well cap
10			Grout 0 to 41 ft bgs. Borehole diameter 10 inches from 0 to 78 ft bgs.
15		Poorly graded Sand with Silt (SP), light brown, moist	
		Well Graded Sand with Gravel (SW), light brown, moist	
20		Well Graded Sand with Clay (SW-SC), light brown, moist	
25		Well Graded Sand with Clay (SW-SC), light brown, moist	
30			0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser
55		Well Graded Sand with Gravel (SW), light brown, wet	Bentonite 41 to 48 ft bgs.
		Well Graded Sand with Gravel (SW), light brown, moist	Filter pack sand 48 to 78 ft bgs.
60		Clay (CL), light brown, moist	
65		Clay (CL), with sand, light brown, moist	
		Well Graded Sand with Gravel (SW), light brown, moist	
70			53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
75		Well Graded Sand with Gravel (SW), light brown, wet	
		Well Graded Sand with Gravel (SW), light brown, moist	End Cap
80		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.	





Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-19**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Down Gradient South

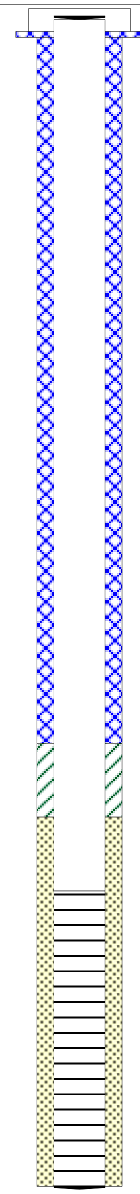
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 91 ft bgs.,	DATE STARTED: 5/9/2020	DATE FINISHED: 5/9/2020
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with Silt (SP-SM), fine to coarse sands, loose, soft, dry, very pale brown (10 YR 7/3).
5	
	Sand with Clay (SC), fine to coarse sand, soft, loose, dry to moist, light gray (10 YR 7/1).
10	Poorly Graded Sand (SP) medium grained, loose, soft, unconsolidated, dry, light gray (10 YR 7/2).
	Clay (CL), moderate plasticity, moist, soft, cohesive, brown (10 YR 5/3).
15	
20	
	Poorly Graded Sand (SP) medium grained, loose, soft, unconsolidated, moist to dry, brown (10 YR 5/3).
25	
30	
	Clay (CL), moderate plasticity, moist, soft to medium dense, cohesive, brown (7.5 YR 5/4).
35	
	Same as above, becoming moist to wet.
	Poorly Graded Sand (SP), fine grained sands, soft, loose, wet, brown (10 YR 5/3).
40	
	Same as above, with trace white staining.
45	Clay (CL), moderate plasticity, medium to stiff, cohesive, brown (7.5 YR 5/4).
50	
55	Well Graded Sand (SW), fine to coarse sands, soft, loose, unconsolidated, brown (10 YR 5/3).
60	
	Clay (CL), moderate plasticity, medium to stiff, cohesive, brown (7.5 YR 5/4).
65	
	Clayey Sand (SC), fine to medium grained sands, medium dense, wet, brown (10 YR 5/3), with thin trace interbedded black lenses.
70	Well Graded Sand (SW), fine to coarse sands, soft, loose, unconsolidated, brown (10 YR 5/3).
	Clay (CL), moderate plasticity, medium to stiff, cohesive, brown (7.5 YR 5/4).
75	Well Graded Sand (SW), fine to coarse sands, soft, loose, unconsolidated, brown (10 YR 5/3).
	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.
80	

WELL CONSTUCTION DIAGRAM



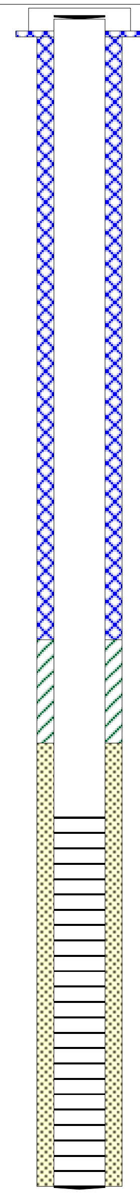
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

	MONITORNG WELL ID:	**BAC-20**	Stantec
INTERMOUNTAIN POWER SERVICE CORP.	CLIENT:	Intermountain Power Service Corporation	
	PROJECT:	Monitoring Well Installation	
	SITE LOCATION:	South Wells	

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/9/2020	DATE FINISHED:	5/10/2020
		LOGGED BY:	Rich Pratt		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly graded Sand with Silt (SP), light brown, dry
15		Well Graded Sand with Gravel (SW), moist, dry
20		Clay (CL), light brown, moist
25		Well Graded Sand with Gravel (SW), moist, light brown
30		Clay (CL), light brown, moist
40		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
55		Well Graded Sand with Gravel (SW), wet, light brown
		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
60		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
65		Clay (CL), light brown, moist
70		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
75		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
80		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-21**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

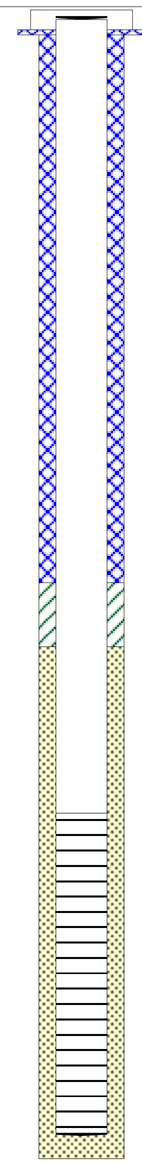
SITE LOCATION: South Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 91 ft bgs.,	DATE STARTED: 5/10/2020	DATE FINISHED: 5/10/2020
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), fine to coarse sand, loose, soft, unconsolidated, very pale brown (10 YR 7/3).
10	Sandy Clay (SC), fine to coarse sands, medium dense, dry, pale brown (10 YR 7/3).
16	Clay (CL), low to medium plasticity, cohesive, medium dense, brown (10 YR 5/3).
30	Well Graded Sand with Clay (SW-SC), fine grained sand, medium dense, dry to moist, very pale brown (10 YR 7/3).
35	Clay (CL), medium plasticity, cohesive, medium dense, light brownish gray (10 YR 6/2).
40	Well Graded Sand (SW), fine grained sand, loose, soft, brown (10 YR 5/3).
41.5	Clay (CL), medium to high plasticity, stiff, cohesive, pale brown (10 YR 6/3).
44	Same as above, becoming yellowish red (10 YR 5/4).
48.5	Well Graded Sand (SW), fine grained sand, loose, soft, brown (10 YR 5/3).
50	Clay (CL), medium to high plasticity, stiff, cohesive, pale brown (10 YR 6/3).
52	Sandy Clay (SC), fine grained sand, loose to medium dense, wet, yellowish brown (10 YR 5/4).
60	Clay (CL), medium plasticity, stiff, cohesive, light yellowish brown (10 YR 6/4).
62	Sandy Clay (SC), fine grained sand, loose to medium dense, wet, yellowish brown (10 YR 5/4).
80	Well Graded Sand (SW), medium grained sand, soft, loose, brown (10 YR 5/4).
85.5	Clay (CL), medium plasticity, medium to stiff density, cohesive, light yellowish brown (10 YR 6/4).
88	End of borehole at 88 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID: **BAC-22**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/10/2020	DATE FINISHED: 5/10/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
5	
10	Poorly graded Sand with Silt and Clay (SP), light brown, dry
15	
20	Clay (CL), light brown, moist
25	Poorly graded Sand with Silt (SP), light brown, dry
	Well Graded Sand with Clay (SW), light brown, moist
30	
35	
	Well Graded Sand with Gravel (SW), moist, light brown
40	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
45	
50	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
55	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), wet, light brown
	Well Graded Sand with Clay (SW), light brown, moist
60	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
65	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
70	Well Graded Sand with Gravel (SW), moist, light brown (black sections)
	Well Graded Sand with Gravel (SW), moist, light brown
75	Clay (CL), light brown, moist
80	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM

Above ground monument with well cap

Grout 0 to 41 ft bgs.

Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

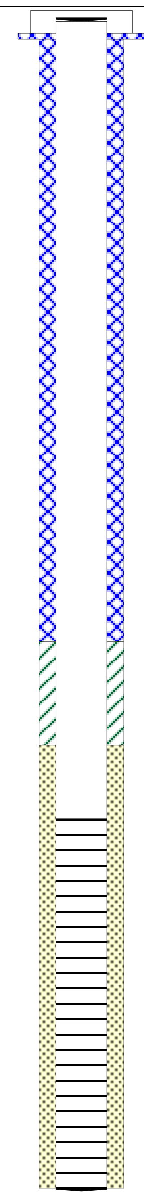
MONITORNG WELL ID:	**BAC-23**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/11/2020	DATE FINISHED: 5/11/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
16	Poorly graded Sand with Silt and Clay (SP), light brown, dry
18	Clay (CL), light brown, dry
35	Well Graded Sand with Clay (SW), light brown, dry
	Poorly graded Sand with Silt (SP), light brown, dry
	Poorly graded Sand with Silt (SP), light brown, moist
41	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
51	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Clay (SW), light brown, wet
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
66	Well Graded Sand with Gravel (SW), moist, light brown
70	Well Graded Sand with Clay (SW), light brown, moist
74	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-24**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

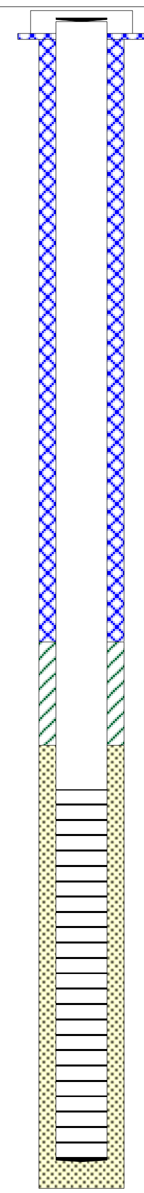
INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 76.2	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/12/2020	DATE FINISHED: 5/12/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80

Poorly graded Sand with Silt (SP), light brown, dry
Well Graded Sand with Gravel (SW), dry, light brown
Poorly graded Sand with Silt (SP), light brown, dry
Poorly graded Sand with Silt and Clay (SP), light brown, dry
Poorly graded Sand with Silt (SP), light brown, dry
Well Graded Sand with Gravel (SW), moist, light brown
Clay with well graded sand (SW), light brown, moist
Clay (CL), light brown, dry
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), dry, light brown
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Clay with well graded sand (SW), light brown, moist
Well Graded Sand with Gravel (SW), wet, light brown
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Clay with well graded sand (SW), light brown, moist
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
End of borehole at 78 ft bgs. Installed monitoring well per scope of work.



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 51 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

51 to 76 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP. | Stantec

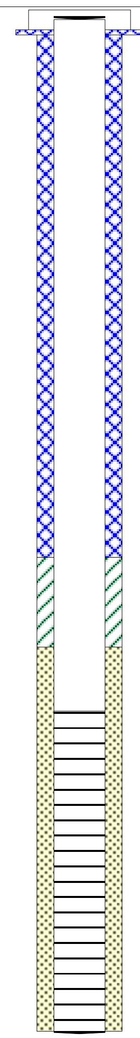
MONITORNG WELL ID:	**BAC-25**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/12/2020	DATE FINISHED: 5/12/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM

Depth scale (feet): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95

Poorly graded Sand with Silt (SP), light brown, dry
Poorly graded Sand with Silt and Clay (SP), light brown, dry
Poorly graded Sand with Silt (SP), light brown, dry
Poorly graded Sand with Silt and Clay (SP), light brown, dry
Poorly graded Sand with Silt (SP), light brown, dry
Poorly Graded Sand with Clay (SW), light brown, dry
Poorly graded Sand with Silt and Clay (SP), light brown, dry
Clay (CL) with sand, light brown, dry
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Clay (SW), light brown, moist
Clay (CL), light brown, moist
Well Graded Sand with Clay (SW), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL) with sand, light brown, dry
Well Graded Sand with Clay (SW), light brown, moist
Clay (CL) with sand, light brown, dry
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), wet, light brown
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Well Graded Sand with Gravel (SW), wet, light brown
Well Graded Sand with Gravel (SW), moist, light brown
Well Graded Sand with Clay (SW), light brown, moist
Clay (CL), light brown, moist
Well Graded Sand with Clay (SW), light brown, moist
End of borehole at 78 ft bgs. Installed monitoring well per scope of work.



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.
Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

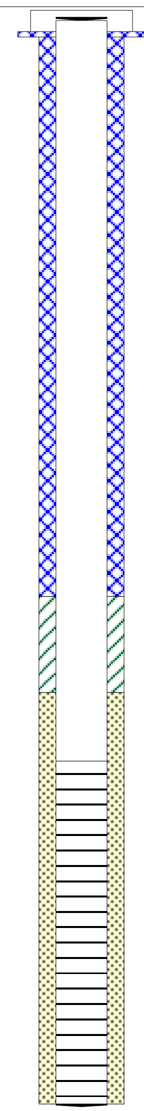
MONITORNG WELL ID:	**BAC-26**		
CLIENT:	Intermountain Power Service Corporation		
PROJECT:	Monitoring Well Installation		
SITE LOCATION:	South Wells		

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/13/2020	DATE FINISHED: 5/13/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
10	Poorly graded Sand with Silt and Clay (SP), light brown, dry
15	Poorly graded Sand with Silt (SP), light brown, dry
	Poorly Graded Sand (SP), dry, light brown
	Poorly graded Sand with Silt and Clay (SP), light brown, moist
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-27**
CLIENT: Intermountain Power Service Corporation
PROJECT: Monitoring Well Installation
SITE LOCATION: North Wells

INTERMOUNTAIN POWER SERVICE CORP.

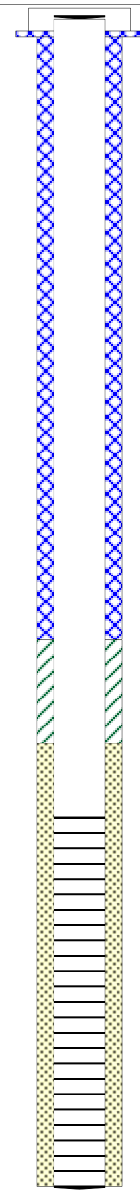
Stantec

DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
DRILLING EQUIPMENT: Pro Sonic 600
SAMPLING METHOD: 4 inch sonic core barrel 0 to 78 ft bgs., 10 inch sonic core barrel 0 to 78 ft bgs.,

COORDINATE SYSTEM:
EASTING: NORTHING:
ELEVATION: BOREHOLE ANGLE: 90 degrees
TOTAL DEPTH (ft.): 78 GROUNDWATER LEVEL (ft. btoc.):
DATE STARTED: 5/13/2020 DATE FINISHED: 5/13/2020
LOGGED BY: Rich Pratt

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
~16	Poorly graded Sand with Silt and Clay (SP), light brown, dry
~26	Clay (CL), light brown, moist
~52	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
~57	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
~66	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
	Well Graded Sand with Clay (SW), light brown, moist
~71	Clay (CL), light brown, moist
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-28**		
CLIENT:	Intermountain Power Service Corporation		
PROJECT:	Monitoring Well Installation		
SITE LOCATION:	North Wells		

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/14/2020	DATE FINISHED:	5/14/2020
		LOGGED BY:	Rich Pratt		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM

Depth scale (feet): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80

Poorly graded Sand with Silt (SP), light brown, dry

Poorly graded Sand with Silt and Clay (SP), light brown, dry

Poorly graded Sand with Silt (SP), light brown, dry

Poorly graded Sand with Silt and Clay (SP), light brown, dry

Clay (CL), light brown, moist

Well Graded Sand with Clay (SW), light brown, moist

Clay (CL), light brown, moist

Well Graded Sand with Clay (SW), light brown, moist

Well Graded Sand with Clay (SW), light brown, wet

Well Graded Sand with Clay (SW), light brown, moist

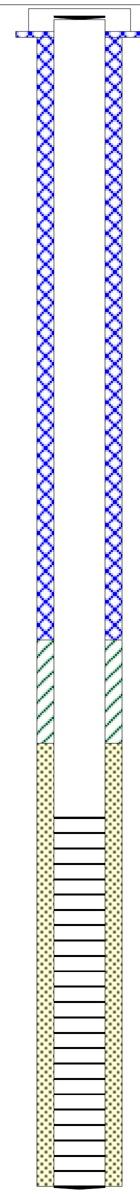
Clay (CL), light brown, moist

Well Graded Sand with Clay (SW), light brown, wet

Well Graded Sand with Clay (SW), light brown, moist

Clay (CL), light brown, moist

End of borehole at 78 ft bgs. Installed monitoring well per scope of work.



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

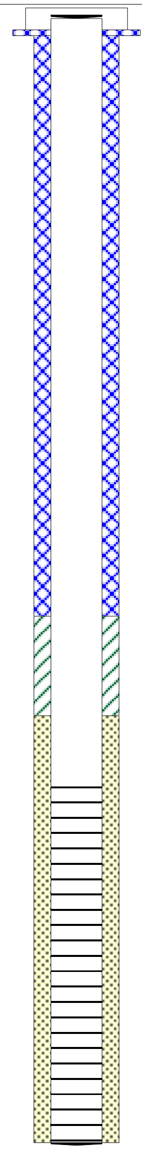
MONITORNG WELL ID:	**BAC-29**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/15/2020	DATE FINISHED: 5/15/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly graded Sand with Silt (SP), light brown, dry
15		Silty Clay, light brown, dry
		Poorly graded Sand with Silt and Clay (SP-SM), light brown, moist
20		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
45		Clay (CL), light brown, moist
50		Well Graded Sand with Clay (SW), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
55		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
60		Well Graded Sand with Gravel (SW), moist, light brown
		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
70		Clay (CL), light brown, moist
		Well Graded Sand with Clay (SW), light brown, moist
		Clay (CL), light brown, moist
		Well Graded Sand with Clay (SW), light brown, moist
		Clay (CL), light brown, moist
80		Well Graded Sand with Clay (SW), light brown, moist
		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

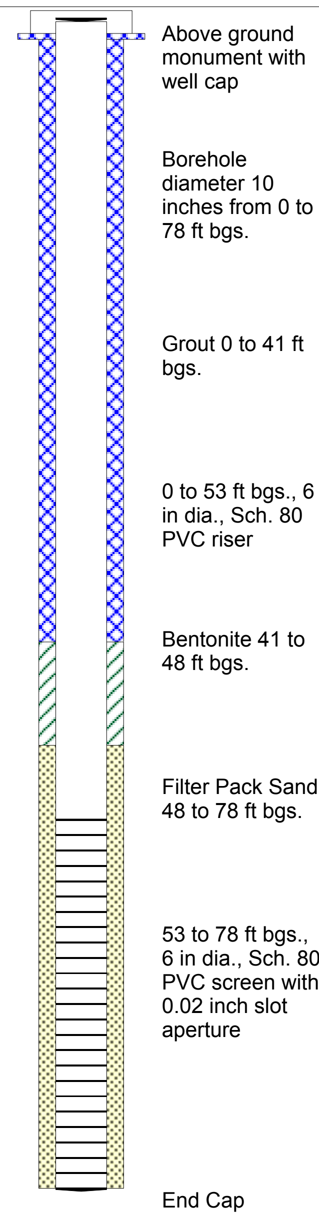
MONITORNG WELL ID:	**BAC-30**		
CLIENT:	Intermountain Power Service Corporation		
PROJECT:	Monitoring Well Installation		
SITE LOCATION:	North Wells		

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/14/2020	DATE FINISHED: 5/15/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Well Graded Sand with some Gravel (SP), sand 90%, gravel 5%, fines 5%, dry, light brown (10 YR 8/2), increasing fines from 11'
5		
10		
15		Sand (SP), sand 90%, fines 10%, loose.
		Poorly-Graded Clay (ML) increasing from fines 60%, sand 40% to fines 95%, sand 5%, medium plasticity, wet
20		Silty Sand (SM), sand 80%, 20% fines, moist
25		Poorly-Graded Silty Clay (CL), low plasticity, iron staining
30		
35		
		Poorly-Graded Silty Clay (CL), increasing plasticity, increasing moisture
40		Poorly-Graded Silty Clay (CL), decreasing plasticity
		Silty Sand (SP), moist
45		Clay (CL), moist, low plasticity
50		Silty Sand (SP), sand 90%, fines 10%, moist, loose
55		Silty Clay (CL), moist, medium-high plasticity, dense and hard
		Sandy Clay (CL) lense
60		Silty Clay (CL), moist, medium-high plasticity, dense and hard
65		Silty Sand (SP), sand 90%, fines 10%, moist, loose
		Clay (CL), moist, hard, medium plasticity
70		Silty Sand (SP), sand 90%, fines 10%, moist, loose
75		Sandy Clay (CL), hard, moist, dense, medium-high plasticity
80		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-31**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: North Wells

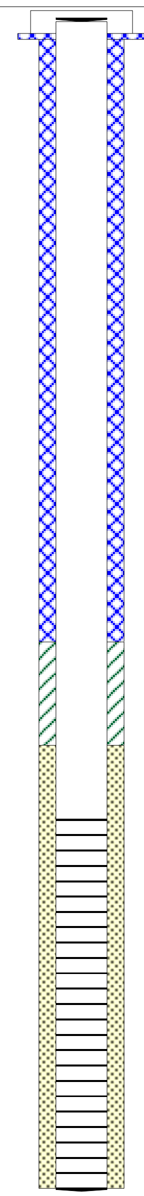
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/15/2020	DATE FINISHED: 5/18/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Silty Sand (SW), sand 50%, gravel 40%, fines 10%, dry to slightly moist, very loose, pinkish-gray (5YR 7/2)
16	Silty Clay (ML), fines 90%, sand 10%, slightly moist
	Silty Sand (SP), increasing fines from sand 80%, fines 20% to sand 60%, fines 40%.
20	Sandy Clay (CL), fines 60%, sand 40%, moist, dense, iron staining, dark reddish brown (5YR 3/3)
41.5	Sand (SP), sand 90%, fines 10%, moist, loose, decreasing sand
	Clay (CL), fines 100%, moist, very hard, olive brown 2.5Y 4/3
	Sandy Clay (CL), moist
48	Silty Sand (SP), moist to very moist, increasingly coarse sand
	Silty Clay (CH), fines 85%, sand 15%
	Silty Sand (SP), moist to very moist
	Clay (CH), fines 100%, very hard
	Silty Sand (SP), sand 90%, fines 10%, moist, loose
	Clay (CL), fines 100%, moist, very hard, medium-high plasticity
64	Silty Sand (SP), fines vary from 10% to 30%, moist to very moist, some iron staining, ~4-5" clay lense at 65'
72	Clay (CH), moist to very moist, high plasticity from 73' to 74.5', very hard from 74.5' to 76.5'
76.5	Silty Sand (SP), sand 80%, fines 20%, grayish brown (2.5Y 5/2)
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs.

Grout 0 to 41 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter Pack Sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

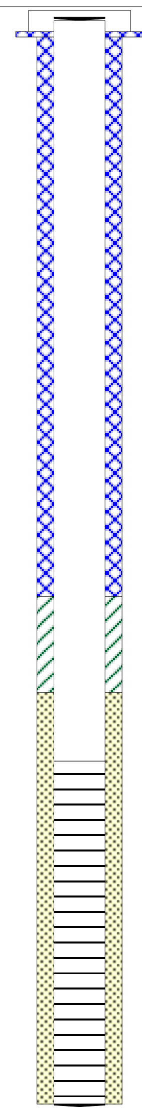
MONITORNG WELL ID:	**BAC-32**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/19/2020	DATE FINISHED: 5/19/2020
		LOGGED BY: Not Available	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Lithological Description infered from BAC-26. Poorly graded Sand with Silt (SP), light brown, dry
10		Poorly graded Sand with Silt and Clay (SP), light brown, dry
15		Poorly graded Sand with Silt (SP), light brown, dry
20		Poorly Graded Sand (SP), dry, light brown
		Poorly graded Sand with Silt and Clay (SP), light brown, moist
		Clay (CL), light brown, moist
50		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), wet, light brown
60		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
65		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Clay (SW), light brown, moist
		Well Graded Sand with Gravel (SW), wet, light brown
80		Clay (CL), light brown, moist
		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-33**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: North Wells

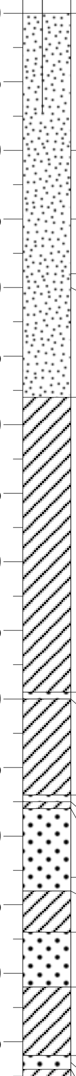
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

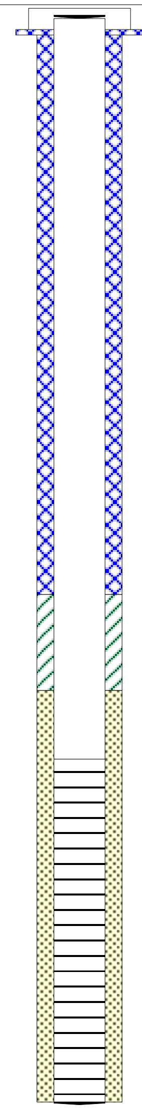
DRILLING CONTRACTOR:	Cascade Drilling
DRILLING METHOD:	Sonic
DRILLING EQUIPMENT:	Pro Sonic 600
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs., 10 inch sonic core barrel 0 to 78 ft bgs.,

COORDINATE SYSTEM:			
EASTING:		NORTHING:	
ELEVATION:		BOREHOLE ANGLE:	90 degrees
TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
DATE STARTED:	5/18/2020	DATE FINISHED:	5/18/2020
LOGGED BY:	Not Available		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Lithological Description inferred from BAC-26. Poorly graded Sand with Silt (SP), light brown, dry
10		Poorly graded Sand with Silt and Clay (SP), light brown, dry
15		Poorly graded Sand with Silt (SP), light brown, dry
20		Poorly Graded Sand (SP), dry, light brown
		Poorly graded Sand with Silt and Clay (SP), light brown, moist
28		Clay (CL), light brown, moist
50		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
57		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
64		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
67		Well Graded Sand with Gravel (SW), moist, light brown
71		Clay (CL), light brown, moist
76		Well Graded Sand with Clay (SW), light brown, moist
		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.



WELL CONSTUCTION DIAGRAM



- Above ground monument with well cap
- Borehole diameter 10 inches from 0 to 78 ft bgs.
- Grout 0 to 41 ft bgs.
- 0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser
- Bentonite 41 to 48 ft bgs.
- Filter Pack Sand 48 to 78 ft bgs.
- 53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
- End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-34**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: North Wells

INTERMOUNTAIN POWER SERVICE CORP.

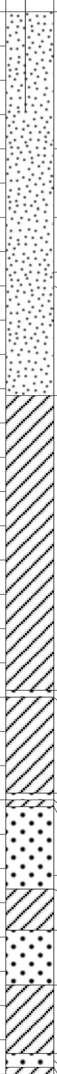
Stantec

DRILLING CONTRACTOR:	Cascade Drilling
DRILLING METHOD:	Sonic
DRILLING EQUIPMENT:	Pro Sonic 600
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs., 10 inch sonic core barrel 0 to 78 ft bgs.,

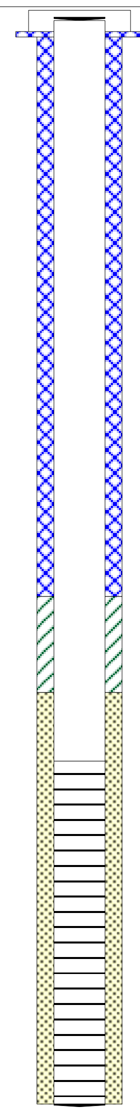
COORDINATE SYSTEM:			
EASTING:		NORTHING:	
ELEVATION:		BOREHOLE ANGLE:	90 degrees
TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
DATE STARTED:	5/21/2020	DATE FINISHED:	5/21/2020
LOGGED BY:	Not Available		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Lithological Description inferred from BAC-26. Poorly graded Sand with Silt (SP), light brown, dry
10	Poorly graded Sand with Silt and Clay (SP), light brown, dry
15	Poorly graded Sand with Silt (SP), light brown, dry
20	Poorly Graded Sand (SP), dry, light brown
	Poorly graded Sand with Silt and Clay (SP), light brown, moist
28	Clay (CL), light brown, moist
50	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
57	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
64	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
67	Well Graded Sand with Gravel (SW), moist, light brown
71	Clay (CL), light brown, moist
76	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

LITHOLOGICAL GRAPHIC



WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs.

Grout 0 to 41 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter Pack Sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-35**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

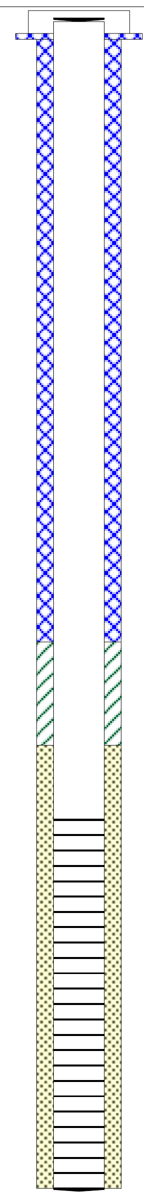
SITE LOCATION: North Wells

INTERMOUNTAIN POWER SERVICE CORP. | Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/28/2020	DATE FINISHED: 5/29/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Silty Sand (SP), sand 90%, fines 10%, very loose, very fine, dry, reddish gray (2.5 YR 7/1)
18	Silty Sand (SM), fines 70%, very fine sand 30%, loose
22	Sandy Silt (ML), fines 70%, very fine sand 30%, medium dense, low plasticity, some oxidation, slightly moist, pale yellow (2.5Y 7/3)
28	Sandy Silty Clay (CL), moist, medium plasticity, dense, moist, some oxidation, light brownish gray (2.5 YR 6/2), yellow (2.5 YR 7/6), hard
52	Sandy Silty Clay (CL), fines 60%, very fine sand 40%, small sand increase, weak, loose
54	Sandy Silty Clay (CL), moist, medium plasticity, dense, moist, some oxidation, light brownish gray (2.5 YR 6/2), yellow (2.5 YR 7/6), hard
58	Fine Sand (SP), sand 90%, fines 10%, loose, weak, moist, very dark grayish brown (2.5Y 3/2), sand lense at 64.5' with medium sand 100%
65	Silty Sandy Clay (CL), fines 90%, sand 10%, moist, dense, low to medium plasticity
68	Silty Sand (SP), sand 80%, fines 20%, moist, loose, very dark grayish brown (2.5 Y 3/2),
70	Clay lense (CL), very fine sand 90%, fines 10%
71	Silty Sand (SP), sand 80%, fines 20%, moist, loose, very dark grayish brown (2.5 Y 3/2),
76	Sandy Silty Clay (CL), fines 90%, very fine sand 10%, moist, dense, low plasticity, reddish gray (5YR 5/2)
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

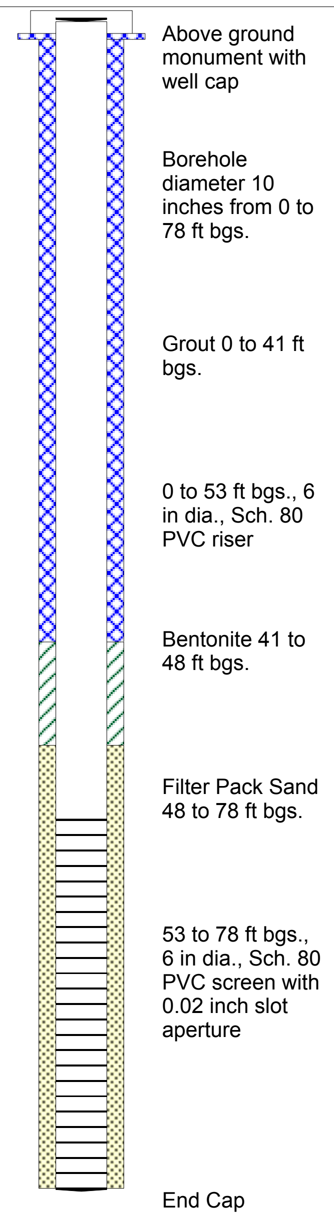
MONITORNG WELL ID:	**BAC-36**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/30/2020	DATE FINISHED: 5/31/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Silty Sand (SM), sand 80%, fines 15%, gravel 5%, dry, very loose, subangular clasts, light gray (2.5Y 7/2)
18	Silty Sandy Clay (CL), fines 80%, fine sand 20%, dense, moist, low to medium plasticity, light olive brown (2.5Y 5/3). Small fracture with iron oxidation, reddish yellow (7.5YR 6/6).
33	No recovery from 33 to 38 ft bgs
38	Silty Sand (SM), fine sand 70%, fines 30%, loose, moist, olive brown (2.5Y 5/3), increasing fines from 45' to 46' with sand 50%, fines 50%
47	Silty Clay (CL), fines 100%, dense, moist, medium plasticity, brown (7.5YR 5/3/)
50	Silty Clay (CL), fines 70%, very fine sand 30%
52	Silty Clay (CL), fines 100%, dense, moist, medium plasticity, brown (7.5YR 5/3/)
58	Gravelly Silty Sand (SM), sand 80%, gravel 10%, fines 10%, loose, moist, light yellowish brown (2.5YR 6/4), gravel lense at 59', decreasing fines
62	Silty Clay (CL), fines 90%, very fine sand 10%, moist, dense, low plasticity, brown (7.5YR 5/4).
69	Silty Sand (SM), very fine sand 70%, fines 30%, reddish yellow (7.5YR 7/6), moist, loose
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-37**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: South Wells

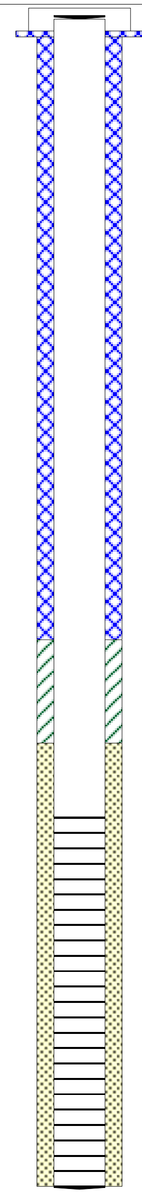
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/29/2020	DATE FINISHED: 5/30/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Silty Fine Sand (SM), sand 80%, fines 20%, dry, loose, light gray (2.5Y 7/2)
18	Silty Sandy Clay (CL), fines 90%, sand 10%, slightly moist, low plasticity, dense, hard, pale yellow (2.5Y 7/3)
	Silty Sandy Clay (CL), fines 70%, fine sand 30%, loose
25	Silty Sandy Clay (CL), fines 90%, sand 10%, slightly moist, low plasticity, dense, hard, iron staining, yellow (2.5Y 7/3)
34	Silty Fine Sand (SM), fine sand 70%, fines 30%, moist, loose
39	Fine Gravel (GM), sand 60%, gravel 30%, fines 10%, angular to subangular clasts
	Silty Fine Sand (SM), fine sand 70%, fines 30%, moist, loose
43	Sandy Clay (CL), fines 90%, sand 10%, moist, medium dense, low plasticity, light brownish gray (2.5 YR 6/2)
50	Fine Silty Sand (SM), sand 80%, fines 20%, moist, loose
52	Silty Clay (CL), 100% fines, moist, hard, low plasticity, reddish
55	Silty Sand (SP), sand 90%, fines 10% , reddish gray (5YR 5/2)
	Silty Sand (SP), sand 70%, fines 30%, reddish gray (5YR 5/2)
62.5	Silty Clay (CL), fines 100%, dense, moist, medium-high plasticity
66	Fine Silty Sand (SM), sand 80%, fines 20%, moist, loose
75	Fine Silty Sand (SM), sand 60%, fines 40%, moist, loose
	Fine Silty Sand (SM), sand 80%, fines 20%, moist, loose
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



- Above ground monument with well cap
- Borehole diameter 10 inches from 0 to 78 ft bgs.
- Grout 0 to 41 ft bgs.
- 0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser
- Bentonite 41 to 48 ft bgs.
- Filter Pack Sand 48 to 78 ft bgs.
- 53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
- End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

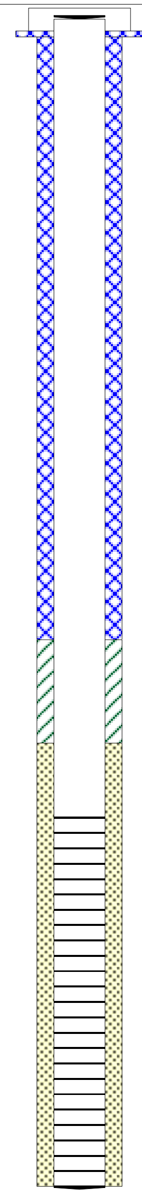
MONITORNG WELL ID:	**BAC-38**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/31/2020	DATE FINISHED: 5/31/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Silty Fine Sand (SM), sand 70%, fines 30%, dry, very loose, light yellowish brown (2.5Y 6/3)
5		
10		Silty Sandy Clay (CL), fines 80%, sand 20%, slightly moist, low plasticity, dense, olive brown (2.5Y 7/3). Fracture-like facies with iron oxidation
15		
20		Gravel Sand (SP), sand 80%, gravel 20%, very loose, dry, light yellowish brown (2.5Y 6/3)
25		
30		Silty Clay (CL), fines 100%, slightly moist, low plasticity, dense, red (2.5YR 5/8)
35		Silty Sand (SP), sand 90%, fines 10%, loose, moist, light olive brown (2.5Y 5/3)
40		
45		Silty Clay (CL), fines 100%, moist, medium-high plasticity, dense, red (2.5YR 5/4)
50		
55		Silty Sand (SM), sand 80%, fines 20%, loose, moist, light olive brown (2.5Y 5/3)
60		Silty Clay (CL), transitioning from fines 90%, sand 10% to fines 60%, sand 40%, moist, medium-high plasticity, dense, red (2.5YR 5/8)
65		Fine sand (SP), sand 100%, moist, very loose, dark grayish brown (2.5Y 3/2)
70		
75		
80		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs.

Grout 0 to 41 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter Pack Sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

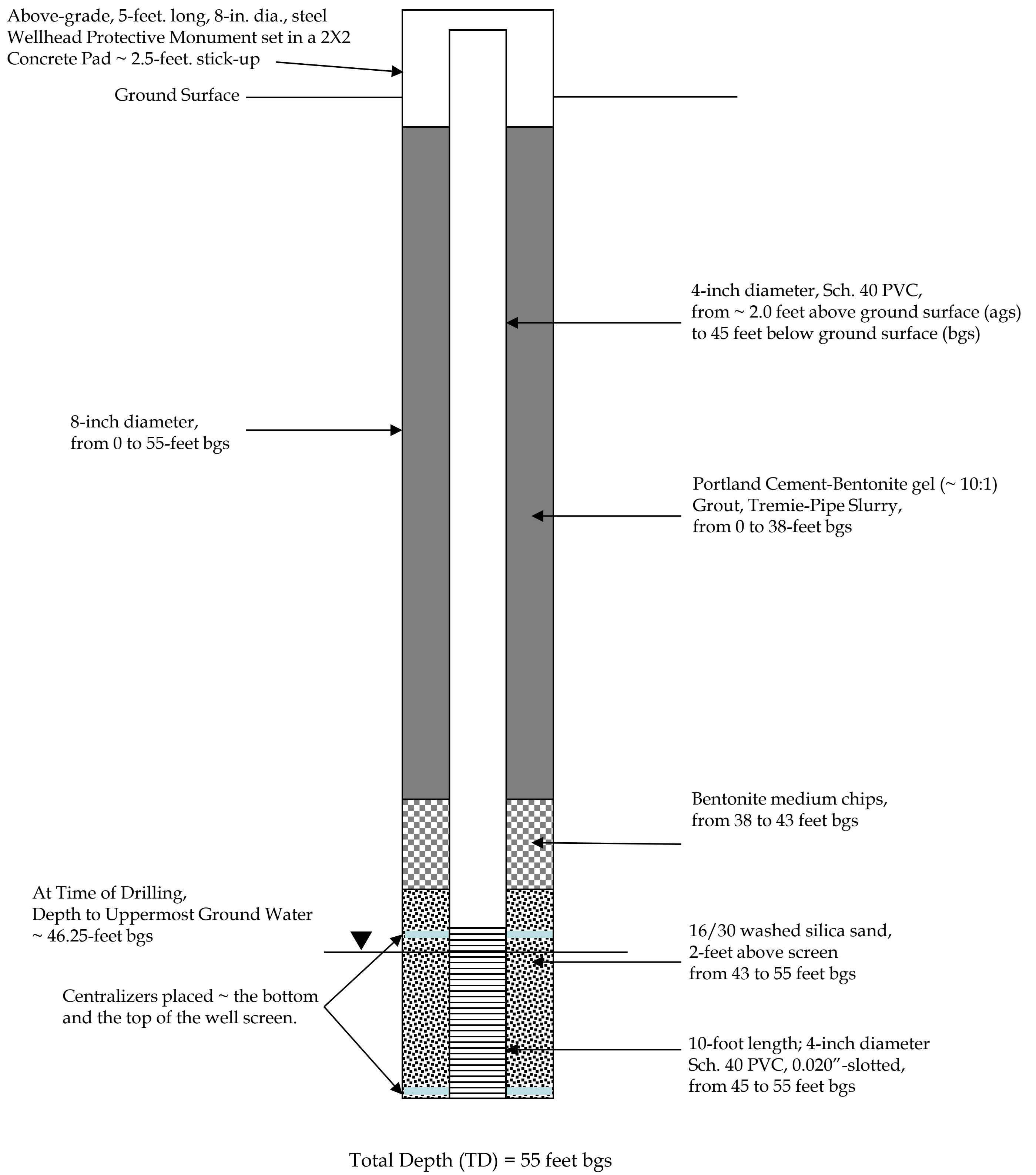
Boring Logs
ISPC
Delta, Utah

BA-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/24/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SC	Clayey SAND:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
5-6	8" Sonic	SP	SAND:
6-9.5	8" Sonic		SAND:
9.5-11	8" Sonic		SAND:
11-11.5	8" Sonic	SM	Silty SAND:
11.5-12	8" Sonic		Silty SAND:
12-13	8" Sonic	SP/SM	SAND with silt:
13-17	8" Sonic	SP	SAND:
17-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22.5	8" Sonic		SAND:
22.5-25	8" Sonic	SM	Silty SAND:
25-26	8" Sonic	SP	SAND:
26-27.5	8" Sonic	SP/SM	SAND with silt:
27.5-28.25	8" Sonic	SM	Silty SAND with clay:
28.25-29.25	8" Sonic	SP/SM	SAND with silt:
29.25-30	8" Sonic	CL	CLAY:
30-31.5	8" Sonic		Sandy CLAY:
31.5-33	8" Sonic	ML	Sandy SILT:
33-35	8" Sonic	SM	Silty SAND with clay:
35-36.25	8" Sonic	SP/SM	SAND with silt:
36.25-40	8" Sonic	CH	CLAY:
40-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic	SP/SM	SAND with silt:
47.5-50	8" Sonic	SM	Silty SAND with clay:
50-51	8" Sonic	SC	Clayey SAND:
51-51.75	8" Sonic	SW	SAND:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53	8" Sonic	CH	Sandy CLAY:
53-54	8" Sonic		Sandy CLAY:
54-55	8" Sonic		CLAY:

TD = 55'; PVC 4-inch screen from 45 to 55; PVC 4-inch riser from -2.5 to 45
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BA-U-1 Schematic

Date Drawn	7/24/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	

Boring Logs

ISPC

Delta, Utah

BA-U-2

Interval (feet)	Drilling Method	USCS	Sample Description
7/25/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	ML	Sandy SILT:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4	8" Sonic		SAND with silt:
4-5	8" Sonic	ML	SILT with sand and clay:
5-6	8" Sonic	SP/SM	SAND with silt:
6-7	8" Sonic	SP	SAND:
7-9	8" Sonic	SW	Gravelly SAND:
9-9.75	8" Sonic		Gravelly SAND:
9.75-10.25	8" Sonic	SP	Gravelly SAND:
10.25-11	8" Sonic	SP/SM	SAND with silt:
11-12.5	8" Sonic	CL	CLAY:
12.5-13	8" Sonic	SP	SAND:
13-15.5	8" Sonic		SAND:
15.5-18	8" Sonic		SAND:
18-22.5	8" Sonic		SAND:
22.5-23	8" Sonic		SAND:
23-23.5	8" Sonic	SM	Silty SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-30	8" Sonic	SM	Silty SAND:
30-32.5	8" Sonic	SC	Clayey SAND:
32.5-35	8" Sonic	SM	Silty SAND with clay:
35-37.5	8" Sonic		Silty SAND:
37.5-40	8" Sonic	CL	Sandy CLAY:
40-42	8" Sonic	SC	Clayey SAND:
42-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		Sandy CLAY:
47.5-51.75	8" Sonic		CLAY:
51.75-53	8" Sonic	SM	Silty SAND:
53-54	8" Sonic		Silty SAND:
54-55	8" Sonic	SC/SM	Clayey SAND with silt:
55-56.5	8" Sonic	CH	CLAY:
56.5-57.5	8" Sonic		CLAY:
57.5-60	8" Sonic	SC	Clayey SAND:
60-60.75	8" Sonic	SM	Silty SAND with clay:
60.75-61.5	8" Sonic	SC	Clayey SAND:
61.5-62.5	8" Sonic	SP	SAND:
62.5-63.5	8" Sonic		SAND:
63.5-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic		SAND:

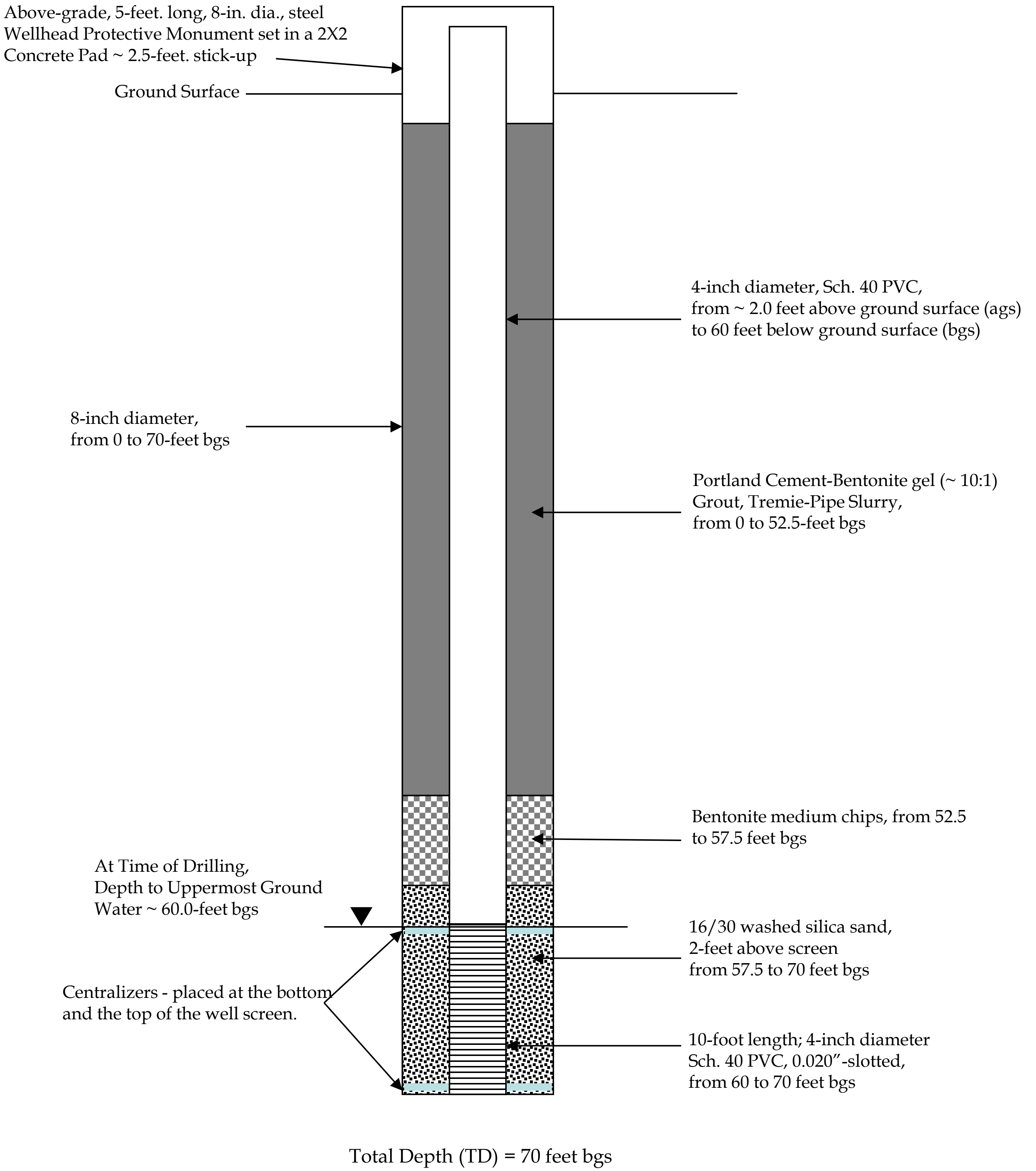
TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



Stantec

IPSC – BOTTOM ASH BASIN AREA
DELTA, UTAH

Well BA-U-2 Schematic

Date Drawn	7/25/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	

Boring Logs

IPSC

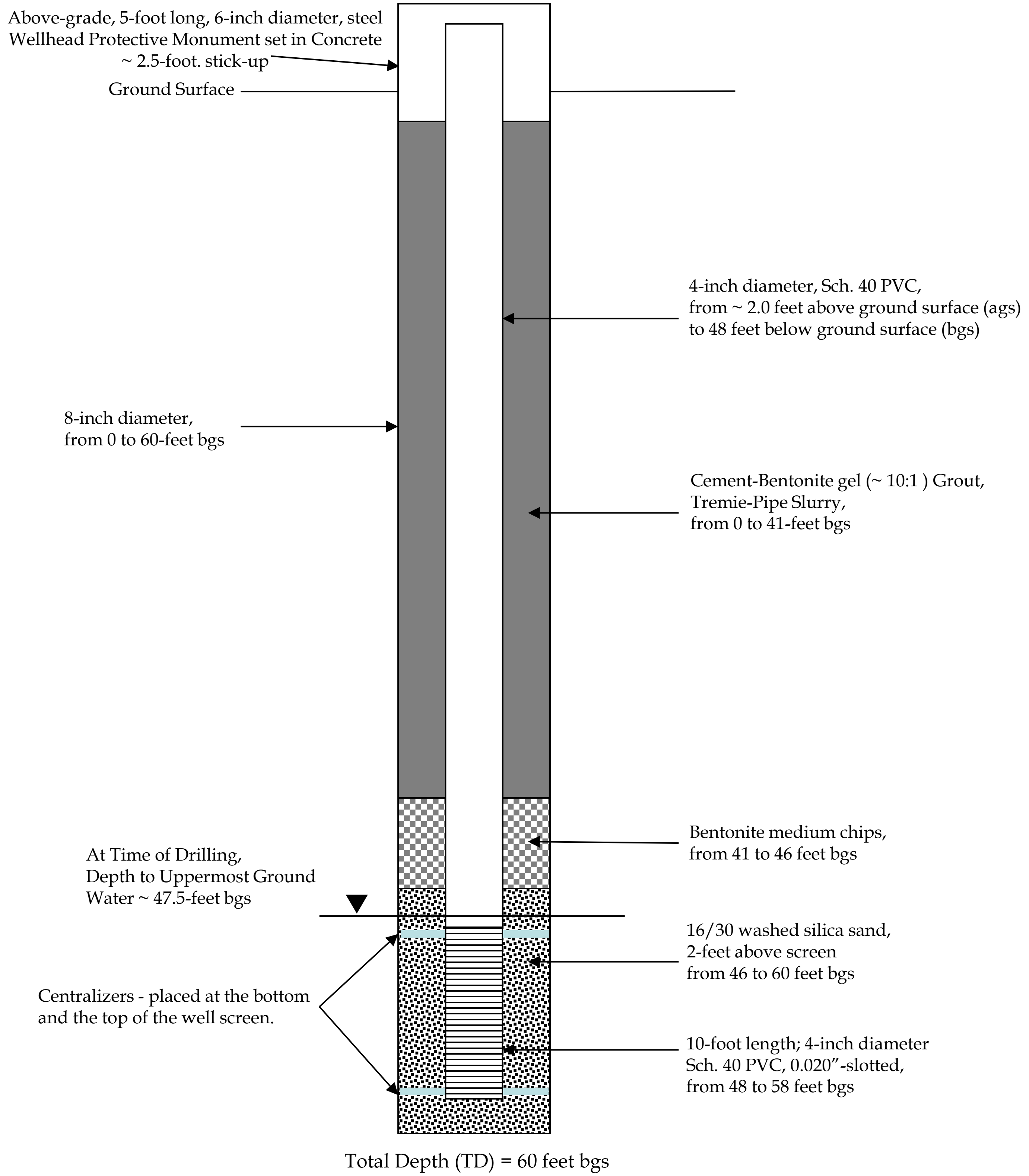
Delta, Utah

WWC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/26/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP	SAND:
2.5-5	8" Sonic		SAND:
5-6.75	8" Sonic	SM	Silty SAND:
6.75-7.5	8" Sonic	ML	Sandy SILT:
7.5-10	8" Sonic		Sandy SILT:
10-12	8" Sonic		Sandy SILT:
12-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	CL	Silty CLAY:
15-17.5	8" Sonic		Silty CLAY:
17.5-18.5	8" Sonic		Silty CLAY:
18.5-19	8" Sonic		Sandy CLAY:
19-20	8" Sonic		Silty CLAY:
20-22	8" Sonic	CH	CLAY:
22-24.5	8" Sonic		Sandy CLAY:
24.5-25.5	8" Sonic		Sandy CLAY:
25.5-27	8" Sonic		Sandy CLAY:
27-31	8" Sonic		CLAY:
31-31.5	8" Sonic		CLAY:
31.5-33	8" Sonic		CLAY:
33-34.5	8" Sonic		Sandy CLAY:
34.5-35	8" Sonic		Sandy CLAY:
35-37.5	8" Sonic	SM	Silty SAND:
37.5-40	8" Sonic		Silty SAND:
40-41.5	8" Sonic	SP	SAND:
41.5-42.5	8" Sonic		SAND:
42.5-44	8" Sonic		SAND:
44-45	8" Sonic		SAND:
45-46.5	8" Sonic	CH	CLAY:
46.5-47.5	8" Sonic		Sandy CLAY:
47.5-50.5	8" Sonic	SC/SM	SAND with silt and clay:
50.5-52.5	8" Sonic	SW	SAND:
52.5-53.5	8" Sonic		SAND:
53.5-55	8" Sonic	SM	Silty SAND:
55-57	8" Sonic		Silty SAND:
57-57.5	8" Sonic	CH	CLAY:
57.5-60			CLAY:

TD = 60'; PVC 4-inch screen from 48 to 58; PVC 4-inch riser from -2.5 to 48
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/26/15
			Last Revision Date

Boring Logs

IPSC

Delta, Utah

WWC-2

Interval (feet)	Driling Method	USCS	Sample Description
7/27/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SM	Silty SAND:
2.5-5	8" Sonic	SP	SAND:
5-7	8" Sonic		SAND:
7-9.5	8" Sonic	SW	Gravelly SAND:
9.5-10	8" Sonic	SW/SP	SAND:
10-12	8" Sonic	SP	SAND:
12-12.5	8" Sonic	SP/SW	Gravelly SAND:
12.5-14.5	8" Sonic	SW	Gravelly SAND:
14.5-15	8" Sonic	SP	SAND with gravel:
15-16	8" Sonic		SAND:
16-17.5	8" Sonic	CL	Sandy CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20	8" Sonic		Clayey SAND:
20-21	8" Sonic		Clayey SAND:
21-22	8" Sonic	CH	CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND with clay:
25-26.5	8" Sonic	SM/SC	Silty SAND and clay:
26.5-27.5	8" Sonic	SC	Clayey SAND with silt:
27.5-31.5	8" Sonic	CH	CLAY:
31.5-34	8" Sonic		Silty CLAY:
34-35.5	8" Sonic	SP	SAND:
35.5-37	8" Sonic	ML	Sandy SILT with clay:
37-38.5	8" Sonic	CL	Silty CLAY:
38.5-40	8" Sonic	SM	Silty SAND:
40-42	8" Sonic	CH	CLAY:
42-42.5	8" Sonic		Silty CLAY:
42.5-45	8" Sonic	SC	Clayey SAND:
45-46.25	8" Sonic	CH	CLAY:
46.25-46.75	8" Sonic	SW/SM	SAND with silt:
46.75-47	8" Sonic	ML	Sandy SILT:
47-47.5	8" Sonic	SM	Silty SAND:
47.5-50	8" Sonic	CH	CLAY:
50-51.5	8" Sonic	SM	Silty SAND:
51.5-52	8" Sonic	CH	Sandy CLAY:
52-52.5	8" Sonic	SM	CLAY:
52.5-53.5	8" Sonic	CH	Sandy CLAY:
53.5-55	8" Sonic	SM	Silty SAND:
55-56.25	8" Sonic	ML	Sandy SILT:
56.25-57.5	8" Sonic		SILT:
57.5-60	8" Sonic	SP/SM	SAND with silt:
60-61.5	8" Sonic	SM	Silty SAND:
61.5-62.5	8" Sonic	CH	CLAY:
62.5-63.75	8" Sonic	SP/SM	SAND with silt:
63.75-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND:
67.5-70	8" Sonic		Gravelly SAND:
70-70.5	8" Sonic	SC/SM	Silty SAND and clay:
70.5-72.5	8" Sonic	CH	CLAY:
72.5-75	8" Sonic		CLAY:

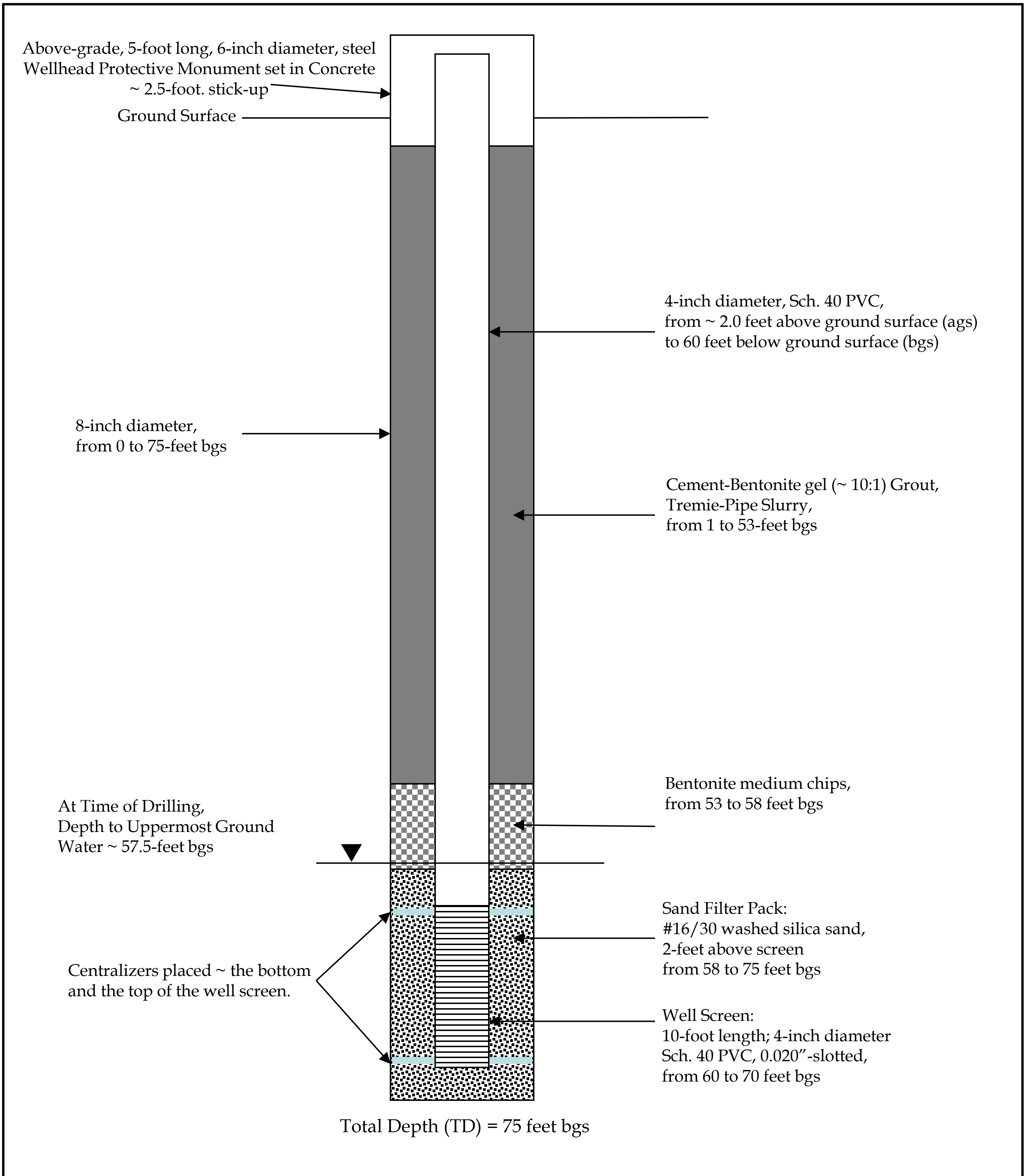
TD = 75'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-2 Schematic

Date Drawn	7/27/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	

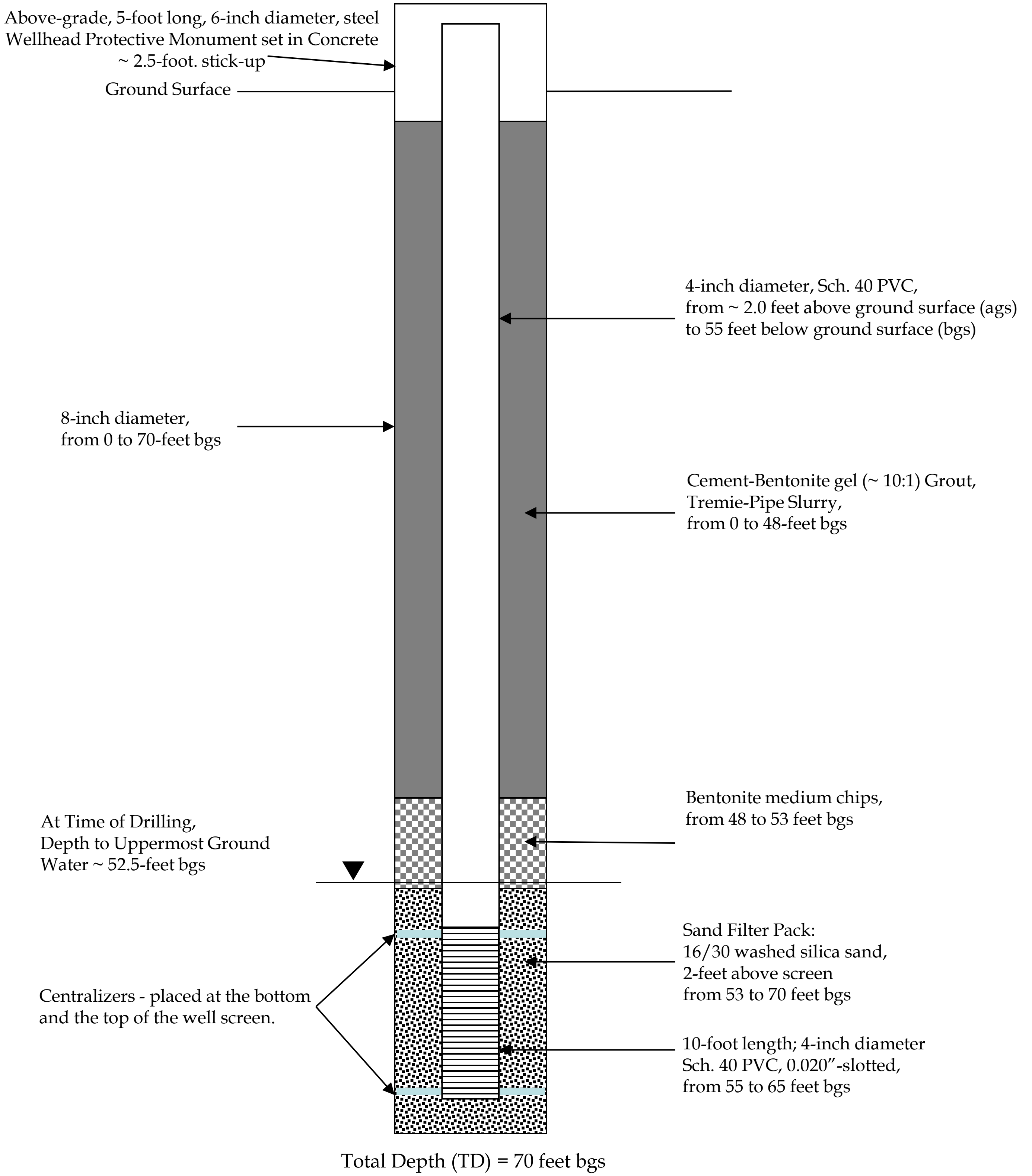
Boring Logs
ISPC
Delta, Utah

WWC-3

Interval (feet)	Drilling Method	USCS	Sample Description
7/30/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1	8" Sonic	SP	Gravelly SAND:
1-2.5	8" Sonic	SM	Silty SAND:
2.5-3.5	8" Sonic		Silty SAND:
3.5-5	8" Sonic	SP/SM	SAND with silt:
5-6.5	8" Sonic	ML	Sandy SILT:
6.5-7.5	8" Sonic	CL	Sandy CLAY:
7.5-8	8" Sonic	SM	Silty SAND:
8-10	8" Sonic	SC	Clayey SAND:
10-11	8" Sonic	SM	Silty SAND:
11-12.5	8" Sonic		Silty SAND with clay:
12.5-13.5	8" Sonic		Silty SAND:
13.5-14	8" Sonic	SC	Clayey SAND:
14-15	8" Sonic	SM	Silty SAND:
15-15.5	8" Sonic	CH	CLAY:
15.5-16	8" Sonic		CLAY:
16-16.5	8" Sonic		Sandy CLAY:
16.5-17.5	8" Sonic		Sandy CLAY:
17.5-20	8" Sonic		CLAY:
20-21	8" Sonic		CLAY:
21-22	8" Sonic		CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND:
25-26.25	8" Sonic	SP/SM	SAND with silt:
26.25-27	8" Sonic	SP	SAND:
27-29	8" Sonic	SM	Silty SAND:
29-30	8" Sonic	CH	CLAY:
30-31	8" Sonic		CLAY:
31-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-36	8" Sonic	CH	CLAY:
36-37	8" Sonic		CLAY:
37-39.5	8" Sonic	SP/SM	SAND with silt:
39.5-40.5	8" Sonic	SP	SAND:
40.5-41.5	8" Sonic		SAND:
41.5-43	8" Sonic	CH	CLAY:
43-44	8" Sonic	SP/SM	SAND with silt:
44-45	8" Sonic	SM	Silty SAND:
45-47.5	8" Sonic	SP	SAND:
47.5-50	8" Sonic	CH	CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic	SP	SAND:
55-61	8" Sonic		SAND:
61-62.5	8" Sonic	SW	SAND:
62.5-65	8" Sonic		SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-69.5	8" Sonic	SW	SAND:
69.5-70	8" Sonic	CH	CLAY:

TD = 70'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec	IPSC – WASTEWATER SURFACE IMPOUNDMENT DELTA, UTAH UTAH		
	Well WWC-3 Schematic		
			Date Drawn 7/30/15
Design by	Drawn by MS	Scale	Last Revision Date

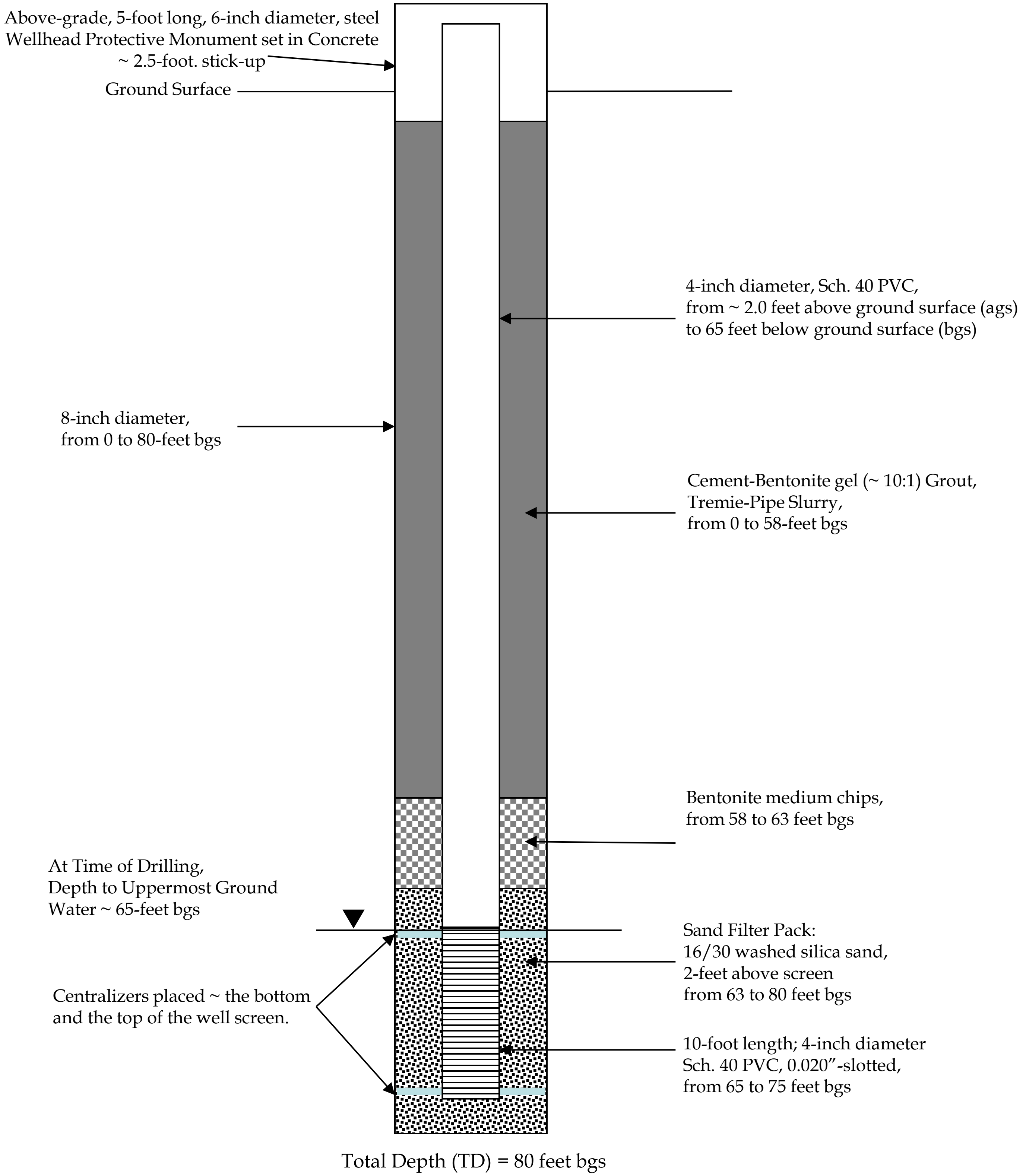
Boring Logs
ISPC
Delta, Utah

WWC-4

Interval (feet)	Drilling Method	USCS	Sample Description
7/29/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-5	8" Sonic		SAND with silt:
5-6.25	8" Sonic	ML	Sandy SILT:
6.25-7.25	8" Sonic	CL	CLAY:
7.25-8	8" Sonic	SC	Clayey SAND:
8-9	8" Sonic	SP/SC	SAND with clay:
9-10	8" Sonic	SP	SAND:
10-11	8" Sonic	ML	SILT:
11-12.5	8" Sonic	ML/CL	Clayey SILT:
12.5-14	8" Sonic	CL	CLAY:
14-15	8" Sonic		Sandy CLAY:
15-16	8" Sonic	SC	Clayey SAND:
16-18	8" Sonic		Clayey SAND:
18-19.5	8" Sonic	SM	Silty SAND:
19.5-20	8" Sonic	CH	CLAY:
20-21.25	8" Sonic		Sandy CLAY:
21.25-22.5	8" Sonic	SM	Silty SAND:
22.5-23.75	8" Sonic	CH	CLAY:
23.75-25	8" Sonic	SM	Silty SAND:
25-25.75	8" Sonic	SC	Clayey SAND:
25.75-27.5	8" Sonic	CL	Sandy CLAY:
27.5-29	8" Sonic	CH	CLAY:
29-30.5	8" Sonic		CLAY:
30.5-31.5	8" Sonic	SM	Silty SAND:
31.5-32.25	8" Sonic	CL	Sandy CLAY:
32.25-32.5	8" Sonic		Sandy CLAY:
32.5-33	8" Sonic	CH	CLAY:
33-36	8" Sonic	SP/SM	SAND with silt:
36-37	8" Sonic	SM	Silty SAND:
37-40	8" Sonic	SP	SAND:
40-42.5	8" Sonic		SAND:
42.5-45	8" Sonic		SAND:
45-46	8" Sonic	SP/SW	SAND:
46-46.5	8" Sonic	CH	CLAY:
45.5-47.5	8" Sonic		Sandy CLAY:
47.5-48.5	8" Sonic		CLAY:
48.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		CLAY:
50.5-52.5	8" Sonic	SM	Silty SAND:
52.5-54	8" Sonic	CH	CLAY:
54-55	8" Sonic	SP	SAND:
55-57	8" Sonic	CH	Sandy CLAY:
57-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic	SM	Silty SAND:
60-62	8" Sonic		Silty SAND:
62-62.5	8" Sonic	SC	Clayey SAND:
62.5-63	8" Sonic	CH	Sandy CLAY:
63-65	8" Sonic	SM	Silty SAND:
65-67.5	8" Sonic	SW	SAND:
67.5-69.5	8" Sonic	SP	SAND:
69.5-70	8" Sonic	SW	SAND:
70-72	8" Sonic		SAND:
72-72.5	8" Sonic	SP/SM	SAND with silt:
72.5-75	8" Sonic	SM	Silty SAND:
75-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-4 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/29/15
			Last Revision Date

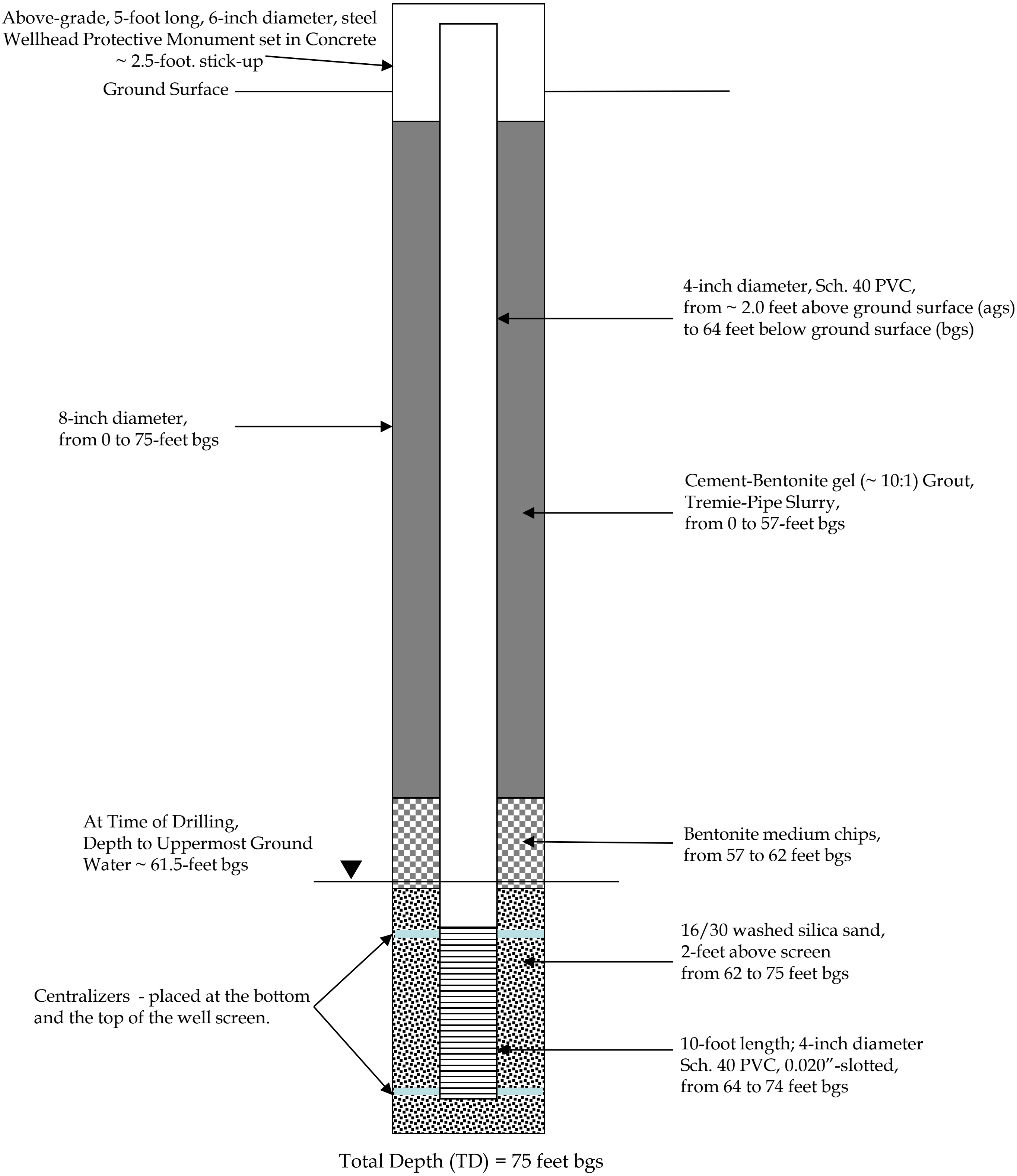
Boring Logs
ISPC
Delta, Utah

WWC-5

Interval (feet)	Drilling Method	USCS	Sample Description
7/28/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4.25	8" Sonic	SM	Silty SAND:
4.25-5	8" Sonic	SP	SAND:
5-7.5	8" Sonic	ML	Clayey SILT:
7.5-9	8" Sonic	CL	Silty CLAY:
9-10	8" Sonic		Sandy CLAY:
10-10.5	8" Sonic	SC	Clayey SAND:
10.5-11.25	8" Sonic	CL	CLAY:
11.25-12.5	8" Sonic	ML	Clayey SILT:
12.5-13.25	8" Sonic	SM	Silty SAND:
13.25-13.75	8" Sonic	SC	Clayey SAND:
13.75-15	8" Sonic	CL	CLAY:
15-16	8" Sonic		CLAY:
16-17.5	8" Sonic	CH	CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20.5	8" Sonic	CH	CLAY:
20.5-21.25	8" Sonic		Sandy CLAY:
21.25-22	8" Sonic		CLAY:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-24	8" Sonic	SM	Silty SAND:
24-25	8" Sonic	CH	CLAY:
25-26	8" Sonic	SM/CH	Silty SAND / CLAY:
26-27.5	8" Sonic	CH	CLAY:
27.5-28	8" Sonic		Sandy CLAY:
28-28.25	8" Sonic	SM	Silty SAND:
28.25-30	8" Sonic	CH	CLAY:
30-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-37.5	8" Sonic		SAND:
37.5-40	8" Sonic	SP/SM	SAND with silt:
40-42.5	8" Sonic	CH	CLAY:
42.5-42.75	8" Sonic	SM	Silty SAND:
42.75-44	8" Sonic	CH	Sandy CLAY:
44-44.5	8" Sonic	SM	Silty SAND:
44.5-45	8" Sonic		Silty SAND:
45-45.5	8" Sonic		Silty SAND:
45.5-46.75	8" Sonic		Silty SAND:
46.75-47.5	8" Sonic	CH	CLAY:
47.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		Sandy CLAY:
50.5-51.5	8" Sonic		CLAY:
51.5-52	8" Sonic	SM	Silty SAND:
52-53.25	8" Sonic	CH	CLAY:
53.25-53.5	8" Sonic		CLAY:
53.5-54	8" Sonic	SC	Clayey SAND:
54-55	8" Sonic	SM/SC	Silty SAND and clay:
55-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic		SAND:
60-60.75	8" Sonic		SAND:
60.75-61.5	8" Sonic	CH	CLAY:
61.5-62.5	8" Sonic	SP/SM	SAND with silt:
62.5-64	8" Sonic		SAND with silt:
64-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND with gravel:
67.5-70	8" Sonic		Gravelly SAND:
70-72.5	8" Sonic		SAND:
72.5-75	8" Sonic		SAND:

TD = 75'; PVC 4-inch screen from 64 to 74; PVC 4-inch riser from -2.5 to 64
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-5 Schematic

			Date Drawn 7/28/15
Design by	Drawn by MS	Scale	Last Revision Date

Boring Logs

ISPC

Delta, Utah

WWC-6

Interval (feet)	Drilling Method	USCS	Sample Description
03/23/2018 - 03/24/2018			
0-0.5	8" Sonic	SM	Silty sand
0.7-7	8" Sonic	SP	Sand, poorly graded, dry
7-12.5	8" Sonic	CH	Silty clay
12.5-15.5	8" Sonic	SM	Sand, some silt
15.5-19.5	8" Sonic	SP	Sand, poorly graded
19.5-21.5	8" Sonic	SW/GW	Sand and gravel
21.5-27	8" Sonic	SP	Sand, poorly graded, running sands @ ~26
27-29.5	8" Sonic	SP	Sand, poorly graded, running sands
29.5-30	8" Sonic	SW	Sand with gravel
30.37	8" Sonic	CH	Clay, stiff
37-41	8" Sonic	CH	Clay, trace silt, moist, stiff
41-47	8" Sonic	CH	Clay, stiff, moist
47-48	8" Sonic	SP	Sand
48-57	8" Sonic	SW	Sand, silt and gravel
57-59	8" Sonic	SP	Sand
59-60.5	8" Sonic	CH	Clay wet
60.5-64.5	8" Sonic	MH	Silt, trace clay
64.5-67	8" Sonic	CH	Clay wet
67-72	8" Sonic	CH	Clay wet
72-77	8" Sonic	SP	Sand, saturated
77-87	8" Sonic	CH	Clay

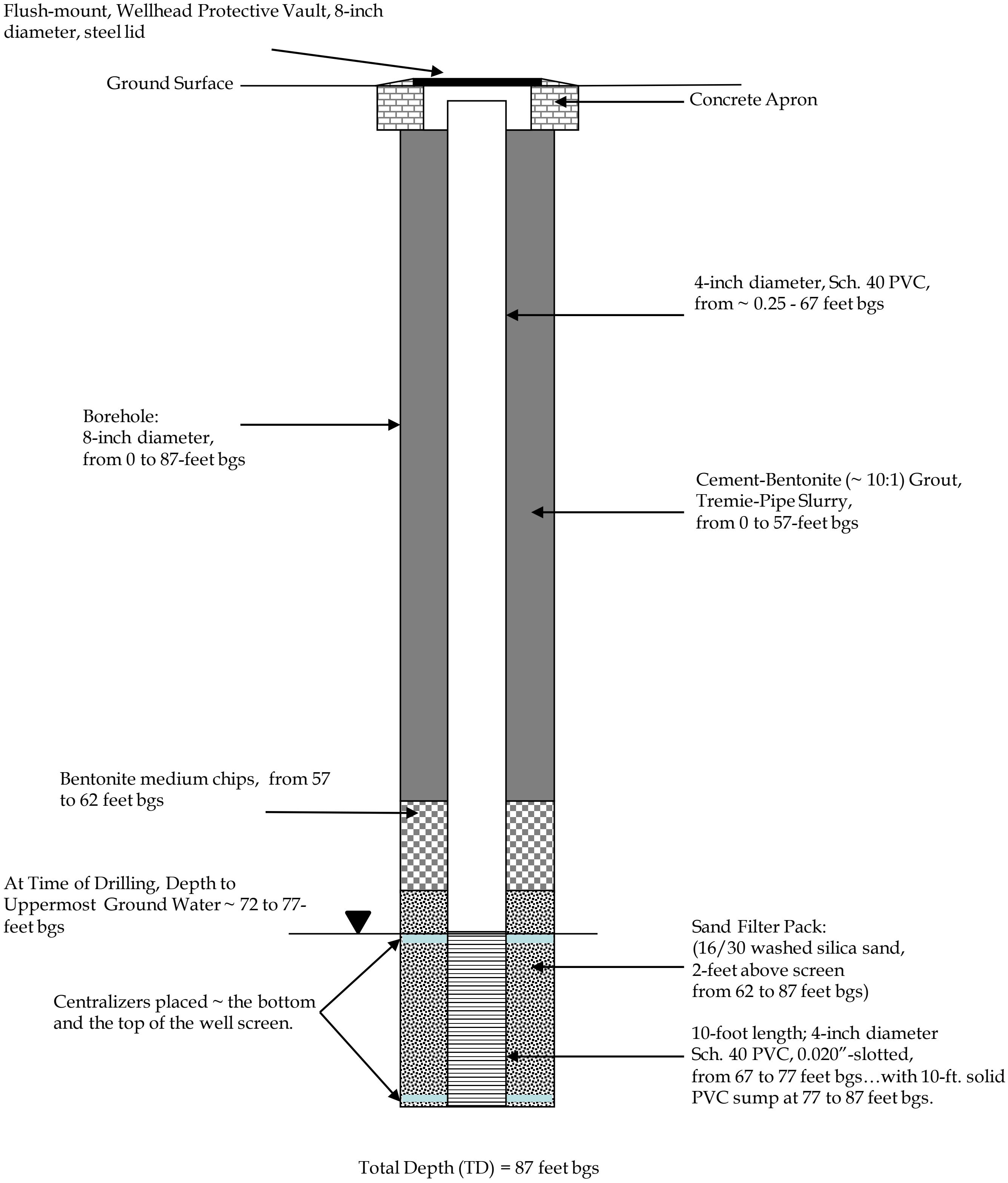
TD = 87'; PVC sump 87-77; 4" screen 77-67; sand 87-62 centralizers 67.5 and 76.5

Drilling Method: Sonic

Drilling Company - Cascade Drilling

Driller - David Donnely

Geologist - Tom Fendler



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
Delta, Utah

Well WWC-6 Schematic

Design by	Drawn by JR	Scale	Date Drawn 10/24/18
			Last Revision Date

Boring Logs

ISPC

Delta, Utah

WWC-7

Interval (feet)	Drilling Method	USCS	Sample Description
03/20/2018 - 03/23/2018			
0-1.5	8" Sonic	SM	Silty sand, dry
1.5-8.5	8" Sonic	SP	Sand, poorly graded, saturated at 7.5
8.5-9	8" Sonic	CH	Sandy clay
9-14	8" Sonic	SC	Clay with trace sand
14-24	8" Sonic	SP	Sand, poorly graded, saturated with heaving sands at 17 '
24-25	8" Sonic	SW/GW	Gravel/sand and gravel
25-27	8" Sonic	CH	Clay, moist
27-34.5	8" Sonic	SP	Sandy, wet
34.5-35.5	8" Sonic	SW/GW	Sand, some gravel
35.5-37	8" Sonic	CH	Clay, moist, stiff
37-47	8" Sonic	CH	Clay, moist, stiff
47-49.5	8" Sonic	CH	Clay, moist, stiff
49.5-50.5	8" Sonic	SP	Sand, poorly softed, moist
50.5-57	8" Sonic	CH	Clay, moist, stiff
57-67	8" Sonic	CH	Clay, moist, stiff
67-72	8" Sonic	CH	Clay, moist, stiff
72-77	8" Sonic	SP	Sand, poorly graded, saturated @76.5
77-87	8" Sonic	SP	Sand, poorly graded, saturated

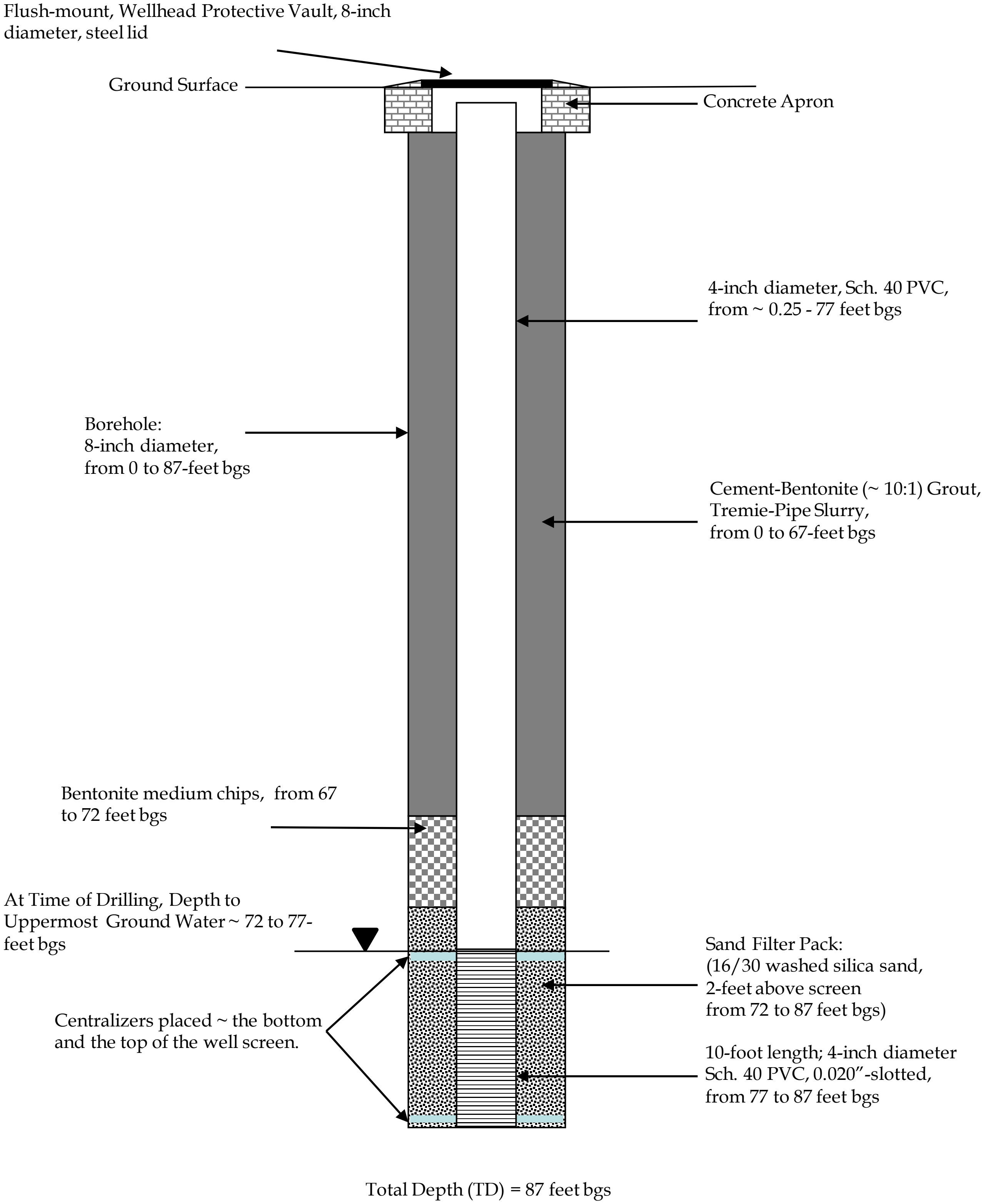
TD = 87'; PVC 4-inch screen from 77 to 87; sand pack 72-87; bentonite pellets 67-72; grout 67-grade

Drilling Method: Sonic

Drilling Company - Cascade Drilling

Driller - David Donnely

Geologist - Tom Fendler



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-7 Schematic

Date Drawn	10/24/18
Last Revision Date	

Design by	Drawn by JR	Scale

Stantec

Project Name: Intermountain Power Service Corporation
Boring Monitor Well: WWC-8

Project No.: 203709098
Completion Date: 2019-04-25

Drilling Firm: Cascade
Boring Method: Sonic
Boring Diameter: 10 inches

Driller: Ryan Miller
Logged by: Rich Pratt
Depth to Water at Drilling: 77 feet
Depth to Water at Drilling (static at 24 hours): 27 feet

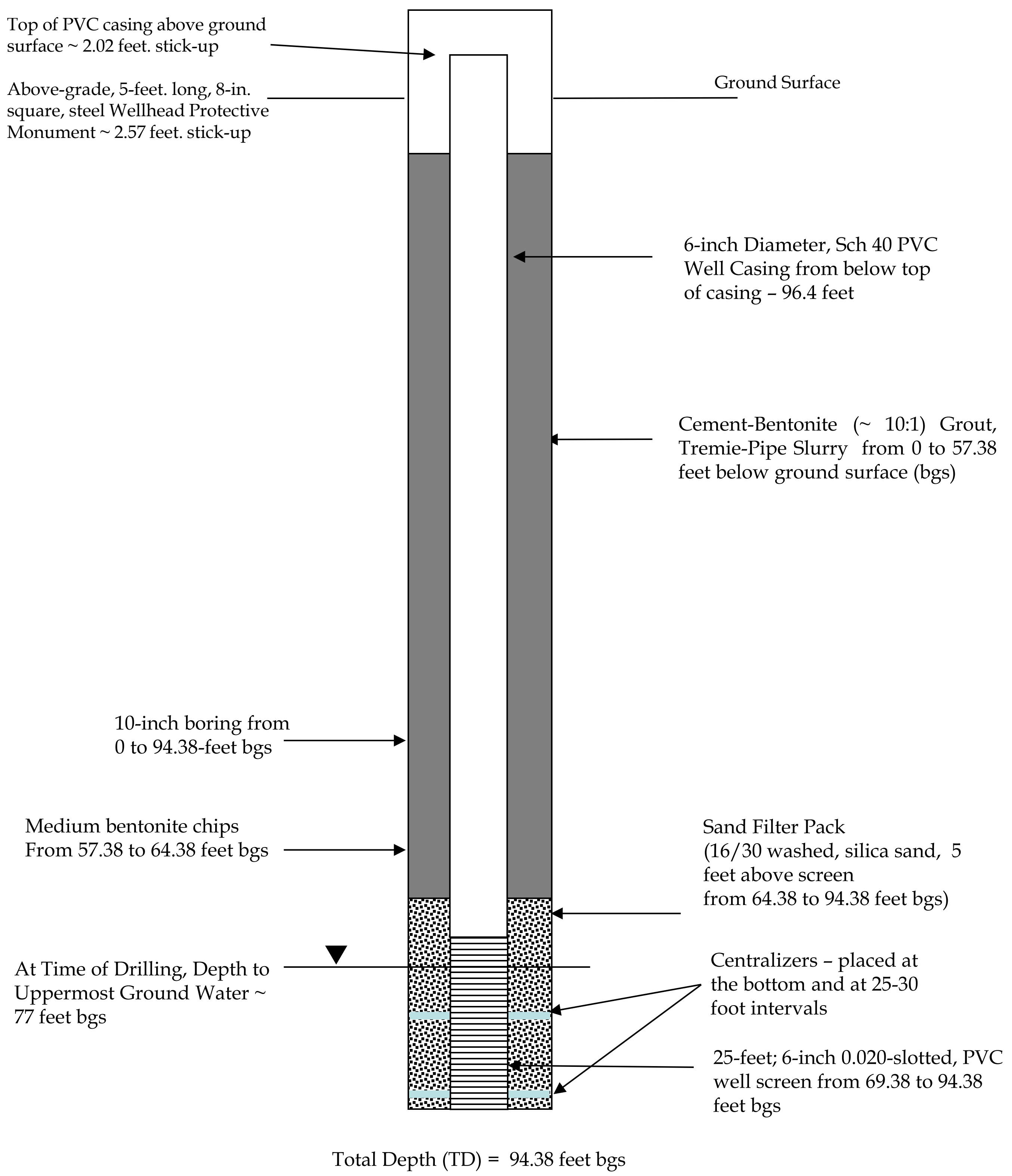
WWC-8

Interval (feet)	Description
0 - 3	Light brown sand, moist
3 - 7	Light brown sand with silt, dry
7 - 9	Medium brown clay with sand, moist
9 - 13	Medium brown clay, moist
13 - 15	Light brown clay, moist
15 - 17	Light brown clay, dry
17 - 26	Light brown clay, moist
26 - 35	Light brown clay with sand, moist
35 - 37	Light brown clay, moist
37 - 41	Medium brown medium grained sand, moist
41 - 43	Medium brown medium grained sand, moist
43 - 55	Medium brown medium grained sand, moist
55 - 59	Light brown clay, moist
59 - 63	Light brown clay with sand, moist
63 - 66	Light brown clay, moist
66 - 67	Light brown clay with sand, moist
67 - 68	Light brown sand, moist
68 - 77	Light brown clay with sand, moist
77 - 88	Medium brown sand, saturated
88 - 93	Light brown clay
93 - 94	Light brown clay with sand
94 - 96	Light brown clay
96 - 97	Medium brown sand

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up
Casing, solid (6-inch PVC): 0-69.38 feet
Screen (6 inch, 0.02 slotted, PVC): 69.38-94.38 feet
Sand Pack: 16/30 sand, 64.38-94.38 feet
Bentonite Seal: Hydrolyzed bentonite pellet seal 57.38-64.38 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA
Top of Manhole Cover (Relative Datum Survey): NA



Stantec	IPSC – WASTEWATER SURFACE IMPOUNDMENT DELTA, UTAH		
	WWC-8 Schematic		
			Date Drawn 6-4-19
	Design by	Drawn by RP	Scale	Last Revision Date

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: WWC-9

Project No.: 203709098

Completion Date: 2019-04-28

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 67 feet

Depth to Water at Drilling (static at 24 hours): 23.75 feet

WWC-9

Interval (feet)	Description
0 - 0.5	Medium brown silt, dry
0.5 - 1	Medium brown clay, dry
1 - 4	Light brown fine-grained sand, dry
4 - 8	Light brown clay, dry
8 - 13	Light brown fine-grained sand, dry
13 - 15	Light brown clay, dry
15 - 16	Light brown clay with sand, dry
16 - 17	Light brown clay, dry
17 - 18	Light brown clay with sand, moist
18 – 21.5	Light brown clay, moist
21.5 - 22	Light brown clay with sand, moist
22 - 23	Light brown clay, moist
23 - 26	Light brown clay with sand, moist
26 - 27	Light brown clay, moist
27 - 30	Light brown clay, moist
30 - 31	Light brown clay, saturated
31 - 32	Light brown clay with sand, moist
32 - 36	Light brown clay, moist
36 - 37	Light brown clay with sand, moist
37 - 38	Light brown clay with sand, moist
38 - 51	Medium brown medium grained sand, moist
51 - 54	Light brown clay, moist
54 - 58	Medium brown medium grained sand, moist
58 - 59	Medium brown medium grained sand, moist
59 - 62	Medium brown medium grained sand, moist
62 - 63	Light brown clay, moist to moist
63 - 66	Light brown clay with sand, moist
66 - 67	Light brown clay, moist
67 - 69	Light brown clay with sand, saturated

Interval (feet)	Description
69 – 69.5	Medium brown sand
69.5 - 70	Light brown clay with sand
70 - 71	Light brown clay
71 - 74	Light brown clay with sand
74 - 75	Medium brown sand
75 - 77	Light brown clay
77 - 83	Medium brown sand
83 - 85	Light brown clay
85 - 87	Light brown clay with sand

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-61.7 feet

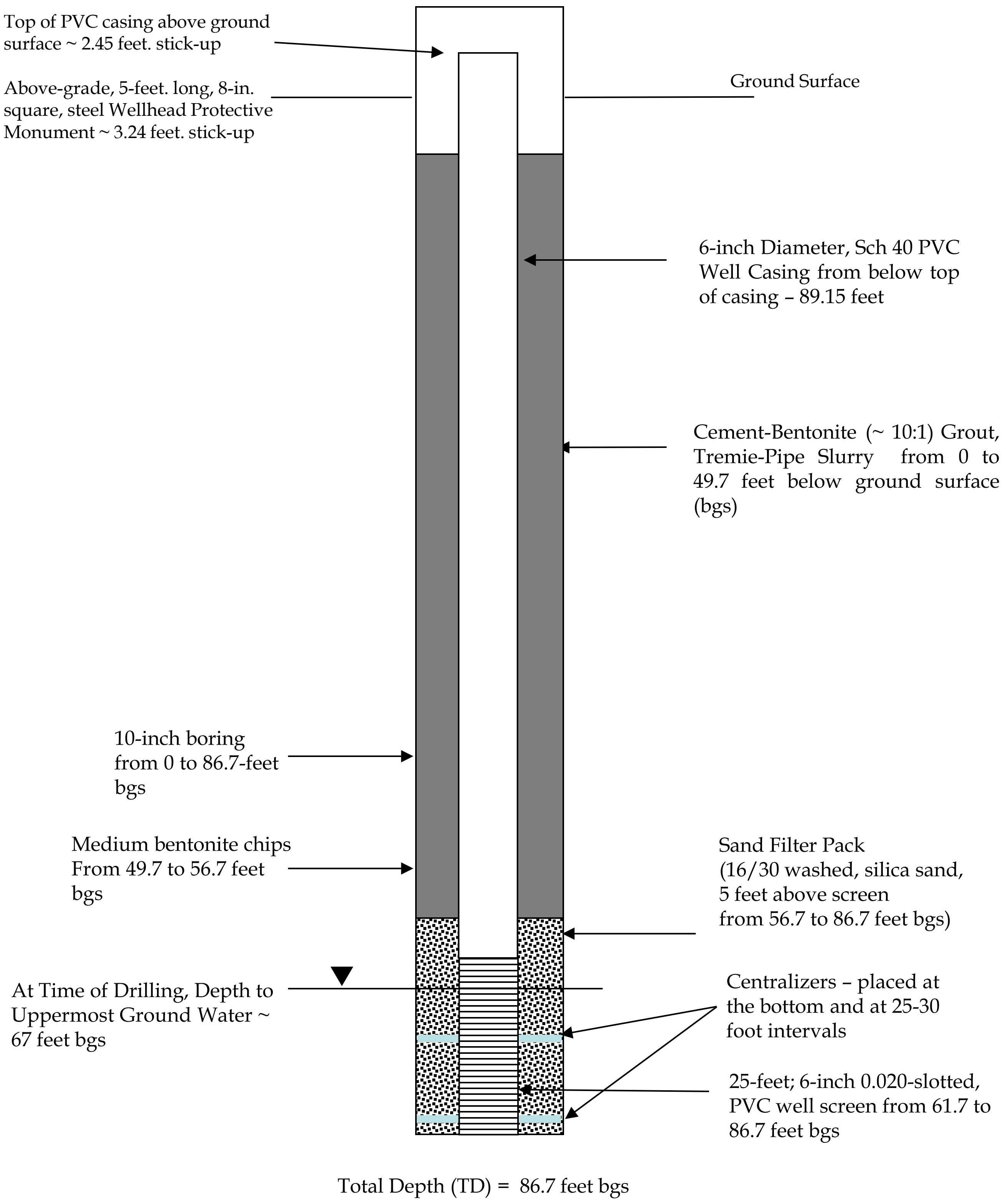
Screen (6 inch, 0.02 slotted, PVC): 61.7-86.7 feet

Sand Pack: 16/30 sand, 56.7-86.7 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 49.7-56.7 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
Delta, Utah

WWC-9 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

Stantec

Project Name: Intermountain Power Service Corporation
Boring Monitor Well: WWC-10

Project No.: 203709098
Completion Date: 2019-04-26

Drilling Firm: Cascade
Boring Method: Sonic
Boring Diameter: 10 inches

Driller: Ryan Miller
Logged by: Rich Pratt
Depth to Water at Drilling: 67 feet
Depth to Water at Drilling (static at 24 hours): 17.65 feet

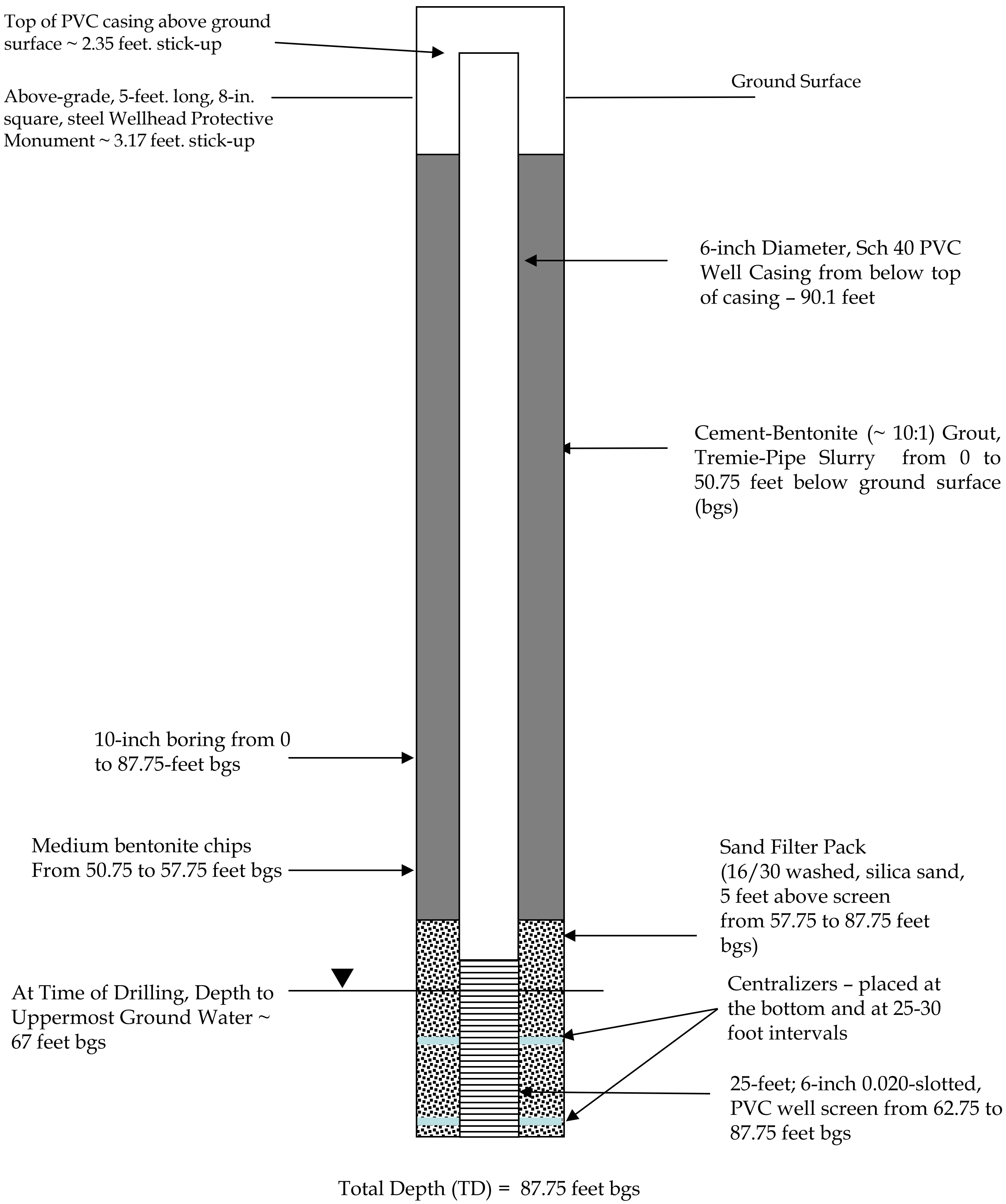
WWC-10

Interval (feet)	Description
0 - 5	Light brown sand, moist
5 – 9.5	Light brown clay with sand, moist
9.5 - 13	Dark gray clay, moist
13 - 14	Dark brown silt with organic plant matter, moist
14 - 15	Dark gray clay, moist
15 - 17	Gray medium grained sand, moist
17 - 34	Gray medium grained sand, moist
34 - 45	Brown medium grained sand, moist
45 - 47	Medium brown clay, moist
47 - 49	Medium brown clay with sand, moist
49 - 50	Medium brown medium grained sand, moist
50 - 51	Medium brown clay with sand, moist
51 - 52	Medium brown medium grained sand, moist
52 - 53	Medium brown clay with sand, moist
53 - 54	Medium brown medium grained sand, moist
54 - 60	Medium brown clay, moist
60 - 61	Medium brown clay with sand, moist
61 - 67	Medium brown clay, moist
67 - 68	Medium brown clay, saturated
68 - 69	Medium brown clay with sand
69 - 70	Medium brown clay
70 - 76	Medium brown clay with sand
76 - 87	Medium brown clay

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up
Casing, solid (6-inch PVC): 0-62.75 feet
Screen (6 inch, 0.02 slotted, PVC): 62.75-87.75 feet
Sand Pack: 16/30 sand, 57.75-87.75 feet
Bentonite Seal: Hydrolyzed bentonite pellet seal 50.75-57.75 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA
Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

WWC-10 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

INTERMOUNTAIN POWER SERVICE CORP.

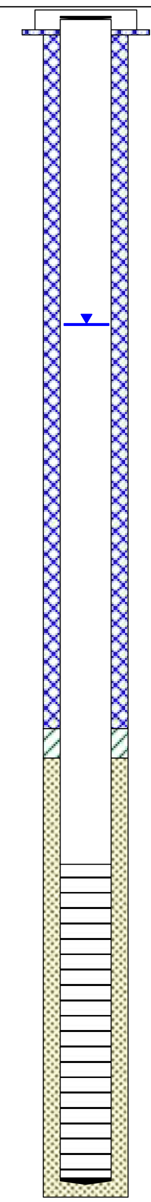
Stantec

MONITORNG WELL ID:	**WWC-11**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 22.82
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/15/2019	DATE FINISHED: 11/16/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), fine sand 95%, loose, soft, dry, very pale brown (10 YR 7/4), trace gravel 5%.
~7	Clay (CL), medium plasticity, cohesive, moist, soft to medium density, light gray (10 YR 7/1), mottled with some trace interfingered clay, brownish yellow (10 YR 6/8).
	Well Graded Sand with Clay (SW-SC), medium grained sand 85%, gravel 10%, clay 5%, moist, loose, pale brown (10 YR 6/3).
	Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, dry to moist, brown (10 YR 5/3).
	Same as above, Clay (CL), no sand.
	Poorly Graded Sand (SP), fine sand 98%, loose soft, dry, pale brown (10 YR 6/3), 2% gravel, subrounded.
~36	Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, moist, brown (10 YR 5/3), gravel are subangular to subrounded, assorted gravel matrix.
~44	Clay (CL), medium plasticity, medium density, moist to wet, cohesive, pale brown (10 YR 6/3).
	Well Graded Sand with gravel (SW), fine to coarse sand 90%, gravel 10%, loose, soft, brown (10 YR 5/3).
~53	Same as above, becoming wet.
	Clay (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
	Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, moist, pale brown (10 YR 6/3).
	Same as above, fine grained sand, saturated, low plasticity, non cohesive.
~66	Same as above, with trace interfingering clay, reddish yellow (5 YR 6/6).
~72	Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, wet, brown (10 YR 5/3), gravel are subrounded, assorted matrix.
~89	Clay with Sand (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
91	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 54.4 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 54.4 to 56.7 ft bgs.
Filter pack sand 56.7 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**WWC-12**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

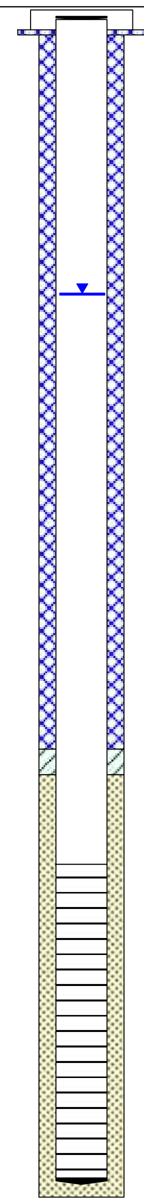
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 20.46
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/11/2019	DATE FINISHED: 11/12/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), 90% sand, 10% silts, light gray (7.5 YR 7/1), soft, loose, fine grained, dry, sand are mostly quartz, subangular quartz grains.
	Same as above, becoming light yellowish brown (10 YR 6/4).
	Same as above, becoming wet at 8.5 ft bgs., perched groundwater.
	Clay (CL), medium plasticity, medium stiff, cohesive, very pale brown (10 YR 7/4).
	Poorly Graded Sand with Silt (SP-SM), 95% fine grained sand, 5% silts, loose, soft, moist, brown (10 YR 4/3), trace gravel.
	Well Graded Sand with Gravel (SW), 80% sand, 20% gravel, fine to coarse sand, moist, loose soft, dark yellowish brown (10YR 4/4), gravel are subrounded to rounded, small.
25	Clay (CL), medium plasticity, medium density, moist, cohesive, light yellowish brown (10 YR 6/4), thickly bedded, sharp contact at 25 ft bgs.
	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10YR 5/3).
40	Well Graded Sand with Gravel (SW), fine to coarse grained sand 90%, small gravel 10%, loose, soft, moist, dark yellowish brown (10 YR 4/4).
	Same as above, increase in gravel to 30%.
	Same as above, decrease in gravel to 10%.
	Poorly Graded Sand (SP), fined grained sand 100%, loose, moist, brown (10YR 4/3). Sharp contact.
55	Clay (CL), high plasticity, stiff, moist, cohesive, light yellowish brown (10 YR 6/4), sharp contact.
	Lost core sample from sonic casing.
	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
70	Well Graded Sand with Silt and Clay (SW-SM), fine or medium grained sand 100%, soft, loose, brown (10 YR 4/3).
	Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).
80	Poorly Graded Sand with Silts and Clay (SP-SC), fine grained sand 95%s, soft, loose, wet, light yellowish brown (10 YR 6/4), trace clay.
	Clay with Sand (CL), medium plasticity, soft to medium density, wet, pale brown (10YR 6/3), sand are fine grained.
	Same as above with gradational transition to clay.
	Clay (CH), high plasticity, mottled, wet, cohesive, pale brown (10 YR 6/3), mottled color is reddish yellow (7.5 YR 7/6).
	End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 55 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 55 to 58 ft bgs.
Filter Pack Sand 58 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

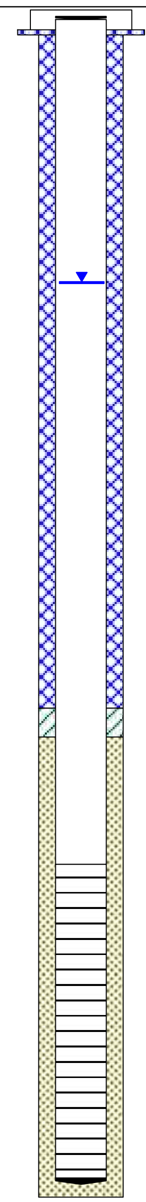
Stantec

MONITORNG WELL ID:	**WWC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.):	91	GROUNDWATER LEVEL (ft. btoc.):	19.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED:	11/13/2019	DATE FINISHED:	11/15/2019
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly Graded Sand with Silts (SP-SM), fine sand 95%, 5% silts, soft, loose, dry, light gray (7.5 YR 7/1).
5		Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, dry, pinkish gray (7.5 YR 7/2), trace gravel, small gravel, assorted matrix, subrounded.
		Same as above, with clay, increase gravel 10%, wet.
10		Clay with Sand (CL), low to medium plasticity, moist, cohesive, very pale brown (10 YR 7/4).
		Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, , moist, pale brown (10 YR 6/3), trace gravel 5%, subrounded.
15		
20		
		Same as above, with clay (SW-SC) at 10%, wet, soft, low plasticity clay.
25		Clay with Sand (CL), medium plasticity, moist cohesive, thick bedded, fine sand, sharp contact at 23 ft, bgs,
		Same as above, Clay (CL), trace black staining.
30		Clay with Sand (CL), medium plasticity, moist cohesive, fine sand.
		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
35		
40		
		Well Graded Sand with gravel (SW), fine to coarse sand 85%, 15% gravel, loose, soft, moist, brown (10 YR 5/3), gravel are small, subrounded, assorted matrix.
45		Poorly Graded Sand (SP), fine to medium grained sand 98%, loose, soft, moist, brown (10 YR 5/3), trace small gravel 2%, subrounded.
50		Same as above, trace clay.
		Clay with Sand (CL), low to medium plasticity, soft to medium density, moist, yellowish brown (10 YR 5/4), secondary sand are fine grained.
55		
60		Clay (CL), medium to high plasticity, medium to stiff density, moist, thickly bedded, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
65		
		Clay with Sand (CL) , medium plasticity, moist to wet, cohesive, brown (10 YR 5/3).
70		Clay (CL), medium plasticity, medium to stiff density, moist, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
75		
		Poorly Graded Sand with Clay (SP-SC), fine grained sand 95%, loose, soft, wet, brown (10 YR 5/3), some trace interfingering clay 5%, reddish yellow (5 YR 5/3).
80		Clay with Sand (CL), low plasticity, soft, wet, non cohesive, pale brown (10 YR 6/3).
85		Clay (CL), medium to high plasticity, wet, cohesive, pale brown (10 YR 6/3), interfingering clay reddish yellow (5 YR 6/6), trace sand.
90		Same as above, becoming medium plasticity.
		End of borehole to 91 ft bgs., per scope of work.
95		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID:	**WWC-14**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 88 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 88 ft bgs.,	DATE STARTED: 5/6/2020	DATE FINISHED: 5/7/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM
0		Poorly graded Sand with Silt (SP), light brown, dry	Above ground monument with well cap
		Well Graded Sand with Clay (SW-SC), light and dark brown, dry	
5		Poorly graded Sand with Silt (SP), light brown, dry	
10		Well Graded Sand with Clay (SW-SC), light and dark brown, dry	Grout 0 to 51 ft bgs.
15		Well Graded Sand with Gravel (SW), moist, dark brown	Borehole diameter 10 inches from 0 to 88 ft bgs.
		Well Graded Sand with Gravel (SW), moist, light brown	
20			
25		Well Graded Sand with Gravel (SW), moist, dark brown	
		Clay (CL), light brown, moist	
30		Well Graded Sand with Clay (SW-SC), light brown, moist	0 to 60 ft bgs., 6 in dia., Sch. 80 PVC riser
		Well Graded Sand with Gravel (SW), moist, dark brown	
35			
40			
45			
50			
55		Well Graded Sand with Clay (SW-SC), light brown, moist	Bentonite 51 to 58 ft bgs.
60			Filter pack sand 58 to 88 ft bgs.
		Clay (CL), light brown, moist	
65			
70		Well Graded Sand with Clay (SW-SC), light brown, moist	
		Well Graded Sand with Gravel (SW), moist, dark brown	60 to 85 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
75		Clay (CL), light brown, moist	
		Well Graded Sand with Gravel (SW), moist, dark brown	
80		Well Graded Sand with Clay (SW-SC), light brown, moist	
85		Clay (CL), light brown, moist	End Cap
90		End of borehole to 88 ft bgs., per scope of work.	
95			

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**WWC-15**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

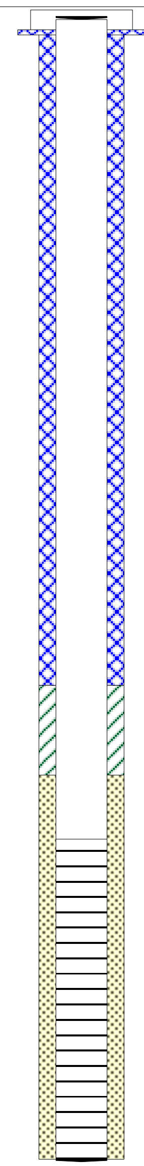
DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 88 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 88 ft bgs.,	DATE STARTED: 5/6/2020	DATE FINISHED: 5/7/2020
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well graded sand with silt (SW-SM), fine to medium grained sands, loose, soft, dry, unconsolidated, light yellowish brown (10 YR 6/4).
6	Poorly graded sand (SP), fine to medium grained, dry, soft, loose, light brownish gray (10 YR 6/2).
15	Poorly Graded Sand with Clay (SP-SC), fine grained, moist, clays are soft, dark yellowish brown (10 YR 5/4).
17	Well Graded Sand (SW), fine to coarse sand, loose, soft, unconsolidated, dark yellowish brown (10 YR 4/4), trace gravels.
25	Poorly graded sand (SP), fine to medium grained, dry, soft, loose, brown (10 YR 4/3).
29	Clay (CL), stiff, medium to high plasticity, moist, cohesive, light yellowish brown (10 YR 6/4).
35	Poorly Graded Sand with Clay (SP-SC), fine to medium grained, moist to wet, soft, noncohesive, pale brown (10 YR 6/3).
38	Clay (CL), stiff, medium to high plasticity, moist, cohesive, light yellowish brown (10 YR 6/4).
45	Poorly Graded Sand (SP), fine or medium grained, loose, soft, moist, brown (10 YR 5/3), trace gravels.
51	Well Graded Sand (SW), fine to coarse sand, loose, soft, unconsolidated, moist, brown (10 YR 5/3).
52	Clays (CL), stiff, medium to high plasticity, moist.
54	Well Graded Sand (SW), fine to coarse sand, loose, soft, unconsolidated, moist, brown (10 YR 5/3), trace gravels, rounded.
62	Clay (CL), medium plasticity, stiff, cohesive, brown (7.5 YR 5/4).
65	Same as above, becoming high plasticity.
68	Poorly Graded Sand (SW), fine or medium grained, wet, saturated, loose, soft, brown (10 YR 5/3).
72	Clay (CL), medium plasticity, stiff, cohesive, brown (7.5 YR 5/4).
73	Poorly Graded Sand (SW), fine or medium grained, wet, saturated, loose, soft, brown (10 YR 5/3).
74	Clay (CL), medium plasticity, stiff, cohesive, brown (7.5 YR 5/4).
78	Clay with Sand (CL), wet, non cohesive, low plasticity, brown (10 YR 5/3).
88	End of borehole at 88 ft bgs. Installed monitoring well per scope of work.

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95

LITHOLOGICAL GRAPHIC

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

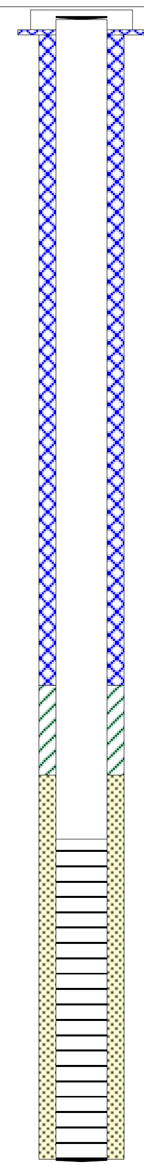
MONITORNG WELL ID:	**WWC-16**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 88 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 88 ft bgs.,	DATE STARTED: 5/7/2020	DATE FINISHED: 5/8/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly graded Sand with Silt (SP), light brown, dry
		Clay (CL), light brown, dry
5		Well Graded Sand with Clay (SW-SC), light brown, dry
10		
15		Clay (CL) with sand, light brown, dry
		Clay (CL), light brown, moist
20		Well Graded Sand with Gravel (SW), moist, brown
25		
30		Clay (CL), light brown, moist
35		
		Well Graded Sand with Clay (SW-SC), light brown, moist
40		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), light brown, moist
45		
50		
55		
60		Clay (CL), light brown, moist
		Well Graded Sand with Clay (SW-SC), light brown, moist
65		Clay (CL), light brown, moist
		Well Graded Sand with Clay (SW-SC), light brown, moist
		Clay (CL), light brown, moist
70		
75		
		Well Graded Sand with Gravel (SW), light brown, moist
80		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, brown
		Clay (CL), light brown, moist
85		
		Well Graded Sand with Clay (SW-SC), light brown, moist
90		End of borehole at 88 bgs. Installed monitoring well per scope of work.
95		

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 51 ft bgs.

Borehole diameter 10 inches from 0 to 88 ft bgs.

0 to 63 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 51 to 58 ft bgs.

Filter pack sand 58 to 88 ft bgs.

63 to 88 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface
dia. = diameter
ft = feet
Sch. = Schedule
YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

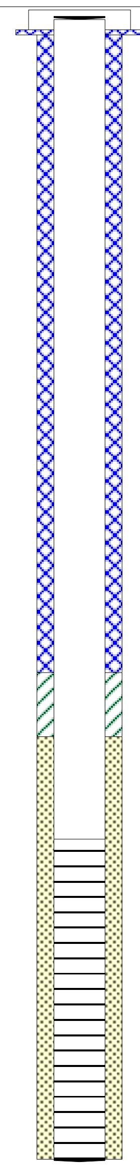
Stantec

MONITORNG WELL ID:	**WWC-17**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.):	88	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 91 ft bgs.,	DATE STARTED:	5/8/2020	DATE FINISHED:	5/8/2020
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with Silt (SW-SM), fine or medium grained sand, loose, soft, dry, very pale brown (10 YR 7/4).
	Poorly Graded Sand (SP), fine to coarse, loose, soft, dry, unconsolidated, light gray (10 YR 7/2).
	Clays (CL), low to medium plasticity, medium dense, moist, light yellowish brown (10 YR 7/4).
	Poorly Graded Sand (SP), fine to coarse, loose, soft, dry, unconsolidated, light gray (10 YR 7/2).
	Clay (CL), medium plasticity, medium dense, cohesive, dark red (2.5 YR 4/6).
	Well Graded Sand (SW), fine grained , loose, soft, moist, yellowish brown (10 YR 5/4).
	Clay (CL), medium plasticity, medium dense, cohesive, dark red (2.5 YR 4/6).
30	Well Graded Sand (SW), fine grained , loose, soft, brown (10 YR 4/3).
	Clay (CL), medium plasticity, medium dense, cohesive, dark red (2.5 YR 4/6), mottled with gray (10 YR 6/1).
	Well Graded Sand (SW), fine grained, loose, soft, wet, brown (10 YR 4/3), with thin black lenses.
50	Sandy Lean Clay (CL), low plasticity, soft to medium dense, wet, yellowish brown (10 YR 6/1).
	Well Graded Sand with Clay (SW-SC), fine grained sand, wet, loose, soft, yellowish brown (10 YR 5/4).
	Sandy Lean Clay (CL), low plasticity, soft to medium dense, wet, brown (10 YR 5/3).
	Well Graded Sand (SW), fine or medium grained sand, loose, soft, wet, brown (10 YR 5/3)
	Clay (CL), moderate plasticity, medium dense, consolidated, brown (10 YR 5/3).
	Well Graded Sand (SW), fine or medium grained sand, loose, soft, wet, brown (10 YR 5/3)
	Clay (CL), medium to high plasticity, stiff, dense, consolidated, brown (10 YR 5/3).
	Well Graded Sand (SW), fine or medium grained sand, loose, soft, wet, brown (10 YR 5/3)
88	End of borehole at 88 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 50 ft bgs.
Borehole diameter 10 inches from 0 to 88 ft bgs.

0 to 63 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 50 to 55 ft bgs.
Filter pack sand 55 to 88 ft bgs.

63 to 88 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

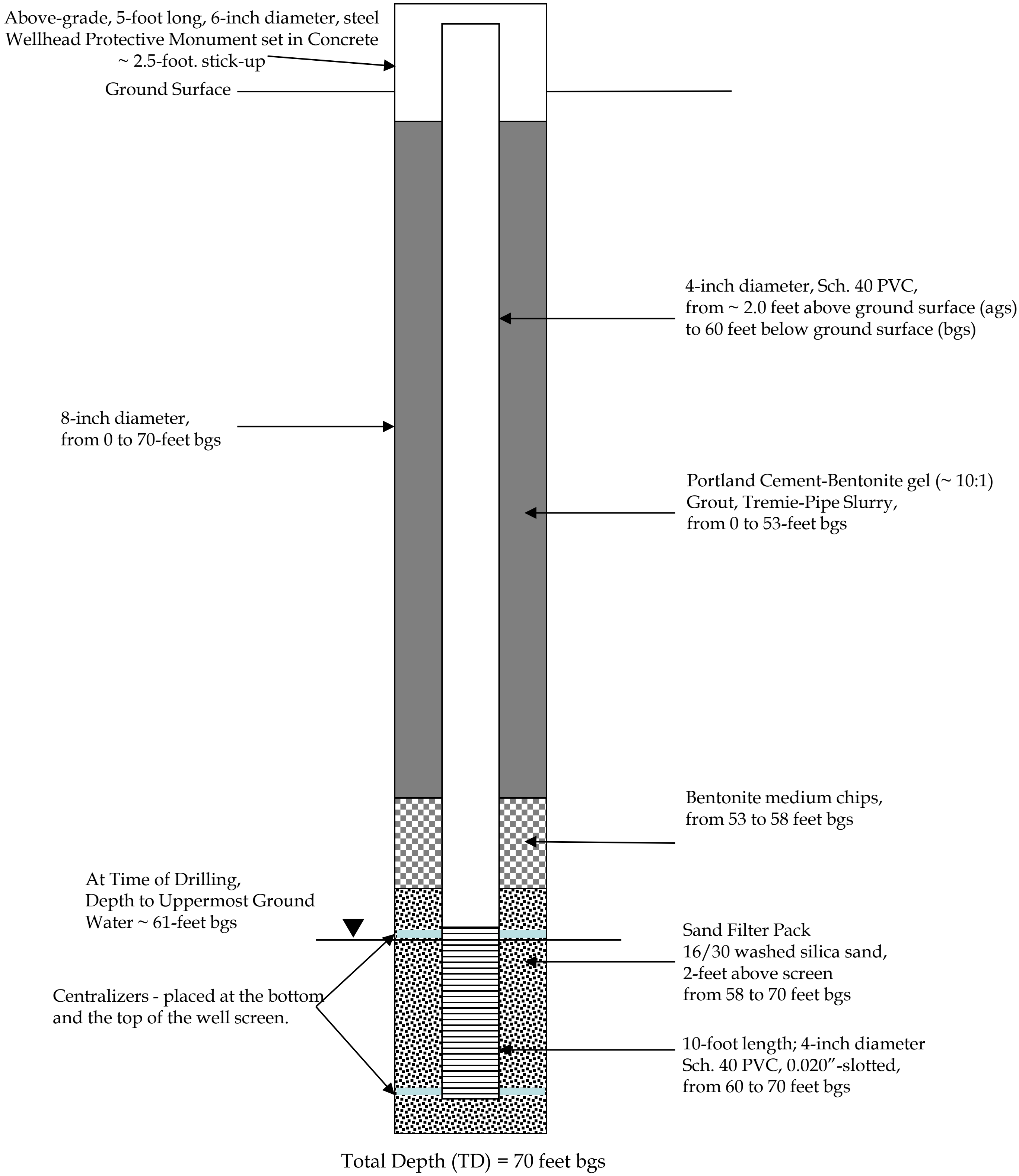
Boring Log
ISPC
Delta, Utah

WWU-1

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-4.75	8" Sonic	SP	SAND:
4.75-5	8" Sonic	SC	Clayey SAND:
5-7	8" Sonic	SP/SM	SAND with silt:
7-10.75	8" Sonic	SC	Clayey SAND:
10.75-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SC	Clayey SAND:
13-14	8" Sonic	SM	Silty SAND:
14-15	8" Sonic	SP	SAND:
15-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22	8" Sonic	SP/SM	SAND with silt:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-25	8" Sonic	CL	Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-28	8" Sonic	SC	Clayey SAND:
28-30	8" Sonic	SW	Gravelly SAND:
30-32.5	8" Sonic	SP/SM	SAND with silt:
32.5-35	8" Sonic	SM	Silty SAND:
35-37.5	8" Sonic	SP	SAND:
37.5-40	8" Sonic		SAND:
40-42.5	8" Sonic	SW/SM	SAND with silt:
42.5-43.25	8" Sonic	SM	Silty SAND:
43.25-44.25	8" Sonic		Silty SAND:
44.25-45	8" Sonic	SP/SW	SAND:
45-47.5	8" Sonic	SW	SAND:
47.5-50	8" Sonic	SP	SAND:
50-50.5	8" Sonic		SAND:
50.5-51.75	8" Sonic	ML	Sandy SILT:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53.25	8" Sonic	SC	Clayey SAND:
53.25-55	8" Sonic		Clayey SAND:
55-56.5	8" Sonic		Clayey SAND:
56.5-57.5	8" Sonic		Clayey SAND:
57.5-60	8" Sonic		Clayey SAND:
60-61	8" Sonic	ML	Clayey SILT with sand:
61-62.5	8" Sonic	SM	Silty SAND:
62.5-63.75	8" Sonic	CL	Sandy CLAY:
63.75-64.75	8" Sonic	SM	Silty SAND:
64.75-65.5	8" Sonic	SP	SAND:
65.5-66.5	8" Sonic	ML	Clayey SILT with sand:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-70	8" Sonic	SM	Silty SAND with clay:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WW-U-1 Schematic

			Date Drawn 8/11/15
Design by	Drawn by MS	Scale	Last Revision Date

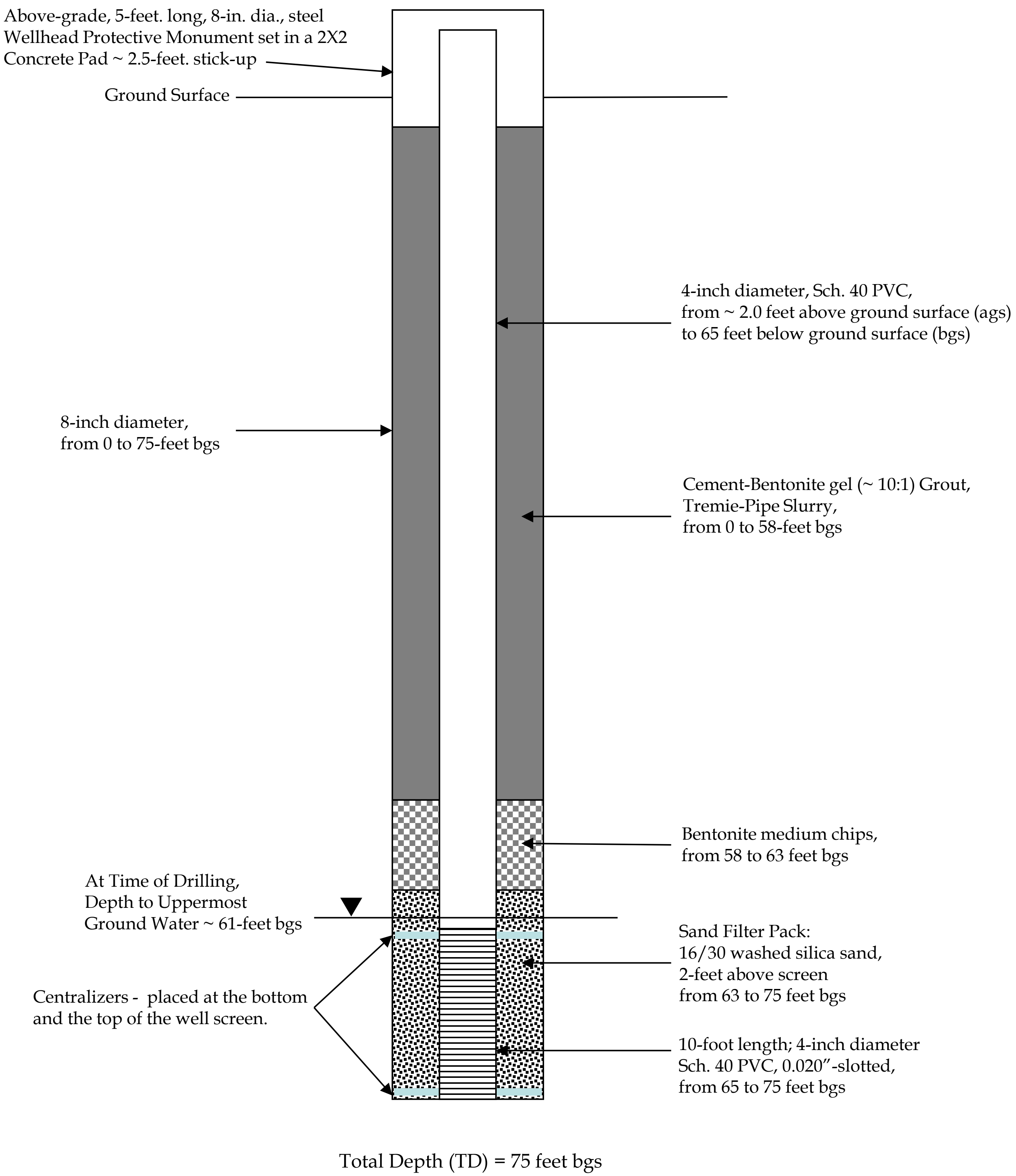
Boring Logs
ISPC
Delta, Utah

WWU-2

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-2.5	8" Sonic	ML	Gravelly SILT with sand:
2.5-4	8" Sonic	SP	SAND:
4-5	8" Sonic		SAND:
5-5.5	8" Sonic		SAND:
5.5-7.5	8" Sonic		SAND:
7.5-9.5	8" Sonic	SP/SW	SAND:
9.5-10	8" Sonic	SP	SAND:
10-11	8" Sonic	SW	SAND:
11-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	ML	Sandy SILT:
15-15.5	8" Sonic	SP	SAND:
15.5-17	8" Sonic	SC	Clayey SAND with gravel:
17-17.5	8" Sonic	SW	Gravelly SAND with sand:
17.5-19	8" Sonic		SAND:
19-20	8" Sonic		SAND:
20-22.5	8" Sonic	GW	Sandy GRAVEL:
22.5-23.5	8" Sonic	SW	SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-32.5	8" Sonic		SAND with silt:
32.5-33.5	8" Sonic	SW/SC	Gravelly SAND with clay:
33.5-35	8" Sonic	SP/SM	SAND with silt:
35-37.5	8" Sonic		SAND with silt:
37.5-39	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
39-40	8" Sonic	SC	Clayey SAND:
40-45	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
45-45.5	8" Sonic	SM	Silty SAND with clay:
45.5-47.5	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
47.5-49.5	8" Sonic	CH/SC	Sandy CLAY/Clayey SAND:
49.5-50	8" Sonic	SP/SM	SAND with silt:
50-51.5	8" Sonic	SC	Clayey SAND:
51.5-52.5	8" Sonic	SP/SC	SAND with clay:
52.5-55	8" Sonic	SP	SAND:
55-56.5	8" Sonic	CH	Sandy CLAY:
56.5-57.5	8" Sonic	SC	Clayey SAND:
57.5-59	8" Sonic	ML	Clayey SILT with sand:
59-60	8" Sonic	CH	Sandy CLAY:
60-62.5	8" Sonic	SC	Clayey SAND:
62.5-64	8" Sonic	CH	Sandy CLAY:
64-65	8" Sonic	SM	Silty SAND:
65-66.5	8" Sonic	SP	SAND:
66.5-67.5	8" Sonic	SM	Silty SAND:
67.5-75	8" Sonic	SW	SAND:

TD = 75'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein



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IPSC – WASTEWATER HOLDING BASIN AREA

DELTA, UTAH

Well WW-U-2 Schematic

Date Drawn 8/11/15

Last Revision Date

Design by

Drawn by MS

Scale

Boring Logs

ISPC

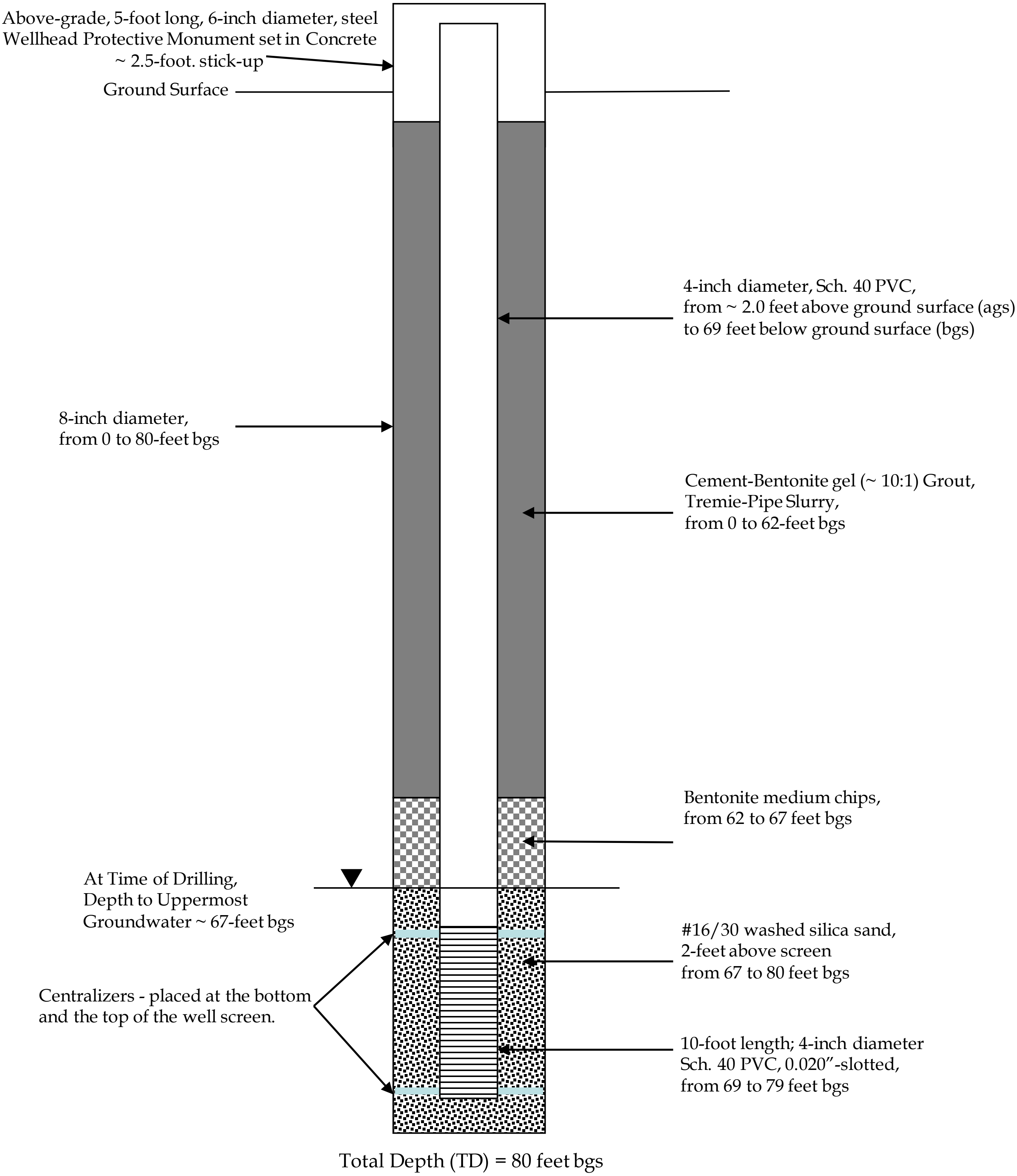
Delta, Utah

SI-U-1

Interval (feet)	USCS	Sample Description
8/12/2015		
0-0.5	TOPSOIL	Surface - Sand and Gravel, roots and grass.
0.5-2.5	SP/SM	SAND with silt:
2.5-5	SP	SAND:
5-6.5	SP/SM	SAND with silt:
6.5-7.5	SW/SM	SAND with silt:
7.5-8	SW	SAND:
8-12.5	SP	SAND:
12.5-17.5		SAND:
17.5-18	SP/SM	SAND with silt:
18-19	SM	Silty SAND:
19-20	CL	CLAY:
20-21.5	SP	SAND:
21.5-22.5	SP/SM	Gravelly SAND with silt:
22.5-26.5	SW	SAND:
26.5-27.5	SW/SC	SAND with clay:
27.5-29.5	ML	Sandy SILT with clay:
29.5-30	SP	SAND:
30-32	ML	Sandy SILT with clay:
32-32.5	SW	SAND with gravel:
32.5-38	SC	Clayey SAND:
38-40	SM	Silty SAND:
40-42.5	SP/SM	SAND with silt:
42.5-44.25	GW	Sandy GRAVEL with clay:
44.25-45	SM	Silty SAND:
45-46.5	SC	Clayey SAND:
46.5-47.75	SP/SC	SAND with clay:
47.75-52.5	SP	SAND:
52.5-54	CH	CLAY:
54-55	SC/CH	Clayey SAND/Sandy CLAY:
55-60	CH	CLAY:
60-62.5		CLAY:
62.5-66		CLAY:
66-70	SC	Clayey SAND:
70-70.75	ML	Clayey SILT with sand:
70.75-71.5	CH	CLAY:
71.5-72.5	SP/SC	SAND with clay:
72.5-75	SP/SM	SAND with silt:
75-75.75	SM	Silty SAND:
75.75-77	SC	Clayey SAND:
77-80	SP/SM	SAND with silt:

TD = 80'; PVC 4-inch screen from 69 to 79; PVC 4-inch riser from -2.5 to 69
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein



Stantec

IPSC – COAL STORAGE AND UNLOADING AREA

DELTA, UTAH

Well SI-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/12/15 Last Revision Date

jbr environmental consultants, inc.

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
BORING/MONITORING WELL: WR-101 / RW-2
DRILLING FIRM: Boart Longyear
BORING METHOD: Sonic
BORING DIAMETER: 10.0-inch

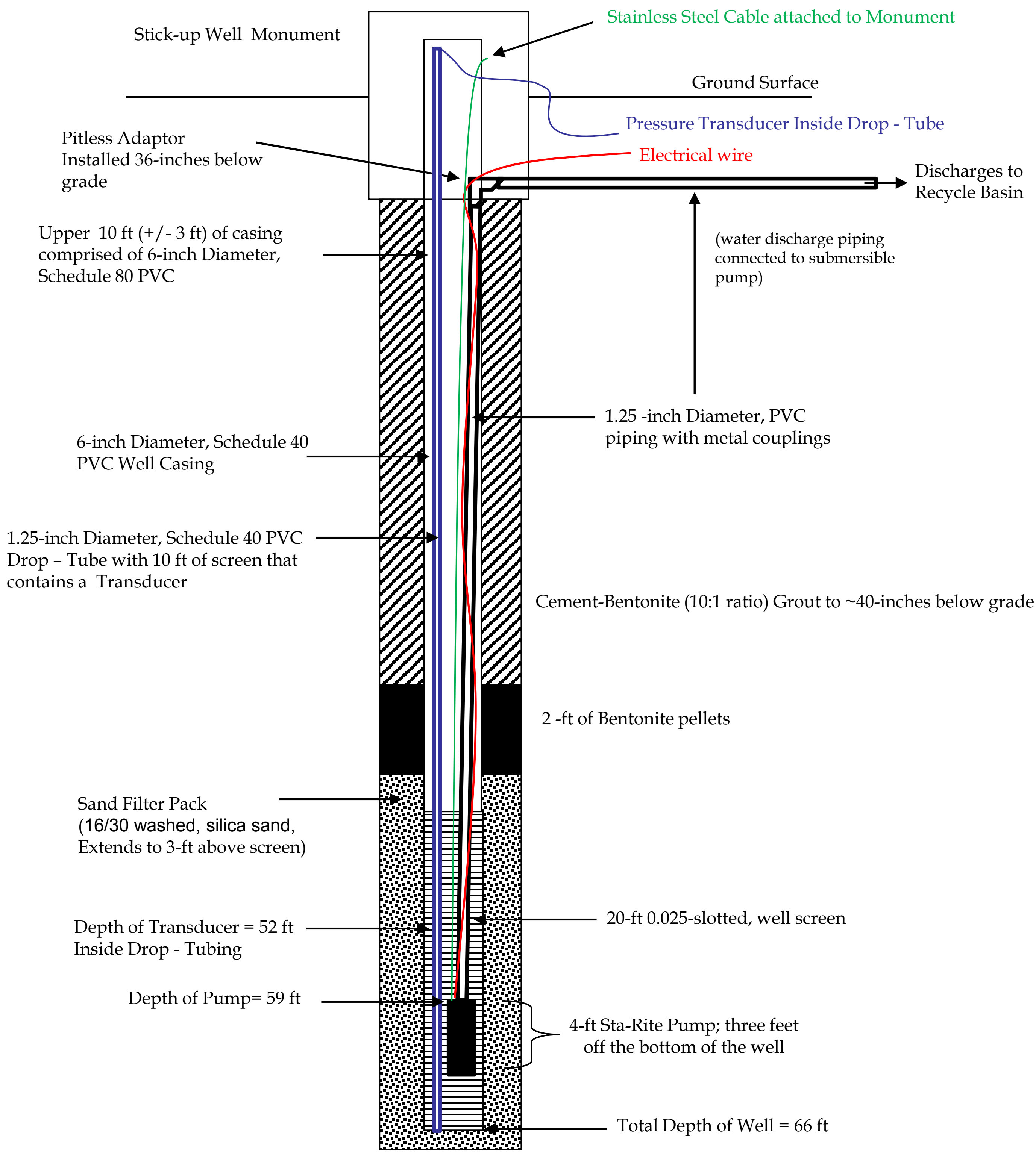
PROJECT No.: 07.00408.01
COMPLETION DATE: 12/11/2007
DRILLER: Robert
LOGGED BY: Thomas Hedrick
DEPTH TO WATER (at drilling): ~ 40 ft.
DEPTH TO WATER (static > 24-hrs.): 36.09 ft.

WR-101 / RW-2

Interval (feet)	Drilling Method	Sample Description
0 - 9	SDM	Light Brown fine grained SAND with clay matrix
9 - 17	SDM	Light Brown clayey SILT
17 - 20	SDM	Light Brown silty CLAY
20 - 25	SDM	Brown medium grained SAND with pebbles, Dry and loose
25 - 28	SDM	Light Brown silty CLAY, very tight, MOIST
28 - 38	SDM	Light Brown CLAY, Moist
38 - 42	SDM	Brown fine grained SAND, Moist
42 - 50	SDM	Brownish/Red CLAY, Dry
50 - 56	SDM	Brown medium grained SAND with clay matrix, very moist/saturated
56 - 58	SDM	Brown silty CLAY, moist
60 - 66	SDM	Brown medium grained SAND, Saturated
		Total Depth = 66 feet BGS, Screened from 66 – 46', Sand 40-66', Bentonite 36-40', Grout 0-36'

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Casing, solid: 6 inch diameter sch. 80 PVC casing, 0-7 ft.
Casing, solid: 6 inch diameter sch. 40 PVC casing, 7 -46 ft.
Screen: 6 inch diameter sch. 40 PVC well screen 0.025-slotted, 46-66 ft.
Sand Pack: 16/30 washed, silica sand, 40-66 ft.
Bentonite Seal: "Pure Gold" Bentonite Pellets, 36-40 ft.
Cement-Bentonite (10:1 ratio) Grout: 0-36 ft.



JBR™	INTERMOUNTAIN POWER PLANT 850 WEST BRUSH WELLMAN ROAD – DELTA, MILLARD COUNTY, UTAH
	Ground Water Recovery Well WR-101 Schematic

Design by	Drawn by	Scale	Date Drawn	Last Revision Date

jbr environmental consultants, inc.

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
BORING/MONITORING WELL: WR-102

PROJECT No.: 08.00463.01
COMPLETION DATE: 3/30/2009

DRILLING FIRM: Boart Longyear
BORING METHOD: Sonic Drilling Method
BORING DIAMETER: 10.0-inch

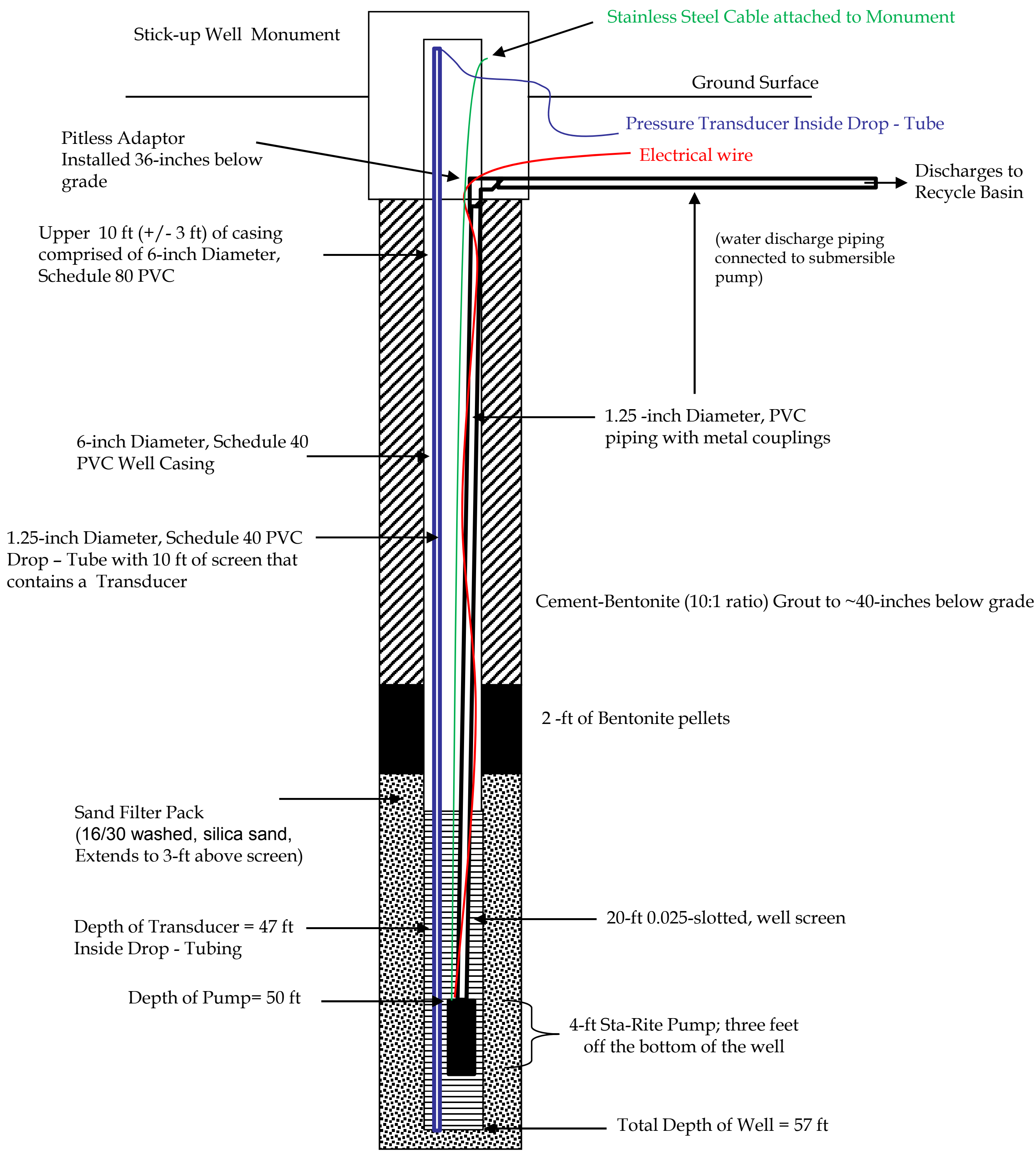
DRILLER: Chato
LOGGED BY: Thomas Hedrick
DEPTH TO WATER (at drilling): ~ 40 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 27 ft.

WR-102

Interval (feet)	Drilling Method	Sample Description
0 - 11	SDM	Light Brown fine grained SAND with pebbles present from 3 - 7 feet, Dry
11 - 16	SDM	Light Brown fine grained SAND with interbeds of brown CLAY, Dry
16 - 35	SDM	Light Gray CLAY, moist at ~ 35 feet,
35 - 37	SDM	Light Gray Clay with a fine to medium grained sandy matrix, very moist
37 - 48	SDM	Brown fine to medium grained SAND, saturated
48 - 50	SDM	Brown CLAY, dry
50 - 53	SDM	Brown to Black medium grained SAND, saturated
53 - 57	SDM	Brown CLAY with two fine grained sand layer present
		Total Depth = 57 feet BGS, Screened from 37 – 57’, Sand 34-57', Bentonite 31-34, Grout 0-31’

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Casing, solid: 6 inch diameter sch. 80 PVC casing, 0-9 ft.
Casing, solid: 6 inch diameter sch. 40 PVC casing, 9 -37 ft.
Screen: 6 inch diameter sch. 40 PVC well screen 0.025-slotted, 37-57 ft.
Sand Pack: 16/30 washed, silica sand, 34-57 ft.
Bentonite Seal: “Pure Gold” Bentonite Pellets, 31-34 ft.
Cement-Bentonite (10:1 ratio) Grout: 0-31 ft.



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INTERMOUNTAIN POWER PLANT
850 WEST BRUSH WELLMAN ROAD – DELTA, MILLARD COUNTY, UTAH

Ground Water Recovery Well WR-102 Schematic

Design by	Drawn by	Scale	Date Drawn	Last Revision Date

jbr environmental consultants, inc.

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
BORING/MONITORING WELL: WR-103

PROJECT No.: 08.00463.01
COMPLETION DATE: 3/31/2009

DRILLING FIRM: Boart Longyear
BORING METHOD: Sonic
BORING DIAMETER: 10.0-inch

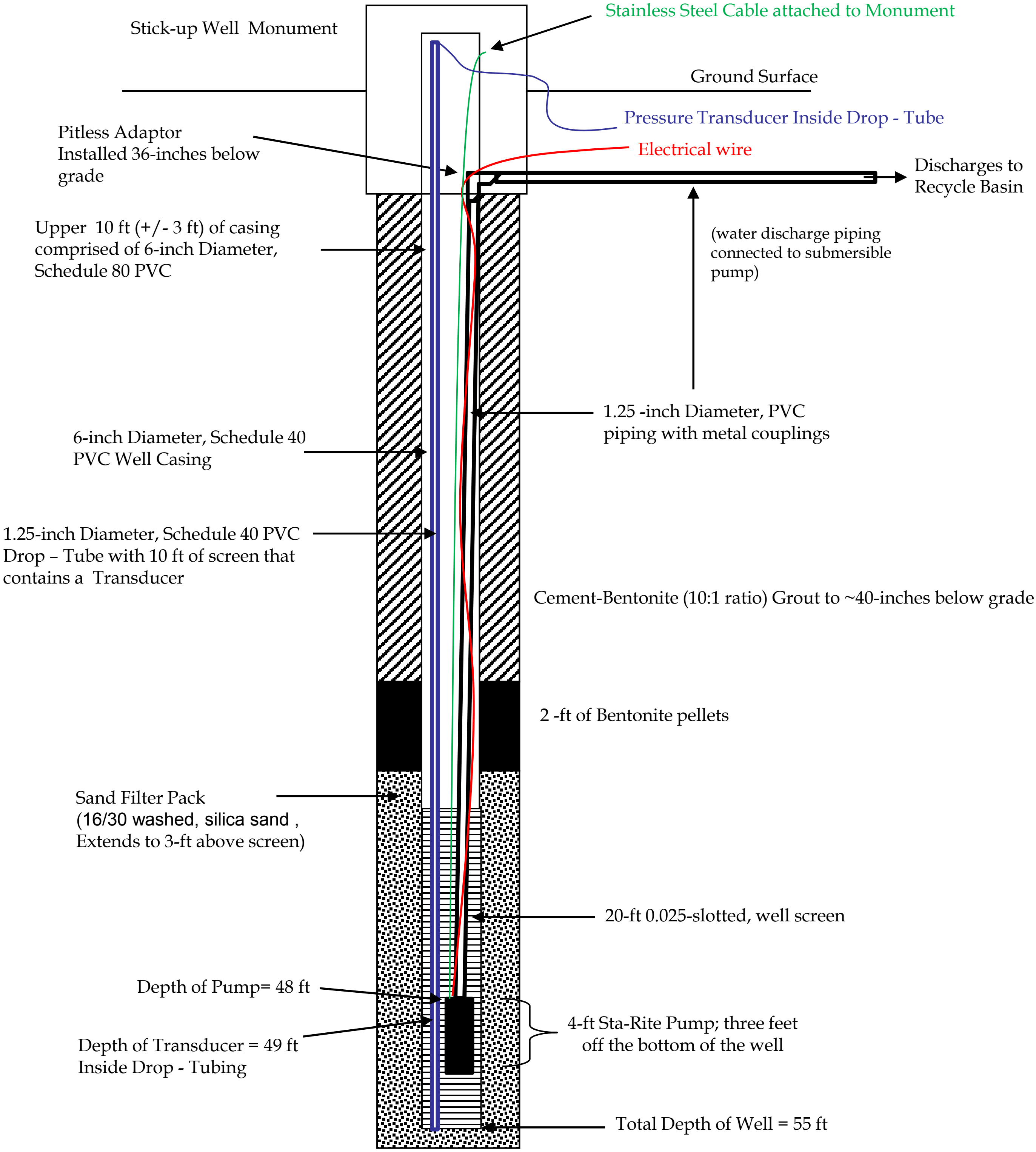
DRILLER: Chato
LOGGED BY: Thomas Hedrick
DEPTH TO WATER (at drilling): ~ 40 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 30 ft.

WR-103

Interval (feet)	Drilling Method	Sample Description
0 - 3	SDM	Brown to Light brown fine grained SAND to silt, Dry
3 - 15	SDM	Light brown fine to medium grained SAND, pebbles present from 3 - 5 feet, Dry
15 - 17	SDM	Light brown fine to medium grained SAND, with interbeds of light brown CLAY with a sandy matrix, Dry
17 - 24	SDM	Light brown CLAY, Dry
24 - 37	SDM	Reddish Gray CLAY, Dry
37 - 45	SDM	Brown to Black medium fine to medium grained SAND, very moist
45 - 47	SDM	Brown fine grained SAND with a CLAY matrix, very moist
47 - 52	SDM	Brown Fine to medium grained SAND, saturated
52 - 55	SDM	Red CLAY, dry
		Total Depth = 55 feet BGS, Screened from 35 – 55’, Sand 32-55', Bentonite 29-32, Grout 0-29’

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Casing, solid: 6 inch diameter sch. 80 PVC casing, 0-6.5 ft.
Casing, solid: 6 inch diameter sch. 40 PVC casing, 6.5 -35 ft.
Screen: 6 inch diameter sch. 40 PVC well screen 0.025-slotted, 35-55 ft.
Sand Pack: 16/30 washed, silica sand, 32-55 ft.
Bentonite Seal: “Pure Gold” Bentonite Pellets, 29-32 ft.
Cement-Bentonite (10:1 ratio) Grout: 0-29 ft.



JBR™

INTERMOUNTAIN POWER PLANT
850 WEST BRUSH WELLMAN ROAD – DELTA, MILLARD COUNTY, UTAH

Ground Water Recovery Well WR-103 Schematic

Design by	Drawn by	Scale	Date Drawn	Last Revision Date

Appendix C Tabulation of UTL and GWPS Values, CCR Unit-Specific

Assessment Monitoring - Statistically Significant Levels above Groundwater Protection Standards
Intermountain Power Service Corporation - Intermountain Generation Facility
Delta, Utah

Constituent	Downgradient Well ID	N	Mean	SD	SE	Median	1st Quartile	3rd Quartile	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	LCL Exceeds GWPS
BOTTOM ASH BASIN																
lithium (mg/L)	BAC-3	11	1.369	0.6401	0.193	1.06	0.944	2.13	0.812	2.53	0.0%	0.7415	0.04	0.7415	0.812	YES
molybdenum (mg/L)	BAC-2	11	0.1595	0.01643	0.004953	0.156	0.143	0.167	0.14	0.194	0.0%	0.04038	0.1	0.1	0.1506	YES
COMBUSTION BY-PRODUCTS LANDFILL																
NO STATISTICALLY SIGNIFICANT LEVELS ABOVE GWPS																
WASTE WATER BASIN																
arsenic (mg/L)	WWC-1	11	0.01664	0.006735	0.002031	0.0181	0.0173	0.02	0.00331	0.0243	0.0%				0.01496	YES
arsenic (mg/L)	WWC-2	11	0.01455	0.0007488	0.0002258	0.0147	0.0141	0.0152	0.0129	0.0155	0.0%	0.01275	0.01	0.01275	0.01415	YES
arsenic (mg/L)	WWC-3	11	0.02086	0.003704	0.001117	0.0214	0.021	0.0226	0.0102	0.0247	0.0%				0.02045	YES

All units micrograms per liter (mg/L)
N: Number of Samples
SD: Standard Deviation
SE: Standard Error
UTL: Upper Tolerance Limit, calculated using samples collected from upgradient wells
Bottom Ash upgrandient wells: BA-U-1, BA-U-2 (n=22)
Waste Water upgradient wells: WW-U-1, WW-U-2, SI-U-1 (n=33)
GWPS: Ground water Protection Standard = the greater value of the UTL or MCL
LCL: Lower Confidence Limit of the Mean, If the LCL exceeds the GWPS it is evidence of a statistically significant level above background

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	UCL	LCL Exceeds GWPS2	UCL Exceeds GWPS
antimony (mg/L)	Background	33	0.00103	0.0001741	0.0000303	0.001	0.001	0.001	0.001	0.002	96.97	0.001	0.006	0.006				
antimony (mg/L)	WWC-1	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	WWC-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	33	0.006554	0.002831	0.0004929	0.00573	0.004425	0.00935	0.001	0.0109	3.03	0.01275	0.01	0.01275				
arsenic (mg/L)	WWC-1	11	0.01664	0.006735	0.002031	0.0181	0.0173	0.02	0.00331	0.0243	0				0.01496	0.0203	YES	YES
arsenic (mg/L)	WWC-2	11	0.01455	0.0007488	0.0002258	0.0147	0.0141	0.0152	0.0129	0.0155	0				0.01415	0.01496	YES	YES
arsenic (mg/L)	WWC-3	11	0.02086	0.003704	0.001117	0.0214	0.021	0.0226	0.0102	0.0247	0				0.02045	0.02262	YES	YES
arsenic (mg/L)	WWC-4	11	0.01206	0.002721	0.0008204	0.013	0.0116	0.0135	0.00498	0.0145	0				0.01147	0.01344	NO	YES
arsenic (mg/L)	WWC-5	11	0.008509	0.002536	0.0007647	0.00783	0.00717	0.0104	0.00371	0.0131	0				0.007123	0.009895	NO	NO
barium (mg/L)	Background	33	0.07908	0.02935	0.005109	0.0761	0.05565	0.09225	0.0446	0.178	0	0.1481	2	2				
barium (mg/L)	WWC-1	11	0.03876	0.01967	0.00593	0.0317	0.0268	0.0536	0.0209	0.077	0				0.02755	0.04481	NO	NO
barium (mg/L)	WWC-2	11	0.03947	0.007406	0.002233	0.0361	0.0339	0.0421	0.031	0.0543	0				0.03543	0.04352	NO	NO
barium (mg/L)	WWC-3	11	0.03304	0.01088	0.003279	0.0302	0.0278	0.0342	0.0242	0.0638	0				0.0242	0.0357	NO	NO
barium (mg/L)	WWC-4	11	0.0646	0.01769	0.005334	0.061	0.0507	0.0768	0.0463	0.101	0				0.05493	0.07427	NO	NO
barium (mg/L)	WWC-5	11	0.05179	0.02411	0.00727	0.0438	0.034	0.067	0.0302	0.103	0				0.03844	0.06223	NO	NO
beryllium (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	33	0.004887	0.0006476	0.0001127	0.005	0.005	0.005	0.00128	0.005	96.97	0.005	0.005	0.005				
cadmium (mg/L)	WWC-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
cadmium (mg/L)	WWC-5	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.002	0.002	NO	NO
chromium (mg/L)	Background	33	0.00627	0.012	0.002088	0.00217	0.002	0.00481	0.000602	0.067	27.27	0.067	0.1	0.1				
chromium (mg/L)	WWC-1	11	0.00337	0.00355	0.00107	0.002	0.002	0.00348	0.002	0.0139	72.73				0.002	0.00369	NO	NO
chromium (mg/L)	WWC-2	11	0.004285	0.006663	0.002009	0.002	0.002	0.00335	0.002	0.0243	72.73				0.002	0.00348	NO	NO
chromium (mg/L)	WWC-3	11	0.002442	0.001151	0.0003471	0.002	0.002	0.002	0.002	0.00577	81.82				0.002	0.00309	NO	NO
chromium (mg/L)	WWC-4	11	0.002615	0.002041	0.0006155	0.002	0.002	0.002	0.002	0.00877	90.91				0.002	0.002	NO	NO
chromium (mg/L)	WWC-5	11	0.002665	0.002078	0.0006264	0.002	0.002	0.00202	0.002	0.00892	72.73				0.002	0.00238	NO	NO
cobalt (mg/L)	Background	33	0.004097	0.000557	0.00009697	0.004	0.004	0.004	0.004	0.0072	96.97	0.0072	0.006	0.0072				
cobalt (mg/L)	WWC-1	11	0.004522	0.001352	0.0004077	0.004	0.004	0.004	0.004	0.00842	81.82				0.004	0.00532	NO	NO
cobalt (mg/L)	WWC-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	WWC-5	11	0.004136	0.0004523	0.0001364	0.004	0.004	0.004	0.004	0.0055	90.91				0.004	0.004	NO	NO
fluoride (mg/L)	Background	33	0.4106	0.2331	0.04058	0.458	0.276	0.548	0	1.01	15.15	0.9086	4	4				
fluoride (mg/L)	WWC-1	11	0.1627	0.1651	0.04978	0.133	0	0.256	0	0.507	36.36				0.0767	0.2488	NO	NO
fluoride (mg/L)	WWC-2	11	0.4225	0.1728	0.0521	0.42	0.358	0.452	0.158	0.833	0				0.328	0.5169	NO	NO
fluoride (mg/L)	WWC-3	11	0.9894	0.09192	0.02772	1.01	0.897	1.06	0.845	1.13	0				0.9391	1.04	NO	NO
fluoride (mg/L)	WWC-4	11	0.4473	0.08237	0.02484	0.435	0.387	0.509	0.319	0.576	0				0.4023	0.4923	NO	NO
fluoride (mg/L)	WWC-5	11	0.3261	0.1374	0.04143	0.331	0.292	0.401	0	0.544	9.091				0.251	0.4012	NO	NO
lead (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lithium (mg/L)	Background	33	0.5821	0.3149	0.05482	0.479	0.4385	0.784	0.235	1.35	0	1.35	0.04	1.35				
lithium (mg/L)	WWC-1	11	1.325	0.7251	0.2186	0.964	0.819	2.18	0.755	2.69	0				0.755	2.41	NO	YES
lithium (mg/L)	WWC-2	11	0.1539	0.05544	0.01672	0.124	0.112	0.225	0.104	0.243	0				0.104	0.241	NO	NO
lithium (mg/L)	WWC-3	11	0.1649	0.04891	0.01475	0.139	0.127	0.23	0.123	0.243	0				0.123	0.241	NO	NO
lithium (mg/L)	WWC-4	11	0.5123	0.2318	0.0699	0.382	0.351	0.75	0.309	0.909	0				0.309	0.879	NO	NO
lithium (mg/L)	WWC-5	11	1.106	1.165	0.3513	0.555	0.497	1.4	0.472	4.41	0				0.472	1.41	NO	YES
mercury (mg/L)	Background	33	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	WWC-1	11	0.0002225	0.00006787	0.00002046	0.000198	0.000168	0.00031	0.00015	0.000328	18.18				0.0001872	0.0002579	NO	NO
mercury (mg/L)	WWC-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	WWC-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	33	0.008239	0.00735	0.001279	0.00619	0.00286	0.009505	0.00182	0.0342	0	0.02676	0.1	0.1				
molybdenum (mg/L)	WWC-1	11	0.008871	0.00245	0.0007387	0.00896	0.0068	0.00995	0.00596	0.0147	0				0.007532	0.01021	NO	NO
molybdenum (mg/L)	WWC-2	11	0.004055	0.001372	0.0004137	0.00372	0.00341	0.00402	0.00304	0.00809	0				0.00304	0.00405	NO	NO
molybdenum (mg/L)	WWC-3	11	0.008955	0.01226	0.003697	0.00537	0.00482	0.00574	0.00464	0.0459	0				0.00464	0.00593	NO	NO
molybdenum (mg/L)	WWC-4	11	0.002949	0.002736	0.0008249	0.00215	0.001	0.00467	0.001	0.0082	45.45				0.001	0.00783	NO	NO
molybdenum (mg/L)	WWC-5	11	0.008649	0.007883	0.002377	0.00523	0.00324	0.0119	0.00301	0.0265	0				0.004262	0.009735	NO	NO
radium226and228combined (pCi/L)	Background	30	1.633	0.7959	0.1453	1.54	1.045	2.19	0.27	3.3	0	3.4	5	5				
radium226and228combined (pCi/L)	WWC-1	10	1.56	0.551	0.1743	1.41	1.15	2.18	0.96	2.51	0				1.241	1.879	NO	NO
radium226and228combined (pCi/L)	WWC-2	10	0.86	0.5302	0.1677	0.715	0.515	1.23	0	1.89	10				0.5526	1.167	NO	NO
radium226and228combined (pCi/L)	WWC-3	10	0.801	1.124	0.3553	0.445	0.015	1.475	-0.14	3.43	10				0.02739	0.9845	NO	NO
radium226and228combined (pCi/L)	WWC-4	10	0.846	0.5889	0.1862	0.815	0.375	1.2	-0.02	1.97	10				0.5046	1.187	NO	NO
radium226and228combined (pCi/L)	WWC-5	10	1.511	0.4353	0.1377	1.555	1.12	1.77	0.92	2.42	0				1.259	1.763	NO	NO
selenium (mg/L)	Background	33	0.005938	0.003461	0.0006026	0.00617	0.002	0.007975	0.002	0.0122	33.33	0.0122	0.05	0.05				
selenium (mg/L)	WWC-1	11	0.01358	0.002457	0.0007407	0.0145	0.0139	0.015	0.00824	0.0153	0				0.00824	0.0152	NO	NO
selenium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	WWC-4	11	0.002142	0.0001713	0.00005166	0.00207	0.002	0.00238	0.002	0.00241	36.36				0.002	0.00239	NO	NO
selenium (mg/L)	WWC-5	11	0.003691	0.0007226	0.0002179	0.00395	0.00336	0.0041	0.002	0.00478	9.091				0.003296	0.004086	NO	NO

thallium (mg/L)	Background	33	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	WWC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	WWC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTLs	MCL	GWPS	LC L	UCL	LCL Exceed GWPS	UCL Exceed GWPS
antimony (mg/L)	Background	22	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100	0.001	0.006	0.006				
antimony (mg/L)	CLW-1	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-6	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-7	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	CLW-8	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	22	0.03012	0.006689	0.001426	0.02775	0.0251	0.0333	0.0236	0.0507	0	0.047	0.01	0.047				
arsenic (mg/L)	CLW-1	11	0.02857	0.001619	0.0004882	0.0285	0.0266	0.0298	0.0264	0.0309	0				0.02769	0.02946	NO	NO
arsenic (mg/L)	CLW-2	11	0.02601	0.001529	0.0004609	0.0258	0.0246	0.0277	0.0243	0.0284	0				0.02517	0.02684	NO	NO
arsenic (mg/L)	CLW-3	11	0.03979	0.002278	0.000687	0.0402	0.0378	0.0412	0.0364	0.0437	0				0.03855	0.04104	NO	NO
arsenic (mg/L)	CLW-4	11	0.03304	0.005682	0.001713	0.0352	0.0308	0.0375	0.0196	0.0388	0				0.02993	0.03614	NO	NO
arsenic (mg/L)	CLW-5	11	0.02075	0.001594	0.0004806	0.021	0.0189	0.0216	0.0182	0.023	0				0.01987	0.02162	NO	NO
arsenic (mg/L)	CLW-6	11	0.01817	0.005867	0.001769	0.0164	0.0143	0.0246	0.0104	0.0287	0				0.01497	0.02138	NO	NO
arsenic (mg/L)	CLW-7	11	0.02379	0.00104	0.0003135	0.0239	0.0234	0.0244	0.0215	0.0257	0				0.02322	0.02436	NO	NO
arsenic (mg/L)	CLW-8	11	0.02325	0.00291	0.0008773	0.0239	0.0224	0.0254	0.0155	0.0258	0				0.0222	0.02476	NO	NO
barium (mg/L)	Background	22	0.09319	0.0127	0.002708	0.0915	0.087	0.0957	0.0758	0.129	0	0.129	2	2				
barium (mg/L)	CLW-1	11	0.06474	0.01389	0.004187	0.0615	0.0582	0.0648	0.053	0.105	0				0.053	0.0668	NO	NO
barium (mg/L)	CLW-2	11	0.08037	0.007668	0.002312	0.0811	0.072	0.0855	0.0711	0.0957	0				0.07618	0.08456	NO	NO
barium (mg/L)	CLW-3	11	0.09952	0.006035	0.00182	0.0995	0.0948	0.103	0.089	0.111	0				0.09622	0.1028	NO	NO
barium (mg/L)	CLW-4	11	0.09573	0.01558	0.004697	0.09	0.0801	0.109	0.0786	0.122	0				0.08721	0.1042	NO	NO
barium (mg/L)	CLW-5	11	0.07757	0.007172	0.002163	0.0801	0.0714	0.0851	0.0671	0.0869	0				0.07365	0.08149	NO	NO
barium (mg/L)	CLW-6	11	0.09176	0.003801	0.001146	0.0902	0.0885	0.0961	0.0873	0.0976	0				0.08969	0.09384	NO	NO
barium (mg/L)	CLW-7	11	0.05569	0.008609	0.002596	0.0539	0.0514	0.0581	0.0475	0.0794	0				0.0475	0.0593	NO	NO
barium (mg/L)	CLW-8	11	0.07477	0.01305	0.003936	0.0707	0.0643	0.0797	0.0609	0.107	0				0.06764	0.08191	NO	NO
beryllium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	22	0.004802	0.0009274	0.0001977	0.005	0.005	0.005	0.00065	0.005	95.45	0.005	0.005	0.005				
cadmium (mg/L)	CLW-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-5	10	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-6	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-7	10	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	CLW-8	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
chromium (mg/L)	Background	22	0.002286	0.001172	0.0002499	0.002	0.002	0.002	0.000529	0.00613	81.82	0.00613	0.1	0.1				
chromium (mg/L)	CLW-1	11	0.007546	0.008927	0.002692	0.002	0.002	0.0157	0.00102	0.0271	45.45				0.00102	0.0187	NO	NO
chromium (mg/L)	CLW-2	11	0.003625	0.003655	0.001102	0.002	0.002	0.00411	0.002	0.014	72.73				0.002	0.00576	NO	NO
chromium (mg/L)	CLW-3	11	0.001997	0.0006608	0.0001992	0.002	0.002	0.002	0.000505	0.00346	81.82				0.000505	0.002	NO	NO
chromium (mg/L)	CLW-4	11	0.00652	0.01496	0.004511	0.002	0.002	0.002	0.000762	0.0516	72.73				0.000762	0.00336	NO	NO
chromium (mg/L)	CLW-5	11	0.002622	0.002475	0.0007463	0.002	0.002	0.002	0.000712	0.00999	72.73				0.000712	0.00214	NO	NO
chromium (mg/L)	CLW-6	11	0.002869	0.00296	0.0008924	0.002	0.002	0.002	0.000612	0.0116	72.73				0.000612	0.00335	NO	NO
chromium (mg/L)	CLW-7	11	0.00338	0.00254	0.0007658	0.002	0.002	0.00421	0.002	0.00891	63.64				0.002	0.00772	NO	NO
chromium (mg/L)	CLW-8	11	0.00317	0.003032	0.0009141	0.002	0.002	0.00224	0.002	0.012	72.73				0.002	0.00463	NO	NO
cobalt (mg/L)	Background	22	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100	0.004	0.006	0.006				
cobalt (mg/L)	CLW-1	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-5	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-6	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-7	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	CLW-8	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
fluoride (mg/L)	Background	22	0.9517	0.1236	0.02635	0.976	0.8675	1.02	0.611	1.17	0	1.242	4	4				
fluoride (mg/L)	CLW-1	11	1.045	0.1158	0.03492	1.06	1.02	1.15	0.834	1.18	0				0.982	1.109	NO	NO
fluoride (mg/L)	CLW-2	11	1.132	0.1564	0.04715	1.18	1.13	1.21	0.695	1.29	0				1.094	1.209	NO	NO
fluoride (mg/L)	CLW-3	11	1.234	0.1135	0.03422	1.23	1.19	1.33	0.948	1.35	0				1.18	1.296	NO	NO
fluoride (mg/L)	CLW-4	11	1.442	0.1068	0.03219	1.44	1.35	1.53	1.27	1.6	0				1.383	1.5	NO	NO
fluoride (mg/L)	CLW-5	11	1.728	0.1058	0.0319	1.71	1.69	1.82	1.51	1.83	0				1.67	1.786	NO	NO
fluoride (mg/L)	CLW-6	11	1.592	0.1303	0.03928	1.61	1.46	1.73	1.38	1.73	0				1.521	1.663	NO	NO
fluoride (mg/L)	CLW-7	11	1.009	0.1205	0.03632	1.02	0.945	1.11	0.792	1.16	0				0.9427	1.074	NO	NO
fluoride (mg/L)	CLW-8	11	0.9985	0.1176	0.03545	1.03	0.933	1.08	0.782	1.13	0				0.9342	1.063	NO	NO
lead (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

lithium (mg/L)	Background	22	0.2651	0.07813	0.01666	0.2155	0.207	0.3485	0.19	0.401	0	0.401	0.04	0.401				
lithium (mg/L)	CLW-1	11	0.2355	0.07161	0.02159	0.192	0.184	0.316	0.173	0.361	0				0.173	0.318	NO	NO
lithium (mg/L)	CLW-2	11	0.2844	0.09059	0.02731	0.227	0.219	0.391	0.211	0.438	0				0.211	0.396	NO	NO
lithium (mg/L)	CLW-3	11	0.2722	0.08772	0.02645	0.217	0.214	0.368	0.197	0.435	0				0.197	0.375	NO	NO
lithium (mg/L)	CLW-4	11	0.2514	0.07328	0.02209	0.204	0.199	0.336	0.189	0.375	0				0.189	0.338	NO	NO
lithium (mg/L)	CLW-5	11	0.217	0.1204	0.03631	0.21	0.188	0.346	0.025	0.411	0				0.1511	0.2828	NO	NO
lithium (mg/L)	CLW-6	11	0.2383	0.09904	0.02986	0.203	0.193	0.333	0.05	0.4	9.091				0.1841	0.2924	NO	NO
lithium (mg/L)	CLW-7	11	0.2294	0.06576	0.01983	0.189	0.182	0.302	0.169	0.331	0				0.169	0.327	NO	NO
lithium (mg/L)	CLW-8	11	0.2343	0.06641	0.02002	0.192	0.188	0.308	0.176	0.35	0				0.176	0.32	NO	NO
mercury (mg/L)	Background	22	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	CLW-1	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-6	11	0.01677	0.05513	0.01662	0.00015	0.00015	0.00015	0.00015	0.183	90.91				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-7	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	CLW-8	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	22	0.004216	0.000791	0.0001686	0.00403	0.003815	0.004215	0.00359	0.00733	0	0.00733	0.1	0.1				
molybdenum (mg/L)	CLW-1	11	0.005008	0.001067	0.0003218	0.00454	0.00407	0.00589	0.00388	0.0068	0				0.004425	0.005591	NO	NO
molybdenum (mg/L)	CLW-2	11	0.004662	0.0004551	0.0001372	0.00461	0.00437	0.00472	0.00427	0.00593	0				0.00427	0.00481	NO	NO
molybdenum (mg/L)	CLW-3	11	0.004852	0.0001833	0.00005526	0.00483	0.00472	0.00498	0.00463	0.0052	0				0.004752	0.004952	NO	NO
molybdenum (mg/L)	CLW-4	11	0.006171	0.002332	0.0007033	0.00525	0.00459	0.00762	0.00414	0.0115	0				0.004892	0.007143	NO	NO
molybdenum (mg/L)	CLW-5	11	0.006953	0.00147	0.0004431	0.00679	0.0054	0.00841	0.00519	0.00922	0				0.00615	0.007756	NO	NO
molybdenum (mg/L)	CLW-6	11	0.008009	0.002976	0.0008972	0.00746	0.00711	0.0105	0.001	0.0117	9.091				0.006383	0.009635	NO	NO
molybdenum (mg/L)	CLW-7	11	0.01692	0.04282	0.01291	0.00396	0.00331	0.00425	0.00329	0.146	0				0.00329	0.00638	NO	NO
molybdenum (mg/L)	CLW-8	11	0.004575	0.0007728	0.000233	0.00435	0.00391	0.00503	0.00359	0.00626	0				0.004153	0.004998	NO	NO
radium226and228combined (pCi/L)	Background	20	1.207	0.7924	0.1772	1.11	0.71	1.66	0	3.7	5	3.106	5	5				
radium226and228combined (pCi/L)	CLW-1	10	1.24	0.6247	0.1975	1.25	0.54	1.885	0.34	2.16	0				0.8779	1.602	NO	NO
radium226and228combined (pCi/L)	CLW-2	10	1.333	0.6785	0.2146	1.195	0.965	1.48	0.65	3.12	0				0.9641	1.603	NO	NO
radium226and228combined (pCi/L)	CLW-3	10	0.998	0.5829	0.1843	1.18	0.465	1.56	0	1.7	10				0.6601	1.336	NO	NO
radium226and228combined (pCi/L)	CLW-4	10	1.063	0.6487	0.2051	1.03	0.49	1.605	0.22	2.24	0				0.687	1.439	NO	NO
radium226and228combined (pCi/L)	CLW-5	10	1.165	0.8818	0.2788	1.015	0.455	2.185	0	2.6	10				0.6538	1.676	NO	NO
radium226and228combined (pCi/L)	CLW-6	10	1.036	0.5369	0.1698	1.02	0.52	1.47	0.25	1.99	0				0.7248	1.347	NO	NO
radium226and228combined (pCi/L)	CLW-7	10	0.682	0.346	0.1094	0.625	0.465	0.93	0.14	1.4	0				0.4814	0.8826	NO	NO
radium226and228combined (pCi/L)	CLW-8	10	0.921	0.5334	0.1687	1.02	0.42	1.305	0.09	1.85	0				0.6118	1.23	NO	NO
selenium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.05	0.05				
selenium (mg/L)	CLW-1	11	0.001903	0.0003232	0.00009745	0.002	0.002	0.002	0.000928	0.002	90.91				0.000928	0.002	NO	NO
selenium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-6	11	0.002436	0.001447	0.0004364	0.002	0.002	0.002	0.002	0.0068	90.91				0.002	0.002	NO	NO
selenium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	CLW-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	CLW-8	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

Constituent Name	Well	N	Mean	Standard Deviation	Standard Error	Median	Lower Quartile,	Upper Quartile,	Minimum	Maximum	% Non-Detects	UTL	MCL	GWPS	LCL	UCL	LCL Exceeds GWPS	UCL Exceeds GWPS
antimony (mg/L)	Background	22	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100	0.001	0.006	0.006				
antimony (mg/L)	BAC-1	11	0.001212	0.0004318	0.0001302	0.001	0.001	0.00138	0.001	0.00237	72.73				0.001	0.00158	NO	NO
antimony (mg/L)	BAC-2	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-3	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-4	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-5	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-6	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
antimony (mg/L)	BAC-7	11	0.001	0	0	0.001	0.001	0.001	0.001	0.001	100				0.001	0.001	NO	NO
arsenic (mg/L)	Background	22	0.01936	0.01013	0.00216	0.02085	0.01585	0.02415	0.001	0.0362	9.091	0.04317	0.01	0.04317				
arsenic (mg/L)	BAC-1	11	0.01477	0.002596	0.0007828	0.0146	0.0129	0.0164	0.0103	0.0202	0				0.01335	0.01619	NO	NO
arsenic (mg/L)	BAC-2	11	0.04513	0.005039	0.001519	0.0444	0.0416	0.0469	0.0386	0.0565	0				0.04237	0.04788	NO	YES
arsenic (mg/L)	BAC-3	11	0.03214	0.01602	0.004831	0.0239	0.0192	0.0496	0.0158	0.0588	0				0.02259	0.03865	NO	NO
arsenic (mg/L)	BAC-4	11	0.03271	0.00833	0.002512	0.0352	0.0322	0.0362	0.00882	0.0407	0				0.03142	0.03659	NO	NO
arsenic (mg/L)	BAC-5	11	0.03282	0.003337	0.001006	0.0325	0.0297	0.0357	0.0275	0.0392	0				0.03099	0.03464	NO	NO
arsenic (mg/L)	BAC-6	11	0.01851	0.005069	0.001528	0.0214	0.0134	0.0229	0.0115	0.0248	0				0.01574	0.02128	NO	NO
arsenic (mg/L)	BAC-7	11	0.02408	0.00717	0.002162	0.0234	0.0191	0.0241	0.0154	0.0434	0				0.02023	0.02683	NO	NO
barium (mg/L)	Background	22	0.1102	0.03251	0.006932	0.1055	0.08195	0.139	0.0636	0.175	0	0.1866	2	2				
barium (mg/L)	BAC-1	11	0.1682	0.2106	0.06349	0.0643	0.049	0.279	0.0391	0.702	0				0.0391	0.39	NO	NO
barium (mg/L)	BAC-2	11	0.02595	0.008703	0.002624	0.0228	0.021	0.0248	0.0202	0.0472	0				0.0202	0.0385	NO	NO
barium (mg/L)	BAC-3	11	0.04248	0.0155	0.004672	0.0376	0.0317	0.048	0.0306	0.0827	0				0.03428	0.04787	NO	NO
barium (mg/L)	BAC-4	11	0.06728	0.01782	0.005373	0.0705	0.0666	0.0772	0.0171	0.0821	0				0.06453	0.07578	NO	NO
barium (mg/L)	BAC-5	11	0.08295	0.008322	0.002509	0.0877	0.0736	0.0893	0.0706	0.0928	0				0.07841	0.0875	NO	NO
barium (mg/L)	BAC-6	11	0.04864	0.02748	0.008286	0.0287	0.0245	0.0781	0.0227	0.0859	0				0.0227	0.0833	NO	NO
barium (mg/L)	BAC-7	11	0.02886	0.0109	0.003288	0.026	0.0214	0.0315	0.0195	0.0577	0				0.0231	0.03327	NO	NO
beryllium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.004	0.004				
beryllium (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
beryllium (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
cadmium (mg/L)	Background	22	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100	0.005	0.005	0.005				
cadmium (mg/L)	BAC-1	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-2	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-3	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-4	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-5	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
cadmium (mg/L)	BAC-6	11	0.004607	0.001303	0.000393	0.005	0.005	0.005	0.000677	0.005	90.91				0.000677	0.005	NO	NO
cadmium (mg/L)	BAC-7	11	0.005	0	0	0.005	0.005	0.005	0.005	0.005	100				0.005	0.005	NO	NO
chromium (mg/L)	Background	22	0.002836	0.002757	0.0005879	0.002	0.002	0.00208	0.000506	0.0125	68.18	0.0125	0.1	0.1				
chromium (mg/L)	BAC-1	11	0.0195	0.03328	0.01003	0.00612	0.00451	0.0184	0.0028	0.114	0				0.0028	0.0412	NO	NO
chromium (mg/L)	BAC-2	11	0.008191	0.003057	0.0009216	0.00777	0.00547	0.0111	0.00483	0.0145	0				0.00652	0.009861	NO	NO
chromium (mg/L)	BAC-3	11	0.01152	0.01677	0.005055	0.00676	0.00447	0.00968	0.00362	0.0615	0				0.00362	0.0114	NO	NO
chromium (mg/L)	BAC-4	11	0.003085	0.002737	0.0008253	0.002	0.002	0.0022	0.002	0.011	63.64				0.002	0.00461	NO	NO
chromium (mg/L)	BAC-5	11	0.003285	0.00425	0.001281	0.002	0.002	0.002	0.002	0.0161	81.82				0.002	0.00204	NO	NO
chromium (mg/L)	BAC-6	11	0.00525	0.0103	0.003106	0.002	0.002	0.00257	0.002	0.0363	63.64				0.002	0.00283	NO	NO
chromium (mg/L)	BAC-7	11	0.004414	0.007316	0.002206	0.002	0.002	0.00217	0.002	0.0264	72.73				0.002	0.00398	NO	NO
cobalt (mg/L)	Background	22	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100	0.004	0.006	0.006				
cobalt (mg/L)	BAC-1	11	0.004242	0.000627	0.000189	0.004	0.004	0.004	0.004	0.00605	81.82				0.004	0.00461	NO	NO
cobalt (mg/L)	BAC-2	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-3	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-4	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-5	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-6	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
cobalt (mg/L)	BAC-7	11	0.004	0	0	0.004	0.004	0.004	0.004	0.004	100				0.004	0.004	NO	NO
fluoride (mg/L)	Background	22	1.081	0.3373	0.07191	0.959	0.843	1.39	0.727	1.75	0	1.75	4	4				
fluoride (mg/L)	BAC-1	11	0.3694	0.2444	0.07368	0.401	0.266	0.507	0	0.854	18.18				0.242	0.4967	NO	NO
fluoride (mg/L)	BAC-2	11	0.8338	0.4598	0.1386	0.986	0.684	1.11	0	1.33	18.18				0.5942	1.073	NO	NO
fluoride (mg/L)	BAC-3	11	0.9784	0.8142	0.2455	0.794	0	1.62	0	2.51	27.27				0.5541	1.403	NO	NO
fluoride (mg/L)	BAC-4	11	1.236	0.1279	0.03857	1.26	1.13	1.35	1.01	1.38	0				1.166	1.306	NO	NO
fluoride (mg/L)	BAC-5	11	1.144	0.1387	0.04181	1.11	1.04	1.26	0.916	1.34	0				1.068	1.219	NO	NO
fluoride (mg/L)	BAC-6	11	0.8664	0.1652	0.04981	0.847	0.754	1.01	0.582	1.15	0				0.7761	0.9566	NO	NO
fluoride (mg/L)	BAC-7	11	1.093	0.3078	0.09282	1.09	0.936	1.31	0.388	1.51	0				0.9252	1.262	NO	NO
lead (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.015	0.015				
lead (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-2	11	0.002019	0.00006332	0.00001909	0.002	0.002	0.002	0.002	0.00221	90.91				0.002	0.002	NO	NO
lead (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

lead (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lead (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
lithium (mg/L)	Background	22	0.322	0.1536	0.03275	0.288	0.2125	0.3525	0.191	0.773	0	0.7415	0.04	0.7415				
lithium (mg/L)	BAC-1	11	0.7318	0.4543	0.137	0.581	0.402	1.3	0.305	1.52	0				0.4639	0.8974	NO	YES
lithium (mg/L)	BAC-2	11	0.7655	0.408	0.123	0.524	0.44	1.22	0.414	1.38	0				0.414	1.32	NO	YES
lithium (mg/L)	BAC-3	11	1.369	0.6401	0.193	1.06	0.944	2.13	0.812	2.53	0				0.812	2.37	YES	YES
lithium (mg/L)	BAC-4	11	0.3416	0.1315	0.03966	0.262	0.243	0.508	0.228	0.532	0				0.228	0.509	NO	NO
lithium (mg/L)	BAC-5	11	0.3574	0.1144	0.03449	0.294	0.277	0.479	0.219	0.538	0				0.2914	0.4126	NO	NO
lithium (mg/L)	BAC-6	11	0.3775	0.1536	0.04631	0.28	0.265	0.542	0.25	0.599	0				0.25	0.597	NO	NO
lithium (mg/L)	BAC-7	11	0.4395	0.193	0.0582	0.327	0.285	0.674	0.269	0.699	0				0.269	0.681	NO	NO
mercury (mg/L)	Background	22	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100	0.00015	0.002	0.002				
mercury (mg/L)	BAC-1	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-2	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-3	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-4	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-5	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-6	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
mercury (mg/L)	BAC-7	11	0.00015	0	0	0.00015	0.00015	0.00015	0.00015	0.00015	100				0.00015	0.00015	NO	NO
molybdenum (mg/L)	Background	22	0.01015	0.01031	0.002198	0.00717	0.00297	0.01355	0.00215	0.0408	0	0.04038	0.1	0.1				
molybdenum (mg/L)	BAC-1	11	0.05256	0.03347	0.01009	0.0467	0.0288	0.0607	0.0232	0.143	0				0.03483	0.06541	NO	NO
molybdenum (mg/L)	BAC-2	11	0.1595	0.01643	0.004953	0.156	0.143	0.167	0.14	0.194	0				0.1506	0.1685	YES	YES
molybdenum (mg/L)	BAC-3	11	0.03511	0.008635	0.002604	0.0337	0.0275	0.0396	0.026	0.0525	0				0.03039	0.03983	NO	NO
molybdenum (mg/L)	BAC-4	11	0.01258	0.002503	0.0007548	0.012	0.0104	0.0143	0.00992	0.017	0				0.01122	0.01395	NO	NO
molybdenum (mg/L)	BAC-5	11	0.008795	0.00228	0.0006875	0.0077	0.00728	0.00926	0.00666	0.0134	0				0.00666	0.0128	NO	NO
molybdenum (mg/L)	BAC-6	11	0.07072	0.02813	0.008481	0.0858	0.0359	0.0921	0.0213	0.0968	0				0.07083	0.08867	NO	NO
molybdenum (mg/L)	BAC-7	11	0.07822	0.00959	0.002892	0.075	0.0702	0.0888	0.0681	0.0944	0				0.0681	0.0942	NO	NO
radium226and228combined (pCi/L)	Background	20	1.231	0.6188	0.1384	1.245	0.84	1.675	0.28	2.42	0	2.713	5	5				
radium226and228combined (pCi/L)	BAC-1	10	1.643	0.7154	0.2262	1.555	0.99	2.435	0.61	2.6	0				1.228	2.058	NO	NO
radium226and228combined (pCi/L)	BAC-2	10	1.067	0.8147	0.2576	0.905	0.405	1.595	0.22	2.9	0				0.5947	1.539	NO	NO
radium226and228combined (pCi/L)	BAC-3	10	1.311	0.5293	0.1674	1.335	0.88	1.78	0.38	2.09	0				1.004	1.618	NO	NO
radium226and228combined (pCi/L)	BAC-4	10	0.85	0.7078	0.2238	0.84	0.31	1	0	2.6	10				0.3394	1.157	NO	NO
radium226and228combined (pCi/L)	BAC-5	10	1.052	0.8877	0.2807	0.665	0.335	1.78	0.19	2.96	0				0.5374	1.567	NO	NO
radium226and228combined (pCi/L)	BAC-6	10	1.22	1.109	0.3508	1.01	0.675	1.5	-0.09	4.07	0				-0.09	1.79	NO	NO
radium226and228combined (pCi/L)	BAC-7	10	1.231	1.035	0.3274	0.95	0.435	1.975	0	3.38	10				0.6308	1.831	NO	NO
selenium (mg/L)	Background	22	0.002272	0.0007933	0.0001691	0.002	0.002	0.002105	0.000691	0.00426	68.18	0.00426	0.05	0.05				
selenium (mg/L)	BAC-1	11	0.01246	0.004803	0.001448	0.0131	0.00818	0.0168	0.00643	0.0204	0				0.009831	0.01508	NO	NO
selenium (mg/L)	BAC-2	11	0.01469	0.001404	0.0004233	0.0144	0.0136	0.0157	0.0128	0.0173	0				0.01392	0.01546	NO	NO
selenium (mg/L)	BAC-3	11	0.02131	0.002908	0.0008769	0.0211	0.019	0.0228	0.0184	0.0287	0				0.01973	0.02278	NO	NO
selenium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
selenium (mg/L)	BAC-6	11	0.002646	0.0009703	0.0002925	0.002	0.002	0.00369	0.002	0.0045	54.55				0.002	0.00414	NO	NO
selenium (mg/L)	BAC-7	11	0.004189	0.001492	0.0004499	0.00446	0.00276	0.00541	0.00257	0.007	0				0.003374	0.005005	NO	NO
thallium (mg/L)	Background	22	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100	0.002	0.02	0.02				
thallium (mg/L)	BAC-1	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-2	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-3	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-4	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-5	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-6	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO
thallium (mg/L)	BAC-7	11	0.002	0	0	0.002	0.002	0.002	0.002	0.002	100				0.002	0.002	NO	NO

ATTACHMENT 8. COPIES OF IPSC'S OCTOBER 2016 STRUCTURAL STABILITY ASSESSMENT AND SAFETY FACTOR ASSESSMENT REPORTS

2016 Engineering Assessments of Coal Combustion Residual (CCR) Facilities, Intermountain Power Plant

Prepared for
Intermountain Power Service Corporation (IPSC)
October 17, 2016

GCI project number: 15GCI634

GERHART COLE INC.
GEOTECHNICAL ENGINEERS

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2016 Engineering Assessments of Coal Combustion Residual (CCR) Facilities, Intermountain Power Plant

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1.1 GENERAL

This document presents engineering assessments of coal combustion residual (CCR) facilities at the Intermountain Power Plant (IPP), near Delta, Utah (see Figure 1-1). These assessments are generally made pursuant to the following sections/paragraphs of Code of Federal Regulations (CFR) Title 40 "Protection of Environment", Part 257 "Criteria for Classification of Solid Waste Disposal Facilities and Practices," Subpart D "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments":

- 257.71: Liner Design Criteria for Existing CCR Surface Impoundments
- 257.73(c) through 257.73(e): Structural Integrity Criteria for Existing CCR Surface Impoundments
- 257.81: Run-on and Run-off Controls for CCR Landfills
- 257.82: Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments

The Intermountain Power Plant is owned by Intermountain Power Agency (IPA) and operated by Intermountain Power Service Corporation (IPSC). Existing CCR surface impoundments at the facility include the Bottom Ash Basin and the Waste Water Basin. Existing facilities also include a CCR landfill, referred to as the Combustion By-Products Landfill. These CCR units are shown in Figure 1-2.

The Bottom Ash Basin was commissioned in 1986. The Bottom Ash Basin receives bottom ash sluiced from the boilers and the boiler area sump. The Basin also provides decant water to the ash water recycle basin for reuse in the ash water system and the sulfur dioxide removal system. The major sources of materials placed in the basin are the bottom ash, boiler slag, and other process materials including pulverized rejects, and chemical clean residue.

The Waste Water Basin was commissioned in 1986. The major sources of materials placed in the basin include flue gas emission control residuals and other process material including process water separated for re-use, wash down, coal pile run-off, boiler blowdown, cooling tower blowdown, regenerant, rinsate, leachate from bottom ash, boiler slag, and pulverizer rejects. After solids have settled, the water is reused.

The Combustion By-Products Landfill was commissioned in 1986. The major sources of materials placed in the landfill include dewatered blowdown from the scrubbers mixed with fly ash from the baghouse, and settled-out solids from both the Bottom Ash Basin and Waste Water Basin.

In the context of Title 40, Part 257 requirements, the Intermountain Power Plant (IPP) does not discharge water to any waterway and is not located on any waterway.

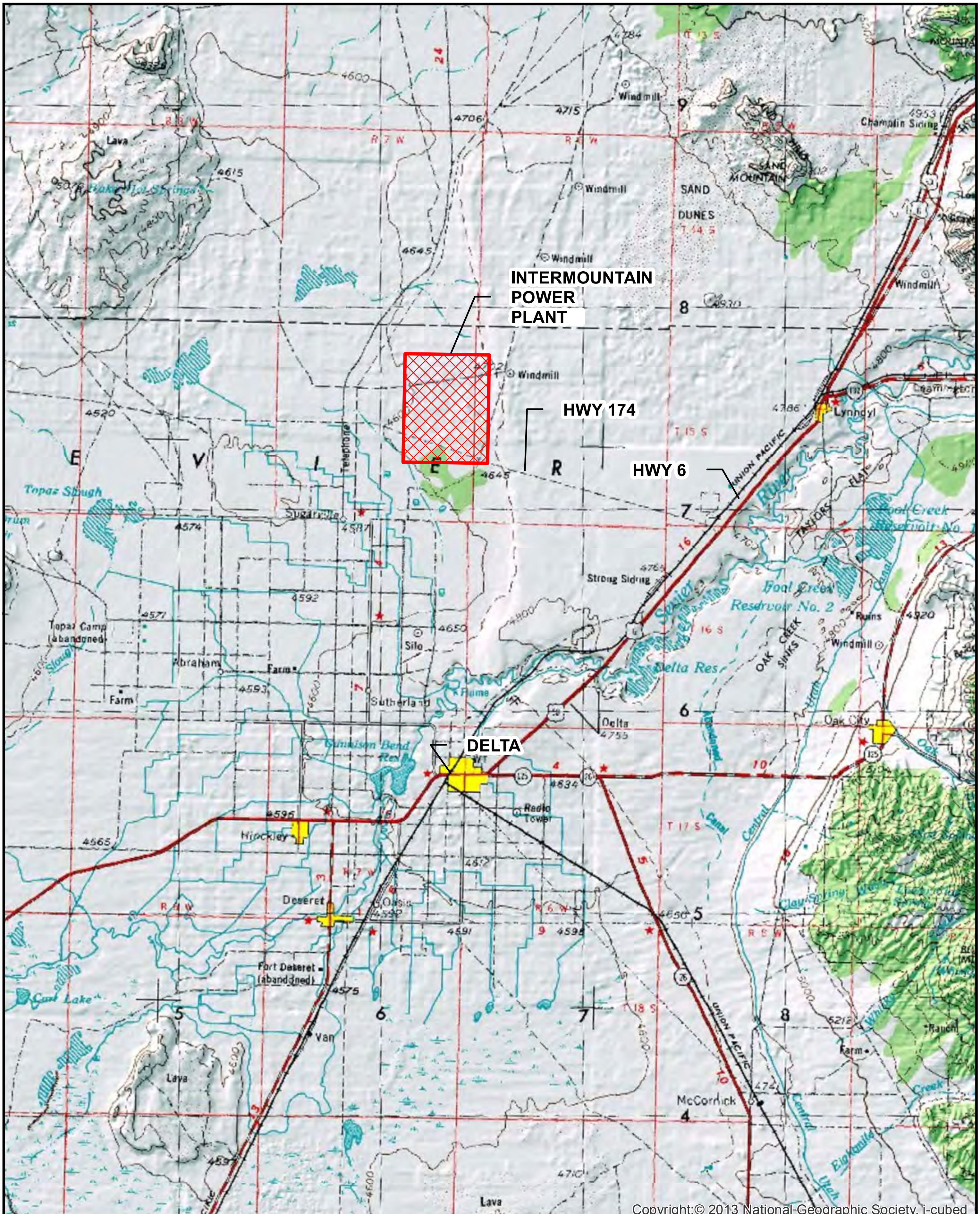
1.2 PURPOSE, AUTHORIZATION, AND SCOPE OF WORK

This report presents the results of engineering assessments performed by Gerhart Cole Inc. (GCI) for IPSC in response to new federal requirements pertaining to the disposal of coal combustion residuals (CCR), pursuant to CFR Title 40, Part 257.

Subjects of the assessments are the Bottom Ash Basin, the Waste Water Basin, and the Combustion By-Products Landfill.

1.3 REFERENCES TO CFR

To facilitate its use, this document references specific sections, paragraphs and clauses of CFR Title 40, Part 257, using the Title's nomenclature such as 257.73(c)(1)(i).



GERHART COLE INC.
GEOTECHNICAL ENGINEERS

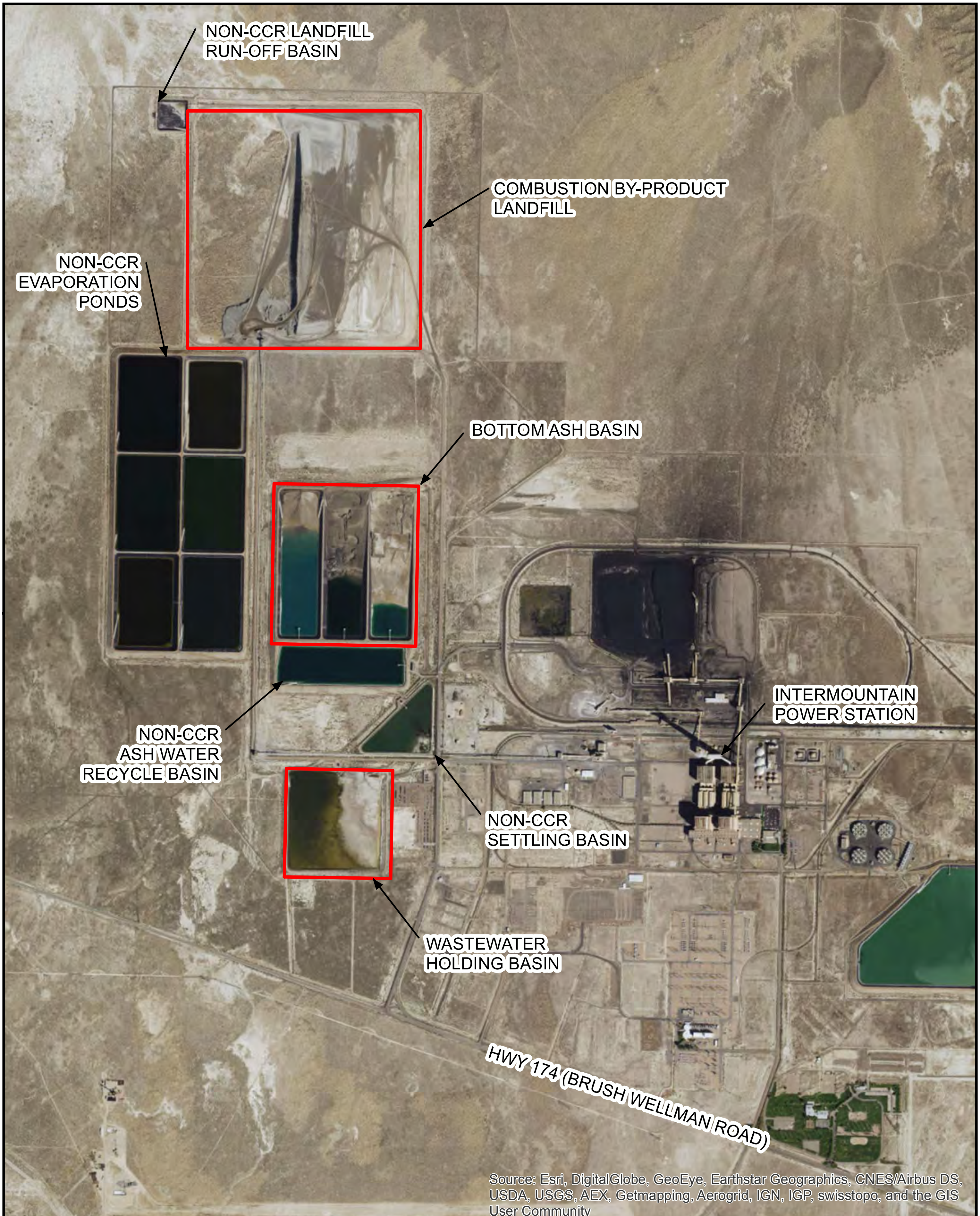
Assessment of Coal Combustion Residual Facilities

Intermountain Power Plant

N

0 5,000 10,000 20,000 Feet

Figure 1-1



GERHART COLE INC.
GEOTECHNICAL ENGINEERS

Assessment of Coal Combustion Residual Facilities

Intermountain Power Plant

N

0 500 1,000 2,000 Feet

Figure 1-2

2.1 BOTTOM ASH BASIN – LINER DESIGN [257.71]

The Bottom Ash Basin is lined with a high density polyethylene (HDPE) geomembrane. Where originally installed, the geomembrane is nominally 80 mils thick. In repaired areas, the geomembrane is 60 mils thick. This membrane rests directly on embankment material, without a discrete, underlying secondary seepage barrier component.

The upper portion of the embankment itself is fill (borrow) material derived from on-site native soils, which, based on test holes drilled in the embankment, generally consist of Clayey Sand (SC, SP-SC) and Poorly graded Sand (SP). Lower portions of the embankment consists of native, in-place (non-fill) soils, which, based on test holes drilled in the embankment, generally classify as Poorly graded Sand (SP) and Silty Sand (SM). At depth below the floor of the basin, there are various strata, including a fairly continuous layer of Sandy Lean Clay (CL).

Based on the types of soil present in the embankment, any composite behavior of soils beneath the geomembrane is anticipated to present a liquid flow rate greater than that of two feet of compacted soil with a hydraulic conductivity not exceeding 1×10^{-7} cm/sec. Consequently, this CCR unit is considered under Part 257 to be an existing unlined surface impoundment.

2.2 BOTTOM ASH BASIN – STRUCTURAL INTEGRITY [257.73]

2.2.1 General [Portions of 257.73(a) through (c)]

2.2.1.1 Hazard Classification

The Bottom Ash Basin is constructed using a combination of above ground embankment/dike and below original grade incision. Accordingly, this unit is not considered an incised CCR unit.

The Bottom Ash Basin covers approximately 105 acres and has a nominal capacity of 3,000 acre-feet without accounting for freeboard, with a maximum design depth of 46 feet (actual maximum 2016 survey depth of 47 feet).

This CCR unit classifies as a Low Hazard Potential CCR surface impoundment. This classification reflects the classification provided by the Utah Department of Natural Resources, Division of Water Rights, Dam Safety Section, which considers low hazard dams to be those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor, or limited to damage sustained by the owner of the structure. This corresponds to the Title 40, Part 257 definition of Low Hazard Potential. The classification is assessed on a periodic (5-year) basis as part of the State's inspection and review process, for which we understand a site inspection was last undertaken April 29, 2014. GCI concurs with this classification and is of the opinion that the classification is in accordance with the requirements of 257.73.

It should be noted that detailed inspections of the units are performed annually by licensed professional engineers, and routine inspections of the CCR impoundments are also performed at intervals not exceeding seven days.

With its inherently adverse high desert climate (i.e. hot dry summers and cold winters), this unit has sparse vegetation with some areas of bare earth. GCI understands that IPSC has worked to establish and re-establish this vegetation.

2.2.1.2 Additional Descriptions of Unit

This CCR unit is owned by Intermountain Power Agency (IPA) and operated by Intermountain Power Service Corporation (IPSC). It is officially identified as Intermountain Power Bottom Ash Basin (UT00463).

This CCR unit is located approximately 11 miles north of Delta, Utah, in Millard County, Utah, at approximately latitude 39.51832 degrees North, Longitude -112.60009 degrees West, as shown in Figure 1-1. Figure 1-2 shows CCR facilities at the IPP at a larger scale.

The CCR unit is being used to dewater/decant bottom ash slurry from the boilers and the boiler area sump via settlement and evaporation.

This CCR unit is situated in the Sevier River Watershed, more specifically USGS hydrologic unit (HUC) 16030005, Lower Sevier. Per the National Resource Conservation Service (NRCS), the Lower Sevier hydrologic unit comprises approximately 4,094 square miles, or about 2,620,563 acres.

Construction records for this CCR unit are sparse. Based on available information, construction of the Intermountain Power Plant began in about September 1981. Available drawings for the facility's impoundment/ponds and embankments are dated 1983, and the unit was commissioned in 1986. It is believed that the unit was built in a single stage of construction.

As stated previously, the upper portion of the Bottom Ash Basin embankment is constructed of compacted fill (borrow) material consisting of on-site native soils which, based on test holes drilled in the embankment, generally consist of Clayey Sand (SC, SP-SC) and Poorly graded Sand (SP). The lower portion of the embankment consists of native, in-place (non-fill) soils which, based on test holes drilled in the embankment, generally classify as Poorly graded Sand (SP) and Silty Sand (SM). At depth below the floor of the basin, there are various strata, including a fairly continuous layer of Sandy Lean Clay (CL). Other than the fill and natural portions of the embankment, there appears to be no explicit zonation of materials or special foundation treatments.

Additional information regarding the physical and/or engineering properties of the materials constituting the foundation and embankment which makes up this CCR unit is provided in Section 2.2.3 of this report.

The Bottom Ash Basin is a relatively large basin, nominally 2,250 feet long and 2,050 feet wide. The Bottom Ash Basin is externally bounded by embankments having a minimum design crest width of about 20 feet (effectively 25 feet based on field observations and measurements) and approximately 3H:1V side slopes both upstream and downstream (i.e., interior and exterior). The embankments (crest Elev. 4684 feet) are approximately 45 feet tall relative to the interior floor (Elev. 4639 feet), based on design drawings, and are a maximum of 36 feet tall relative to the east and west exteriors, based on field measurements. Field surveys indicate central portions of the basin are somewhat lower, being near Elev. 4637 feet. The south end of the Bottom Ash Basin is bounded by the adjoining non-CCR Ash Water Recycle Basin. Relative to the floor of the Ash Water Recycle Basin (which has the same nominal elevation of 4639 feet), the Bottom Ash Basin is approximately 45 feet tall. The latter height is considered to be the nominal "height" of the structure, being the vertical measurement from the downstream/exterior toe of the unit at its lowest point to the lowest elevation of the crest of the unit. The Bottom Ash Basin is internally subdivided into three sections with intermediate embankments. These embankments are contained within the overall perimeter of the Bottom Ash Basin. Elevations are based on 1929 Mean Sea Level datum, as used in the original design drawings and power plant datum.

This unit is an "off-channel" structure, built substantially above surrounding grade, and therefore only receives meteoric water and the water that is pumped into it. The unit does not receive any runoff from adjoining areas. As such, the facility is designed and operated without a spillway structure.

Inlets to each partition within the Bottom Ash Basin include four 10-inch diameter steel pipes placed on the north embankment crest that discharge directly into energy dissipation discharge structures. The energy dissipation structures consist of a 4-foot wide, 3-foot high concrete rundown structure containing several 18-inch wide baffleblocks spaced on about 3-foot centers. An outlet drop-inlet decant structure is provided at the south end of each section. The concrete descant structures are 8-foot by 14-foot- by 47-foot high (approximate dimensions), and direct water into 24-inch steel, concrete encased discharge pipes that convey fluids to the non-CCR Ash Water Recycle Basin.

Based on field surveys, the storage volume of the Bottom Ash Basin, when empty, is approximately 3000 acre-feet without accounting for approximately 3 feet of freeboard. The normal operating pool surface elevation varies depending upon CCR handling activities within the basin. The maximum normal operating pool surface elevation in one section is reported as less than 4681 feet. When this elevation is reached (or before), discharge operations switch to another section to allow for CCR dewatering and subsequent removal from the section for placement within the Combustion By-Product Landfill.

The maximum pool surface elevation following peak discharge from the inflow design flood is simply the operating pool surface elevation plus the amount of meteoric water received, as discussed hereafter in Section 2.3. We understand this elevation is maintained by standard operating procedures to be less than Elev. 4681 feet in each section.

Area-capacity curves for this CCR unit, developed by Grimshaw Surveying and provided by IPSC, are presented in Appendix C.

This CCR unit is lined with a high density polyethylene (HDPE) geomembrane, nominally 60 to 80 mils thick, depending on location. This membrane rests directly on embankment material.

Available drawing and specification excerpts from the design and construction of this unit are presented in Appendix A of this report. Additional cross-sections of the embankments, based on post-construction geotechnical studies, are presented in Section 2.2.3 and Appendix B of this report.

Existing instrumentation for this unit includes a staff gauge to monitor the water surface pool elevation in the unit and also 11 "perched" groundwater monitoring wells, located outside the embankment. These wells are used to help assess potential leakage from the lined CCR unit. Not considered part of CCR unit instrumentation, there are 24 survey monuments located along the periphery (crest) of the unit. We have considered data from these monuments in our subsequent assessment of unit stability.

Because this unit does not have spillways or diversion features, capacities and substantiating calculations are not presented herein.

To our knowledge there is no record of structural instability of this CCR unit. Additional discussion of stability is presented in Section 2.2.2.

2.2.2 Structural Stability Assessments [257.73(d)]

We are of the opinion that the design, construction, operation, and maintenance of the Bottom Ash Basin is consistent with recognized and generally accepted good engineering practices, for the maximum volume of CCR and CCR waste water that can be impounded. This assessment is based on our review of construction drawings and specifications, the results of post-construction geotechnical studies, periodic observations reported by IPSC, and our own observations.

Stability of the CCR unit's embankment and foundation soils is demonstrated by adequate factors of safety with respect to shear failure, as presented hereafter in Section 2.2.3. Stability is also demonstrated by the lack of visual distress during periodic observations, as well as minimal movement in the 24 survey settlement monuments placed along the embankment. The accuracy of these monuments placed in 2012 appears to be on the order of a couple hundredths of a foot. The largest variance observed through the four measuring events to date (including the survey tolerance) is 0.05 feet at SM9 located in the south embankment. Monuments SM21 through SM24, located along the north embankment, present an apparent settlement 0.04 feet. We consider these movements normal, resulting from the accumulation of relatively thick deposits of CCR solids in the headwaters of the basin.

Because the unit is lined with an HDPE liner, there is minimal concern regarding adverse effects of surface erosion, wave action, and adverse effects of sudden drawdown on the earthen materials inside the basin. The basin is protected at the inlet points with the aforementioned concrete energy dissipaters. External to the basin, it appears that there are regular and adequate maintenance efforts to control and otherwise prevent erosion of the embankment material.

Based on a review of construction specifications (which required compaction of at least 90% of the maximum density as determined by ASTM D 1557), as well as penetration test results obtained during post-construction geotechnical stability assessments of the embankments, we are of the opinion that the embankments (dikes) are compacted to a density sufficient to withstand the range of loading conditions to which the CCR unit is anticipated to be subjected.

As stated previously, with its inherently adverse climate, this unit has sparse vegetation with some areas of bare earth on the exterior of the basin. GCI understands that IPSC has worked to establish and re-establish this vegetation. Other maintenance activities include the eradication of burrowing animals as needed..

As described previously, given the nature and configuration of this CCR unit, it does not have spillway or diversions. This is discussed further in Section 2.3. Due to its low hazard potential, the design flood discharge, were it applicable, would be based on a 100-year flood.

Hydraulic features passing through the CCR unit are inlet and outlet piping. Based on visual observations and reported behavior during operations, there are no indications of structural inadequacy relative to the pipes and outlet structures. Scheduled observations are made and reported by qualified persons relative to potential indicators of structural distress. Such indicators include excessive, turbid, or sediment-laden seepage; signs of piping or internal erosion; transverse or longitudinal cracking; slides, bulges, boils, sloughs, scarps, sinkholes, or depressions; abormally high or low pool levels; animal burrows; excessive or lacking vegetative cover; slope erosion; or appearance of debris.

Apart from the south embankment, all of the downstream embankment slopes of the Bottom Ash Basin are such that they are not exposed to external bodies of water. The south embankment is common with the non-CCR ash water recycle basin. This basin is also lined, so the embankment slope is not subject to rapid-drawdown conditions. The embankment slope presents adequate factor of safety with respect to potential structural instability caused by shearing of the embankment and/or foundation soils as shown subsequently in Section 2.2.3.

2.2.3 "Safety Factor" Assessments [257.73(e)]

Minimum factors of safety with respect to slope stability have been calculated for the Bottom Ash Basin using several potentially critical cross sections. These calculations were performed using a method-of-slices approach with Bishop's simplified/modified method for evaluating both force and moment equilibrium. Failure was constrained to breaching failures, where a sufficient portion of the cross-section of the embankment slips to allow release of at least a portion of the impoundment's contents to the surrounding area. Shallow failures are not included in these analyses as they would not result in breach or discharge of material. Both static and pseudo-static (i.e, dynamic or seismic) loading conditions were considered. A rapid drawdown case was not considered since the basin is lined.

For the seismic case, a horizontal seismic coefficient (k_h) equal to half the peak ground acceleration for the site was used. The mapped peak ground acceleration for the site is about 0.16g (based on B/C boundary conditions), representing a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years (which equates to an average return period of about 2,475 years), as reported by the USGS as part of its 2008 National Seismic Hazard Mapping Project (the most recent maps for which full hazard deaggregations are available). This value was then adjusted to 0.23g to account for local soil (site classification D) conditions. Hence, the horizontal seismic coefficient used in the analyses is 0.12. Also with respect to the seismic case, a composite Mohr-Coulomb failure envelope was also used, with drained strengths at low stresses and undrained strengths for clays at high confining stresses. Soil strengths were reduced by approximately 20 percent to account for possible soil softening caused by cyclic loading.

Additional details regarding development of strength parameters and cross-sections are presented in our original slope stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013. The stability analyses performed for that report were reassessed for the purposes of this report.

Graphical results showing the calculated critical surfaces and factors of safety for various cross-sections are presented in Appendix B (Figure B-1 through Figure B-10), with the factors of safety also summarized on Table 2-1. As can be seen in the Table, the calculated static factors of safety under the long-term, maximum storage pool loading condition for the various potential critical sections are all at least 1.50. In the case of this unit, the maximum surcharge pool is essentially the same as the long-term maximum storage pool; consequently, separate factors of safety for the maximum surcharge pool were not calculated. The calculated seismic factor of safety for all cross-sections is at least 1.00. As such, we consider this unit stable with respect to slope stability.

Liquefaction analyses were performed using the methods of Youd et al. (2001) for granular layers located below the existing groundwater table (nominally located at a depth of 50 feet below the crest of the embankments). Test hole data representing these layers is presented in our original stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013. The seismic analysis event was obtained from the modal event from the deaggregation previously referenced with regards to slope stability, corresponding to ground motions with a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years. This event has a moment magnitude of 5.4 at a distance of about 12.3 km. (By way of comparison, the mean event magnitude is 6.1).

The minimum calculated factor of safety against triggering liquefaction was 2.5, corresponding to conditions near the northern embankment near a depth of about

50 feet. This is well in excess of the minimum 1.2 value required. It should be recognized that as performed, this analysis did not take into account the geologic age of the deposits at the critical depth; doing so would likely result in even a larger factor of safety. As such, we consider this unit stable with respect to any potential liquefaction.

2.3 BOTTOM ASH BASIN – HYDROLOGIC AND HYDRAULIC CAPACITY [257.82]

For the low hazard potential classification of this unit, the inflow design flood is a 100-year event. However, as stated previously, this unit is an "off-channel" structure which is built substantially above surrounding grade, and only receives meteoric water and the water that is pumped into it. The unit does not receive runoff from adjoining areas. As such, there is no inflow design flood control system.

Per NOAA Atlas 14, Volume 1, Version 5, the precipitation event near Delta, Utah, corresponding to a 100-year, 24-hour event is 1.97 inches. Given the area of the basin together with the minimal additional contributory areas represented by adjoining roads along the crests of the embankment, we believe that this impoundment unit can readily accommodate this precipitation within the 3-foot nominal freeboard volume, and thus meet the intent of 257.82 requirements.

Table 2-1 Summary of Slope Stability Analysis Results – Bottom Ash Basin

Scenario / Location	Figure No.	Factor of Safety	
		Static	Seismic
North Embankment of Bottom Ash Basin	B-1,B-2	2.54	1.14
Southeast Corner of Bottom Ash Basin, East Embankment	B-3,B-4	2.47	1.34
Southeast Corner of Bottom Ash Basin, South Embankment	B-5,B-6	2.24	1.22
Southwest Corner of Bottom Ash Basin, West Embankment	B-7,B-8	2.56	1.39
Southwest Corner of Bottom Ash Basin, South Embankment	B-9,B-10	2.34	1.28

3.1 WASTE WATER BASIN – LINER DESIGN [257.71]

The Waste Water Basin is lined with a high density polyethylene (HDPE) geomembrane. Where originally installed, the geomembrane is nominally 80 mils thick. In repaired areas, the geomembrane may be 60 mils thick. This membrane rests directly on embankment material, without a discrete, underlying secondary seepage barrier component.

The upper portion of the embankment is fill material derived from native soils, which, based on test holes drilled in the embankment, generally consist of Clayey Sand (SP-SC). The lower portion of the embankment consists of native, in-place (non-fill) soils, which, based on test holes drilled in the embankment, generally classify as Silty Sand (SM), Clayey Sand (SC), and Sandy Lean Clay (CL). At depth below the floor of the basin, there are various strata, including a rather continuous layer of Sandy Lean Clay (CL).

Based on the types of soil present in the embankment, any composite behavior of the soils beneath the geomembrane is anticipated to present a liquid flow rate greater than that of two feet of compacted soil with a hydraulic conductivity not exceeding 1×10^{-7} cm/sec. Consequently, this CCR unit is considered under Part 257 to be an existing unlined surface impoundment. As such, this basin is subject to the requirements of 257.101(a) which requires groundwater monitoring and/or retrofit and/or closure and/or establishment of alternative disposal capacity.

3.2 WASTE WATER BASIN – STRUCTURAL INTEGRITY [257.73]

3.2.1 General [Portions of 257.73(a) through (c)]

3.2.1.1 Hazard Classification

The Waste Water Basin is constructed using a combination of above ground embankment/dike and below original grade incision. Accordingly, this unit is not considered an incised CCR unit.

The Waste Water Basin, as planned, covers approximately 53 acres and has a nominal capacity of 650 acre-feet without accounting for a nominal 3 feet of freeboard, with a maximum design depth of 20 feet (actual maximum 2016 survey depth of 22 feet). A 2016 survey indicates that the actual capacity (again without freeboard) is closer to 765 acre-feet.

This CCR unit classifies as a Low Hazard Potential CCR surface impoundment. This classification reflects the classification provided by the Utah Department of Natural Resources, Division of Water Rights, Dam Safety Section, which considers low hazard dams to be those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor, or limited to damage sustained by the owner of the structure. This corresponds to the Title 40, Part 257 definition of Low Hazard Potential. The classification is assessed on a periodic (5-year) basis as part of the State's inspection and review process, for which we understand a site inspection was last undertaken April 29, 2014. GCI concurs with this classification and is of the opinion that the classification is in accordance with the requirements of 257.73.

It should be noted that detailed inspections of the units are performed annually by licensed professional engineers, and routine inspections of the CCW impoundments are also performed at intervals not exceeding seven days.

With its inherently adverse high desert climate (i.e., hot, dry summers and cold winters), this unit has sparse vegetation with some areas of bare earth. GCI understands that IPSC has worked to establish and re-establish this vegetation.

3.2.1.2 Additional Descriptions of Unit

This CCR unit is owned by Intermountain Power Agency (IPA) and operated by Intermountain Power Service Corporation (IPSC). It is officially identified as Intermountain Power Waste Water Basin (UT00468).

This CCR unit is located approximately 11 miles north of Delta, Utah, in Millard County, Utah, at approximately latitude 39.50784 degrees North, Longitude -112.60009 degrees West, as shown in Figure 1-1. Figure 1-2 shows CCR facilities at the IPP at a larger scale.

This CCR unit is being used to store waste water from various sources. During storage, CCR settles out via gravity. Water from the basin is decanted into a structure after which it is pumped either to the non-CCR Ash Water Recycle Basins or non-CCR Evaporation Ponds.

This CCR unit is situated in the Sevier River Watershed, more specifically USGS hydrologic unit (HUC) 16030005, Lower Sevier. Per the NRCS, the Lower Sevier hydrologic unit comprises approximately 4,094 square miles, or about 2,620,563 acres.

Construction records for this CCR unit are sparse. Based on available information, construction of the Intermountain Power Plant started in about September 1981. Available drawings for the facility's impoundments/ponds and embankments are dated 1983, and the unit was commissioned in 1986. It is believed that the unit was built in a single stage of construction.

As stated previously, the upper portion of the Waste Water Basin embankment consists of fill material derived from native soils, which, based on test holes drilled in the embankment, generally consist of Clayey Sand (SP-SC). The lower portion of the embankment consists of native, in-place (non-fill) soils that, based on test holes drilled in the embankment, generally classify as Silty Sand (SM), Clayey Sand (SC), and Sandy Lean Clay (CL). At depth below the floor of the basin, there are various strata, including a rather continuous layer of Sandy Lean Clay (CL). Other than the fill and natural portions of the embankment, there appears to be no explicit zonation of materials or special foundation treatments.

Additional information regarding the physical and/or engineering properties of materials constituting the foundation and embankment comprising this CCR unit is provided in Section 3.2.3 of this report.

The Waste Water Basin presents a footprint of about 1,500 feet square. The unit is bounded on all sides by embankments having a minimum design crest width of about

20 feet (effectively 25 feet based on field observations and measurements) and approximately 3H:1V side slopes both upstream and downstream (i.e., interior and exterior). The embankments (crest Elev. 4650 feet) are approximately 20 feet tall relative to the interior floor (Elev. 4630 feet) based on design drawings, and about a maximum of 12 feet tall relative to the existing ground surface, based on field measurements. Recent field surveys indicate that the central portion of the basin is somewhat lower, being near Elev. 4628 feet. The 12-foot height is considered to be the nominal "height" of the structure, being the vertical measurement from the downstream/exterior toe of the unit at its lowest point to the lowest elevation of the crest of the unit. Elevations are based on 1929 Mean Sea Level datum, as used in the original design drawings.

This unit is an "off-channel" structure that is built substantially above surrounding grade and only receives meteoric water and the water that is pumped into it. The unit does not receive any runoff from adjoining areas. As such, the facility is designed and operated without a spillway structure.

The inlet to the Waste Water Basin is a buried and submerged inlet pipeline located near the northeast corner of the basin, along the east embankment. The outlet consists of a drop-inlet structure located at the north end of the basin that feeds water to the Waste Water Basin Pump Station, where the water is subsequently pumped to other facilities.

Based on field surveys, the storage volume of the Waste Water Basin, when empty, is approximately 765 acre-feet (650 acre-feet design plan) without accounting for approximately 3 feet of freeboard. The maximum normal operating pool surface is reported as approximately Elev. 4647 feet.

The maximum pool surface elevation following peak discharge from the inflow design flood is simply the operating pool surface elevation plus the amount of meteoric water received, as discussed hereafter in Section 3.3. We understand this elevation is maintained by standard operating procedures to be less than Elev. 4647 feet.

Area-capacity curves for this CCR unit, developed by Grimshaw Surveying and provided by IPSC, are presented in Appendix C.

The CCR unit is lined with a high density polyethylene (HDPE) geomembrane, nominally 60 to 80 mils thick, depending on location. This membrane rests directly on embankment material.

Available drawing and specification excerpts from the design and construction of this unit are presented in Appendix A. Additional embankment cross-sections, based on post-construction geotechnical studies, are presented in Section 3.2.3 and Appendix B of this report.

Existing instrumentation for this unit includes a staff gauge to monitor the water surface pool elevation in the unit and also 7 "perched" groundwater monitoring wells, located outside the embankment. These wells are used to help assess potential leakage from the lined CCR unit. Not considered part of CCR unit instrumentation, there are 16 survey monuments located along the periphery (crest) of the unit. We have considered data from these monuments in our subsequent assessment of unit stability.

Because this unit does not have spillways or diversion features, capacities and substantiating calculations are not presented herein.

To our knowledge there is no record of structural instability of this CCR unit. Additional discussions of stability are presented in Section 3.2.2.

3.2.2 Structural Stability Assessments [257.73(d)]

We are of the opinion that the design, construction, operation, and maintenance of the Waste Water Basin is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR waste water that can be impounded. This assessment is based on a review of construction drawings and specifications, the results of post-construction geotechnical studies, periodic observations reported by IPSC, and our own observations.

Stability of the CCR unit's embankment and foundation soils is demonstrated by adequate factors of safety with respect to shear failure, as presented hereafter in Section 3.2.3. Stability is also demonstrated by the lack of visual distress during periodic observations, as well as minimal movement in the 16 survey settlement monuments placed along the embankment. The accuracy of these monuments placed in 2012 appears to be on the order of a couple hundredths of a foot. The largest variance observed through the four measuring events to date (including the survey tolerance) is 0.07 feet at SM32 located in the south embankment. Monuments SM31 through SM35, located along the southwest quadrant of the embankment, present an apparent typical settlement 0.04 to 0.05 feet. We believe these movements are not indicative of adverse stability, but recommend continued monitoring.

Given the nature of this CCR unit, there are no abutments, hence, no comments regarding such are offered.

Because the unit is lined with an HDPE liner, there is minimal concern regarding adverse effects of surface erosion, wave action, and adverse effects of sudden drawdown. External to the basin, it appears that there are regular and adequate maintenance efforts to control and otherwise prevent erosion of the embankment material.

Based on a review of the construction specifications (which required compaction of at least 90% of the maximum density as determined by ASTM D 1557) as well as penetration test results obtained during post-construction geotechnical stability assessments of the embankments, we are of the opinion that the embankments (dikes) are compacted to a density sufficient to withstand the range of loading conditions to which the CCR unit is subjected.

As stated previously, with its inherently adverse climate, this unit has sparse vegetation with some areas of bare earth on the exterior of the basin. GCI understands that IPSC has worked to establish and re-establish this vegetation. Other maintenance activities include the eradication of burrowing animals as needed.

As described previously, given the nature and configuration of this CCR unit, it does not have a spillway or diversions. This is discussed further in response to 257.82. Due to its low hazard potential, the design flood discharge, were it applicable, would be based on a 100-year flood.

Hydraulic features passing through the CCR units are inlet and outlet piping. Based on visual observations and reported behavior during operations, there are no indications of inadequate structural integrity. Scheduled observations are made and reported by qualified persons relative to potential indicators of structural distress. Such indicators include excessive, turbid, or sediment-laden seepage; signs of piping or internal erosion; transverse or longitudinal cracking; slides, bulges, boils, sloughs, scarps, sinkholes, or depressions; abormally high or low pool levels; animal burrows; excessive or lacking vegetative cover; slope erosion; or appearance of debris.

All of the downstream (external) embankment slopes of the Waste Water Basin are such that they are not exposed to external bodies of water.

3.2.3 "Safety Factor" Assessments [257.73(e)]

Minimum factors of safety with respect to slope stability have been calculated for the Waste Water Basin using two potentially critical cross sections. These calculations were performed using a method-of-slices approach with Bishop's simplified/modified for evaluating both force and moment equilibrium. Failure was constrained to breaching failures, where a sufficient portion of the cross-section of the embankment slips to allow release of at least a portion of the impoundment's contents to the surrounding area. Shallow failures are not included in these analyses as they would not result in breach or discharge of material. Both static and pseudo-static (i.e, dynamic or seismic) loading conditions were considered. A rapid drawdown case was not considered since the basin is lined.

For the seismic case, a horizontal seismic coefficient (k_h) equal to half the peak ground acceleration for the site was used. The mapped peak ground acceleration for the site is about 0.16g (based on B/C boundary conditions), representing a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years (which equates to an average return period of about 2,475 years), as reported by the USGS as part of its 2008 National Seismic Hazard Mapping Project (the most recent maps for which full hazard deaggregations are available). This value was then adjusted to 0.23g to account for local soil (site classification D) conditions. Hence, the horizontal seismic coefficient used in the analyses is 0.12. Also with respect to the seismic case, a composite Mohr-Coulomb failure envelope was also used, with drained strengths at low stresses and undrained strengths for clays at high confining stresses. Soil strengths were reduced by approximately 20 percent to account for possible soil softening caused by cyclic loading.

Additional details regarding development of strength parameters and cross-sections are presented in our original slope stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013. The stability analyses included in that report were reassessed for the purposes of this report.

Graphical results showing the calculated critical surfaces and factors of safety for various cross-sections are presented in Appendix B (Figure B-11 through Figure B-14), with the factors of safety also summarized on Table 3-1. As can be seen in the Table, the calculated static factors of safety under the long-term, maximum storage pool loading condition for the various potential critical sections are all at least 1.50. In the case of this unit, the maximum surcharge pool is essentially the same as the long-term maximum storage pool; consequently, separate factors of safety for the maximum surcharge pool were not calculated. The calculated seismic factor of safety for all cross-sections is at least 1.00. As such, we consider this unit stable with respect to slope stability.

Liquefaction analyses were performed using the methods of Youd et al. (2001) for granular layers located below the existing groundwater table (nominally located at a depth of 28 to 30 feet below the crest of the embankments). Test hole data representing these layers is presented in our original stability assessment report titled, "IPP Coal Combustion Waste Ponds, Geotechnical Stability Analysis Report," prepared for IPSC by Gerhart Cole Inc., and dated April 2013. The seismic analysis event was obtained from the modal event from the deaggregation previously referenced with regards to slope stability, corresponding to ground motions with a 2% probability of exceedance (i.e., 98% probability of non-exceedance) in 50 years. This event has a moment magnitude of 5.4 at a distance of about 12.3 km. (By way of comparison, the mean event magnitude is 6.1).

The minimum calculated factor of safety against triggering liquefaction was 1.8, corresponding to conditions near the southern embankment near a depth of about 41 feet. This is well in excess of the minimum 1.2 value required. It should be recognized that as performed, this analysis did not take into account the geologic age of the deposits at the critical depth; doing so would likely result in even a larger factor of safety. As such, we consider this unit stable with respect to any potential liquefaction.

3.3 WASTE WATER BASIN – HYDROLOGIC AND HYDRAULIC CAPACITY [257.82]

For the low hazard potential classification of this unit, the inflow design flood is a 100-year event. However, as stated previously, this unit is an "off-channel" structure which is built substantially above surrounding grade which only receives meteoric water and the water that is pumped into it. The unit does not receive runoff from adjoining areas. As such, there is no inflow design flood control system.

Per NOAA Atlas 14, Volume 1, Version 5, the precipitation event near Delta, Utah, corresponding to a 100-year, 24-hour event is 1.97 inches. Given the area of the basin (about 53 acres) together with the minimal additional contributing area presented by adjoining roads along the crests of the embankment, we believe that this impoundment unit can readily accommodate this precipitation within the 3-foot freeboard volume, and thus meet the intent of 257.82 requirements.

Table 3-1 Summary of Slope Stability Analysis Results – Waste Water Basin

Scenario / Location	Figure No.	Factor of Safety	
		Static	Seismic
Northwest Corner of Waste Water Basin	B-11,B-12	4.46	2.64
South Embankment of Waste Water Basin	B-13,B-14	3.86	2.20

4.1 COMBUSTION BY-PRODUCT LANDFILL – RUN-ON AND RUN-OFF CONTROLS [257.81]

4.1.1 GENERAL

The CCR landfill, referred to as the Combustion By-Product Landfill, consists of approximately 271 acres with a nearly square footprint (see Figure 1-1). It is surrounded by the "Ash Truck Haul Road." The landfill is informally divided into seven sections running north-south, each being approximately 480 feet wide. Sections are numbered 1 through 7, starting from east to west. The landfill area has been unevenly utilized, with a majority of the landfilled CCR material located in Sections 1 through 4, reaching a height of approximately 40 to 60 feet above the surrounding (original) grade. Side slopes of the landfill vary from approximately 1.3H:1V along the active west face to approximately 4 to 5H:1V along the non-active (but not closed) south, east, and north faces.

The landfill is isolated from the surrounding area by (listed in order of distance away from the landfilled CCR materials) the Ash Truck Haul Road, a drainage/containment channel, another perimeter road, and an exterior berm. The roads and channel are unpaved. The typical geometry of the drainage channel may be approximated as a trapezoid, being typically at least 4 feet deep, at least 12 feet wide at the base, and with nominal 1.5H:1V side slopes. The exterior berm is typically at least 4 to 6 feet tall and isolates the drainage channel and landfill facility from the surrounding area.

The natural slope in the vicinity of the site is approximately 0.5 to 1% down to the west and north. The drainage channel typically follows this grade. At the northwest corner of the landfill, there is the Landfill Run-off Basin into which the perimeter drainage channels from the south and east discharge. This lined basin has an approximate storage capacity of 30 acre-feet, excluding freeboard.

The surrounding area land cover may generally be described as desert shrub with a poor degree of density. Native soils in the general area are largely mapped by the USDA/SCS (U.S. Soil Conservation Service, now known as the Natural Resources Conservation Service, NRCS) as "Yenrab-Uffens complex (0 to 10% slopes)" with a lesser part of "Yenrab fine sand". The former unit is considered to be a combination of hydrologic groups A and C, whereas the latter is hydrologic group A. Of the four possible groups of A through D, group A soils are considered to present the lowest runoff potential, and include deep sands with very little silt and clay as well as deep rapidly permeable gravel. Group C soils present a moderately high runoff potential, and include shallow soils and soils containing considerable clay and colloids with below average infiltration potential after saturation.

Per 257.81, the run-on/run-off evaluation event is a 24-hour, 25-year storm. Per NOAA Atlas 14, Volume 1, Version 5, the event near Delta, Utah, corresponding to 24-hour, 25-year storm produces 1.61 inches of precipitation.

4.1.2 RUN-ON CONTROL

The run-on control plan consists of isolating the landfill unit from the surrounding area, thereby preventing run-on. The landfill unit is configured such that the CCR material is placed at or above the surrounding grade. The landfill area and perimeter drainage channel are also isolated from the relatively level surrounding area by the exterior perimeter berm. Any precipitation excess is forced around the landfill area. Consequently, run-on of flow onto the CCR unit during peak discharge from the evaluation storm event is not anticipated.

4.1.3 RUN-OFF CONTROL

The run-off control plan consists of using the perimeter drainage channel to control precipitation run-off. As stated previously, the landfill is configured such that run-off is intercepted by the perimeter drainage channel and then conveyed to the Landfill Run-off Basin. To evaluate run-off from the landfill, a SCS-based curve number (CN) and unit hydrograph approach has been used. Based on the nature of the CCR material when placed, we have conservatively estimated the curve number to be 96, much like a dirt road or an artificial western desert landscape with a weed barrier and minimal granular cover. The calculated total runoff from the landfill under this scenario for the evaluation storm is about 27.1 acre-feet. This is less than the storage capacity of the Landfill Run-off Basin.

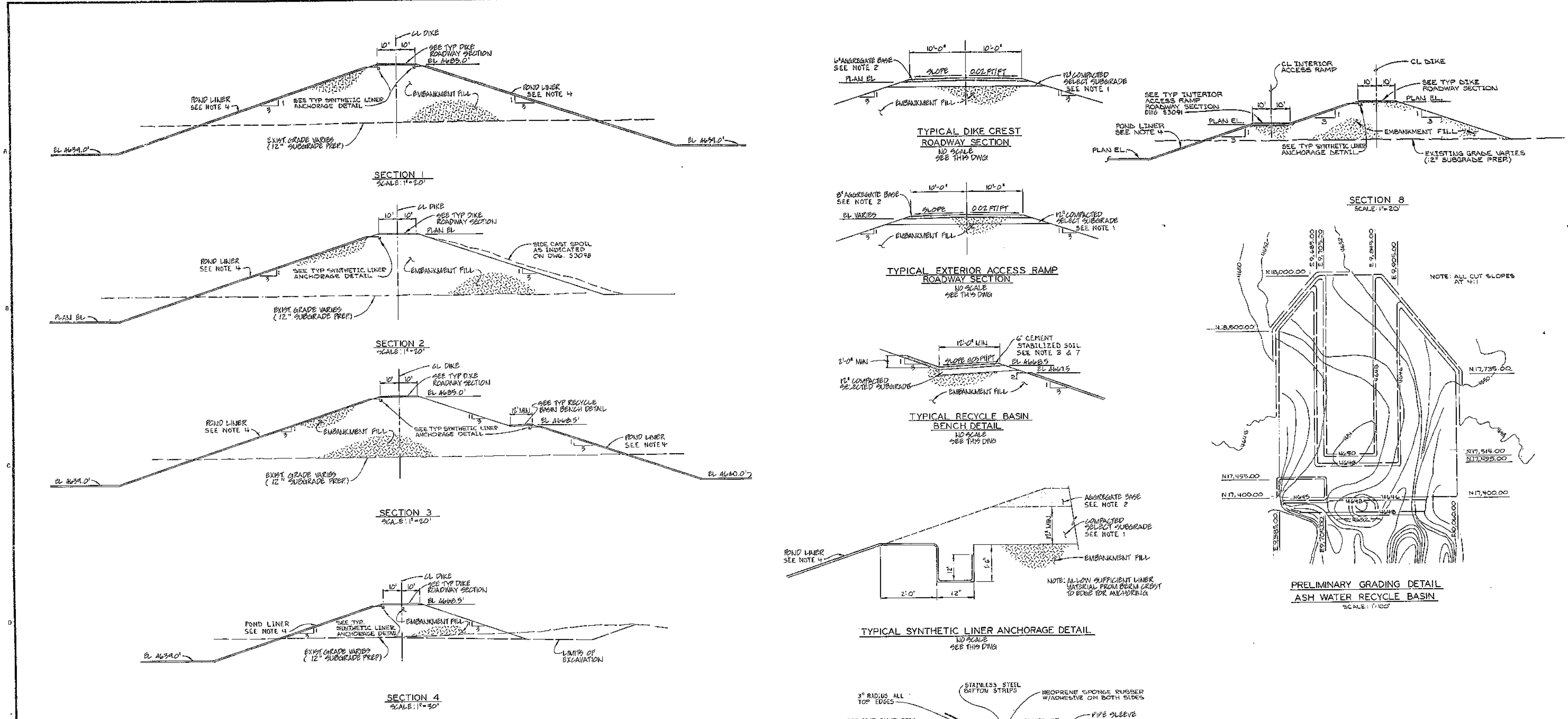
With respect to capacity of the drainage channel, based on a conservative Manning's 'n' value of 0.045, the calculated maximum carrying capacity is approximately 330 to 460 cfs for slopes ranging from 0.5 to 1%. Using common methods of estimating time of concentration for sheet flow, shallow concentrated flow, and channel flow (where overland flow is assumed to occur from the mid-point of the landfill, and channel length is based on the point furthest from the run-off basin), the calculated time of concentration for routing is approximately 40 minutes. Using the median temporal storm distribution from NOAA Atlas 14, Volume 1, Version 5 (general precipitation area), the 1975/1986 SCS triangular unit hydrograph approach with K=484 produces a calculated peak runoff of approximately 23.0 cfs when all flow is routed to a single conveyance. Supporting calculations are provided in Appendix D. In reality, the landfill is served by at least two different conveyances – the portion of the drainage channel extending east from the run-off basin along the north and then east sides of the landfill, and the other portion of the drainage channel extending south from the run-off basin along the west and then south sides of the landfill. Given the calculated peak carrying capacity of the drainage channel is greater than the calculated peak run-off, we are of the opinion that that the run-off control system is adequate to contain the water volume resulting from the evaluation storm.

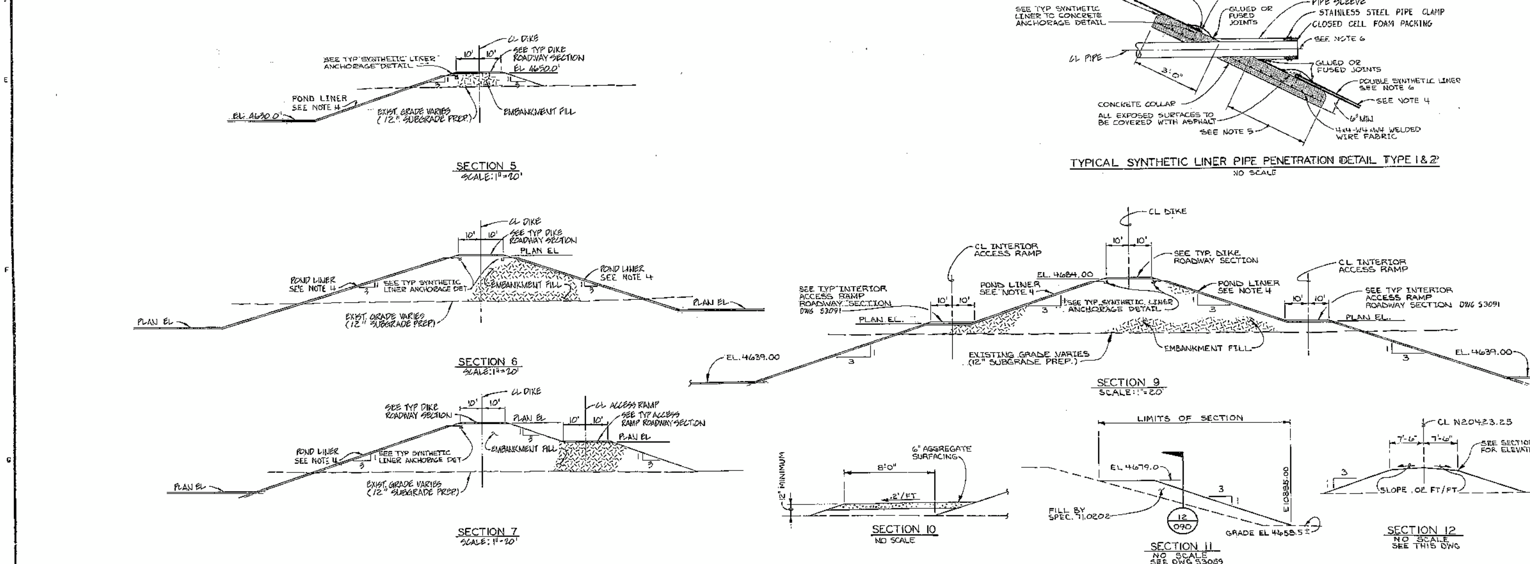
5.1 LIMITATIONS

The assessments and recommendations presented in this document are based on limited field studies and laboratory testing, as well as our understanding of the project's design, manner of construction, operation, and maintenance. If conditions are found later that are different from those described, we should be notified immediately so that we can make revisions as necessary.

This document was prepared solely for the use of the addressee (our Client) and may not contain sufficient information for other parties or uses.

We represent that our services are performed within the limitations prescribed by our Client, in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representation, expressed or implied, and no warranty or guarantee is included or intended. We do not assume responsibility for the accuracy of information provided by others.





GENERAL NOTES

1. 12" COMPACTED SELECT SUBGRADE TO BE PLACED UNDER CONTRACT 71.0202.
2. AGGREGATE BASE TO BE PLACED UNDER CONTRACT 71.0202.
3. CEMENT STABILIZED SOIL TO BE PLACED UNDER CONTRACT 71.0202.
4. ALL POND LINERS EXCEPT FOR ONSITE RESERVOIR TO BE INSTALLED UNDER CONTRACT 71.0206. ONSITE RESERVOIR LINER SHALL BE INSTALLED UNDER CONTRACT 71.0207 IF A SYNTHETIC LINER IS SELECTED BY THE OWNER. ONSITE RESERVOIR LINER SHALL BE INSTALLED UNDER CONTRACT 71.0202 IF A CLAY LINER IS SELECTED BY THE OWNER.
5. EXTEND CONCRETE COLLAR TO TOE OF DIKE FOR TYPE 2 PIPE PENETRATION.
6. COLLAR AND DOUBLE SYNTHETIC LINER SHALL EXTEND THREE FEET EITHER SIDE OF PIPE FOR TYPE 1 AND 2 DISCHARGE PIPE. DOUBLE LINER SHALL EXTEND TEN FEET PAST TOE OF SLOPE. ANCHORAGE DETAILS FOR DOUBLE SYNTHETIC LINER SHALL BE AS DETAILED BY LINER SUPPLIER.
7. SOIL-CEMENT SHALL CONSIST OF 10 PERCENT CEMENT BY WEIGHT.

REV 3 11-9-84 ISSUED FOR CONST SPEC 71.0206 71.0202
REV 2 8-17-84 ISSUED FOR BIDS SPEC 71.0206
REV 2 2-28-84 ISSUED FOR CONST SPEC 71.0202, 71.0207
REV 1 12-2-83 ISSUED FOR BIDS SPEC 71.0207
REV 1 11-23-83 ISSUED FOR ADDENDUM 1 SPEC 71.0202
REV 0 11-1-83 ISSUED FOR BIDS SPEC 71.0202

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM
4	6-30-87	CONFORMED TO CONSTRUCTION RECORDS	BD	BLM		
3	11-9-84	ECN 026/71.0202 & APPROVED FOR CONST SPEC 71.0206		GVR	BLM	
2	2-28-84	REVISED & APPROVED FOR CONST SPEC 71.0202, 71.0207		GVR	BLM	
1	11-23-83	ADDED EXT DETAIL, NOTE 7, & DIMENSIONS	LEN		AH	
0	11-1-83	INITIAL ISSUE	GVR		BLM	

SCALE: AS NOTED

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF UTAH
SIGNED B. L. McCorkle DATE 11-1-83 REG NO. 5454

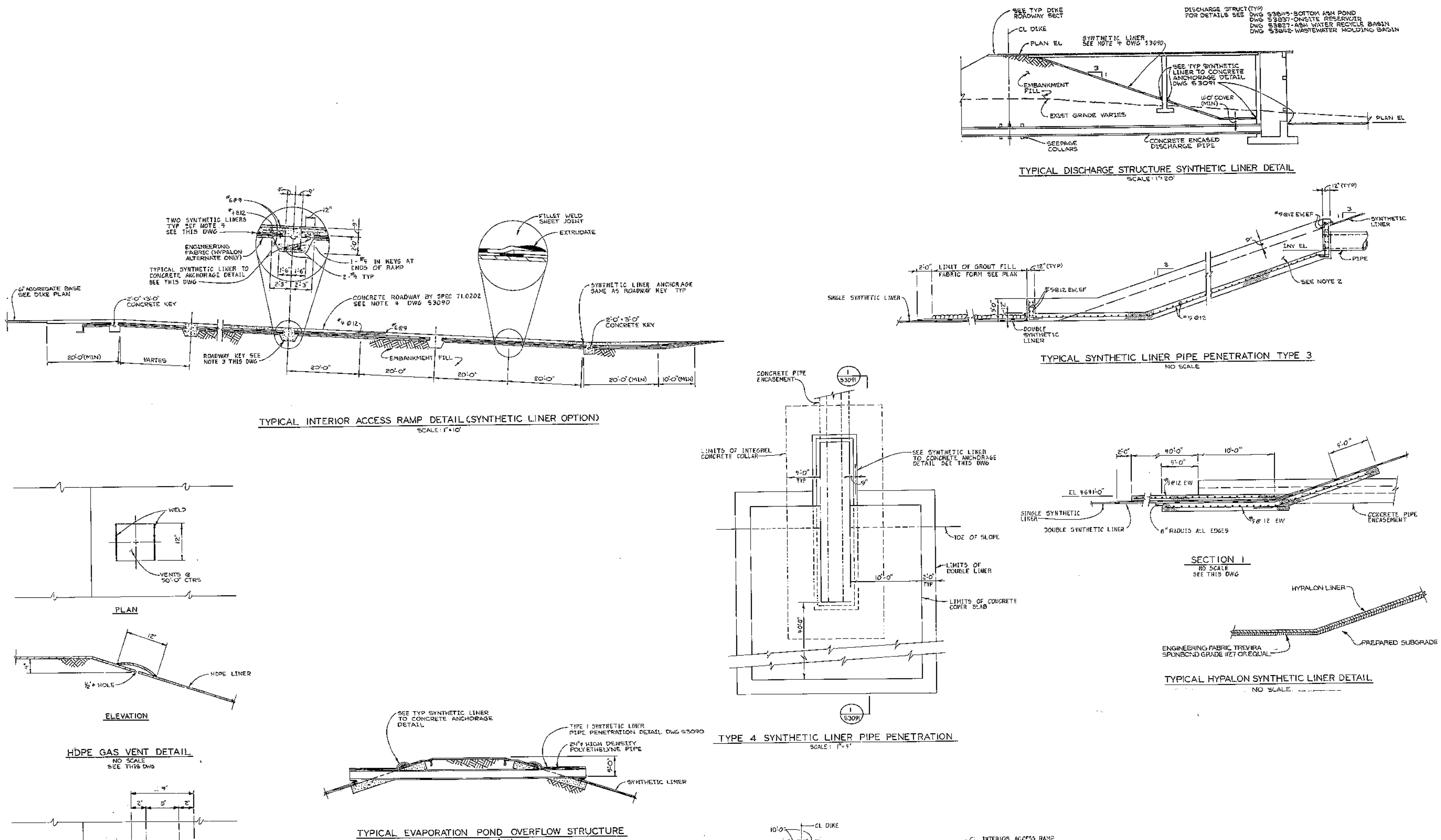
REGISTERED PROFESSIONAL ENGINEER No. 5454 Burford L. McCorkle STATE OF UTAH

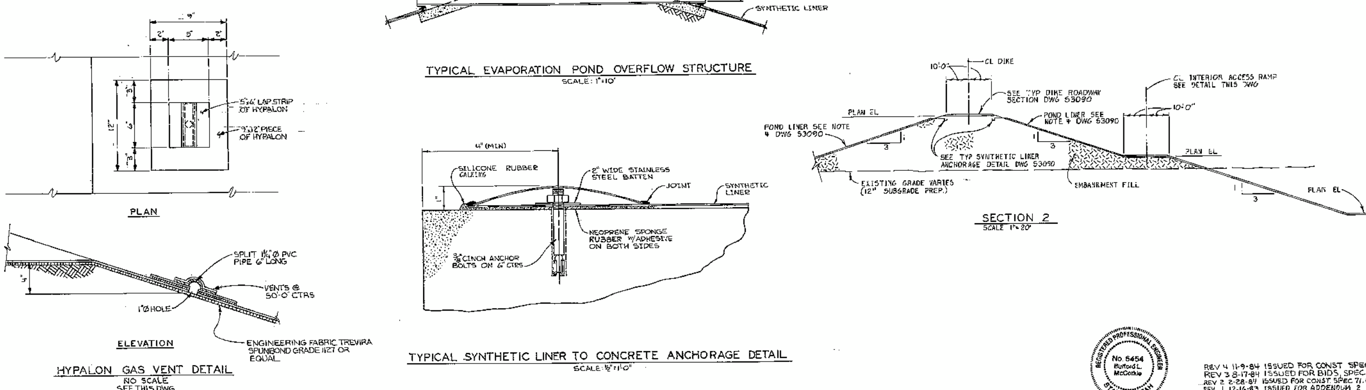
BLACK & VEATCH CONSULTING ENGINEERS
ENGINEER | DRAWN WML
CHECKED GVR | DATE 2-28-84

IPP INTERMOUNTAIN POWER PROJECT

PONDS AND EMBANKMENTS
SECTIONS AND DETAILS

PROJECT / DRAWING NUMBER: 9255-9STU-S3090 REV 4
CODE
AREA





NOTES

1. SEE DWG S3090 FOR GENERAL NOTES.
2. TYPE 3 PENETRATION SHALL EXTEND THREE FEET EITHER SIDE OF THE DISCHARGE PIPE.
3. THE CONCRETE ROADWAY SHALL BE INSTALLED IN TWO POURS. THE FIRST POUR SHALL CONSIST OF THE KEYS ONLY. THE SYNTHETIC LINER SHALL THEN BE PLACED ON THE RAMP AND ATTACHED TO THE KEYS. THE ROADWAY SURFACE SHALL BE POURED FOLLOWING THE INSTALLATION OF THE SYNTHETIC LINER.
4. IN ADDITION TO THE REQUIREMENTS OF THE TYPICAL ANCHORAGE DETAIL, THE HDPE SHEETS SHALL BE SEPARATED BY NEOPRENE SPONGE RUBBER WITH ADHESIVE ON BOTH SIDES. TWO LINES OF BATTEN STRIPS SHALL BE USED ON ALL FOUR SIDES OF THE KEY TRENCH ACHORAGE DETAIL.

REGISTERED PROFESSIONAL ENGINEER No. 5454 Buford L. McCorkle STATE OF UTAH

REV 4 11-9-84 ISSUED FOR CONST SPEC 71.0206
REV 3 8-17-84 ISSUED FOR BIDS, SPEC 71.0206
REV 2 2-28-84 ISSUED FOR CONST. SPEC 71.0202, 71.0207
REV 1 12-16-83 ISSUED FOR ADDENDUM 2 SPEC 71.0202
REV 0 12-2-83 ISSUED FOR BIDS SPEC 71.0207
REV 0 11-1-83 ISSUED FOR BIDS, SPEC 71.0202

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM
5	6-30-87	CONFORMED TO CONSTRUCTION RECORDS	BD		BLM	
4	11-9-84	APPROVED FOR CONST SPEC 71.0206		GVR	BLM	
3	8-17-84	REVISED & ADDED DETAILS & NOTES 3,4.		GVR	BLM	
2	2-28-84	REVISED & APPROVED FOR CONST. SPEC 71.0202, 71.0207		GVR	BLM	
1	12-16-83	ADDED DETAILS AND SECTIONS 1 & 2	LEN	GVR	BLM	
0	11-1-83	INITIAL ISSUE	GVR		BLM	

SCALE: AS NOTED

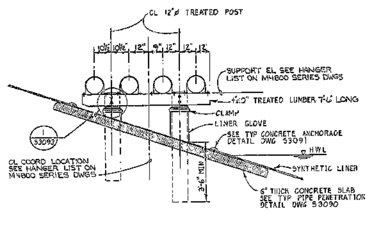
I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF UTAH
SIGNED B. L. McCorkle
DATE 11/1/83 REG NO. 5454

BLACK & VEATCH CONSULTING ENGINEERS
ENGINEER | DRAWN TAR
CHECKED GVR | DATE 2-28-84

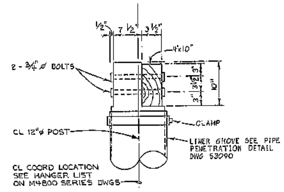
IPP INTERMOUNTAIN POWER PROJECT

PONDS AND EMBANKMENTS
LINER DETAILS

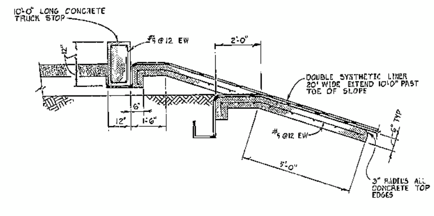
PROJECT 9255 – DRAWING NUMBER 9STU-S3091 – REV 5



BOTTOM ASH PIPE SUPPORT DETAIL LOOKING EAST
(120 REQUIRED)
NO SCALE



DETAIL 1
NO SCALE
SEE THIS DWG



DETAIL 2
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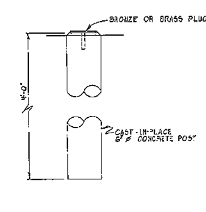
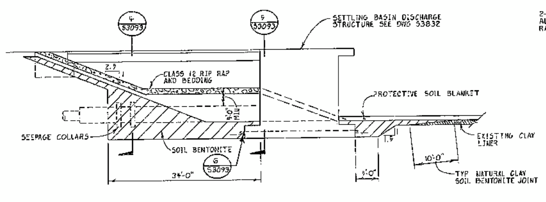
SEE DWG 53098



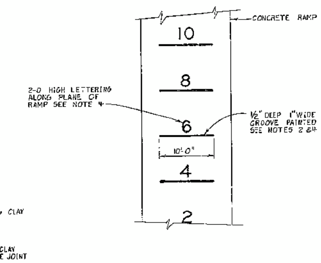
SETTLEMENT MONUMENT
NO SCALE

SETTLEMENT MONUMENT LOCATION*		
MONUMENT NUMBER	NORTH COORDINATE	EAST COORDINATE
SM-1	19,017	19,080
SM-2	14,080	19,459
SM-3	13,141	18,500
SM-4	13,500	17,490
SM-5	14,285	18,000
SM-6	22,410	7,323
SM-7	20,190	6,329
SM-8	20,190	8,299
SM-9	17,961	7,323
SM-10	20,495	9,780
SM-11	19,320	10,809
SM-12	19,320	8,759
SM-13	18,176	9,780
SM-14	17,490	9,780

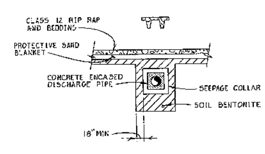
* SEE NOTES BELOW



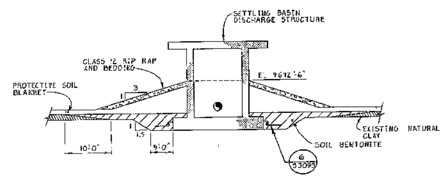
SETTLING BASIN STRUCTURE DIKE INTERFACE
SCALE: 1"=10'



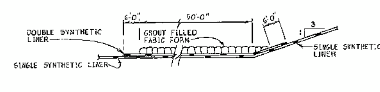
DETAIL 3
NO SCALE
SEE NOTE 2



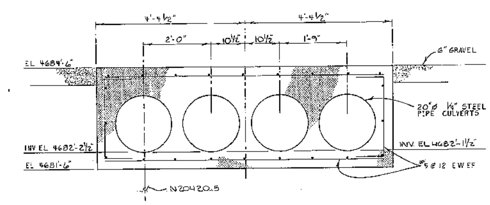
SECTION 4
SCALE: 1"=10'
SEE THIS DWG



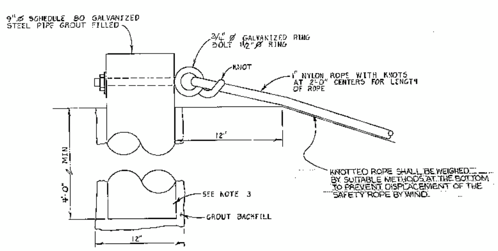
SECTION 5
SCALE: 1"=10'
SEE THIS DWG



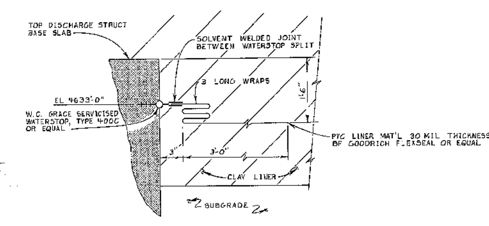
BOTTOM ASH POND GROUT FILLED FABRIC FORM DETAIL
NO SCALE



BOTTOM ASH CULVERT DETAIL LOOKING WEST
(3 REQUIRED)
NO SCALE



SAFETY ROPE DETAIL
NO SCALE



DETAIL 6
NO SCALE
SEE THIS DWG

NOTES

1. SEE DWG 53090 FOR GENERAL NOTES
2. GRIND GROOVE AND PAINT DEPTH LEVEL EVERY 2'-0" CHANGE IN VERTICAL ELEVATION.
3. SAFETY ROPES AT 100 FEET SPACING CENTERED BETWEEN GAS VENTS ON PERIMETER OF ALL SYNTHETIC LINED PONDS. INSTALLED BY CONTRACT 71.0206.
4. PAINT SHALL BE A MIN 10 MILS OF CARBOLINE 195 SURFACER BELOW 8 MILS OF WHITE CARBOLINE PHENOLINE 300 FINISH BACKGROUND. THE NUMBERS SHALL BE PAINTED WITH A MIN OF 8 MILS OF CARBOLINE PHENOLINE 302, BLACK.
5. MONUMENTS SHALL BE LOCATED ON EDGE OF AGGREGATE SURFACED ROADS, AS AS CLOSE AS POSSIBLE TO LISTED COORDINATES.
6. MONUMENTS SHALL BE INSTALLED AS SOON AS POSSIBLE FOLLOWING COMPLETION OF EACH RESPECTIVE EMBANKMENT TO PROPERLY MONITOR SETTLEMENT.
7. THE ELEVATION OF EACH MONUMENT SHALL BE ESTABLISHED TO THE NEAREST 0.01 FT.
8. THE CONTRACTOR SHALL SUBMIT FINAL LOCATIONS AND ELEVATIONS OF ALL MONEMENTS TO THE CONSTRUCTION MANAGER.

REGISTERED PROFESSIONAL ENGINEER No. 5454 Burford L. McCorkle STATE OF UTAH

REV 5 11-9-84 ISSUED FOR CONST SPEC 71.0206
REV 4 8-29-84 ISSUED TO CONTR 71.0202
REV 3 8-17-84 ISSUED FOR BIDS, SPEC 71.0206
REV 2 2-28-84 ISSUED FOR CONSTRUCTION SPEC. 71.0202, 71.0207
REV 1 12-16-83 ISSUED FOR ADDENDUM 2 SPEC 71.0202
REV 0 11-23-83 ISSUED FOR ADDENDUM 1 SPEC 71.0202
REV 0 12-2-83 ISSUED FOR BIDS SPEC 71.0207

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLK
6	6-30-87	CONFORMED TO CONSTRUCTION RECORDS	BD		BLM	
5	11-9-84	APPROVED FOR CONST SPEC 71.0206	MSK	GVR	BLM	
4	8-29-84	REVISED ASH PIPE SUPPORT DETAIL & DETAIL 1	MSK	GVR	BLM	
3	8-17-84	ECN 022/71.0202, REVISED & ADDED DETAILS, NOTES	MSK	GVR	BLM	
2	2-28-84	REVISED & APPROVED FOR CONST. SPEC. 71.0202, 71.0207	MSK	GVR	BLM	
1	12-16-83	ADDED DETAILS AND NOTES	LEN	GVR	BLM	
0	11-23-83	INITIAL ISSUE	LEN			

SCALE:

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF UTAH
SIGNED B L McCorkle
DATE 11-23-83 REG NO. 5454

BLACK & VEATCH CONSULTING ENGINEERS
ENGINEER GVR DRAWN LEN
CHECKED GVR DATE 2-28-84

IPP INTERMOUNTAIN POWER PROJECT

PONDS AND EMBANKMENTS
LINER DETAILS

PROJECT 9255 - DRAWING NUMBER 9STU-S3093 REV 6
CODE
AREA

from borrow areas as necessary. After preparation of the fill or embankment site, the subgrade shall be scarified, leveled, and rolled so that surface materials of the subgrade will be compact and well bonded with the first layer of the fill or embankment. All material deposited in fills and embankments shall be free from rocks or stones, brush, stumps, logs, roots, debris, and organic or other objectionable materials. Fills and embankments shall be constructed in horizontal layers not exceeding 8 inches in uncompacted thickness. Material deposited in piles or windrows by excavating and hauling equipment shall be spread and leveled prior to compaction.

Each layer shall be thoroughly compacted. The compacted density of each layer shall be at least 90 per cent of the maximum density within a range of ±2 per cent of optimum moisture content as determined by ASTM D1557. If the material fails to meet the density specified, compaction methods shall be modified as required to attain the specified density.

2A.10 BORROW AREAS. Material necessary to complete fills and embankments shall be excavated from borrow areas and hauled to the fill or embankment site. Borrow material will be available on the Owner's property.

The location, size, shape, depth, drainage, and surfacing of all borrow areas shall be acceptable to the Construction Manager. Borrow areas shall be regular in shape, with finish graded surfaces when completed. Side slopes shall not be steeper than three horizontal to one vertical and shall be uniform for the entire length of any one side.

2A.11 MAINTENANCE AND RESTORATION OF FILLS AND BACKFILLS. Fills and backfills that settle or erode before final acceptance of the work, and pavement, structures, and other facilities damaged by such settlement or erosion, shall be repaired. The settled or eroded areas shall be refilled, compacted, and graded to conform to the elevation indicated on the drawings or to the elevation of the adjacent ground surface. Damaged facilities shall be repaired in a manner acceptable to the Construction Manager.

Earth slopes of the roads and parking areas constructed under these specifications shall be maintained to the lines and grades indicated on the drawings until the final acceptance of the roads and parking areas.

2A.12 GRADING TO ESTABLISH FINAL GRADES. All areas of the site shall be graded as required to establish the final grade elevations as indicated on the drawings. The grading shall be finished to the contours and elevations indicated on the drawings or, if not indicated, to the matching contours and elevations of the original, undisturbed ground surface. The final grading shall provide smooth uniform surfacing and effective drainage of the ground areas.

Slope Stability Analysis Results

Intermountain Power Station CCR Assessment

Cross-section: North Embankment of Bottom Ash Basin
Static Limit Equilibrium Analysis

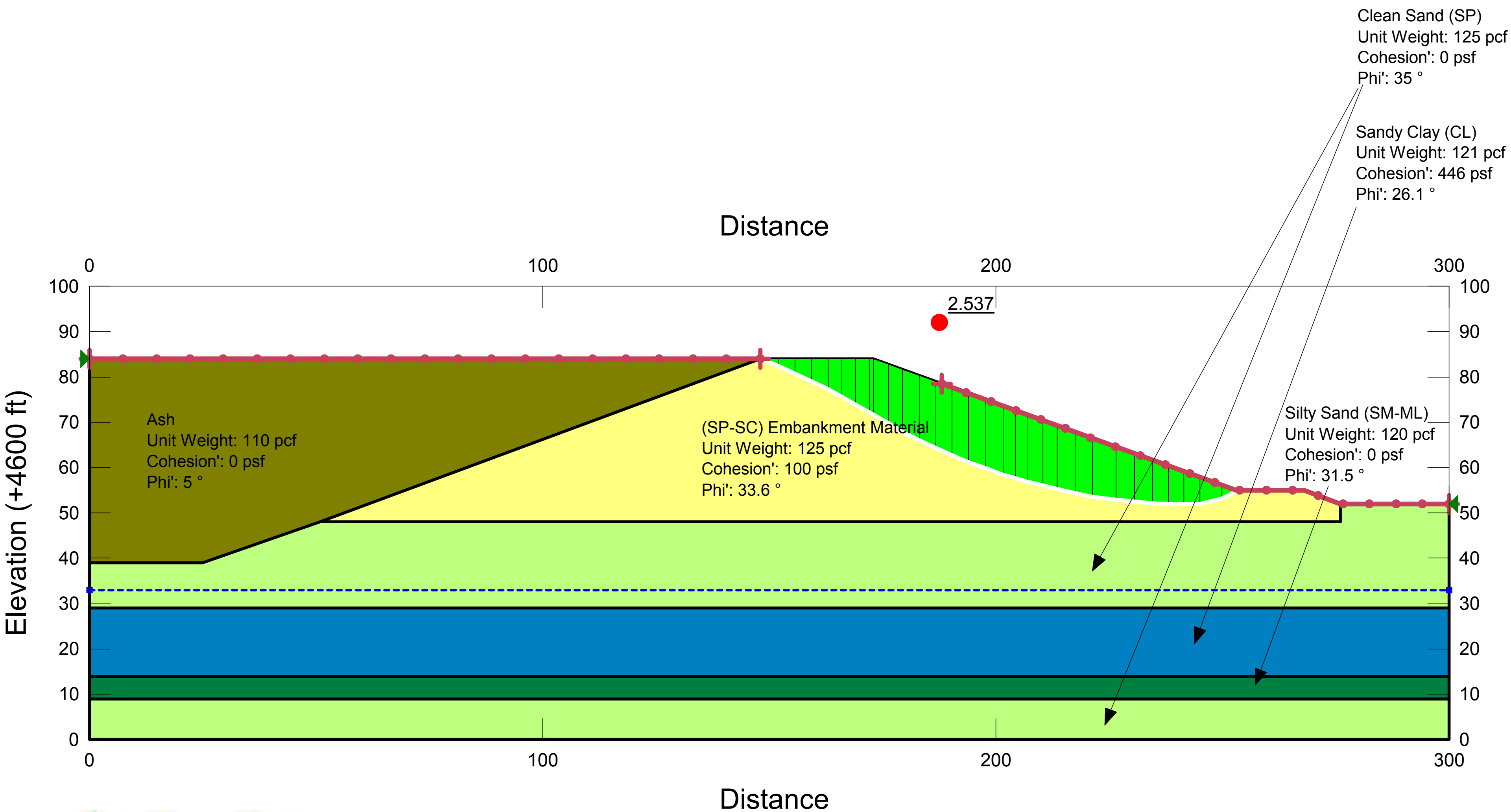
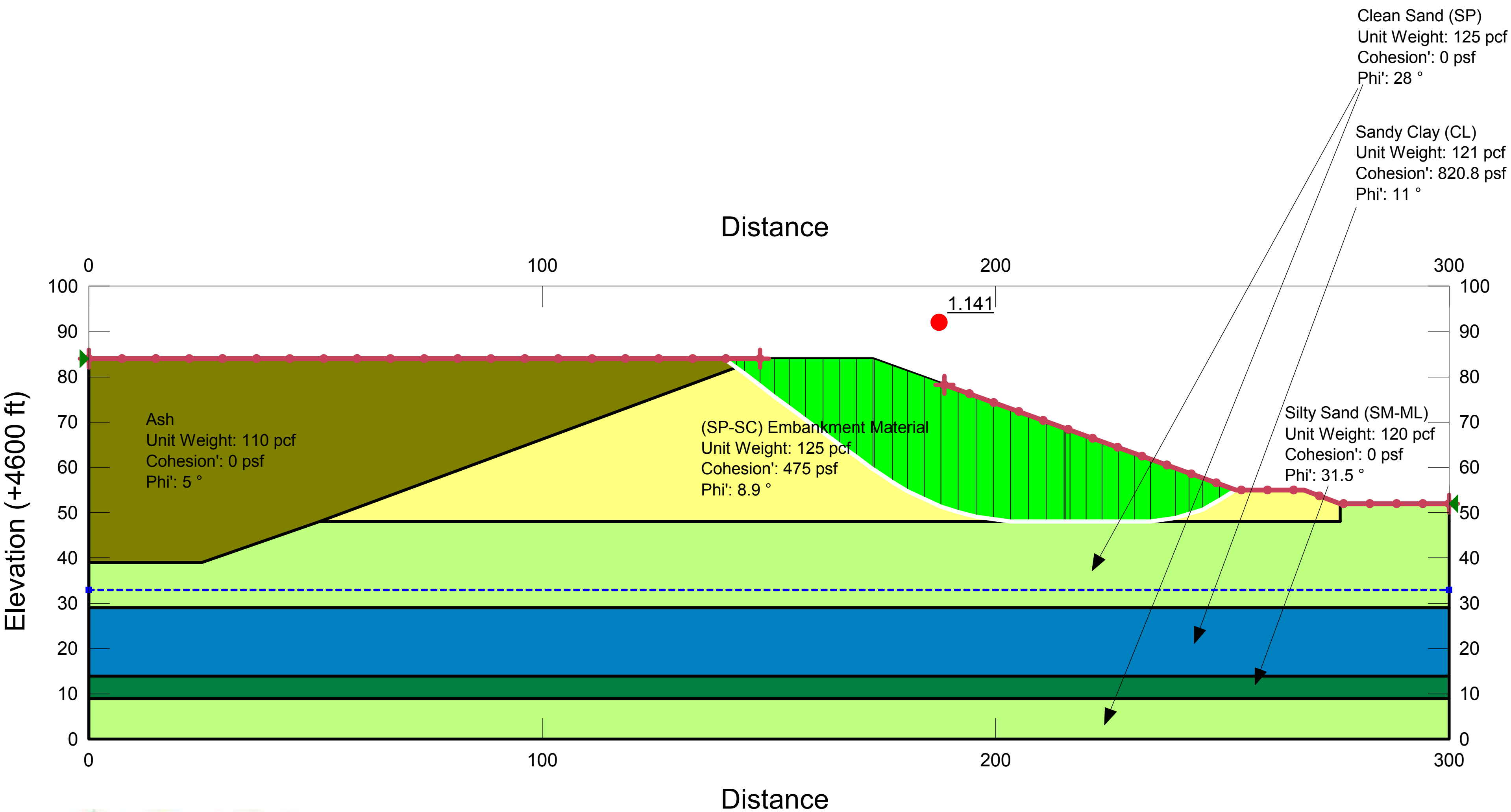


Figure B-1

Intermountain Power Station CCR Assessment

Cross-section: North Embankment of Bottom Ash Basin
Pseudo-Dynamic Limit Equilibrium Analysis

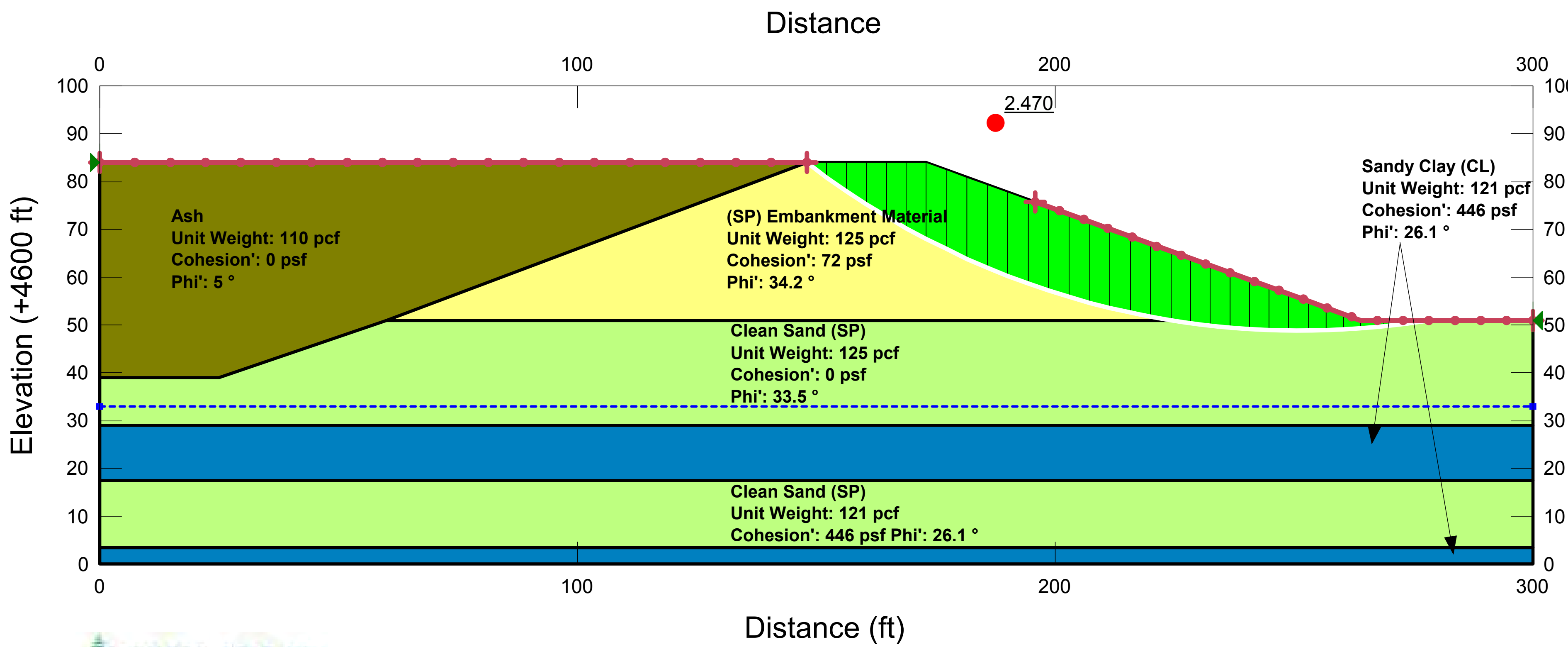


GERHART COLE INC.

Figure B-2

Intermountain Power Station CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin
Static Limit Equilibrium Analysis

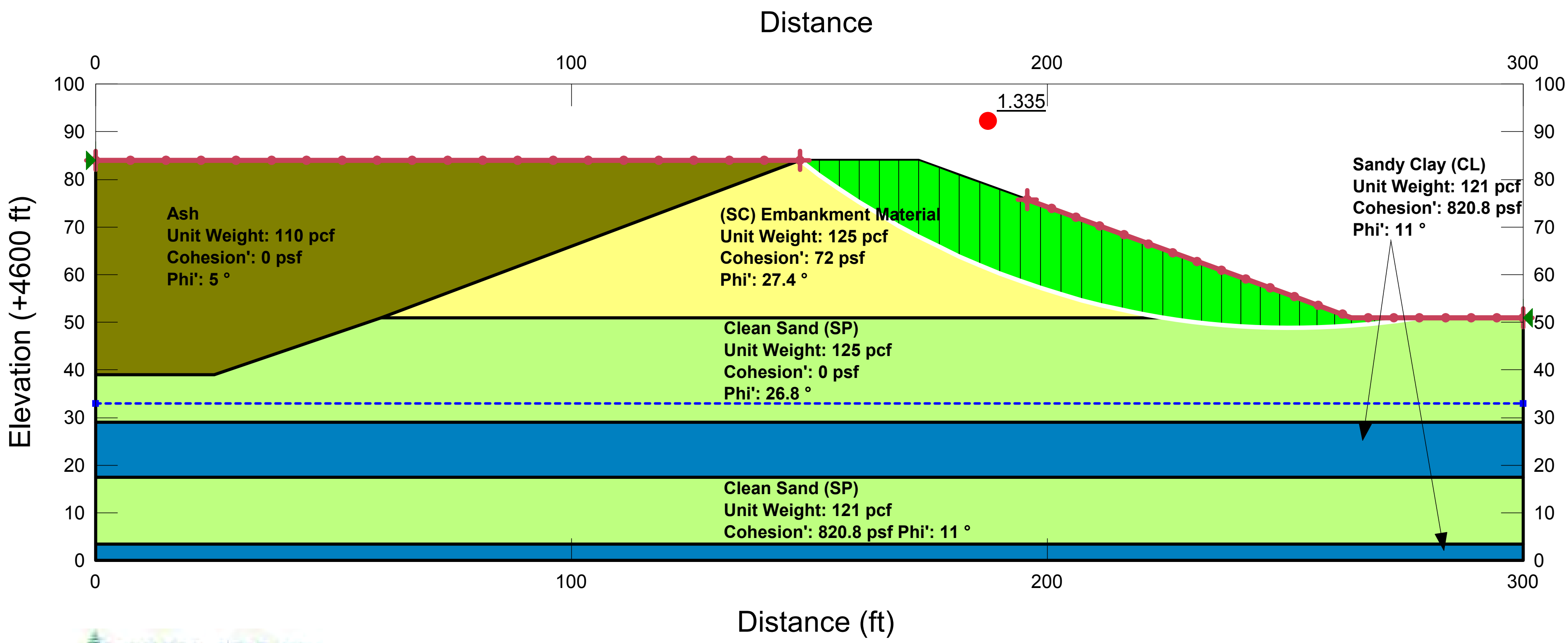


GERHART COLE INC.

Figure B-3

Intermountain Power Station CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin
Pseudo-Dynamic Limit Equilibrium Analysis



GERHART COLE INC.

Figure B-4

Intermountain Power Station CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin - South Embankment
Static Limit Equilibrium Analysis

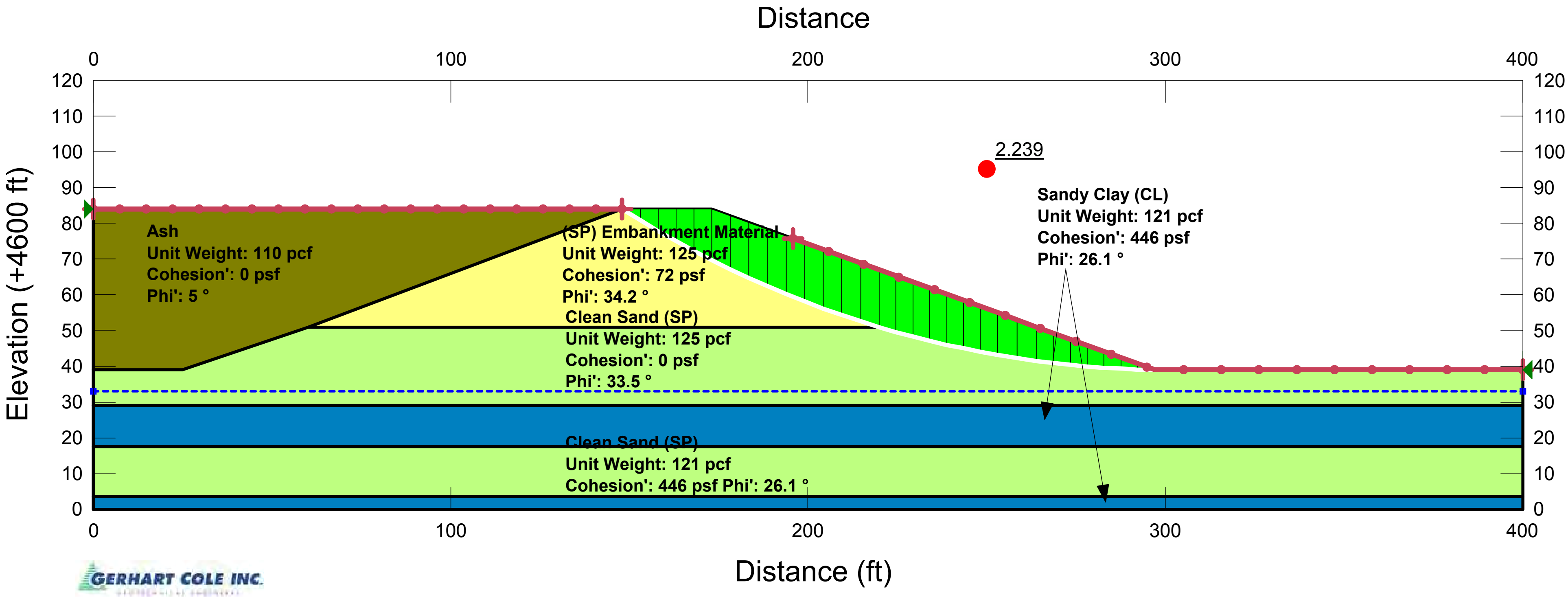
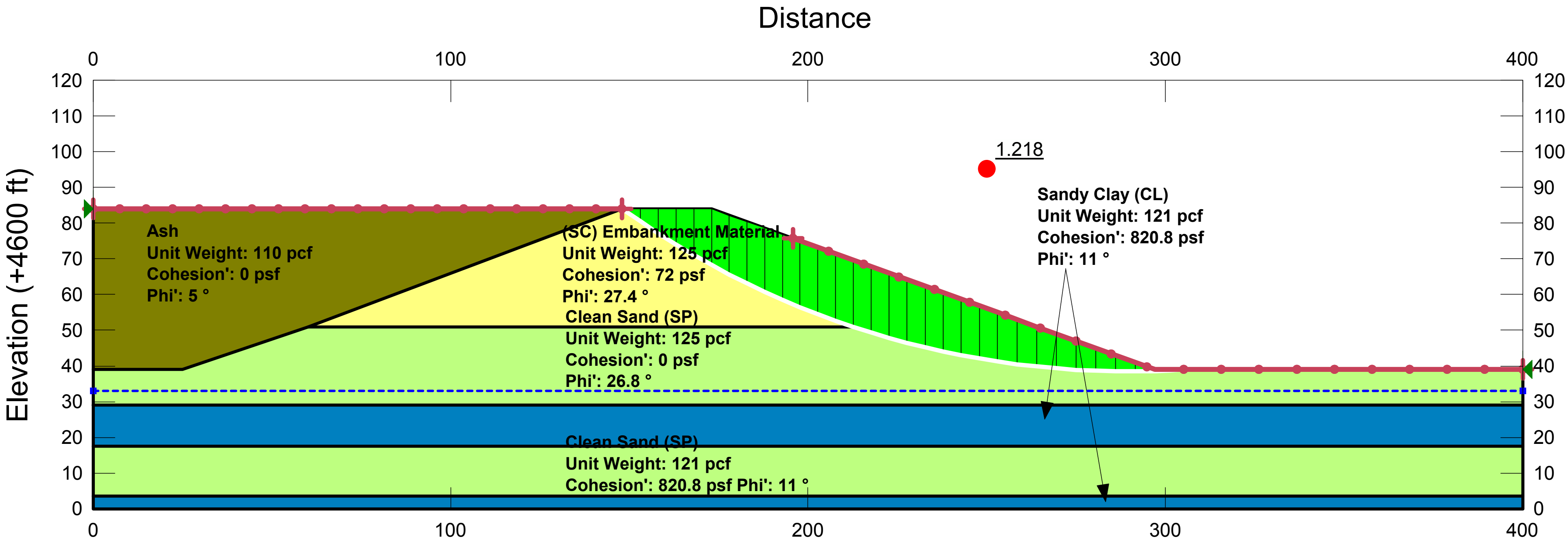


Figure B-5

Intermountain Power Station CCR Assessment

Cross-section: Southeast Corner of Bottom Ash Basin - South Embankment
Pseudo-Dynamic Limit Equilibrium Analysis

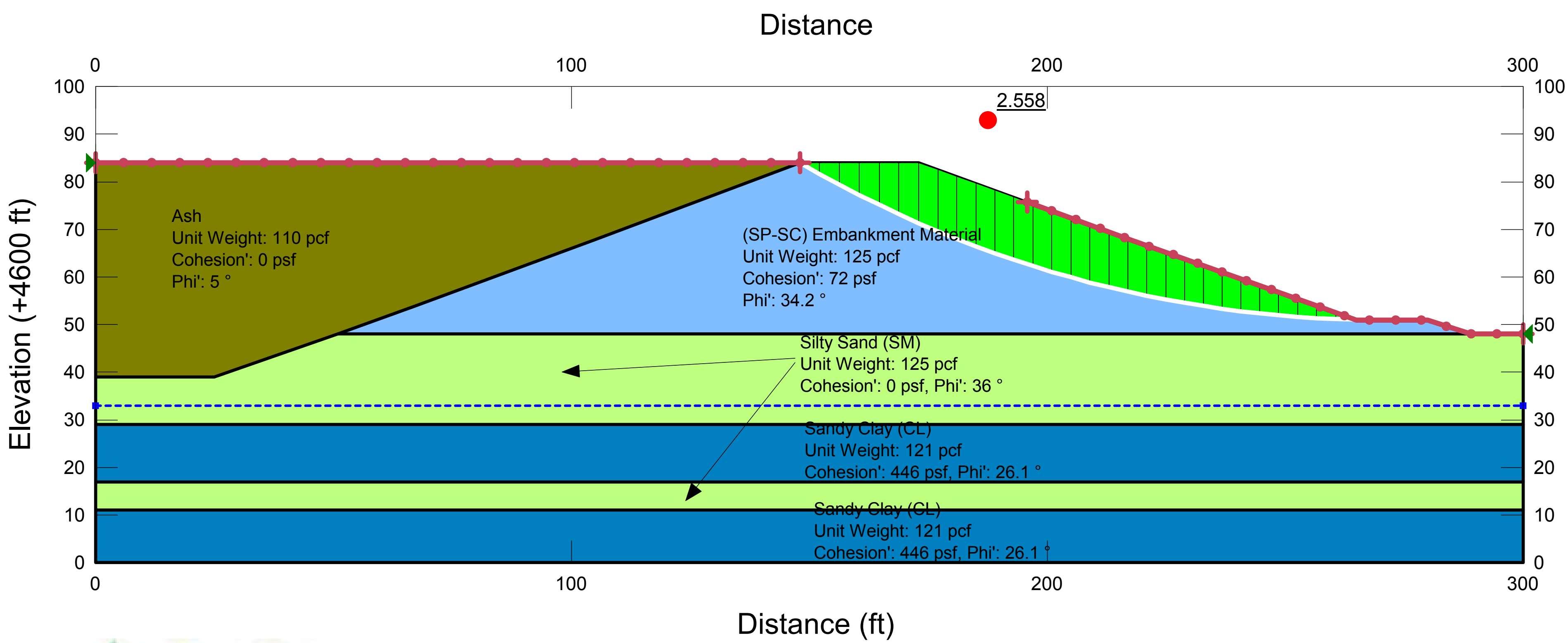


GERHART COLE INC.

Figure B-6

Intermountain Power Station CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin
Static Limit Equilibrium Analysis

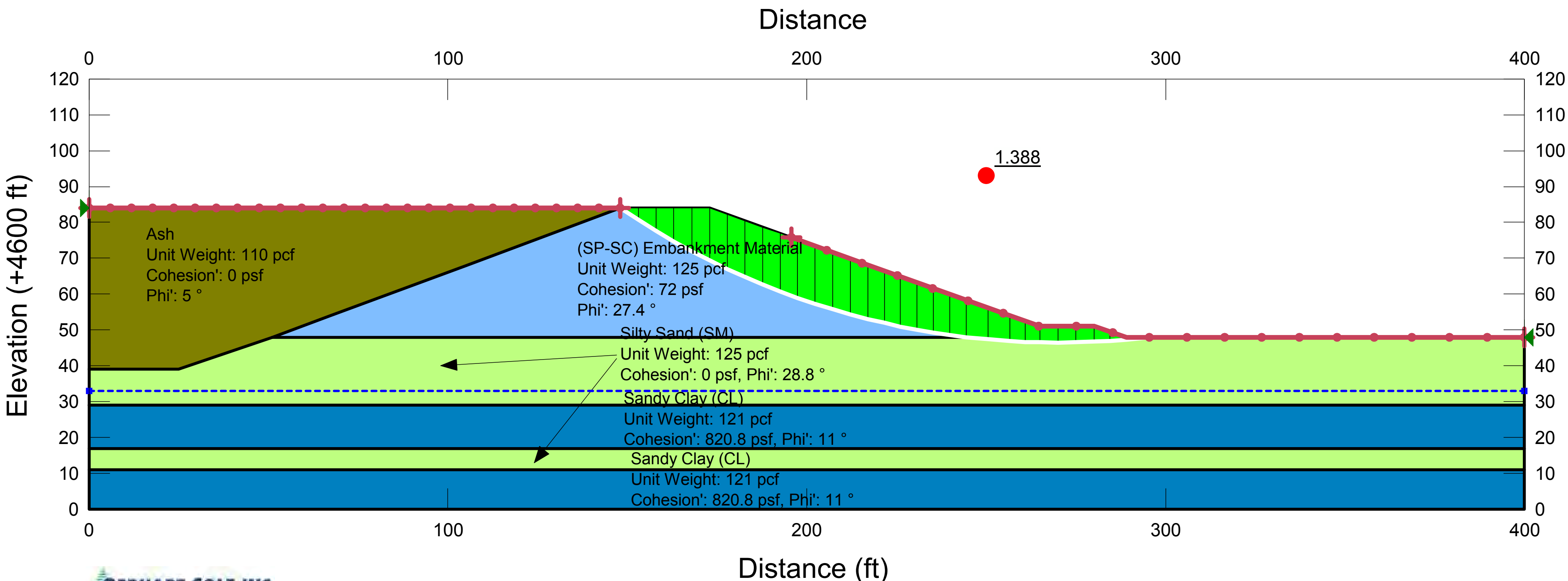


GERHART COLE INC.

Figure B-7

Intermountain Power Station CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin
Pseudo-Dynamic Limit Equilibrium Analysis



GERHART COLE INC.

Figure B-8

Intermountain Power Station CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin -South Embankment
Static Limit Equilibrium Analysis

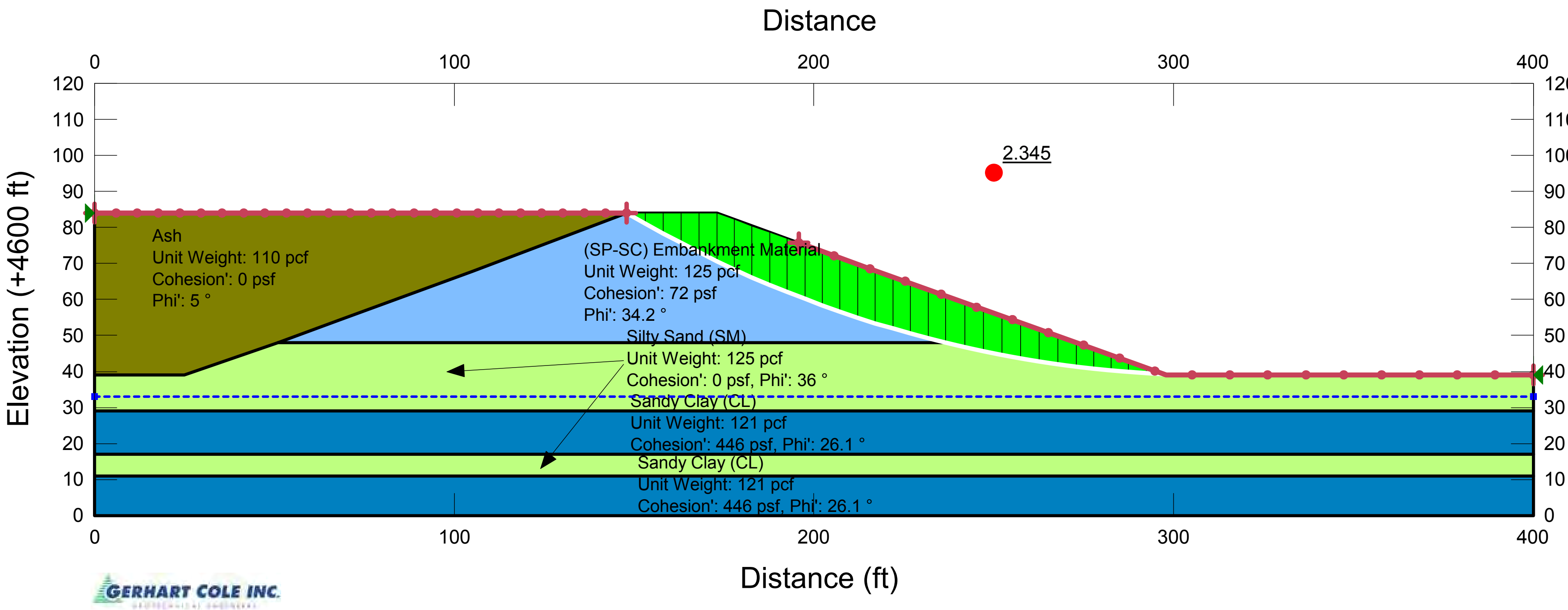
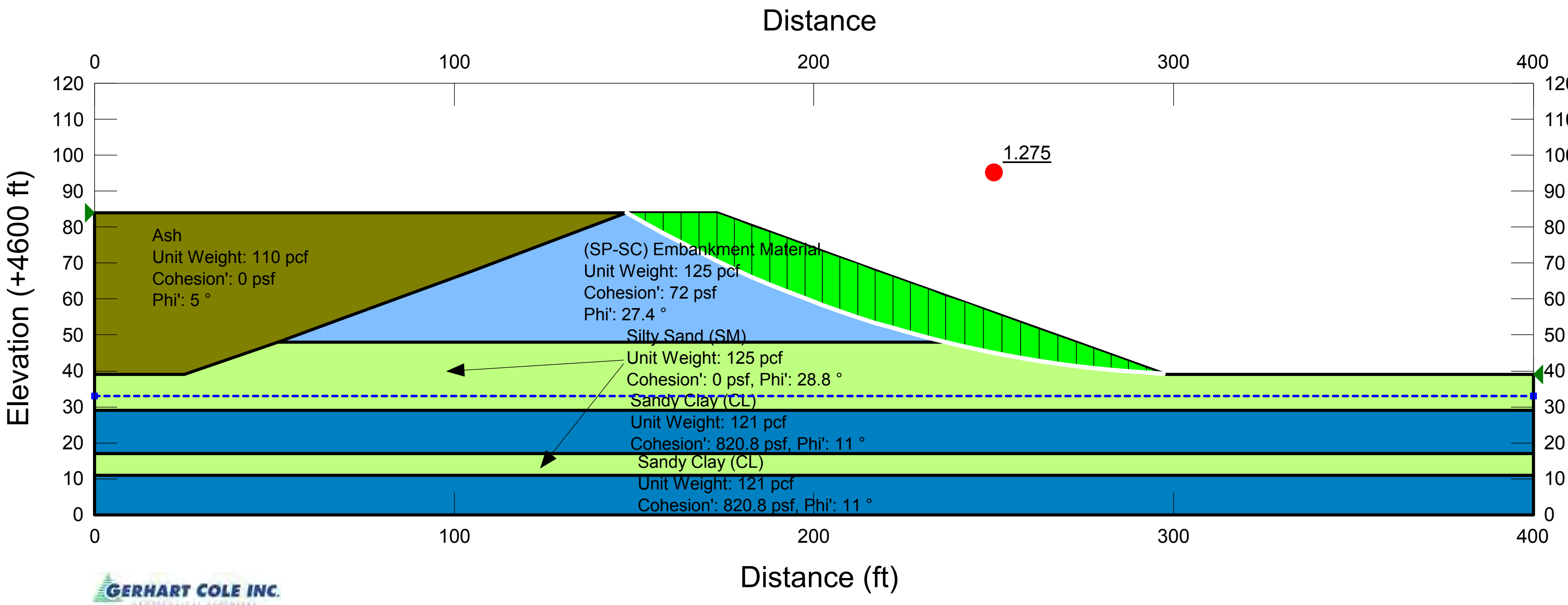


Figure B-9

Intermountain Power Station CCR Assessment

Cross-section: Southwest Corner of Bottom Ash Basin - South Embankment
Pseudo-Dynamic Limit Equilibrium Analysis

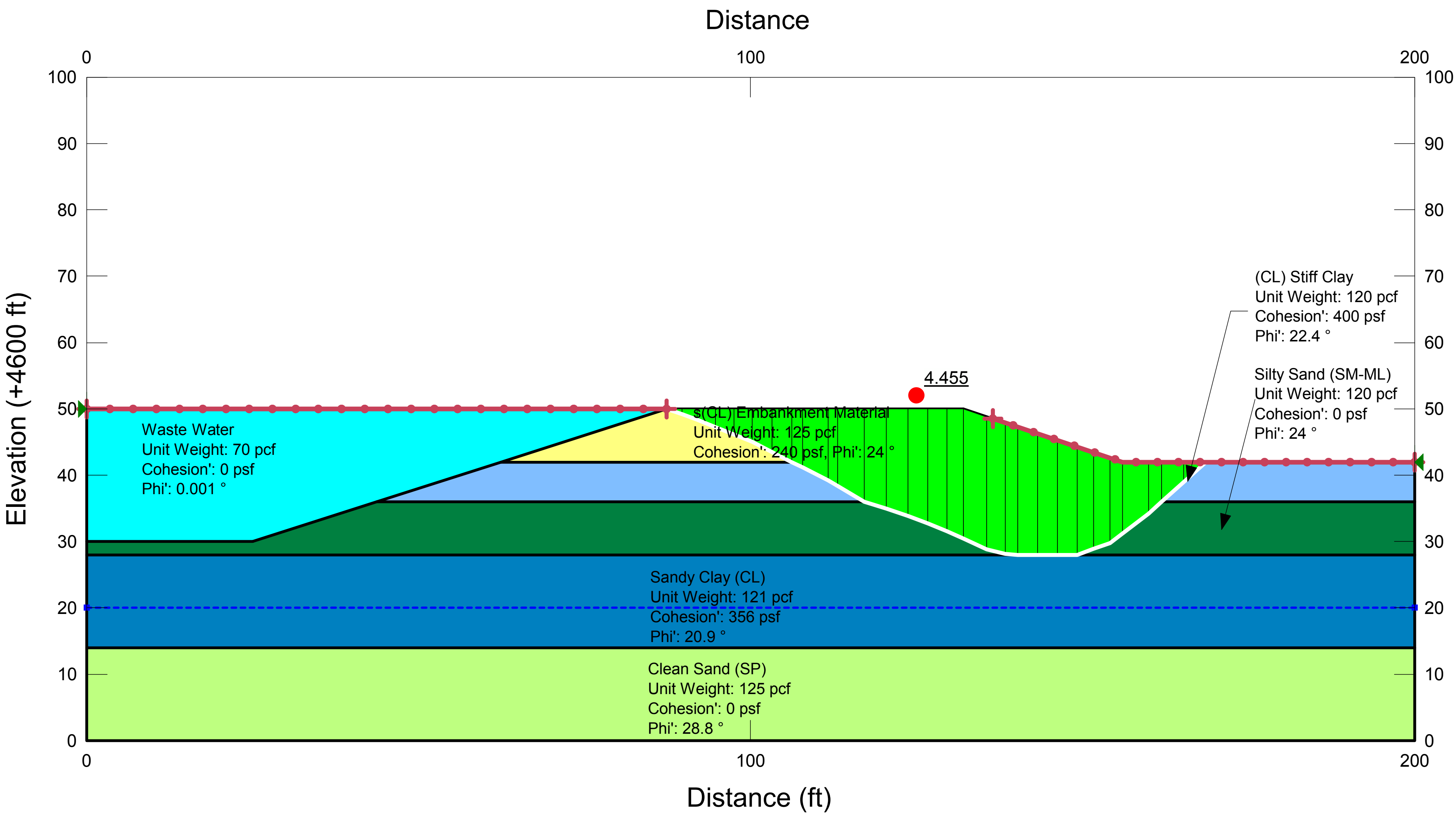


GERHART COLE INC.

Figure B-10

Intermountain Power Station CCR Assessment

Cross-section: Northwest Corner of Waste Water Basin
Static Limit Equilibrium Analysis

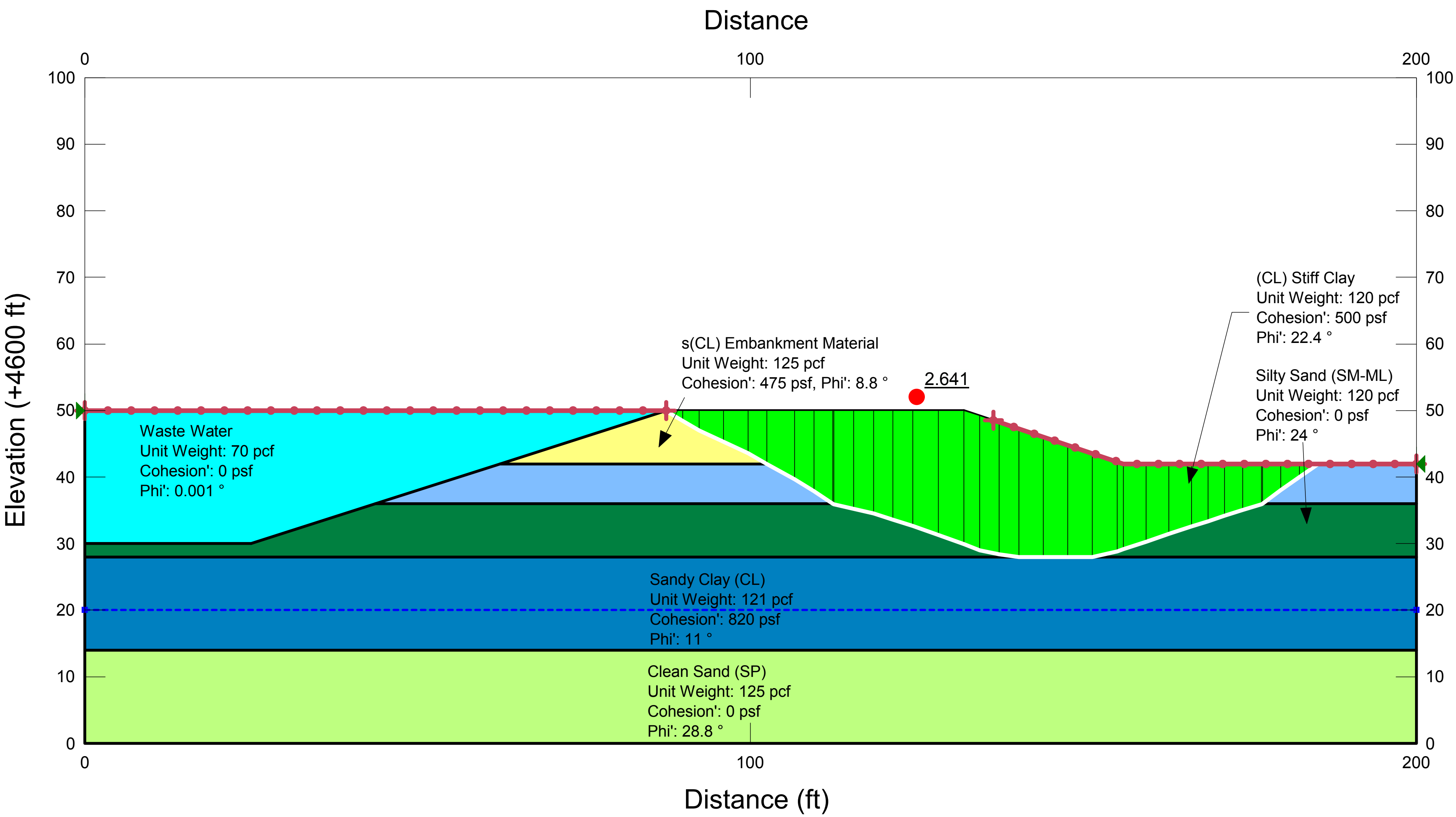


GERHART COLE INC.

Figure B-11

Intermountain Power Station CCR Assessment

Cross-section: Northwest Corner of Waste Water Basin
Pseudo-Dynamic Limit Equilibrium Analysis

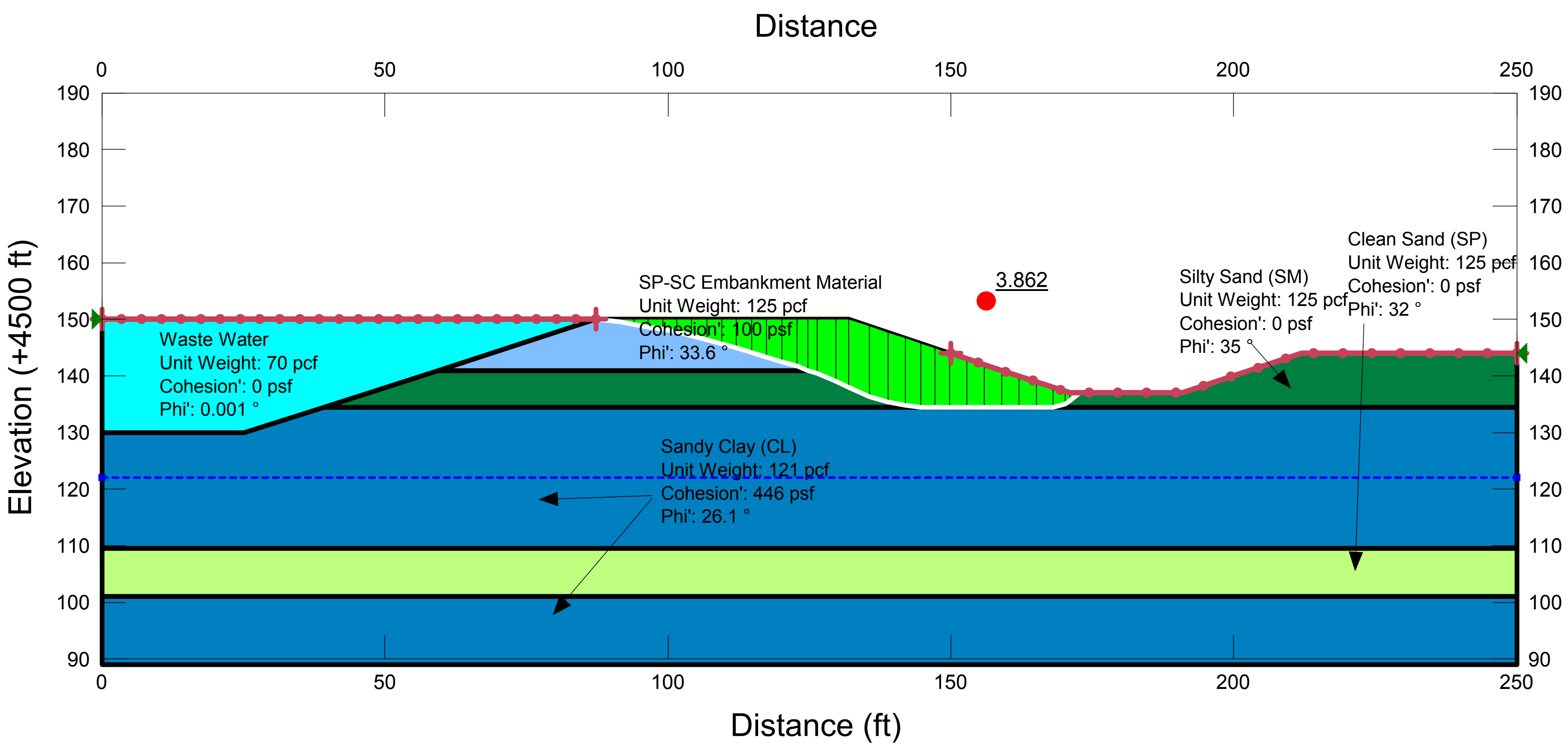


GERHART COLE INC.

Figure B-12

Intermountain Power Station CCR Assessment

Cross-section: South Embankment of Waste Water Basin
Static Limit Equilibrium Analysis

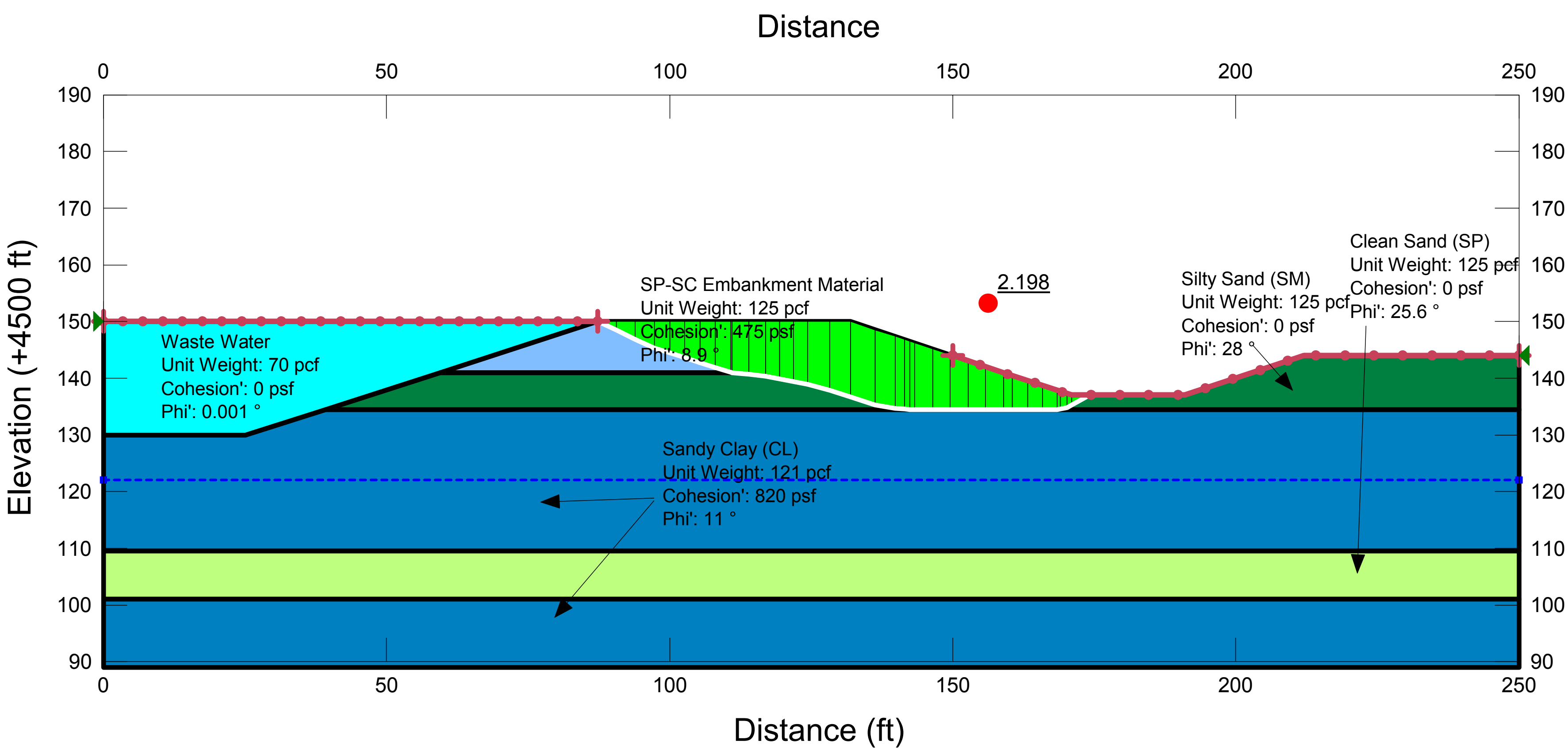


GERHART COLE INC.

Figure B-13

Intermountain Power Station CCR Assessment

Cross-section: South Embankment of Waste Water Basin
Pseudo-Dynamic Limit Equilibrium Analysis



GERHART COLE INC.

Figure B-14

Bottom Ash Basin Capacity Table

Contour Elevation	Water Depth	Volume in Acre Feet
4684	47	3421
4682	45	3124
4680	43	2929
4678	41	2744
4676	39	2561
4674	37	2383
4672	35	2210
4670	33	2041
4668	31	1877
4666	29	1718
4664	27	1564
4662	25	1414
4660	23	1268
4658	21	1127
4656	19	990
4654	17	858
4652	15	729
4650	13	606
4648	11	486
4646	9	371
4644	7	260
4642	5	153
4640	3	50
4637	0	0

Waste Water Basin Capacity Table

Contour Elevation	Water Depth	Volume in Acre Feet
4650	22	917
4649	21	866
4648	20	815
4647	19	765
4646	18	716
4645	17	667
4644	16	618
4643	15	570
4642	14	522
4641	13	474
4640	12	427
4639	11	380
4638	10	334
4637	9	287
4636	8	242
4635	7	197
4634	6	152
4633	5	108
4632	4	64
4631	3	28
4630	2	8.5
4629	1	1.3
4628	0	0

RAINFALL EXCESS CALCULATIONS

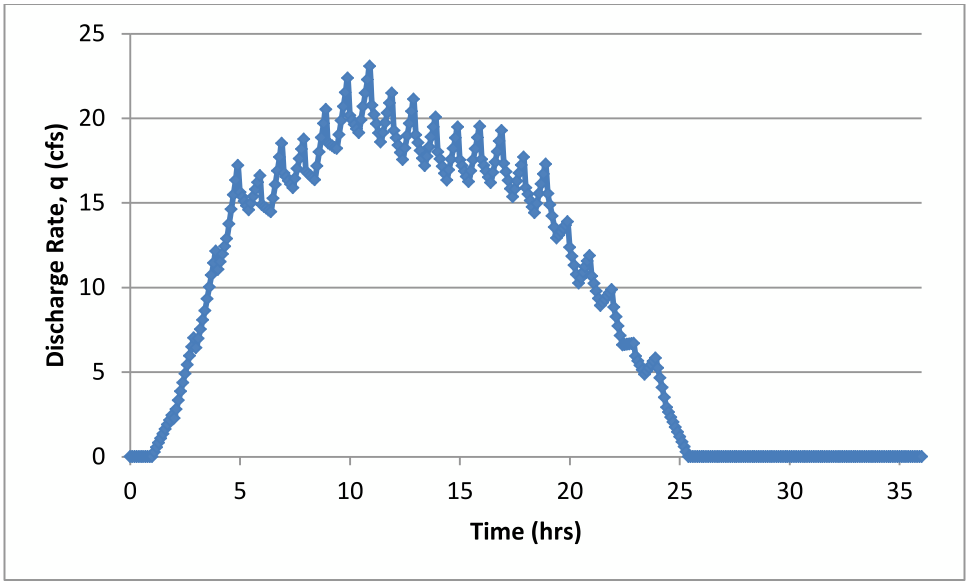
Rainfall Excess L

CN	**96**
Precip (in)	**1.61**
Duration (hr)	**24**
Area (ac)	**271**
(mi^2)	0.4234375
S' (in)	0.4166667

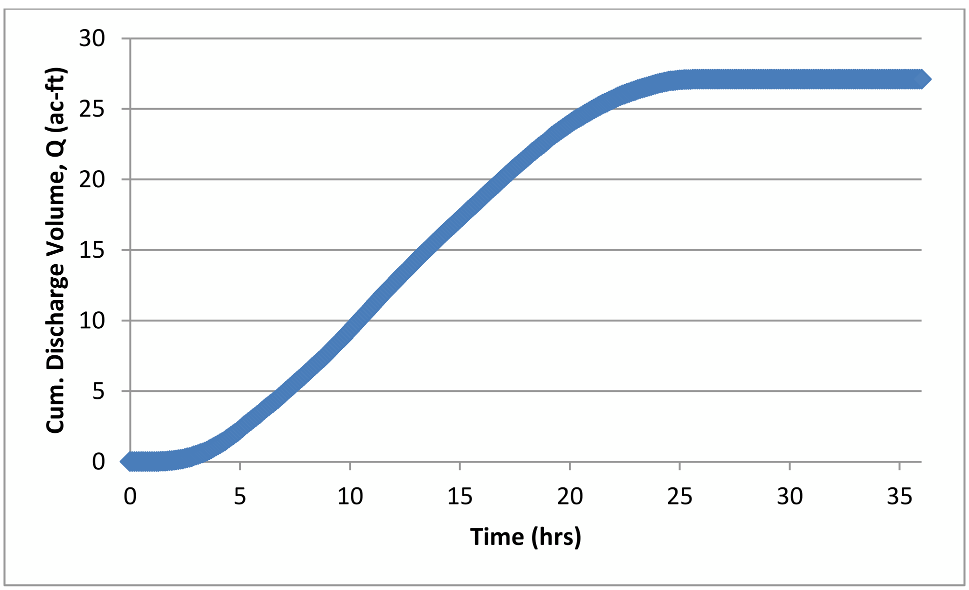
Increment	Time (hr)	Duration (%)	Precip (%)	Precip (in)	Cumulative Excess, R (in)	Incrementa Excess, R (in)	Cumulative Excess (ac-ft)	Instantanec Excess (in/hr)	Cumulative Infiltration (in)
0	0	0	0	0	0	0	0	0	0
1	1	4.1666667	5	0.0805	1.94E-05	1.94E-05	0.0004381	1.94E-05	0.0804806
2	2	8.3333333	9.6666667	0.1556333	0.0106905	0.0106711	0.2414267	0.0106711	0.1449429
3	3	12.5	14.25	0.229425	0.0379253	0.0272348	0.8564795	0.0272348	0.1914997
4	4	16.666667	19.5	0.31395	0.082165	0.0442397	1.85556	0.0442397	0.231785
5	5	20.833333	25.416667	0.4092083	0.1430149	0.0608499	3.229753	0.0608499	0.2661934
6	6	25	30	0.483	0.1956718	0.0526569	4.4189224	0.0526569	0.2873282
7	7	29.166667	35.1875	0.5665188	0.2594517	0.0637799	5.8592841	0.0637799	0.3070671
8	8	33.333333	39.916667	0.6426583	0.3205401	0.0610884	7.2388637	0.0610884	0.3221182
9	9	37.5	45.125	0.7265125	0.3903204	0.0697803	8.8147355	0.0697803	0.3361921
10	10	41.666667	50.555556	0.8139444	0.4652688	0.0749484	10.507321	0.0749484	0.3486756
11	11	45.833333	55.958333	0.9009292	0.541589	0.0763201	12.230884	0.0763201	0.3593402
12	12	50	60.75	0.978075	0.6104602	0.0688713	13.786227	0.0688713	0.3676148
13	13	54.166667	65.541667	1.0552208	0.680251	0.0697907	15.362334	0.0697907	0.3749699
14	14	58.333333	69.944444	1.1261056	0.745063	0.064812	16.826006	0.064812	0.3810426
15	15	62.5	74.25	1.195425	0.8089885	0.0639255	18.269656	0.0639255	0.3864365
16	16	66.666667	78.555556	1.2647444	0.8733819	0.0643934	19.723875	0.0643934	0.3913625
17	17	70.833333	82.75	1.332275	0.9365079	0.0631259	21.149469	0.0631259	0.3957671
18	18	75	86.5	1.39265	0.9932368	0.0567289	22.430597	0.0567289	0.3994132
19	19	79.166667	90.25	1.453025	1.0502122	0.0569754	23.717292	0.0569754	0.4028128
20	20	83.333333	93	1.4973	1.0921366	0.0419245	24.664086	0.0419245	0.4051634
21	21	87.5	95.5	1.53755	1.1303463	0.0382097	25.526988	0.0382097	0.4072037
22	22	91.666667	97.5	1.56975	1.1609762	0.0306299	26.218713	0.0306299	0.4087738
23	23	95.833333	98.75	1.589875	1.1801466	0.0191704	26.651644	0.0191704	0.4097284
24	24	100	100	1.61	1.1993368	0.0191902	27.085022	0.0191902	0.4106632

COMPOSITE RUNOFF HYDROGRAPH

(Oscillations due to discretization of 24 unit hydrographs)



COMPOSITE DISCHARGE CURVE



tc (hr) **0.6666667**
Lag Time = 0.6 x tc (hr) 0.4

Incremental Hydrograph #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Increment 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
time (hr) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Time to Peak, tp (hr)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
Cum Time to Peak, tp (hr)	0.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.9	
Excess, R (in)	1.94E-05	0.0106711	0.0272348	0.0442397	0.0608499	0.0526569	0.0637799	0.0610884	0.0697803	0.0749484	0.0763201	0.0688713	0.0697907	0.064812	0.0639255	0.0643934	0.0631259	0.0567289	0.0569754	0.0419245	0.0382097	0.0306299	0.0191704	0.0191902	
qp (cfs)	0.0044174	2.429969	6.2017824	10.074061	13.856446	11.990791	14.523647	13.910761	15.890041	17.066906	17.379259	15.683043	15.892414	14.758689	14.556809	14.663367	14.374743	12.918044	12.974166	9.5468419	8.7009311	6.9748949	4.365389	4.3698914	
Total Time (hr)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	q (cfs)	Cumulative q (cfs)
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0.0004908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0004908
0.2	0.0009816	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0009816
0.3	0.0014725	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0014725
0.4	0.0019633	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0019633
0.5	0.0024541	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0024541
0.6	0.0029449	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0029449
0.7	0.0034357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0034357
0.8	0.0039265	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0039265
0.9	0.0044174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0044174
1	0.0041229	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0041229
1.1	0.0038284	0.2699966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2738249
1.2	0.0035339	0.5399931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.543527
1.3	0.0032394	0.8099897	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8132291
1.4	0.0029449	1.0799862	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0829311
1.5	0.0026504	1.3499828	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3526332
1.6	0.0023559	1.6199794	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.6223353
1.7	0.0020614	1.8899759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.8920373
1.8	0.0017669	2.1599725	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1617394
1.9	0.0014725	2.429969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4314415
2	0.001178	2.2679711	3.06E-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.2691491
2.1	0.0008835	2.1059732	0.6890869	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.7959436
2.2	0.000589	1.9439752	1.3781739	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.3227381
2.3	0.0002945	1.7819773	2.0672608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8495326
2.4	8.414E-06	1.6199794	2.7563477	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.3763355
2.5	0	1.4579814	3.4454347	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.9034161
2.6	0	1.2959835	4.1345216	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.4305051
2.7	0	1.1339855	4.8236085	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9575941
2.8	0	0.9719876	5.5126955	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.4846831
2.9	0	0.8099897	6.2017824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.0117721
3	0	0.6479917	5.7883302	1.491E-14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.436322
3.1	0	0.4859938	5.3748781	1.1193401	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.980212
3.2	0	0.3239959	4.9614259	2.2386803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.5241021
3.3	0	0.1619979	4.5479738	3.3580204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.0679921
3.4	0	0.0046285	4.1345216	4.4773605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.6165106
3.5	0	0	3.7210694	5.5967007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.3177701
3.6	0	0	3.3076173	6.7160408	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.023658
3.7	0	0	2.8941651	7.8353809	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.729546
3.8	0	0	2.480713	8.9547211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.435434
3.9	0	0	2.0672608	10.074061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.141322
4	0	0	1.6538086	9.4024571	2.735E-14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.056266
4.1	0	0	1.2403565	8.730853	1.5396051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.510815
4.2	0	0	0.8269043	8.0592489	3.0792102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.965363
4.3	0	0	0.4134522	7.3876449	4.6188152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.419912
4.4	0	0	0.0118129	6.7160408	6.1584203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.886274
4.5	0	0	0	6.0444367	7.6980254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.742462
4.6	0	0	0	5.3728326	9.2376305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.610463
4.7	0	0	0	4.7012286	10.777236	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.478464
4.8	0	0	0	4.0296245	12.316841	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.346465
4.9	0	0	0	3.3580204	13.856446	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.214466
5	0	0	0	2.6864163	12.932683	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.619099
5.1	0	0	0	2.0148122	12.00892	1.3323102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.356042
5.2	0	0	0	1.3432082	11.085157	2.6646203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.092985
5.3	0	0	0	0.6716041	10.161394	3.9969305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.829928
5.4	0	0	0	0.0191887	9.2376305	5.3292407	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.58606
5.5	0	0	0	0	8.3138674	6.6615508	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.975418
5.6	0	0	0	0	7.3901044	7.993861	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.383965

5.7	0	0	0	0	6.4663413	9.3261711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.792512
5.8	0	0	0	0	5.5425783	10.658481	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.20106
5.9	0	0	0	0	4.6188152	11.990791	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.609607
6	0	0	0	0	3.6950522	11.191405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.886458
6.1	0	0	0	0	2.7712891	10.392019	1.6137386	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.777047
6.2	0	0	0	0	1.8475261	9.5926332	3.2274772	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.667636
6.3	0	0	0	0	0.923763	8.7932471	4.8412158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.558226
6.4	0	0	0	0	0.0263932	7.993861	6.4549544	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.475209
6.5	0	0	0	0	0	7.1944749	8.0686929	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.263168
6.6	0	0	0	0	0	6.3950888	9.6824315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.07752
6.7	0	0	0	0	0	5.5957027	11.29617	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.891873
6.8	0	0	0	0	0	4.7963166	12.909909	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.706225
6.9	0	0	0	0	0	3.9969305	14.523647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.520578
7	0	0	0	0	0	3.1975444	13.555404	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.752949
7.1	0	0	0	0	0	2.3981583	12.587161	1.5456401	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.530959
7.2	0	0	0	0	0	1.5987722	11.618918	3.0912802	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.30897
7.3	0	0	0	0	0	0.7993861	10.650675	4.6369203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.086981
7.4	0	0	0	0	0	0.0228396	9.6824315	6.1825604	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.887832
7.5	0	0	0	0	0	0	8.7141884	7.7282005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.442389
7.6	0	0	0	0	0	0	7.7459452	9.2738406	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.019786
7.7	0	0	0	0	0	0	6.7777021	10.819481	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.597183
7.8	0	0	0	0	0	0	5.8094589	12.365121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.17458
7.9	0	0	0	0	0	0	4.8412158	13.910761	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.751977
8	0	0	0	0	0	0	3.8729726	12.983377	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.856349
8.1	0	0	0	0	0	0	2.9047295	12.055993	1.7655601	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.726282
8.2	0	0	0	0	0	0	1.9364863	11.128609	3.5311202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.596215
8.3	0	0	0	0	0	0	0.9682432	10.201225	5.2966803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.466148
8.4	0	0	0	0	0	0	0.0276641	9.2738406	7.0622404	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.363745
8.5	0	0	0	0	0	0	0	8.3464566	8.8278005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.174257
8.6	0	0	0	0	0	0	0	7.4190725	10.593361	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.012433
8.7	0	0	0	0	0	0	0	6.4916884	12.358921	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.850609
8.8	0	0	0	0	0	0	0	5.5643044	14.124481	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.688785
8.9	0	0	0	0	0	0	0	4.6369203	15.890041	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.526961
9	0	0	0	0	0	0	0	3.7095363	14.830705	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.540241
9.1	0	0	0	0	0	0	0	2.7821522	13.771369	1.8963229	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.449844
9.2	0	0	0	0	0	0	0	1.8547681	12.712033	3.7926457	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.359447
9.3	0	0	0	0	0	0	0	0.9273841	11.652697	5.6889686	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.269049
9.4	0	0	0	0	0	0	0	0.0264967	10.593361	7.5852915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.205149
9.5	0	0	0	0	0	0	0	0	9.5340246	9.4816143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.015639
9.6	0	0	0	0	0	0	0	0	8.4746885	11.377937	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.852626
9.7	0	0	0	0	0	0	0	0	7.4153524	13.27426	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.689612
9.8	0	0	0	0	0	0	0	0	6.3560164	15.170583	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.526599
9.9	0	0	0	0	0	0	0	0	5.2966803	17.066906	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22.363586
10	0	0	0	0	0	0	0	0	4.2373443	15.929112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.166456
10.1	0	0	0	0	0	0	0	0	3.1780082	14.791318	1.9310288	0	0	0	0	0	0	0	0	0	0	0	0	0	19.900355
10.2	0	0	0	0	0	0	0	0	2.1186721	13.653525	3.8620575	0	0	0	0	0	0	0	0	0	0	0	0	0	19.634254
10.3	0	0	0	0	0	0	0	0	1.0593361	12.515731	5.7930863	0	0	0	0	0	0	0	0	0	0	0	0	0	19.368153
10.4	0	0	0	0	0	0	0	0	0.0302667	11.377937	7.7241151	0	0	0	0	0	0	0	0	0	0	0	0	0	19.132319
10.5	0	0	0	0	0	0	0	0	0	10.240143	9.6551438	0	0	0	0	0	0	0	0	0	0	0	0	0	19.895287
10.6	0	0	0	0	0	0	0	0	0	9.1023498	11.586173	0	0	0	0	0	0	0	0	0	0	0	0	0	20.688522
10.7	0	0	0	0	0	0	0	0	0	7.964556	13.517201	0	0	0	0	0	0	0	0	0	0	0	0	0	21.481757
10.8	0	0	0	0	0	0	0	0	0	6.8267623	15.44823	0	0	0	0	0	0	0	0	0	0	0	0	0	22.274992
10.9	0	0	0	0	0	0	0	0	0	5.6889686	17.379259	0	0	0	0	0	0	0	0	0	0	0	0	0	23.068227
11	0	0	0	0	0	0	0	0	0	4.5511749	16.220642	0	0	0	0	0	0	0	0	0	0	0	0	0	20.771817
11.1	0	0	0	0	0	0	0	0	0	3.4133812	15.062024	1.7425603	0	0	0	0	0	0	0	0	0	0	0	0	20.217966
11.2	0	0	0	0	0	0	0	0	0	2.2755874	13.903407	3.4851206	0	0	0	0	0	0	0	0	0	0	0	0	19.664115
11.3	0	0	0	0	0	0	0	0	0	1.1377937	12.74479	5.2276809	0	0	0	0	0	0	0	0	0	0	0	0	19.110265
11.4	0	0	0	0	0	0	0	0	0	0.0325084	11.586173	6.9702413	0	0	0	0	0	0	0	0	0	0	0	0	18.588922
11.5	0	0	0	0	0	0	0	0	0	0	10.427555	8.7128016	0	0	0	0	0	0	0	0	0	0	0	0	19.140357
11.6	0	0	0	0	0	0	0	0	0	0	9.2689381	10.455362	0	0	0	0	0	0	0	0	0	0	0	0	19.7243
11.7	0	0	0	0	0	0	0	0	0	0	8.1103208	12.197922	0	0	0	0	0	0	0	0	0	0	0	0	20.308243
11.8	0	0	0	0	0	0	0	0	0	0	6.9517036	13.940483	0	0	0	0	0	0	0	0	0	0	0	0	20.892186
11.9	0	0	0	0	0	0	0	0	0	0	5.7930863	15.683043	0	0	0	0	0	0	0	0	0	0	0	0	21.476129
12	0	0	0	0	0	0	0	0	0	0	4.634469	14.637507	0	0	0	0	0	0	0	0	0	0	0	0	19.271976
12.1	0	0	0	0	0	0	0	0	0	0	3.4758518	13.59197	1.7658237	0	0	0	0	0	0	0	0	0	0	0	18.833646
12.2	0	0	0	0	0	0	0	0	0	0	2.3172345	12.546434	3.5316475	0	0	0	0	0	0	0	0	0	0	0	18.395316
12.3	0	0	0	0	0	0	0	0	0	0	1.1586173	11.500898	5.2974712	0	0	0	0	0	0	0	0	0	0	0	17.956987
12.4	0	0	0	0	0	0	0	0	0	0	0.0331034	10.455362	7.063295	0	0	0	0	0	0	0	0	0	0	0	17.55176
12.5	0	0	0	0	0	0	0	0	0	0	0	9.4098257	8.8291187	0	0	0	0	0	0	0	0	0	0	0	18.238944

12.6	0	0	0	0	0	0	0	0	0	0	0	8.3642895	10.594942	0	0	0	0	0	0	0	0	0	0	0	18.959232
12.7	0	0	0	0	0	0	0	0	0	0	0	7.3187533	12.360766	0	0	0	0	0	0	0	0	0	0	0	19.67952
12.8	0	0	0	0	0	0	0	0	0	0	0	6.2732171	14.12659	0	0	0	0	0	0	0	0	0	0	0	20.399807
12.9	0	0	0	0	0	0	0	0	0	0	0	5.2276809	15.892414	0	0	0	0	0	0	0	0	0	0	0	21.120095
13	0	0	0	0	0	0	0	0	0	0	0	4.1821448	14.832919	0	0	0	0	0	0	0	0	0	0	0	19.015064
13.1	0	0	0	0	0	0	0	0	0	0	0	3.1366086	13.773425	1.6398543	0	0	0	0	0	0	0	0	0	0	18.549888
13.2	0	0	0	0	0	0	0	0	0	0	0	2.0910724	12.713931	3.2797087	0	0	0	0	0	0	0	0	0	0	18.084712
13.3	0	0	0	0	0	0	0	0	0	0	0	1.0455362	11.654437	4.919563	0	0	0	0	0	0	0	0	0	0	17.619536
13.4	0	0	0	0	0	0	0	0	0	0	0	0.0298725	10.594942	6.5594173	0	0	0	0	0	0	0	0	0	0	17.184232
13.5	0	0	0	0	0	0	0	0	0	0	0	0	9.5354482	8.1992716	0	0	0	0	0	0	0	0	0	0	17.73472
13.6	0	0	0	0	0	0	0	0	0	0	0	0	8.475954	9.839126	0	0	0	0	0	0	0	0	0	0	18.31508
13.7	0	0	0	0	0	0	0	0	0	0	0	0	7.4164597	11.47898	0	0	0	0	0	0	0	0	0	0	18.89544
13.8	0	0	0	0	0	0	0	0	0	0	0	0	6.3569655	13.118835	0	0	0	0	0	0	0	0	0	0	19.4758
13.9	0	0	0	0	0	0	0	0	0	0	0	0	5.2974712	14.758689	0	0	0	0	0	0	0	0	0	0	20.05616
14	0	0	0	0	0	0	0	0	0	0	0	0	4.237977	13.774776	0	0	0	0	0	0	0	0	0	0	18.012753
14.1	0	0	0	0	0	0	0	0	0	0	0	0	3.1784827	12.790864	1.6174232	0	0	0	0	0	0	0	0	0	17.58677
14.2	0	0	0	0	0	0	0	0	0	0	0	0	2.1189885	11.806951	3.2348465	0	0	0	0	0	0	0	0	0	17.160786
14.3	0	0	0	0	0	0	0	0	0	0	0	0	1.0594942	10.823039	4.8522697	0	0	0	0	0	0	0	0	0	16.734803
14.4	0	0	0	0	0	0	0	0	0	0	0	0	0.0302713	9.839126	6.4696929	0	0	0	0	0	0	0	0	0	16.33909
14.5	0	0	0	0	0	0	0	0	0	0	0	0	0	8.8552134	8.0871162	0	0	0	0	0	0	0	0	0	16.94233
14.6	0	0	0	0	0	0	0	0	0	0	0	0	0	7.8713008	9.7045394	0	0	0	0	0	0	0	0	0	17.57584
14.7	0	0	0	0	0	0	0	0	0	0	0	0	0	6.8873882	11.321963	0	0	0	0	0	0	0	0	0	18.209351
14.8	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9034756	12.939386	0	0	0	0	0	0	0	0	0	18.842861
14.9	0	0	0	0	0	0	0	0	0	0	0	0	0	4.919563	14.556809	0	0	0	0	0	0	0	0	0	19.476372
15	0	0	0	0	0	0	0	0	0	0	0	0	0	3.9356504	13.586355	0	0	0	0	0	0	0	0	0	17.522006
15.1	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9517378	12.615901	1.629263	0	0	0	0	0	0	0	0	17.196902
15.2	0	0	0	0	0	0	0	0	0	0	0	0	0	1.9678252	11.645447	3.2585261	0	0	0	0	0	0	0	0	16.871799
15.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9839126	10.674993	4.8877891	0	0	0	0	0	0	0	0	16.546695
15.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0281118	9.7045394	6.5170522	0	0	0	0	0	0	0	0	16.249703
15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.7340855	8.1463152	0	0	0	0	0	0	0	0	16.880401
15.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.7636315	9.7755783	0	0	0	0	0	0	0	0	17.53921
15.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.7931776	11.404841	0	0	0	0	0	0	0	0	18.198019
15.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.8227236	13.034104	0	0	0	0	0	0	0	0	18.856828
15.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.8522697	14.663367	0	0	0	0	0	0	0	0	19.515637
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8818158	13.68581	0	0	0	0	0	0	0	0	17.567625
16.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9113618	12.708252	1.5971937	0	0	0	0	0	0	0	17.216807
16.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.9409079	11.730694	3.1943874	0	0	0	0	0	0	0	16.865989
16.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9704539	10.753136	4.7915811	0	0	0	0	0	0	0	16.515171
16.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0277273	9.7755783	6.3887748	0	0	0	0	0	0	0	16.19208
16.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.7980204	7.9859684	0	0	0	0	0	0	0	16.783989
16.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.8204626	9.5831621	0	0	0	0	0	0	0	17.403625
16.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.8429048	11.180356	0	0	0	0	0	0	0	18.023261
16.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.865347	12.77755	0	0	0	0	0	0	0	18.642896
16.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.8877891	14.374743	0	0	0	0	0	0	0	19.262532
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.9102313	13.416427	0	0	0	0	0	0	0	17.326658
17.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9326735	12.458111	1.4353382	0	0	0	0	0	0	16.826122
17.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.9551157	11.499795	2.8706764	0	0	0	0	0	0	16.325587
17.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9775578	10.541478	4.3060146	0	0	0	0	0	0	15.825051
17.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0279302	9.5831621	5.7413528	0	0	0	0	0	0	15.352445
17.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.6248459	7.176691	0	0	0	0	0	0	15.801537
17.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.6665297	8.6120291	0	0	0	0	0	0	16.278559
17.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.7082135	10.047367	0	0	0	0	0	0	16.755581
17.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.7498973	11.482706	0	0	0	0	0	0	17.232603
17.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.7915811	12.918044	0	0	0	0	0	0	17.709625
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8332649	12.056841	0	0	0	0	0	0	15.890106
18.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8749486	11.195638	1.441574	0	0	0	0	0	15.512161
18.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.9166324	10.334435	2.883148	0	0	0	0	0	15.134215
18.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9583162	9.4732321	4.324722	0	0	0	0	0	14.75627
18.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0273805	8.6120291	5.766296	0	0	0	0	0	14.405706
18.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.7508262	7.20787	0	0	0	0	0	14.958696
18.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.8896233	8.6494441	0	0	0	0	0	15.539067
18.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.0284204	10.091018	0	0	0	0	0	16.119438
18.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.1672175	11.532592	0	0	0	0	0	16.69981
18.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.3060146	12.974166	0	0	0	0	0	17.280181
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4448117	12.109222	0	0	0	0	0	15.554033
19.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5836087	11.244277	1.0607602	0	0	0	0	14.888646
19.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7224058	10.379333	2.1215204	0	0	0	0	14.223259
19.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8612029	9.5143885	3.1822806	0	0	0	0	13.557872
19.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0246058	8.6494441	4.2430408	0	0	0	0	12.917091

19.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.7844996	5.3038011	0	0	0	0	13.088301
19.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.9195552	6.3645613	0	0	0	0	13.284117
19.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.0546108	7.4253215	0	0	0	0	13.479932
19.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.1896664	8.4860817	0	0	0	0	13.675748
19.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.324722	9.5468419	0	0	0	0	13.871564
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4597776	8.9103858	1.374E-13	0	0	0	12.370163
20.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5948332	8.2739297	0.9667701	0	0	0	11.835533
20.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7298888	7.6374735	1.9335402	0	0	0	11.300903
20.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8649444	7.0010174	2.9003104	0	0	0	10.766272
20.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0247127	6.3645613	3.8670805	0	0	0	10.256354
20.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.7281051	4.8338506	0	0	0	10.561956
20.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.091649	5.8006207	0	0	0	10.89227
20.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.4551929	6.7673908	0	0	0	11.222584
20.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8187368	7.7341609	0	0	0	11.552898
20.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.1822806	8.7009311	0	0	0	11.883212
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5458245	8.120869	2.203E-13	0	0	10.666693
21.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.9093684	7.5408069	0.7749883	0	0	10.225164
21.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2729123	6.9607448	1.5499766	0	0	9.7836337
21.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6364561	6.3806828	2.324965	0	0	9.3421039
21.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0181845	5.8006207	3.0999533	0	0	8.9187585
21.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.2205586	3.8749416	0	0	9.0955002
21.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.6404966	4.6499299	0	0	9.2904265
21.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.0604345	5.4249183	0	0	9.4853527
21.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4803724	6.1999066	0	0	9.680279
21.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9003104	6.9748949	0	0	9.8752053
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.3202483	6.5099019	2.068E-13	0	8.8301502
22.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7401862	6.0449089	0.4850432	0	8.2701384
22.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1601241	5.5799159	0.9700865	0	7.7101265
22.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5800621	5.1149229	1.4551297	0	7.1501147
22.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0165732	4.6499299	1.9401729	0	6.606676
22.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.1849369	2.4252161	0	6.6101531
22.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.7199439	2.9102594	0	6.6302033
22.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.254951	3.3953026	0	6.6502535
22.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.789958	3.8803458	0	6.6703038
22.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.324965	4.365389	0	6.690354
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.859972	4.0743631	2.76E-13	5.9343351
23.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.394979	3.7833372	0.4855435	5.6638596
23.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.929986	3.4923112	0.971087	5.3933842
23.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.464993	3.2012853	1.4566305	5.1229088
23.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0132855	2.9102594	1.942174	4.8657188
23.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.6192334	2.4277174	5.0469509
23.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.3282075	2.9132609	5.2414684
23.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0371816	3.3988044	5.435986
23.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7461556	3.8843479	5.6305035
23.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4551297	4.3698914	5.8250211
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1641037	4.0785653	5.242669
24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8730778	3.7872392	4.660317
24.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5820519	3.4959131	4.077965
24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2910259	3.204587	3.495613
24.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.008315	2.9132609	2.921576
24.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.6219348	2.6219348
24.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.3306087	2.3306087
24.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0392827	2.0392827
24.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7479566	1.7479566
24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4566305	1.4566305
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1653044	1.1653044
25.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8739783	0.8739783
25.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5826522	0.5826522
25.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2913261	0.2913261
25.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0083236	0.0083236
25.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

26.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
26.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
26.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
26.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
26.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
26.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
27.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
28.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
29.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
30.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
31.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
32.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0

33.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
33.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
34.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
35.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0

Incremental Hydrograph #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Time to Peak, tp (hr)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
Cum Time to Peak, tp (hr)	0.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.9	
Excess, R (in)	1.94E-05	0.0106711	0.0272348	0.0442397	0.0608499	0.0526569	0.0637799	0.0610884	0.0697803	0.0749484	0.0763201	0.0688713	0.0697907	0.064812	0.0639255	0.0643934	0.0631259	0.0567289	0.0569754	0.0419245	0.0382097	0.0306299	0.0191704	0.0191902	
Qa (ac-ft)	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	
Total Time (hr)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Q (ac-ft)	Cumulative Q (ac-ft)
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	1.752E-06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.752E-06
0.2	6.571E-06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.571E-06
0.3	1.489E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.489E-05
0.4	2.629E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.629E-05
0.5	4.118E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.118E-05
0.6	5.914E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.914E-05
0.7	8.061E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.061E-05
0.8	0.0001051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0001051
0.9	0.0001347	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0001347
1	0.0001643	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0001643
1.1	0.0001963	0.000964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0011602
1.2	0.0002261	0.0036148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0038409
1.3	0.0002537	0.0081936	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0084473
1.4	0.0002799	0.0144593	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0147393
1.5	0.000304	0.0226529	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.022957
1.6	0.0003259	0.0325335	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0328594
1.7	0.000345	0.0443419	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0446869
1.8	0.000364	0.0578373	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0582013
1.9	0.0003792	0.074104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0744832
2	0.0003943	0.0903707	1.093E-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.090765
2.1	0.0004061	0.1079629	0.0024602	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1108292
2.2	0.0004179	0.1243502	0.0092258	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1339939
2.3	0.0004245	0.1395324	0.0209118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1608687
2.4	0.0004311	0.1539918	0.0369032	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.191326
2.5	0.0004344	0.1672461	0.057815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2254955
2.6	0.0004376	0.1792956	0.0830321	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2627653
2.7	0.0004381	0.1897786	0.1131697	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3033864
2.8	0.0004381	0.2002616	0.1476127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3483123
2.9	0.0004381	0.2085757	0.1891287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3981425
3	0.0004381	0.2168898	0.2306448	5.324E-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4479727
3.1	0.0004381	0.2233965	0.2755437	0.0039963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5033746
3.2	0.0004381	0.2299032	0.3173672	0.0149862	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5626947
3.3	0.0004381	0.233518	0.3561156	0.0339687	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6240404
3.4	0.0004381	0.2371328	0.3930187	0.0599448	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6905345
3.5	0.0004381	0.2389403	0.4268466	0.0939136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7601386
3.6	0.0004381	0.2407477	0.4575993	0.1348759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8336609
3.7	0.0004381	0.2409887	0.4843541	0.1838308	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9096116
3.8	0.0004381	0.2409887	0.5111089	0.2397793	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9923149
3.9	0.0004381	0.2409887	0.5323282	0.3072172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0809722
4	0.0004381	0.2409887	0.5535475	0.3746552	9.764E-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1696294
4.1	0.0004381	0.2409887	0.5701539	0.447588	0.0054968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2646655
4.2	0.0004381	0.2409887	0.5867604	0.5155255	0.0206129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3643255
4.3	0.0004381	0.2409887	0.5959862	0.5784676	0.0467226	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4626031
4.4	0.0004381	0.2409887	0.605212	0.6384124	0.0824516	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5675027
4.5	0.0004381	0.2409887	0.6098249	0.6933618	0.1291741	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.6737876
4.6	0.0004381	0.2409887	0.6144377	0.7433159	0.185516	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7846964
4.7	0.0004381	0.2409887	0.6150528	0.7867759	0.2528515	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.8961069
4.8	0.0004381	0.2409887	0.6150528	0.8302359	0.3298063	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0165217
4.9	0.0004381	0.2409887	0.6150528	0.8647041	0.4225643	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.143748
5	0.0004381	0.2409887	0.6150528	0.8991724	0.5153224	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.2709743
5.1	0.0004381	0.2409887	0.6150528	0.9261476	0.6156384	0.0047567	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4030222
5.2	0.0004381	0.2409887	0.6150528	0.9531227	0.7090836	0.0178375	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5365234
5.3	0.0004381	0.2409887	0.6150528	0.968109	0.7956577	0.0404318	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.660678
5.4	0.0004381	0.2409887	0.6150528	0.9830952	0.8781093	0.0713502	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.7890342

5.5	0.0004381	0.2409887	0.6150528	0.9905883	0.9536899	0.1117819	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.9125397
5.6	0.0004381	0.2409887	0.6150528	0.9980814	1.0223996	0.1605379	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.0374983
5.7	0.0004381	0.2409887	0.6150528	0.9990804	1.082177	0.2188072	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.1565441
5.8	0.0004381	0.2409887	0.6150528	0.9990804	1.1419544	0.2854007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.282915
5.9	0.0004381	0.2409887	0.6150528	0.9990804	1.189364	0.3656696	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4105936
6	0.0004381	0.2409887	0.6150528	0.9990804	1.2367737	0.4459385	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.5382722
6.1	0.0004381	0.2409887	0.6150528	0.9990804	1.2738769	0.5327479	0.0057614	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.6679462
6.2	0.0004381	0.2409887	0.6150528	0.9990804	1.3109801	0.6136114	0.0216054	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8017569
6.3	0.0004381	0.2409887	0.6150528	0.9990804	1.331593	0.6885291	0.0489723	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.9246544
6.4	0.0004381	0.2409887	0.6150528	0.9990804	1.3522059	0.7598792	0.0864217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.0540668
6.5	0.0004381	0.2409887	0.6150528	0.9990804	1.3625123	0.8252836	0.135394	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.1787499
6.6	0.0004381	0.2409887	0.6150528	0.9990804	1.3728188	0.884742	0.1944488	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.3075696
6.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	0.9364709	0.2650266	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.4312504
6.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	0.9881998	0.3456868	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.5636395
6.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.0292261	0.4429112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.7018903
7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.0702525	0.5401356	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.8401411
7.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.10236	0.645282	0.0055183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.9829134
7.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1344676	0.7432266	0.0206937	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.1281409
7.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1523052	0.8339694	0.0469057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.2629332
7.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1701427	0.9203911	0.0827748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.4030616
7.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1790615	0.999611	0.1296805	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.5381059
7.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1879802	1.0716291	0.1862432	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.6756056
7.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.1342849	0.2538426	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.8070499
7.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.1969406	0.3310991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9469621
7.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.2466331	0.4242207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.0897762
8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.2963255	0.5173423	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.2325903
8.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.3352153	0.6180517	0.0063035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.3784928
8.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.3741051	0.7118631	0.0236381	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.5285286
8.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.3957105	0.7987766	0.0535796	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.6669891
8.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4173159	0.8815514	0.0945523	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.812342
8.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4281186	0.9574282	0.148132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.9526012
8.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4389214	1.0264072	0.2127427	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.0969936
8.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.0864189	0.2899604	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.2356634
8.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.1464306	0.3782092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.383924
8.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.1940261	0.4845806	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.5378908
9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.2416216	0.5909519	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.6918577
9.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.2788703	0.7059906	0.0067703	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.8509153
9.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3161189	0.8131499	0.0253888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.0139417
9.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3368126	0.9124298	0.0575479	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.1660744
9.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3575063	1.0069821	0.1015551	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.3253276
9.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3678532	1.093655	0.1591031	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.4798954
9.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3782	1.1724486	0.2284991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.6384318
9.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.2409991	0.3114358	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.7912985
9.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.3095495	0.4062206	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.9546337
9.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.3639171	0.5204701	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.1232508
10	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.4182846	0.6347196	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.291868
10.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.4608332	0.7582784	0.0068943	0	0	0	0	0	0	0	0	0	0	0	0	0	9.4648695
10.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5033817	0.8733742	0.0258534	0	0	0	0	0	0	0	0	0	0	0	0	0	9.6414731
10.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5270198	0.9800071	0.0586011	0	0	0	0	0	0	0	0	0	0	0	0	0	9.8044917
10.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5506579	1.0815623	0.1034138	0	0	0	0	0	0	0	0	0	0	0	0	0	9.9744976
10.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5624769	1.1746545	0.1620149	0	0	0	0	0	0	0	0	0	0	0	0	0	10.13801
10.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.574296	1.2592838	0.232681	0	0	0	0	0	0	0	0	0	0	0	0	0	10.305124
10.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.3329112	0.3171356	0	0	0	0	0	0	0	0	0	0	0	0	0	10.464782
10.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.4065387	0.4136551	0	0	0	0	0	0	0	0	0	0	0	0	0	10.634929
10.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.4649329	0.5299956	0	0	0	0	0	0	0	0	0	0	0	0	0	10.809664
11	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.5233271	0.6463361	0	0	0	0	0	0	0	0	0	0	0	0	0	10.984399
11.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.5690269	0.7721562	0.0062214	0	0	0	0	0	0	0	0	0	0	0	0	11.16214
11.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6147268	0.8893584	0.0233301	0	0	0	0	0	0	0	0	0	0	0	0	11.342151
11.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6401155	0.9979429	0.0528817	0	0	0	0	0	0	0	0	0	0	0	0	11.505676
11.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6655043	1.1013567	0.0933206	0	0	0	0	0	0	0	0	0	0	0	0	11.674917
11.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6781987	1.1961526	0.1462023	0	0	0	0	0	0	0	0	0	0	0	0	11.835289
11.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6908931	1.2823308	0.2099713	0	0	0	0	0	0	0	0	0	0	0	0	11.997931
11.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.3573058	0.2861831	0	0	0	0	0	0	0	0	0	0	0	0	12.15081
11.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.4322807	0.3732823	0	0	0	0	0	0	0	0	0	0	0	0	12.312884
11.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.4917437	0.478268	0	0	0	0	0	0	0	0	0	0	0	0	12.477333
12	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.5512066	0.5832537	0	0	0	0	0	0	0	0	0	0	0	0	12.641781
12.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.5977428	0.6967937	0.0063044	0	0	0	0	0	0	0	0	0	0	0	12.808162

12.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.644279	0.802557	0.0236416	0	0	0	0	0	0	0	0	0	0	0	12.977799
12.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.6701324	0.9005436	0.0535876	0	0	0	0	0	0	0	0	0	0	0	13.131585
12.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.6959859	0.9938642	0.0945664	0	0	0	0	0	0	0	0	0	0	0	13.291738
12.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7089126	1.0794081	0.1481541	0	0	0	0	0	0	0	0	0	0	0	13.443796
12.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7218393	1.1571753	0.2127745	0	0	0	0	0	0	0	0	0	0	0	13.59911
12.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.2248327	0.2900037	0	0	0	0	0	0	0	0	0	0	0	13.74572
12.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.2924901	0.3782657	0	0	0	0	0	0	0	0	0	0	0	13.90164
12.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.3461494	0.4846529	0	0	0	0	0	0	0	0	0	0	0	14.061686
13	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.3998088	0.5910402	0	0	0	0	0	0	0	0	0	0	0	14.221733
13.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.441803	0.706096	0.0058547	0	0	0	0	0	0	0	0	0	0	14.384638
13.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.4837973	0.8132713	0.0219551	0	0	0	0	0	0	0	0	0	0	14.549908
13.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5071275	0.912566	0.0497648	0	0	0	0	0	0	0	0	0	0	14.700342
13.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5304576	1.0071325	0.0878203	0	0	0	0	0	0	0	0	0	0	14.856294
13.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5421227	1.0938184	0.1375851	0	0	0	0	0	0	0	0	0	0	15.00441
13.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5537877	1.1726237	0.1975957	0	0	0	0	0	0	0	0	0	0	15.154891
13.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.2411844	0.2693156	0	0	0	0	0	0	0	0	0	0	15.296727
13.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.309745	0.3512812	0	0	0	0	0	0	0	0	0	0	15.447253
13.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.3641207	0.450079	0	0	0	0	0	0	0	0	0	0	15.600427
14	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.4184964	0.5488769	0	0	0	0	0	0	0	0	0	0	15.7536
14.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.4610513	0.6557249	0.0057746	0	0	0	0	0	0	0	0	0	15.908778
14.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5036062	0.7552546	0.0216548	0	0	0	0	0	0	0	0	0	16.066743
14.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5272478	0.8474659	0.0490841	0	0	0	0	0	0	0	0	0	16.210025
14.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5508894	0.9352862	0.086619	0	0	0	0	0	0	0	0	0	16.359022
14.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5627102	1.0157881	0.1357031	0	0	0	0	0	0	0	0	0	16.500429
14.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.574531	1.0889717	0.1948928	0	0	0	0	0	0	0	0	0	16.644623
14.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.1526414	0.2656317	0	0	0	0	0	0	0	0	0	16.780607
14.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.2163111	0.3464761	0	0	0	0	0	0	0	0	0	16.925122
14.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.2668078	0.4439225	0	0	0	0	0	0	0	0	0	17.073065
15	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.3173045	0.5413689	0	0	0	0	0	0	0	0	0	17.221008
15.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.3568236	0.6467554	0.0058169	0	0	0	0	0	0	0	0	17.37173
15.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.3963427	0.7449237	0.0218133	0	0	0	0	0	0	0	0	17.525414
15.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4182978	0.8358736	0.0494434	0	0	0	0	0	0	0	0	17.665949
15.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4402529	0.9224927	0.0872531	0	0	0	0	0	0	0	0	17.812333
15.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4512304	1.0018934	0.1366965	0	0	0	0	0	0	0	0	17.952155
15.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.462208	1.074076	0.1963195	0	0	0	0	0	0	0	0	18.094938
15.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.1368748	0.2675762	0	0	0	0	0	0	0	0	18.230457
15.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.1996736	0.3490124	0	0	0	0	0	0	0	0	18.374692
15.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.2494795	0.4471721	0	0	0	0	0	0	0	0	18.522658
16	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.2992854	0.5453318	0	0	0	0	0	0	0	0	18.670623
16.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.338264	0.6514898	0.0057024	0	0	0	0	0	0	0	18.821462
16.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.3772426	0.7503766	0.0213839	0	0	0	0	0	0	0	18.975009
16.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.3988973	0.8419924	0.0484702	0	0	0	0	0	0	0	19.115366
16.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4205521	0.9292455	0.0855357	0	0	0	0	0	0	0	19.261339
16.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4313795	1.0092275	0.1340059	0	0	0	0	0	0	0	19.400619
16.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4422068	1.0819384	0.1924552	0	0	0	0	0	0	0	19.542606
16.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.1451969	0.2623094	0	0	0	0	0	0	0	19.677163
16.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.2084554	0.3421426	0	0	0	0	0	0	0	19.820254
16.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.2586259	0.4383703	0	0	0	0	0	0	0	19.966653
17	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.3087964	0.5345979	0	0	0	0	0	0	0	20.113051
17.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.3480603	0.6386663	0.0051245	0	0	0	0	0	0	20.261508
17.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.3873242	0.7356067	0.0192169	0	0	0	0	0	0	20.411804
17.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4091375	0.8254191	0.0435584	0	0	0	0	0	0	20.547771
17.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4309508	0.9109548	0.0768677	0	0	0	0	0	0	20.68843
17.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4418574	0.9893625	0.1204261	0	0	0	0	0	0	20.821302
17.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.452764	1.0606422	0.1729523	0	0	0	0	0	0	20.956015
17.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.1226556	0.2357276	0	0	0	0	0	0	21.082258
17.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.1846689	0.3074708	0	0	0	0	0	0	21.216014
17.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.2338519	0.393947	0	0	0	0	0	0	21.351674
18	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.2830349	0.4804231	0	0	0	0	0	0	21.487333
18.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.321526	0.5739455	0.0051468	0	0	0	0	0	21.624493
18.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.360017	0.6610622	0.0193004	0	0	0	0	0	21.764254
18.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.3814009	0.7417733	0.0437476	0	0	0	0	0	21.890797
18.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4027849	0.818641	0.0772016	0	0	0	0	0	22.022502
18.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4134768	0.889103	0.1209493	0	0	0	0	0	22.147404
18.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4241688	0.9531595	0.1737037	0	0	0	0	0	22.274907
18.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.0088885	0.2367517	0	0	0	0	0	22.395109
18.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.0646176	0.3088066	0	0	0	0	0	22.522893

18.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.1088165	0.3956585	0	0	0	0	0	22.653944
19	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.1530155	0.4825103	0	0	0	0	0	22.784995
19.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.1876059	0.576439	0.0037872	0	0	0	0	22.917301
19.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2221964	0.6639342	0.0142019	0	0	0	0	23.049802
19.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2414133	0.7449959	0.032191	0	0	0	0	23.168069
19.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2606302	0.8221976	0.0568077	0	0	0	0	23.289105
19.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2702387	0.8929657	0.0889987	0	0	0	0	23.401672
19.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2798472	0.9573005	0.1278172	0	0	0	0	23.514434
19.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.0132716	0.1742101	0	0	0	0	23.618079
19.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.0692428	0.2272306	0	0	0	0	23.727071
19.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.1136338	0.2911392	0	0	0	0	23.83537
20	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.1580247	0.3550478	4.905E-16	0	0	0	23.94367
20.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.1927655	0.4241638	0.0034516	0	0	0	24.050978
20.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2275062	0.4885458	0.0129435	0	0	0	24.159593
20.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2468066	0.5481939	0.0293387	0	0	0	24.254937
20.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.266107	0.6050015	0.0517741	0	0	0	24.35348
20.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2757573	0.6570752	0.0811128	0	0	0	24.444543
20.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2854075	0.7044149	0.1164918	0	0	0	24.536912
20.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.7456005	0.158774	0	0	0	24.621666
20.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.786786	0.2070965	0	0	0	24.711174
20.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.8194504	0.2653424	0	0	0	24.802084
21	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.8521148	0.3235883	7.864E-16	0	0	24.892995
21.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.8776783	0.3865802	0.0027669	0	0	24.984317
21.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9032417	0.4452576	0.0103759	0	0	25.076167
21.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9174436	0.4996204	0.0235187	0	0	25.157874
21.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9316455	0.5513945	0.0415035	0	0	25.241835
21.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9387465	0.5988542	0.0650222	0	0	25.319914
21.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9458474	0.6419993	0.0933829	0	0	25.398521
21.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.6795355	0.1272774	0	0	25.470899
21.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.7170718	0.166014	0	0	25.547172
21.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.7468419	0.2127055	0	0	25.623633
22	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.776612	0.2593969	7.383E-16	0	25.700095
22.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.7999104	0.3098929	0.0017317	0	25.775621
22.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8232088	0.3569302	0.006494	0	25.850719
22.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8361523	0.4005088	0.0147197	0	25.915467
22.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8490958	0.4420123	0.0259759	0	25.98117
22.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8555676	0.4800572	0.0406955	0	26.040406
22.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8620394	0.5146435	0.0584457	0	26.099214
22.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.5447335	0.0796593	0	26.151381
22.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.5748236	0.1039035	0	26.205715
22.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.5986881	0.1331263	0	26.258802
23	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6225526	0.1623492	9.854E-16	26.31189
23.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6412292	0.1939532	0.0017335	26.363904
23.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6599058	0.2233925	0.0065007	26.416787
23.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6702816	0.2506671	0.0147348	26.462672
23.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6806575	0.276643	0.0260027	26.510291
23.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6858455	0.3004542	0.0407375	26.554025
23.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6910334	0.3221008	0.058506	26.598628
23.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.3409333	0.0797415	26.639388
23.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.3597658	0.1040106	26.68249
23.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.3747019	0.1332636	26.726679
24	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.389638	0.1625166	26.770868
24.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4013272	0.1941532	26.814193
24.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4130163	0.2236229	26.855352
24.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4195103	0.2509257	26.889149
24.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4260042	0.2769283	26.921646
24.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4292512	0.3007641	26.948728
24.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4324982	0.322433	26.973644
24.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.3412849	26.992929
24.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.3601368	27.011781
24.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.3750884	27.026733
25	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.3900399	27.041684
25.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4017411	27.053385
25.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4134423	27.065087
25.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.419943	27.071587
25.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4264436	27.078088
25.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4296939	27.081338

25.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4329443	27.084589
25.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
25.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
25.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
26.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
27.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
28.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
29.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
30.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
31.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
32	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
32.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022
32.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777	27.085022

32.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
32.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
32.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
32.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
32.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
32.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
32.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
33.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
34.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.1	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.2	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.3	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.4	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.5	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.6	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.7	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.8	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
35.9	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022
36	0.0004381	0.2409887	0.6150528	0.9990804	1.374193	1.1891694	1.4403617	1.3795796	1.5758718	1.6925857	1.7235629	1.5553431	1.5761071	1.4636716	1.4436505	1.4542183	1.4255944	1.2811283	1.2866942	0.9467942	0.8629023	0.6917251	0.4329311	0.4333777		27.085022

ATTACHMENT 9. COPIES OF DRILLING LOGS AND WELL SCHEMATIC DIAGRAMS

Boring Logs

IPSC

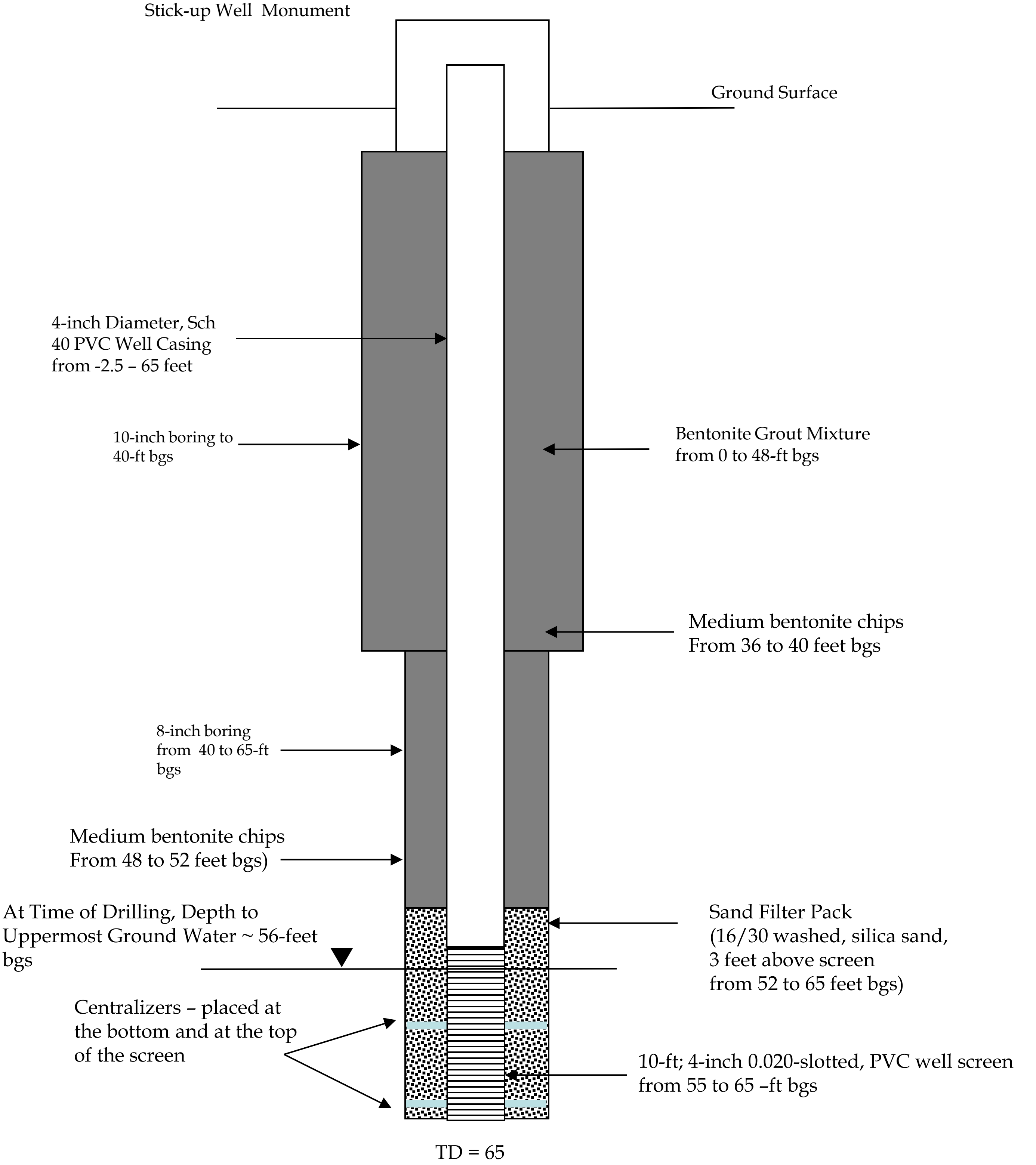
Delta, Utah

CLW-1

Interval (feet)	Drilling Method	Sample Description
		5/11/2015
0-3	10" Sonic	Brown fine grained Sand with gravel, dry
3-6	10" Sonic	Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-8	10" Sonic	Light Brown fine grained Sand
8-11.5	10" Sonic	Grayish white fine grained Sand, gravels present, rounded, dry
11.5-13.5	10" Sonic	Tan SILT with clay matrix, slightly moist
13.5-17	10" Sonic	Grayish Tan CLAY with small amount of silt present, slightly moist
17-23	10" Sonic	Grayish Tan SILT with fine grain sand present, trace amounts of clay, slightly moist
23-27	10" Sonic	Tannish Gray CLAY, denser, dry
27-32	10" Sonic	Tan CLAY, slightly moist
32-35	10" Sonic	Tan CLAY, denser material, slightly moist
		5/12/2015
35-48	10" Sonic to 40 feet	Tannish gray CLAY, moist
48-51	8" Sonic	Tannish gray CLAY, moist, softer
51-52	8" Sonic	Orangish, Brown, black fine grained Sand, moist
52-54	8" Sonic	Orangish, Brown , Red CLAY, slightly moist
54-56	8" Sonic	Orangish Brown CLAY with a fine grained sand matrix, slightly moist
56-62	8" Sonic	Light Brown fine grained Sand, saturated
62-63	8" Sonic	Light Brown CLAY, slightly moist
63-63.5	8" Sonic	Fine to medium grained Sand, slightly moist
63.5-64	8" Sonic	Light Brown CLAY, dry to slightly moist
64-65	8" Sonic	Light Brown fine grained Sand with clay matrix, moist

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec	ISPC– CB LANDFILL AREA DELTA, UTAH			
	Figure 1 – CLW-1 Schematic			
				Date Drawn
	Design by	Drawn by	Scale	Last Revision Date

Boring Logs

IPSC

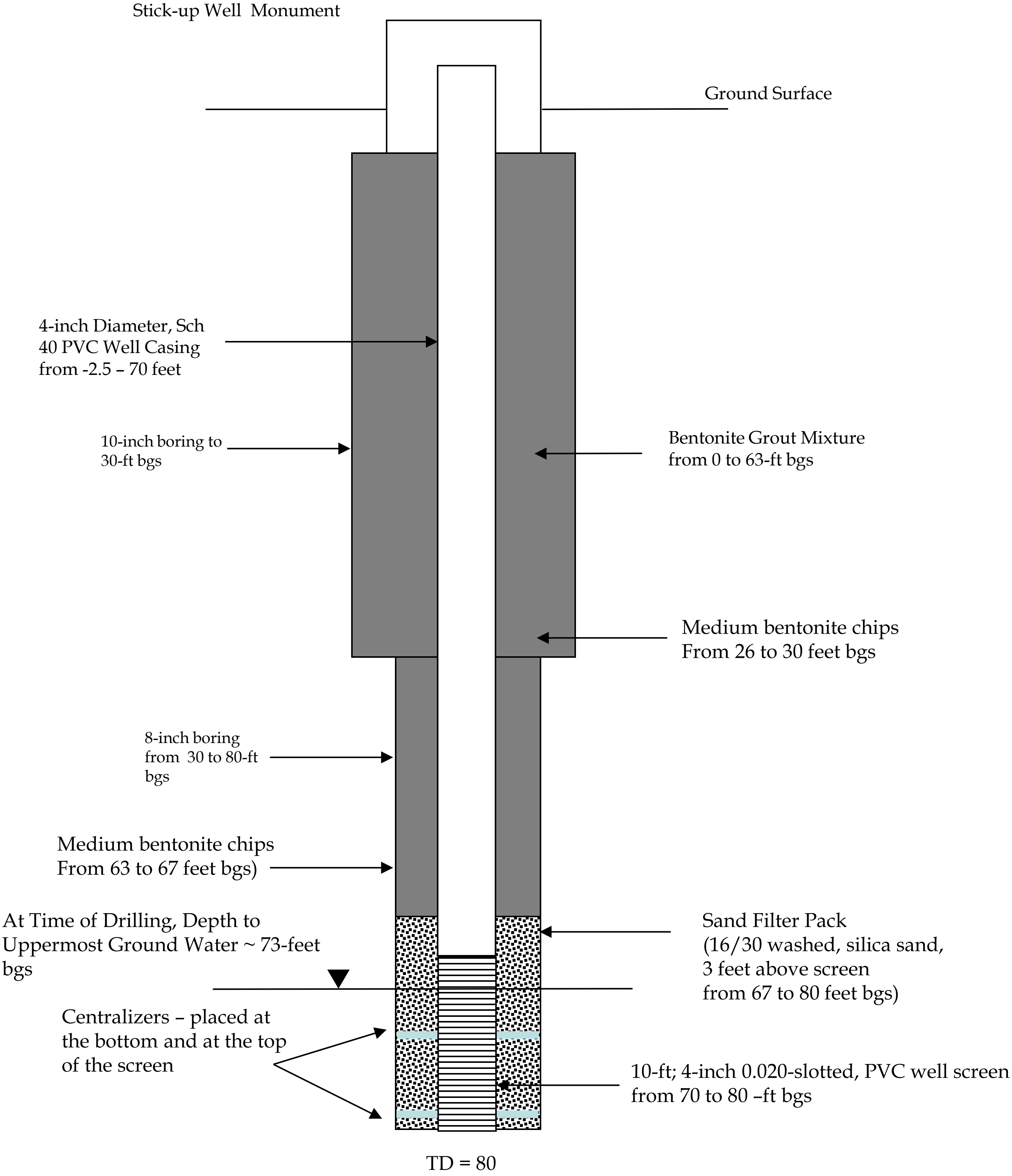
Delta, Utah

CLW-2

Interval (feet)	Drilling Method	Sample Description
		5/14/2015
0-8	10" Sonic	Brown fine grained Sand, clay present with gravel, dry
8-10	10" Sonic	Light to Dark Brown medium to course grained SAND, gravel present, dry
10-17	10" Sonic	Light Brown to Brown clayey SILT, slightly moist
17-25	10" Sonic	Light Brown Silty CLAY, moist
25-46	10" Sonic to 30 feet	Brown CLAY, slightly moist, from 40 to 45 feet transitioned to a Tan to Light Gray color
46-46.5	8" Sonic	Very moist to saturated zone, very soft clay , very sticky
46.5-50	8" Sonic	Light Gray CLAY, moist
50-51	8" Sonic	Tan to Light Gray with Orange zones, CLAY, slightly moist
51-51.5	8" Sonic	Very moist zone, CLAY
62	8" Sonic	Transitioning to a Orangish Red CLAY, Slightly moist
66-66.5	8" Sonic	Moist zone, transitioning from an Orangish Red to a Brown CLAY
66.5-73	8" Sonic	Reddish brown fine grained Sand with a clay matrix, very moist
73-80	8" Sonic	Brown fine gained Sand, trace amounts of clay, saturated.

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec	ISPC– CB LANDFILL AREA DELTA, UTAH			
	Figure 1 – CLW-2 Schematic			
				Date Drawn
	Design by	Drawn by	Scale	Last Revision Date

Boring Logs

IPSC

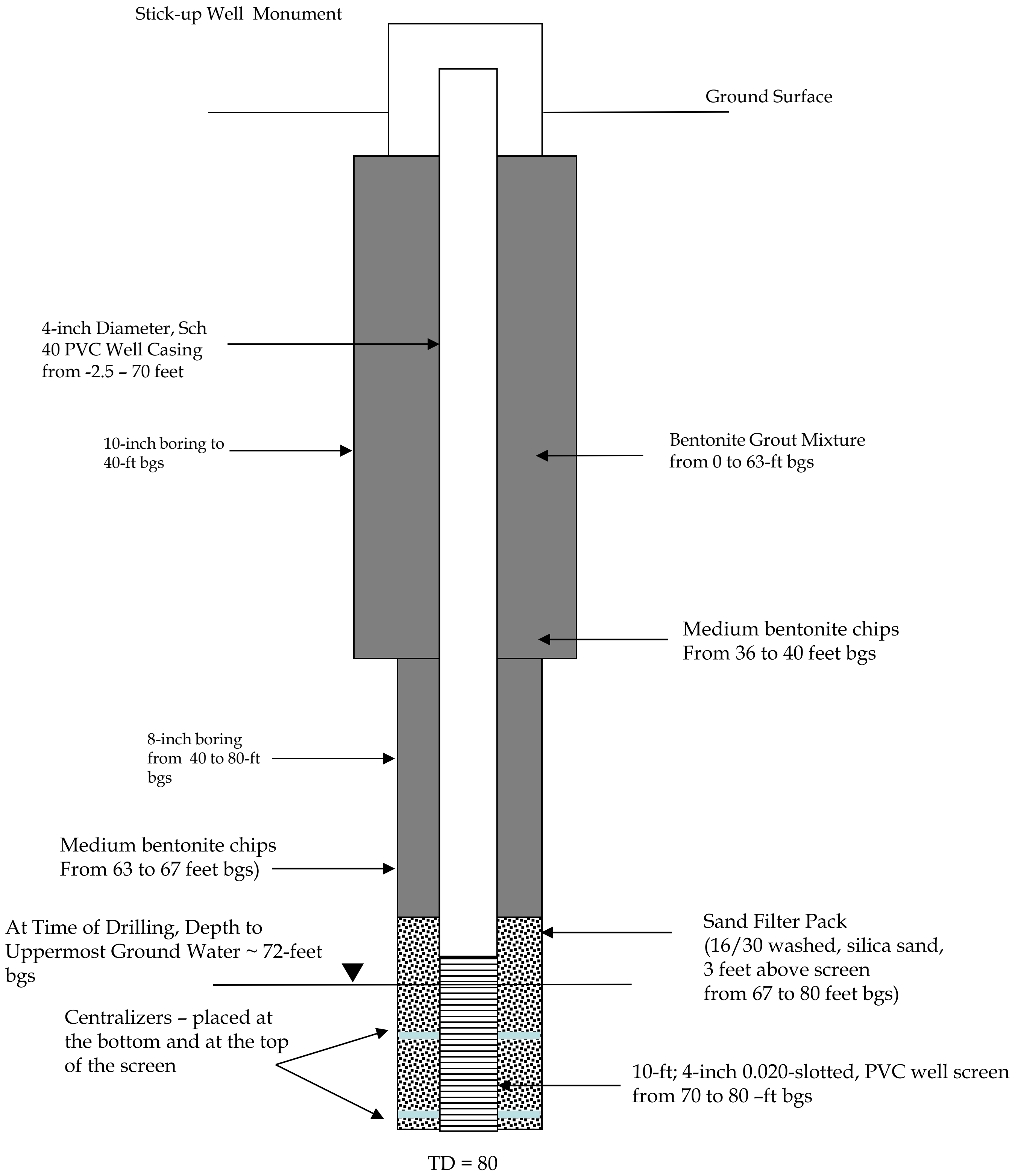
Delta, Utah

CLW-3

Interval (feet)	Drilling Method	Drill Time	Sample Description
			5/13/2015
0-3	10" Sonic		Brown fine grained Sand , clay present with gravel, dry
3-6	10" Sonic		Light to Dark Brown fine to medium grained Sand, no gravel present, dry
6-11	10" Sonic		Grayish White fine grained Sand, gravels present, rounded, dry
11-13	10" Sonic		Brownish Orange SILT, with fine grained sand present, soft
13-16	10" Sonic		Tannish Gray SILT with a clay present, very moist, sticky
16-21	10" Sonic		Tannish Gray SILT with a clay matrix, very moist, sticky
21-24	10" Sonic		Light Gray CLAY, with silt present, very moist
24-33	10" Sonic		Light Gray to Orange CLAY, with silt present, slightly moist
32-40	10" Sonic to 40 feet		Tan CLAY, denser material, slightly moist
40-66	8" Sonic		Tan to Light Brown CLAY, slightly moist to Dry
63	8" Sonic		Transiting into a Darker Gray CLAY, Moist
66-72	8" Sonic		Very moist to saturated, clay very plastic, firm and sticky
72-73	8" Sonic		Dark Gray fine to medium grained Sand, saturated
73-74	8" Sonic		Dark Gray CLAY, sticky firm, very moist
74-80	8" Sonic		Dark Gray fine to medium grained Sand, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec	ISPC– CB LANDFILL AREA DELTA, UTAH			
	Figure 1 – CLW-3 Schematic			
				Date Drawn
	Design by	Drawn by	Scale	Last Revision Date

Boring Logs

IPSC

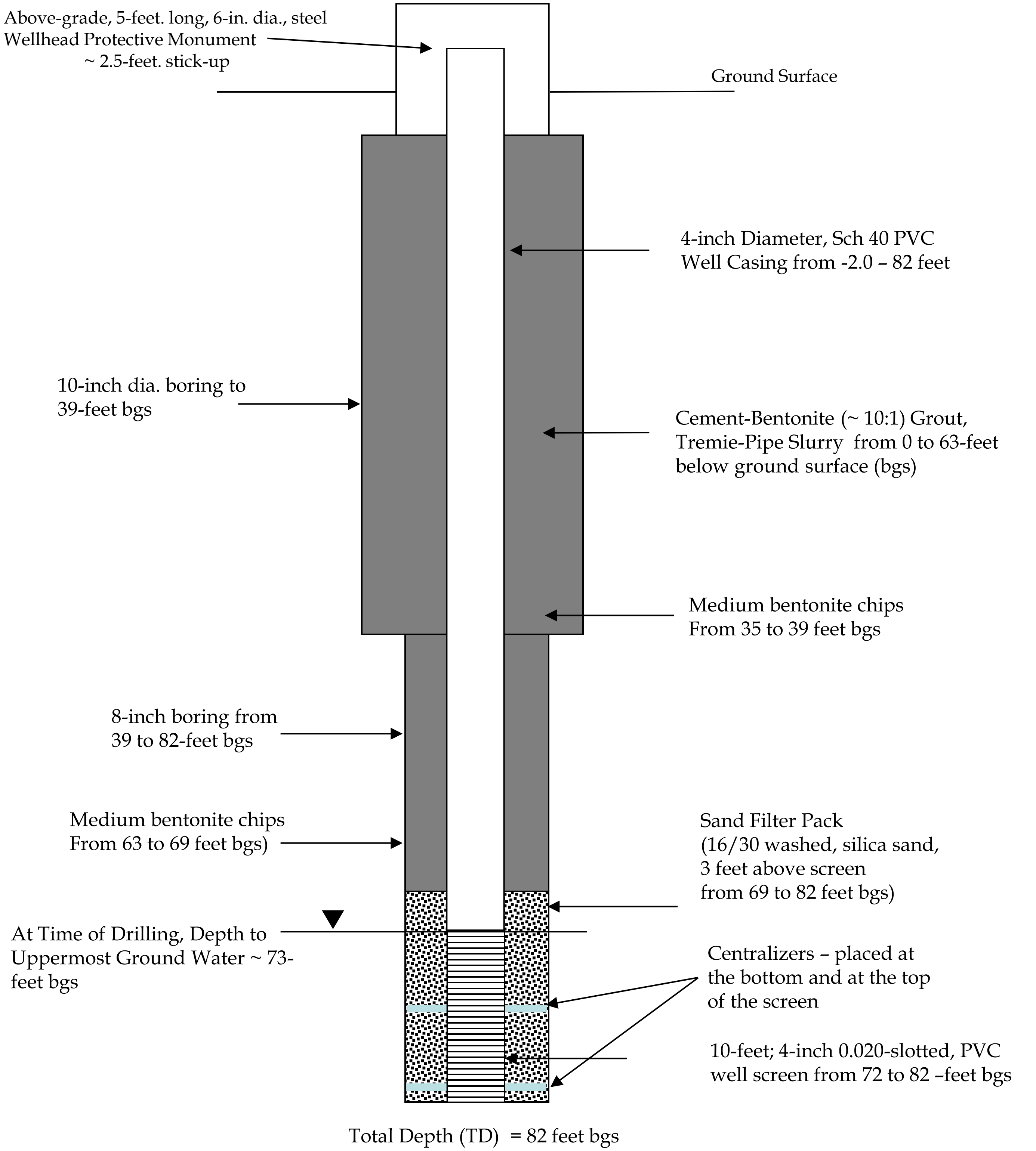
Delta, Utah

CLW-4

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-2	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
2-5	10" Sonic	Light Brown fine grained Sands, dry
5-11	10" Sonic	Light Brown to gray fine grained SAND, dry to slightly moist
11-13	10" Sonic	Light Brown silty CLAY, slightly moist, good plasticity
13-14	10" Sonic	Light Brown fine grained SAND, with clays present, poor plasticity, dry
14-16	10" Sonic	Light Brown clayey SILT, dry
16-18	10" Sonic	Light Brown to Brown silty CLAY, slightly moist, good plasticity
18-21	10" Sonic	Light Brown to Gray silty CLAY, slightly moist to moist, good plasticity
21-24	10" Sonic	Brownish Gray CLAY, moist, high plascity
34-32	10" Sonic	Browninsh Gray CLAY, moist to very moist, high plasticity
32-53	10" Sonic to 39 feet	Brownish Gray CLAY, dencer, slightly moist,
		44 - thin layer of brownish orange fine grained sand
		47 - transitioning into a gray clay
		49 - thin layer of brownish orange fine grained sand
53-55	8" Sonic	Brownish Gray CLAY, dense, very plastic, slightly moist
55-73	8" Sonic	Brown CLAY, very plastic, slightly moist
73-82	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

ISPC– CB LANDFILL AREA

DELTA, UTAH

CLW-4 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

IPSC

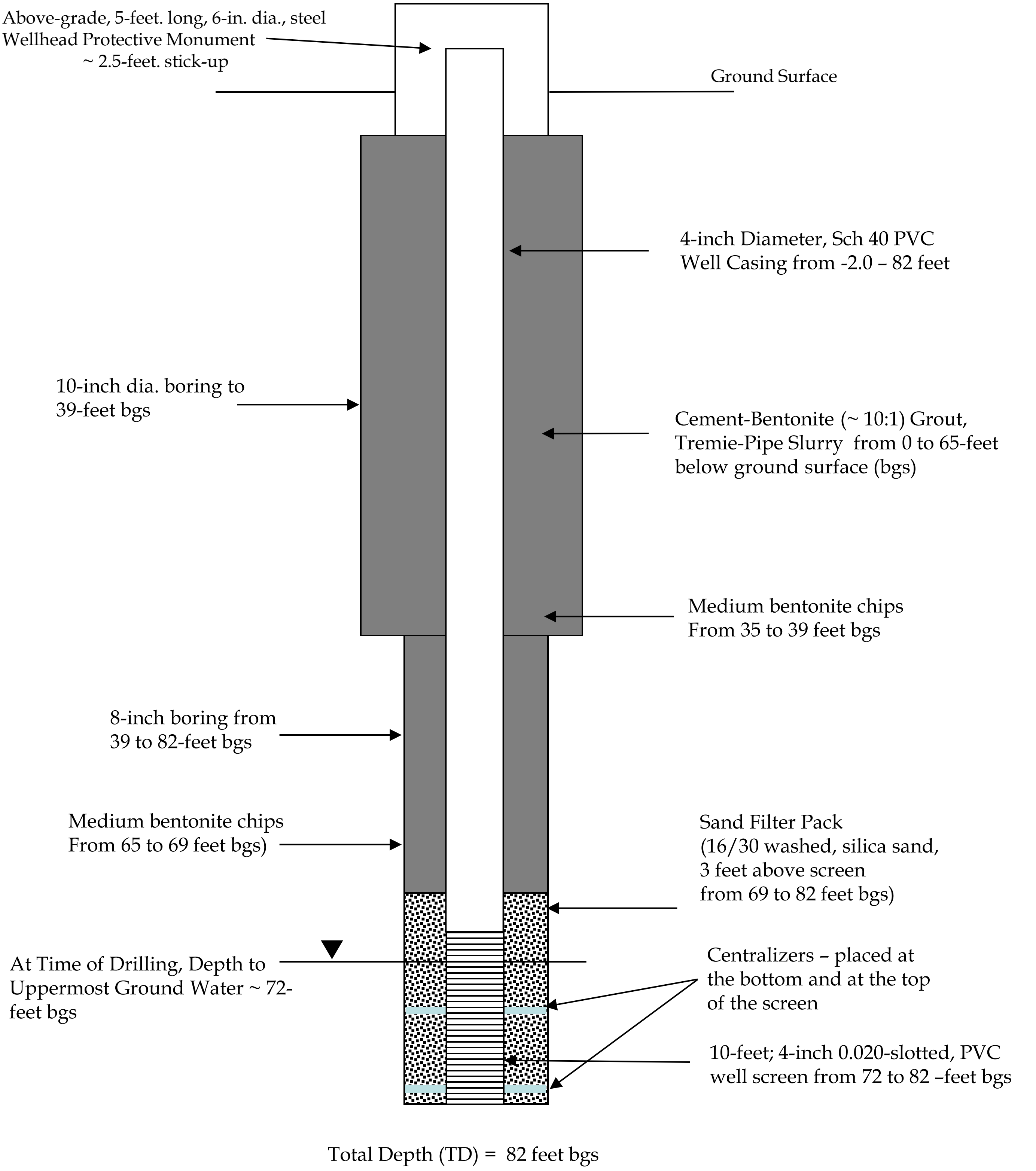
Delta, Utah

CLW-5

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-4	10" Sonic	Gravels with medium to fine grand sands, moist
4-7.5	10" Sonic	Light Brown sitly CLAY, slightly moist, good plasticity
7.5-10	10" Sonic	Light Brown fine to medium grained SAND, dry
10-12	10" Sonic	Light Brown to Gray fine to medium grained SAND, gravels present, slightly moist
12-13	10" Sonic	Light Brown clayey SILT, slightly moist,
13-15	10" Sonic	Brown fine to medium grained SAND, wht clays and silts, slightly moist
		7/27/2015
15-22	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
22-32	10" Sonic	Light Brown CLAY, moistgood plasticity
32-38	10" Sonic	Brown CLAY, slightly moist, high plasticity
38-40	10" Sonic to 39 feet	Light Gray CLAY, slightly moist, hight plasticity
40-44	8" Sonic	Light Brown to Brown CLAY, slightly moist, high plasticity
44-52	8" Sonic	Light Gray CLAY, hight plasticity, slighly moist
52-53	8" Sonic	Brown CLAY, high plasticity, slightly moist
53-55	8" Sonic	Gray CLAY, high plasticity, slightly moist
55-72	8" Sonic	Gray CLAY, high plasticity, moist
72-74	8" Sonic	Gray fine grained SAND, with clay matrix, moist to saturated
74-75	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
75-78	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated
78-80	8" Sonic	Gray CLAY with fine grained sandy matrix, poor plasticity, moist
80-82	8" Sonic	Gray fine grained SAND wht a clayey matrix, poor plasticity, saturated

TD = 82; PVC 4-inch screen from 72 to 82; PVC 4-inch riser from -2.5 to 72

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

ISPC– CB LANDFILL AREA

DELTA, UTAH

CLW-5 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

IPSC

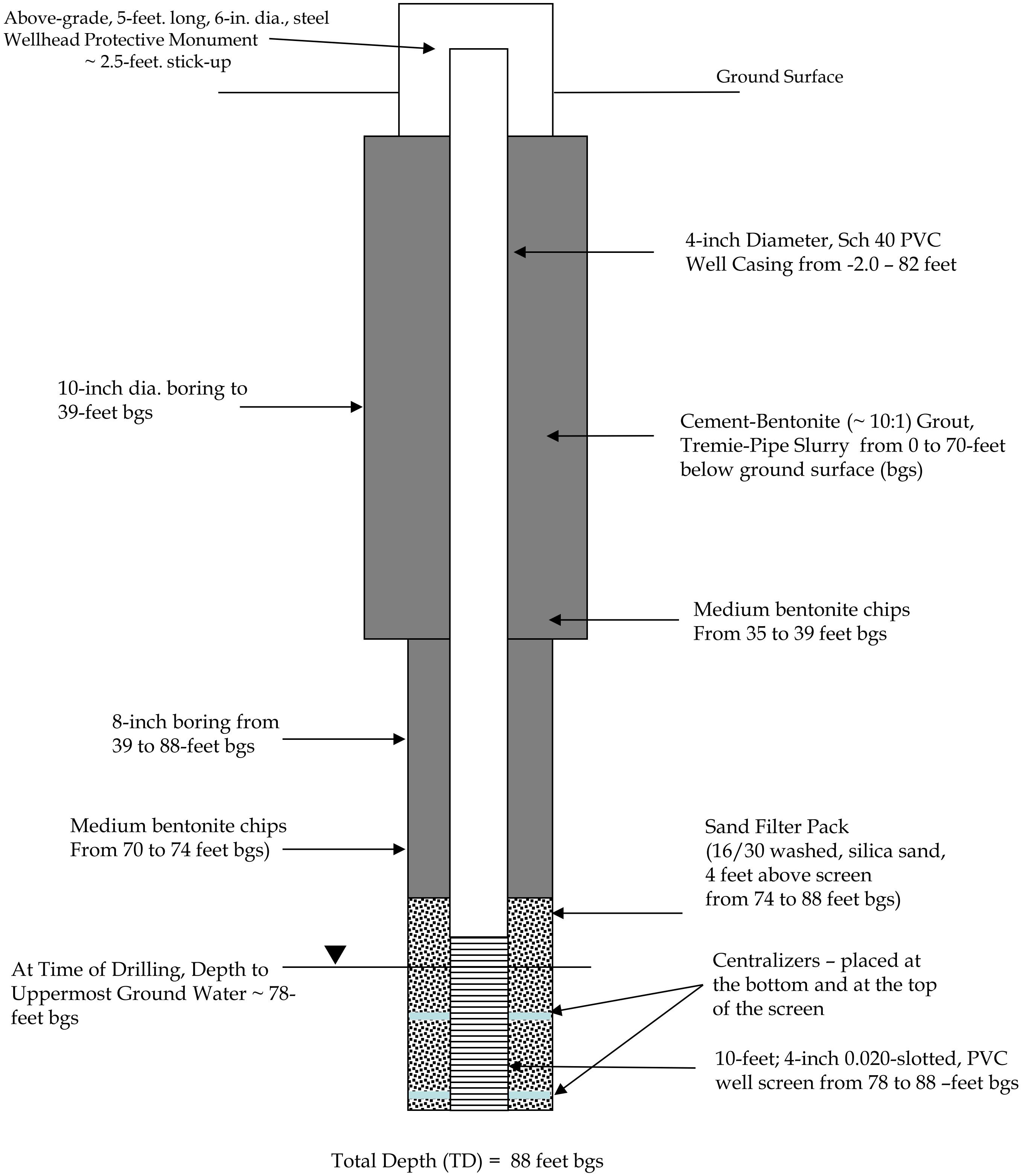
Delta, Utah

CLW-6

Interval (feet)	Drilling Method	Sample Description
		7/26/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown silty fine grained SAND, dry
5-7	10" Sonic	Light Brown fine grained sandy SILT, dry
7-12	10" Sonic	Light Brown fine to medium grained SAND, dry
12-15	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
15-21	10" Sonic	Light Brown to Brown clayey SILT, slightly moist, poor plasticity
21-22	10" Sonic	Light Brown fine grained sand, with a clay matrix, dry
21-23		Light Brown to Brown clayey SILT, slightly moist, poor plasticity
23-32	10" Sonic	Light Brown CLAY, moist, sticky, high plasticity
32-38	10" Sonic	Light Brown to Gray CLAY, moist, high plasticity
38-47	10" Sonic	Light Gray to Gray CLAY, slightly moist, high plasticity
47-55	10" Sonic to 39 feet	Transitioned to a Brownish gray CLAY, high plasticity, slight moist
55-72	8" Sonic	Brown CLAY, high plasticity, slightly moist
		58 - 58.5 very moist to saturated, 59 - slightly moist
72-78	8" Sonic	Gray CLAY, very moist, high plasticity
78-82	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
82-84	8" Sonic	Gray CLAY, high plasticity, very moist
84-85	8" Sonic	Gray fine grained SAND with a clay matrix, poor plasticity, saturated
85-88	8" Sonic	Gray CLAY, high plasticity, very moist

TD = 88; PVC 4-inch screen from 78 to 88; PVC 4-inch riser from -2.5 to 78

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-6 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

IPSC

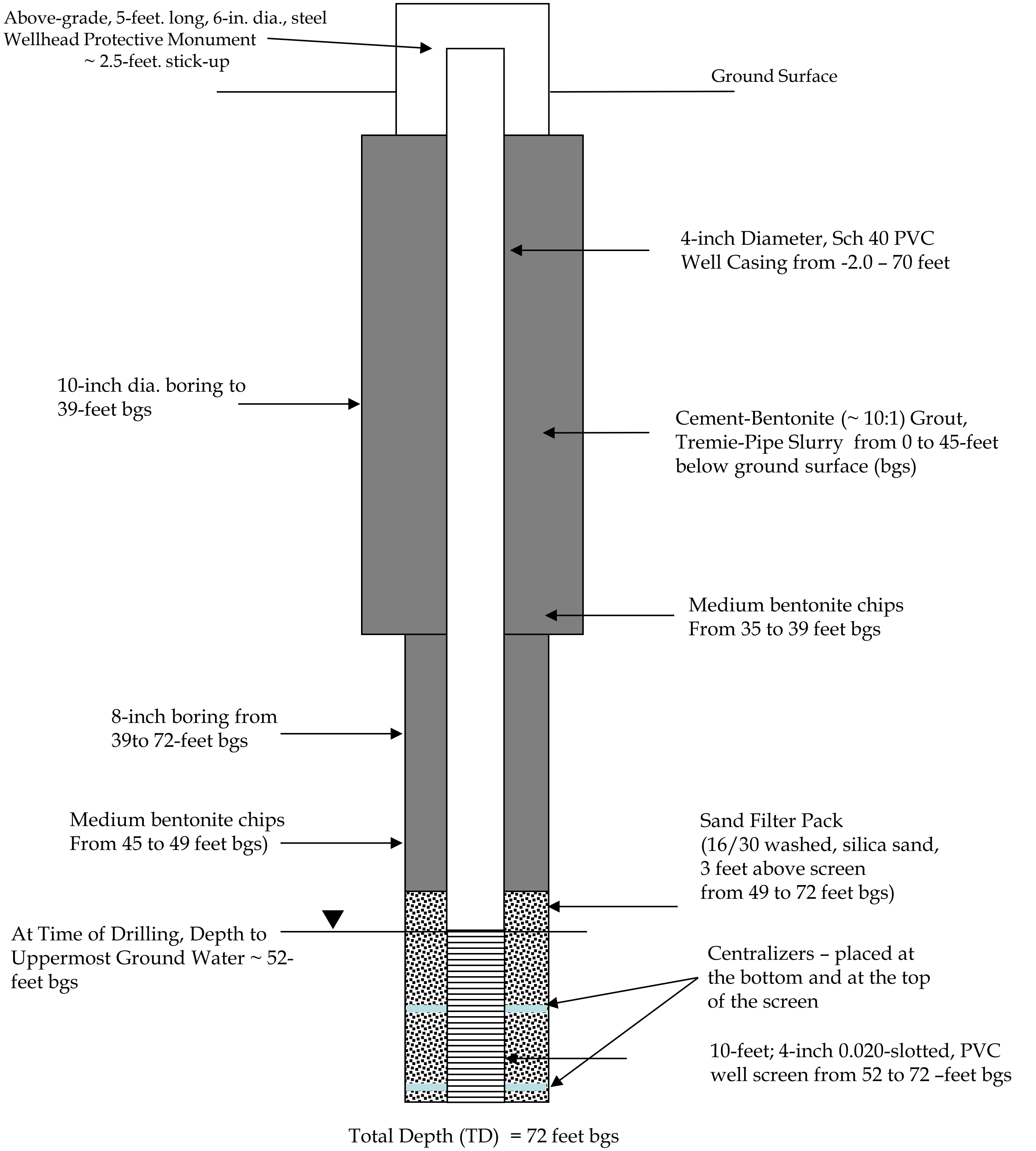
Delta, Utah

CLW-7

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-8	10" Sonic	Light Brown fine grained Sands with silts and gravel, angular, Dry
8-12	10" Sonic	Light Brown fine grained Sands with silts and clay, No gravel, Dry
12-15	10" Sonic	Tan SILT with a clay matrix, Dry
15-17	10" Sonic	Light Brown to Gray CLAY, medium plasticity, silty present, Dry
17-22	10" Sonic	Light Brown Clayey SILT, slightly moist
22-24	10" Sonic	Light Brown to Grayish silty CLAY, Dry
24-32	10" Sonic	Light Brown to Grayish CLAY, Brown silts and fine grained sands present, , Dry
32-40	10" Sonic to 39 feet	Light Brown CLAY, slightly moist, became denser at 35 feet
40-43	8" Sonic	Light Brown to Grayish CLAY, very dense, slightly moist
43-48	8" Sonic	Gray CLAY, slightly moist, some layers of a brown fine grained sand present every 3 to 4 inches alone the core
48-50	8" Sonic	Gray CLAY, slightly moist, some Iron Oxide present
50-51.5	8" Sonic	Brown fine to medium grained SANDS, saturated
51.5-58	8" Sonic	Brown CLAY, moist to slightly moist
58-58.5	8" Sonic	Brown fine grained SANDS, with a clay matrix, saturated
58.5-61	8" Sonic	Brown CLAY, moist to slightly moist
61-68	8" Sonic	Brown fine to medium grained SANDS, saturated
68-70	8" Sonic	Brown CLAY, moist to slightly moist
70-72	8" Sonic	Brown fine to medium grained SANDS, saturated

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-7 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

IPSC

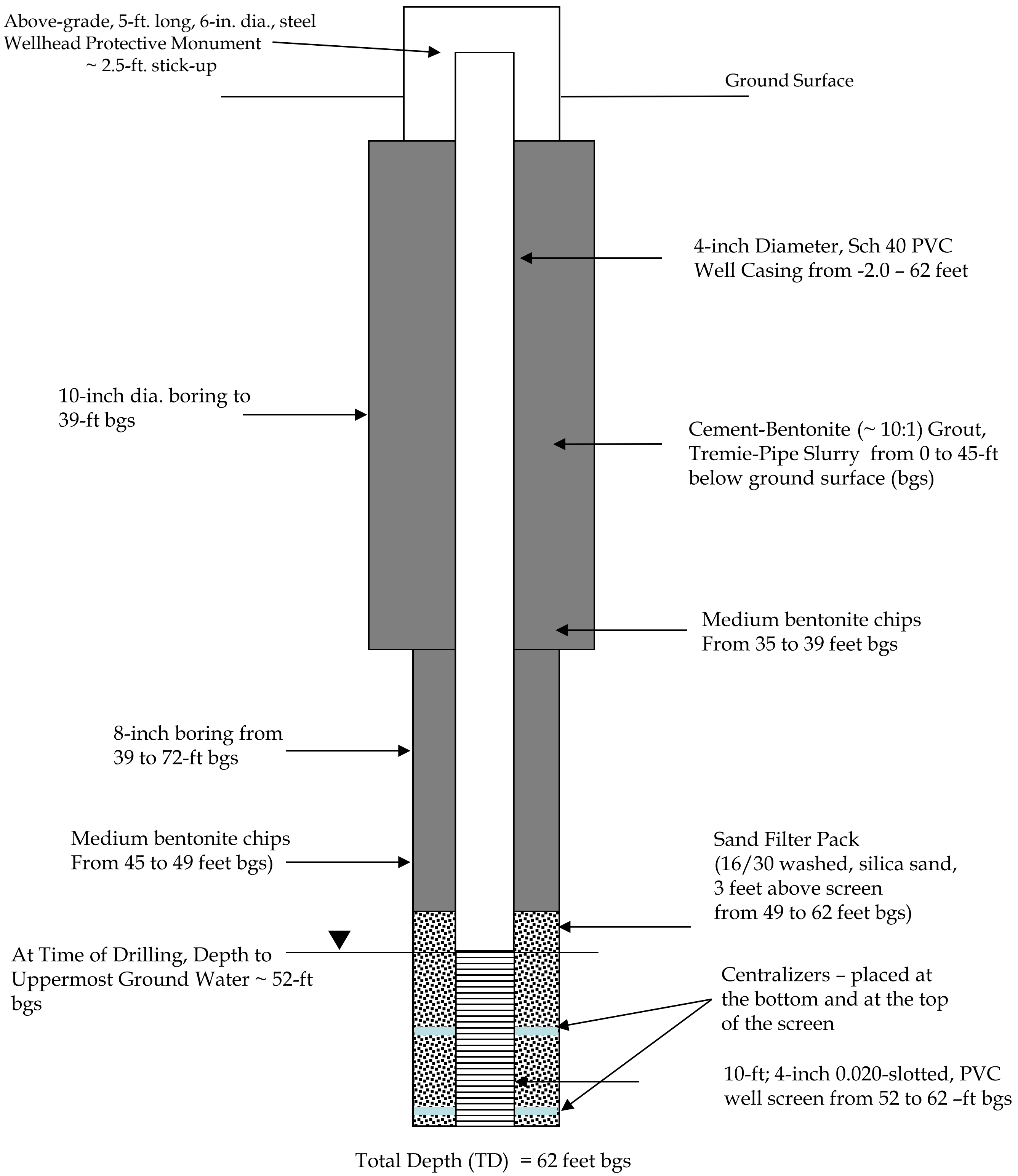
Delta, Utah

CLW-8

Interval (feet)	Drilling Method	Sample Description
		7/24/2015
0-3	10" Sonic	Light Brown fine grained Sands with silts and gravel, dry
3-5	10" Sonic	Light Brown fine grained Sands, slightly moist
5-7	10" Sonic	Tannish white fine grained Sand, with smooth, rounded pebbles, slightly moist
7-10	10" Sonic	Tannish white silty, fine grained Sand, slightly moist
10-13	10" Sonic	Tan SILT with a clay matrix, slightly most, slightly plastic
13-15	10" Sonic	Tan Clayey SILT, dry, plastic
15-18	10" Sonic	Light Brown to tan silty CLAY, slightly moist, good plasticity
18-24	10" Sonic	Light Brown CLAY with silts present, slightly moist, good plasticity
24-32	10" Sonic	Brown silty CLAY, slightly moist, good plasticity
32-37	10" Sonic	Brown CLAY, dence, dry to slihgtly moist, very plastic
37-52	10" Sonic to 39 feet	Transitioned fomrthe Brown CLAY to a Gray CLAY, with interbeds of brown fine gran sand layers, highly plastic, slihglty moist
52-62	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 62; PVC 4-inch screen from 52 to 62; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

ISPC– CB LANDFILL AREA
DELTA, UTAH

CLW-8 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

IPSC

Delta, Utah

CL-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/22/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	SAND with silt:
2-2.5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
2.5-5	8" Sonic	SM	Silty SAND:
5-6	8" Sonic	CL	CLAY:
6-7.5	8" Sonic	SM/ML	Silty SAND/Sandy SILT with clay:
7.5-10	8" Sonic	CH	CLAY:
10-11	8" Sonic		CLAY:
11-12.5	8" Sonic		CLAY:
12.5-13.5	8" Sonic		CLAY:
13.5-15	8" Sonic	ML	Sandy SILT:
15-16.5	8" Sonic	SP/SM	SAND with silt:
16.5-17.5	8" Sonic	SM	Silty SAND:
17.5-20	8" Sonic	SP	SAND:
20-21	8" Sonic		SAND:
21-22	8" Sonic	ML	Sandy SILT:
22-23	8" Sonic	SP	SAND:
23-24	8" Sonic	ML	Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26	8" Sonic	ML	Sandy SILT:
26-28	8" Sonic		Sandy SILT:
28-30	8" Sonic		SILT with clay:
30-32	8" Sonic		Sandy SILT:
32-34	8" Sonic	SP	SAND:
34-35	8" Sonic	ML	Sandy SILT with clay:
35-40	8" Sonic	CL	CLAY:
40-42	8" Sonic	ML	SILT with clay:
42-45	8" Sonic	CH	CLAY:
45-55	8" Sonic		CLAY:
55-65	8" Sonic		CLAY:
7/23/2015			
65-66.5	8" Sonic	CH	Sandy CLAY:
66.5-67.5	8" Sonic	SP/SM	SAND with silt:
67.5-72.5	8" Sonic		SAND with silt:
72.5-73.5	8" Sonic	SP	SAND:
73.5-75	8" Sonic	SC	Clayey SAND:
75-76.5	8" Sonic	SW	SAND:
76.5-79	8" Sonic	SP	SAND:
79-80	8" Sonic	CH	CLAY:

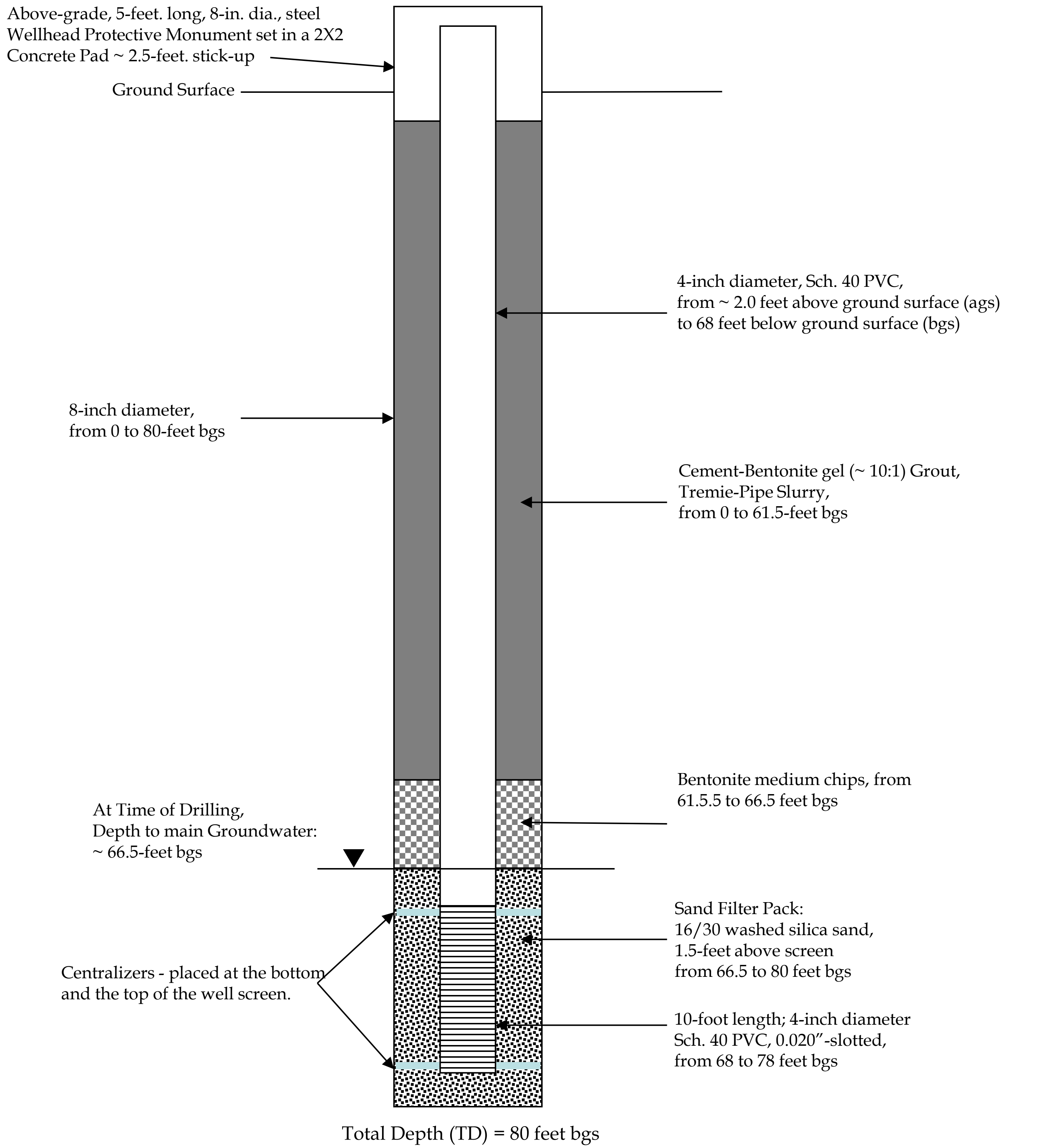
TD = 80'; PVC 4-inch screen from 68 to 78; PVC 4-inch riser from -2.5 to 68

Drilling Method: Guspech GS24-300RS 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



Stantec

IPSC – COMBUSTION BYPRODUCT LANDFILL AREA
DELTA, UTAH

Well CL-U-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/23/15
			Last Revision Date

Boring Logs

IPSC

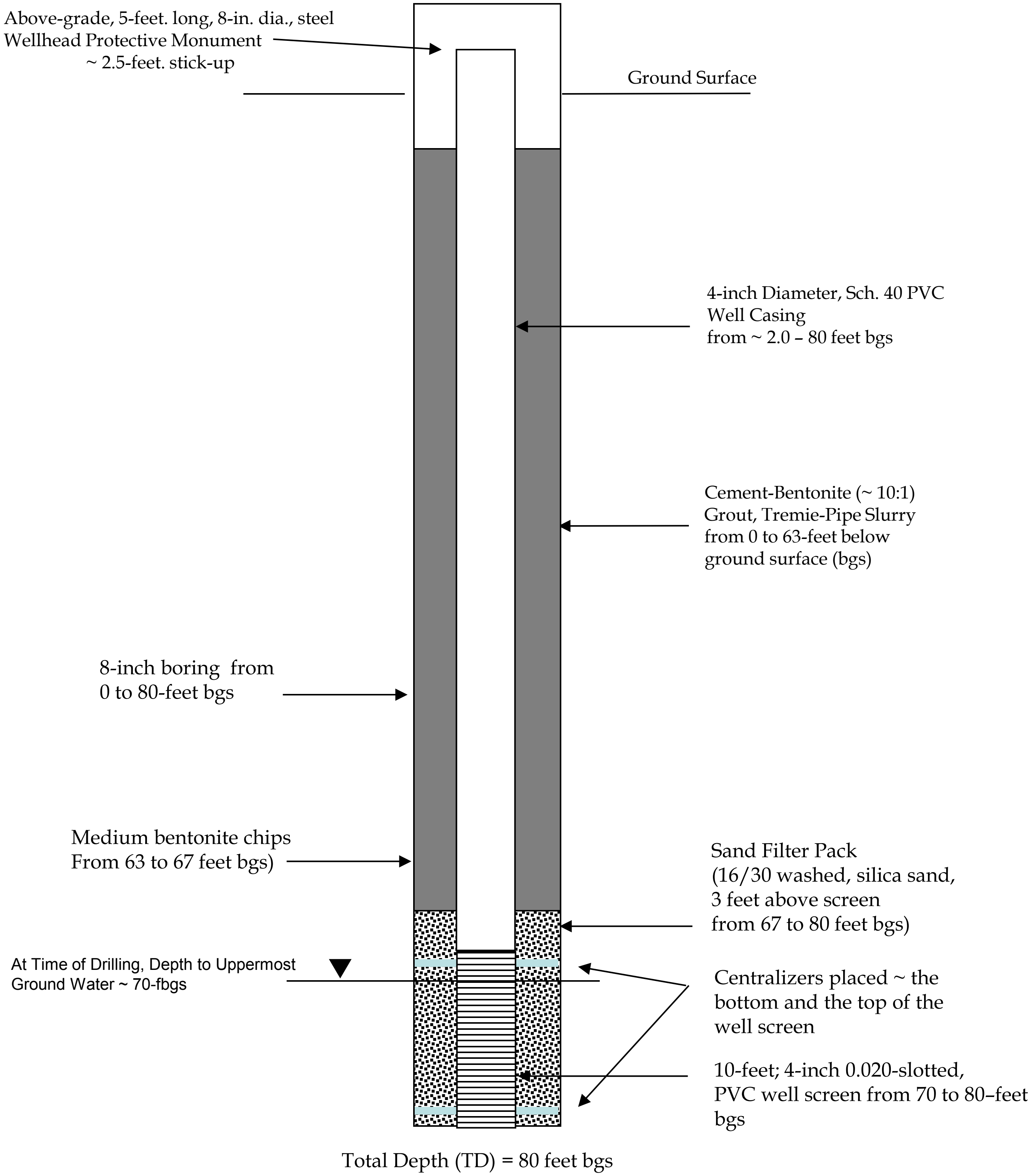
Delta, Utah

CLU-2

Interval (feet)	Drilling Method	Sample Description
		7/22/2015
0-6	8" Sonic	Light Brown fine grained SAND with silt, dry
6-7.5	8" Sonic	Light Brown to Tan CLAY with silt, slightly moist
7.5-13	8" Sonic	Light Brown fine grained SAND with silt, dry
13-16	8" Sonic	Brown fine grained SAND with clayey matrix, slightly moist, some plasticity
16-24	8" Sonic	Light Brown fine grained SAND, dry
24-35	8" Sonic	Light Brown clayey SILT, dry
35-44	8" Sonic	Light Brown Silty CLAY, dry, good plasticity
44-48	8" Sonic	Gray Clayey SILT, dry, slightly plastic
48-49	8" Sonic	Brownish Orange CLAY, with a silty matrix, dry, good plasticity
49-60	8" Sonic	Brownish Orange CLAY, slightly moist
	8" Sonic	53-55 soil becomes slightly moist and Iron Oxide present
	8" Sonic	57-61 soil is dry
61-67	8" Sonic	Brownish Gray CLAY, at 61 feet very moist, very plastic
67-70	8" Sonic	Gray CLAY, moist, very plastic
70-75	8" Sonic	Gray fine to medium grained SAND, saturated, nonplastic
75-77	8" Sonic	Greenish Gray to Brown Clay fine grained SAND with a CLAY matrix, saturated
77-80	8" Sonic	Brownish Gray, fine to medium grained SAND, saturated

TD = 80; PVC 4-inch screen from 70 to 80; PVC 4-inch riser from -2.5 to 70

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

IPSC– CB LANDFILL AREA

DELTA, UTAH

Well CLU-2 Schematic

Design by	Drawn by TH	Scale	Date Drawn 9/1/15
			Last Revision Date

Boring Logs

ISPC

Delta, Utah

CL-U-3

Interval (feet)	Drilling Method	USCS	Sample Description
3/26/2018			
0-2	8" Sonic	SW	Sand, silt and clay
2-14	8" Sonic	SP	Sand, poorly graded, dry
14-17	8" Sonic	MH	Silt, dry
17-18	8" Sonic	MH	Silt with trace clay, dry
18-27.5	8" Sonic	MH	Silt, dry
27.5-37	8" Sonic	CH	Clay, silt stringers every 3-10", red mottling, moist
37-48	8" Sonic	CH	Clay, distance between silt stringers increasing to 10-18"
48-57	8" Sonic	CH	Clay, massively bedded
57-64	8" Sonic	CH	Clay, massively bedded
64-65	8" Sonic	SP	Sand, medium-grain, saturated
65-66	8" Sonic	MH	Silt, saturated
66-67	8" Sonic	SP	Sand, saturated
67-74	8" Sonic	SP	Sand, saturated
74-75	8" Sonic	CH	Clay
75-77	8" Sonic	SP	Sand, saturated

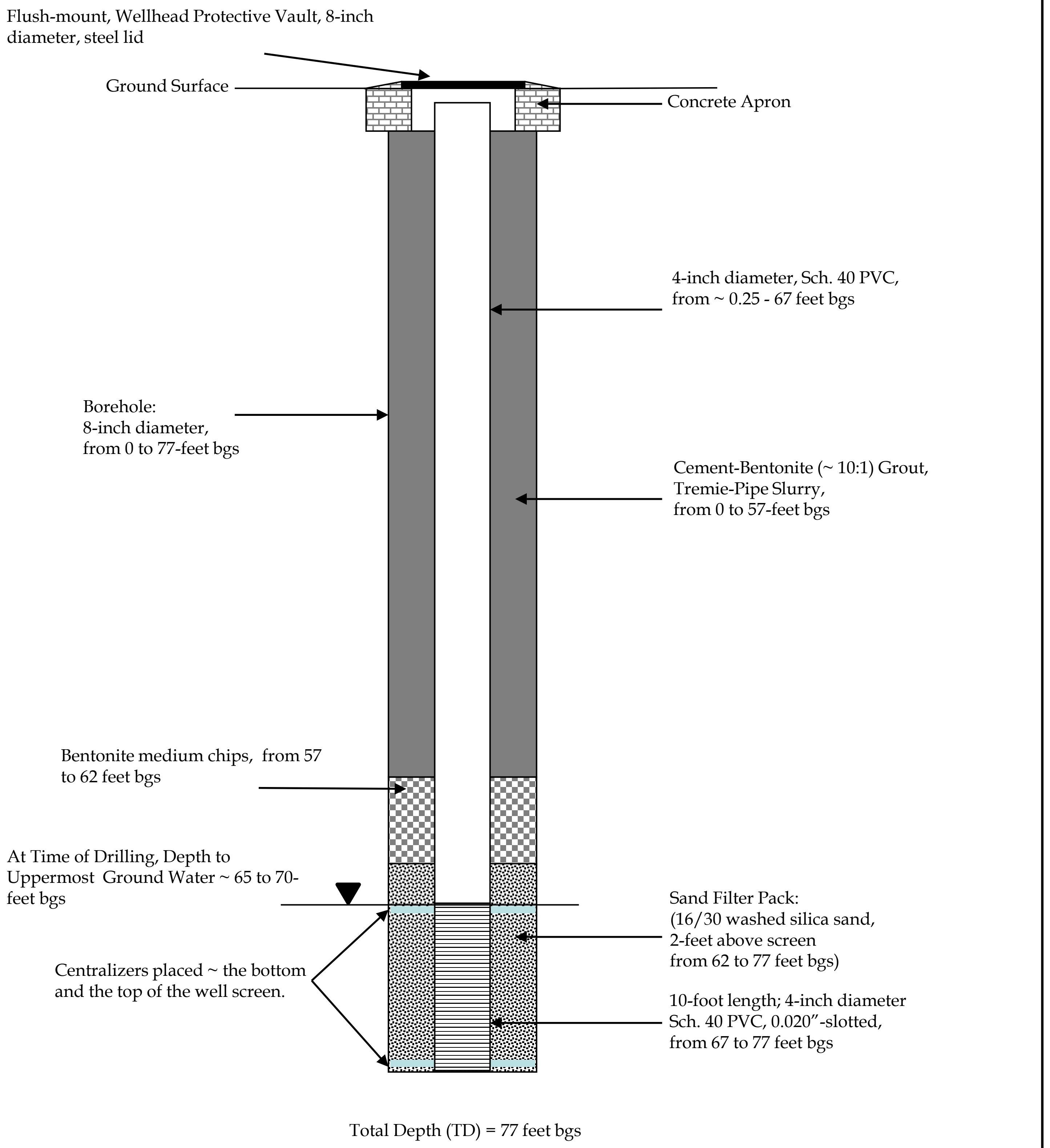
TD = 77; screen 67-77; sand 62-7; plug 57-62; grout to surface; centralizers 66.5 and 76.5

Drilling Method: Sonic

Drilling Company - Cascade Drilling

Driller - David Donnely

Geologist - Tom Fendler



Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA
DELTA, UTAH

Well CL-U-3 Schematic

Design by	Drawn by JR	Scale	Date Drawn 10/24/18
			Last Revision Date

Boring Logs

ISPC

Delta, Utah

BAC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/31/2015			
0-0.75	8" Sonic	Concrete	Surface - concrete soil mixture
0.75-2.5	8" Sonic	SM	Silty SAND:
2.5-3.25	8" Sonic		Silty SAND:
3.25-5	8" Sonic	SP/SM	SAND with silt:
5-12.5	8" Sonic		SAND with silt:
12.5-13.5	8" Sonic		SAND with silt:
13.5-14.5	8" Sonic	ML	Sandy SILT:
14.5-15	8" Sonic		Sandy SILT:
15-17.5	8" Sonic	SP	SAND:
17.5-19	8" Sonic	SP/SW	SAND:
19-20	8" Sonic	SP/SM	SAND with silt:
20-21.5	8" Sonic	SP	SAND:
21.5-22.5	8" Sonic		Sandy SILT:
22.5-24	8" Sonic	ML	Sandy SILT:
24-25	8" Sonic	SP	SAND:
25-26.75	8" Sonic	SM	Silty SAND:
26.75-27.5	8" Sonic	SP	SAND:
27.5-28.5	8" Sonic		SAND:
28.5-30	8" Sonic	SM	Silty SAND:
30-31.5	8" Sonic	SP	SAND:
31.5-32.25	8" Sonic	SM	Silty SAND:
32.25-33.75	8" Sonic	SP/SM	SAND with silt:
33.75-35	8" Sonic	SM	Silty SAND:
35-36	8" Sonic	SP/SM	SAND with silt:
36-37.5	8" Sonic	SM	Silty SAND:
37.5-38	8" Sonic	SP/SM	SAND with silt:
38-38.5	8" Sonic	SM	Silty SAND:
38.5-40	8" Sonic	ML	Sandy SILT:
40-42.5	8" Sonic	SC	Clayey SAND:
42.5-43.5	8" Sonic	CL	Sandy CLAY:
43.5-44.5	8" Sonic		Sandy CLAY:
44.5-45	8" Sonic		Sandy CLAY:
45-46	8" Sonic		Sandy CLAY:
46-47	8" Sonic		Sandy CLAY:
47-47.75	8" Sonic	SW	SAND:
47.75-48.5	8" Sonic	CH	Sandy CLAY:
48.5-50	8" Sonic		Sandy CLAY:
50-51.5	8" Sonic		CLAY:
51.5-53.5	8" Sonic		Sandy CLAY:
53.5-56	8" Sonic		CLAY:
56-57.5	8" Sonic		Sandy CLAY:
57.5-58	8" Sonic	SC	Clayey SAND:
58-59.5	8" Sonic	CH	CLAY:
59.5-60	8" Sonic	SC	Clayey SAND:
60-64.5	8" Sonic	SM	Silty SAND with clay:
64.5-65.5	8" Sonic	SC	Clayey SAND:
65.5-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic	SW	SAND:

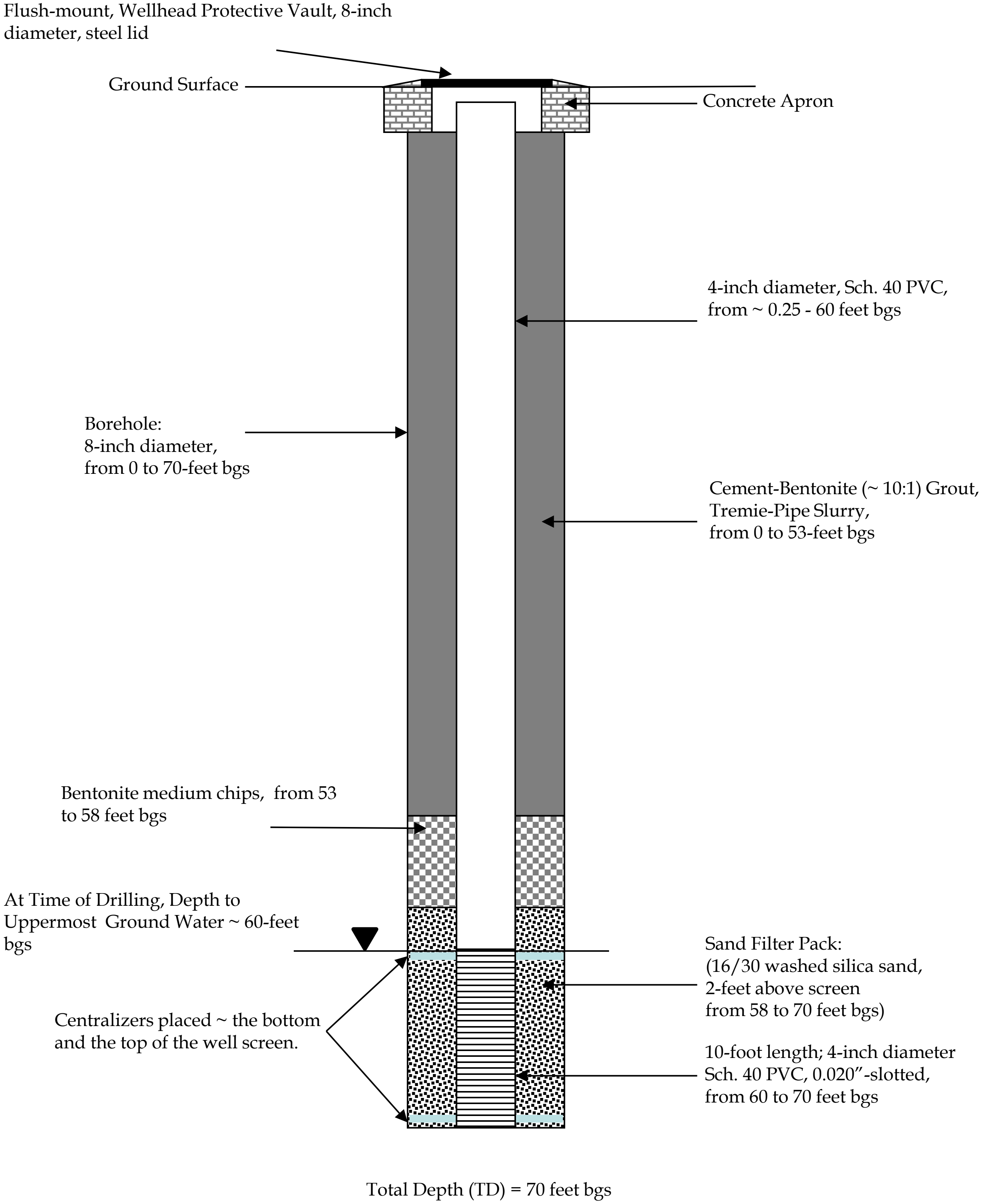
TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from 0 to 60

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT AREA

DELTA, UTAH

Well BAC-1 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/31/15
			Last Revision Date

Boring Logs

IPSC

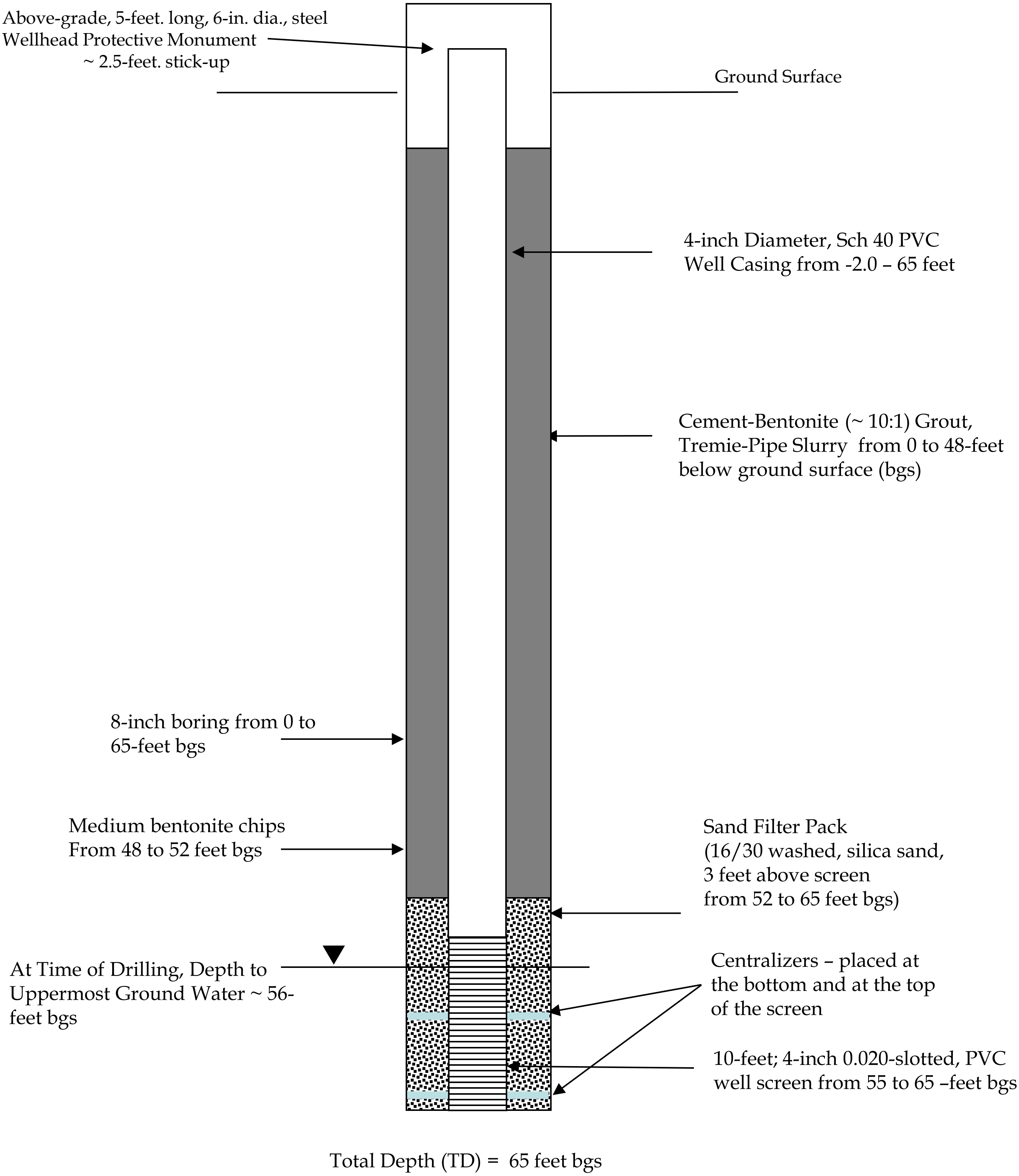
Delta, Utah

BAC-2

Interval (feet)	Drilling Method	Sample Description
		7/29/2015
0-6	8" Sonic	Light Brown fine grained Sand, gravels, dry
6-12	8" Sonic	Light Brown fine grained SAND, moist
12-18	8" Sonic	Light Brown fine to medium grained sand, dry
18-23	8" Sonic	Light Brown fine to medium grained sand, with a clay matrix, dry
23-24	8" Sonic	Light Brown fine to medium grained sand, very moist, trace amount of clay
24-26	8" Sonic	Brown fine to medium grained sand, slightly moist
26-30	8" Sonic	Brown fine to medium grained sand, with gravels present, slightly moist
30-33	8" Sonic	Light Brown fine grained sand, slightly moist
33-34	8" Sonic	Light Brown CLAY, very moist, high plasticity
34-36	8" Sonic	Light Brown fine grained sand, with a clay matrix, moist
36-38	8" Sonic	Light Brown Silty CLAY, moderately plastic, slightly moist
38-40	8" Sonic	Brownish Red silty CLAY, good plasticity, slightly moist
40-41	8" Sonic	Brown fine grained SAND, saturated
41-42	8" Sonic	Brown SILT with a clay matrix, slightly moist
42-52	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist
52-55	8" Sonic	Reddish brown CLAY, high plasticity, dry to slightly moist, very dense
55-56	8" Sonic	Brown fine grained SAND with a clay matrix very moist to saturated
56-57	8" Sonic	Reddish brown CLAY, high plasticity, slightly moist to moist
57-65	8" Sonic	Brown fine grained SAND with a clay matrix, saturated

TD = 65; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec	IPSC – BOTTOM ASH SURFACE IMPOUNDMENT DELTA, UTAH		
	BAC-2 Schematic		
			Date Drawn 9/1/15
			Last Revision Date
	Design by	Drawn by TH	Scale

Boring Logs

IPSC

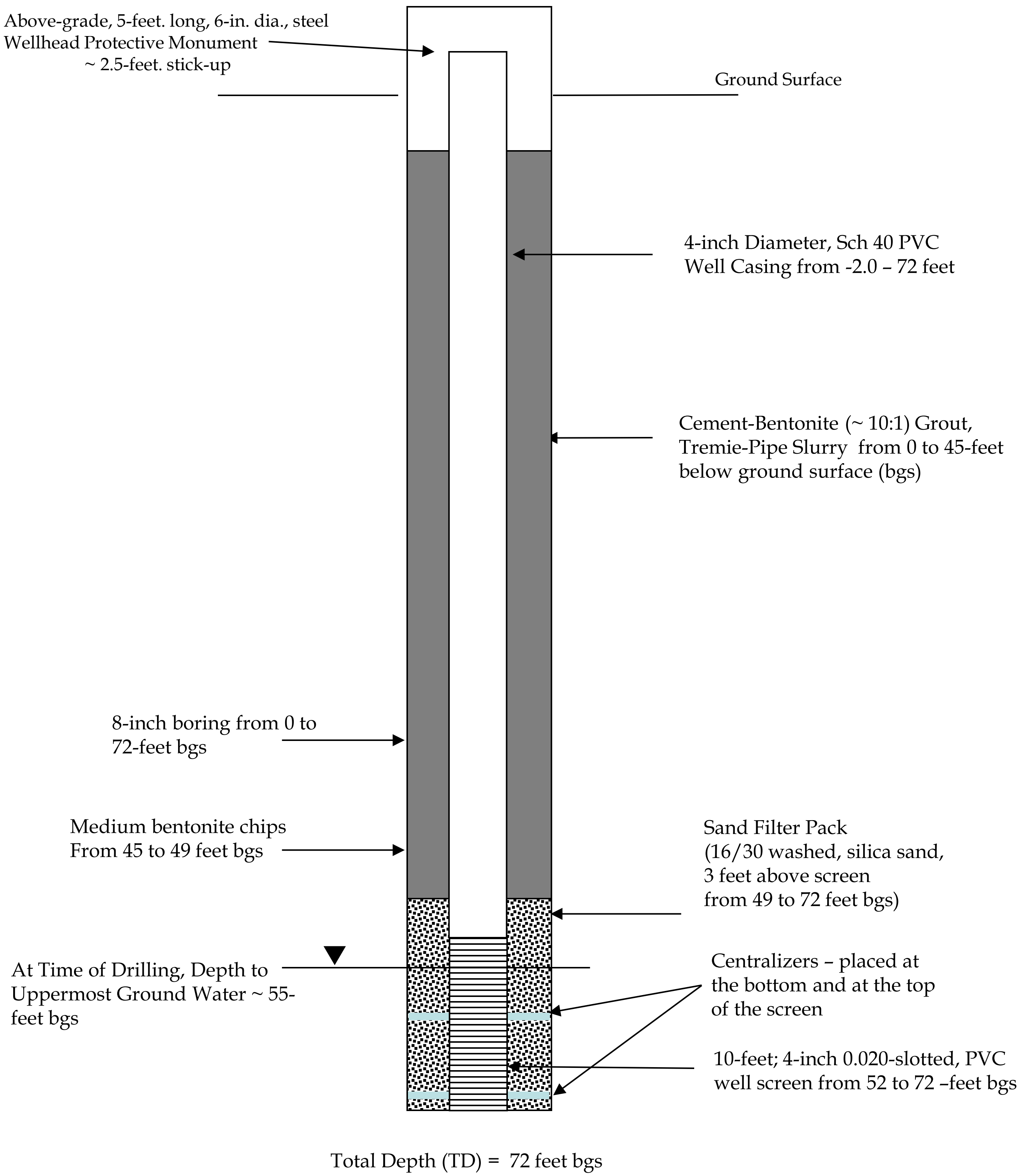
Delta, Utah

BAC-3

Interval (feet)	Drilling Method	Sample Description
		7/28/2015
0-8.5	8" Sonic	Light Brown fine grained Sand, dry
8.5-11	8" Sonic	Light Brown fine to medium grained SAND, moist
11-14	8" Sonic	Light Brown fine grained sand, with a clay matrix, dry
14-17	8" Sonic	Gravels with fine to medium grained SAND, slightly moist
17-20	8" Sonic	Brown fine grained sand, slightly moist
20-22	8" Sonic	Brown fine to medium grained sand, with a clay matrix, slightly moist
22-26	8" Sonic	Brown fine to medium grained sand, with a clay matrix, moist
26-30	8" Sonic	Brown fine grained sand, moist
30-43	8" Sonic	Light Brown CLAY, slightly moist to moist, high plasticity
		30-33 Silty CLAY, poor plasticity
		33-35 Silty CLAY, moderately plastic
		35-43 very little silt present, high plasticity
43-45	8" Sonic	Transitioned to a Reddish Brown CLAY, dry, high plasticity
45-50	8" Sonic	Transitioned to a Brown CLAY, dry, high plasticity
50-55	8" Sonic	Light Brown CLAY, moist, high plasticity
55-58	8" Sonic	Light Brown fine grained SAND, with a clay matrix, slightly moist to moist
58-72	8" Sonic	Light Brown CLAY, with a sandy matrix medium to poor plasticity, moist

TD = 72; PVC 4-inch screen from 52 to 72; PVC 4-inch riser from -2.5 to 52

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Thomas Hedrick



Stantec

ISPC– BOTTOM ASH SURFACE IMPOUNDMENT

DELTA, UTAH

BAC-3 Schematic

			Date Drawn 9/1/15
			Last Revision Date
Design by	Drawn by TH	Scale	

Boring Log

ISPC

Delta, Utah

BAC-4

Interval (feet)	Drilling Method	USCS	Sample Description
8/10/2015			
0-0.5	8' Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8' Sonic	SP/SM	SAND with silt:
2.5-5	8' Sonic	SP	SAND:
5-9	8' Sonic		SAND:
9-10	8' Sonic	SP/SM	SAND with silt:
10-15	8' Sonic	SP	SAND:
15-17.5	8' Sonic	SP/SM	SAND with silt:
17.5-19	8' Sonic		SAND with silt:
19-2	8' Sonic	SC	Clayey SAND:
20-21	8' Sonic		Clayey SAND:
21-22	8' Sonic	CL	Sandy CLAY:
22-22.5	8' Sonic	ML	Sandy SILT:
22.5-25	8' Sonic	CL	Sandy CLAY:
25-32.5	8' Sonic	CH	CLAY:
32.5-33.75	8' Sonic	SP	SAND:
33.75-35	8' Sonic	SM	Silty SAND:
35-36.5	8' Sonic	SP/SM	SAND with silt:
36.5-37.5	8' Sonic		SAND with silt:
37.5-38	8' Sonic	SM	Silty SAND:
38-38.75	8' Sonic	CH	Sandy CLAY:
38.75-39	8' Sonic	SP/SM	SAND with silt:
39-40	8' Sonic	CH	Sandy CLAY:
40-42.5	8' Sonic	ML	Sandy SILT with clay:
42.5-43.5	8' Sonic	SM	Silty SAND and clay:
43.5-45	8' Sonic	CH	CLAY:
45-47.5	8' Sonic		CLAY:
47.5-48.5	8' Sonic		CLAY:
48.5-50	8' Sonic	ML	Clayey SILT with sand:
50-51.25	8' Sonic		Clayey SILT:
51.25-52.5	8' Sonic	CH	CLAY:
52.5-55	8' Sonic	SC	Clayey SAND:
55-56.5	8' Sonic	SM	Silty SAND:
56.5-57	8' Sonic	ML	Clayey SILT with sand:
57-57.5	8' Sonic	CH	CLAY:
57.5-58.5	8' Sonic		CLAY:
58.5-59.5	8' Sonic	ML	Clayey SILT with sand:
59.5-61	8' Sonic		Clayey SILT with sand:
61-64	8' Sonic		Clayey SILT with sand:
64-65	8' Sonic		Clayey SILT with sand:
65-65.5	8' Sonic	SM	Silty SAND:
65.5-67	8' Sonic	CL	Silty CLAY:
67-67.5	8' Sonic	ML	Clayey SILT:
67.5-69	8' Sonic	CH	CLAY:
69-69.5	8' Sonic		CLAY:
69.5-70	8' Sonic		CLAY:
70-72.5	8' Sonic	ML	Sandy SILT with clay:
72.5-74	8' Sonic	CH	Silty CLAY:
74-75	8' Sonic	SM	Silty SAND:

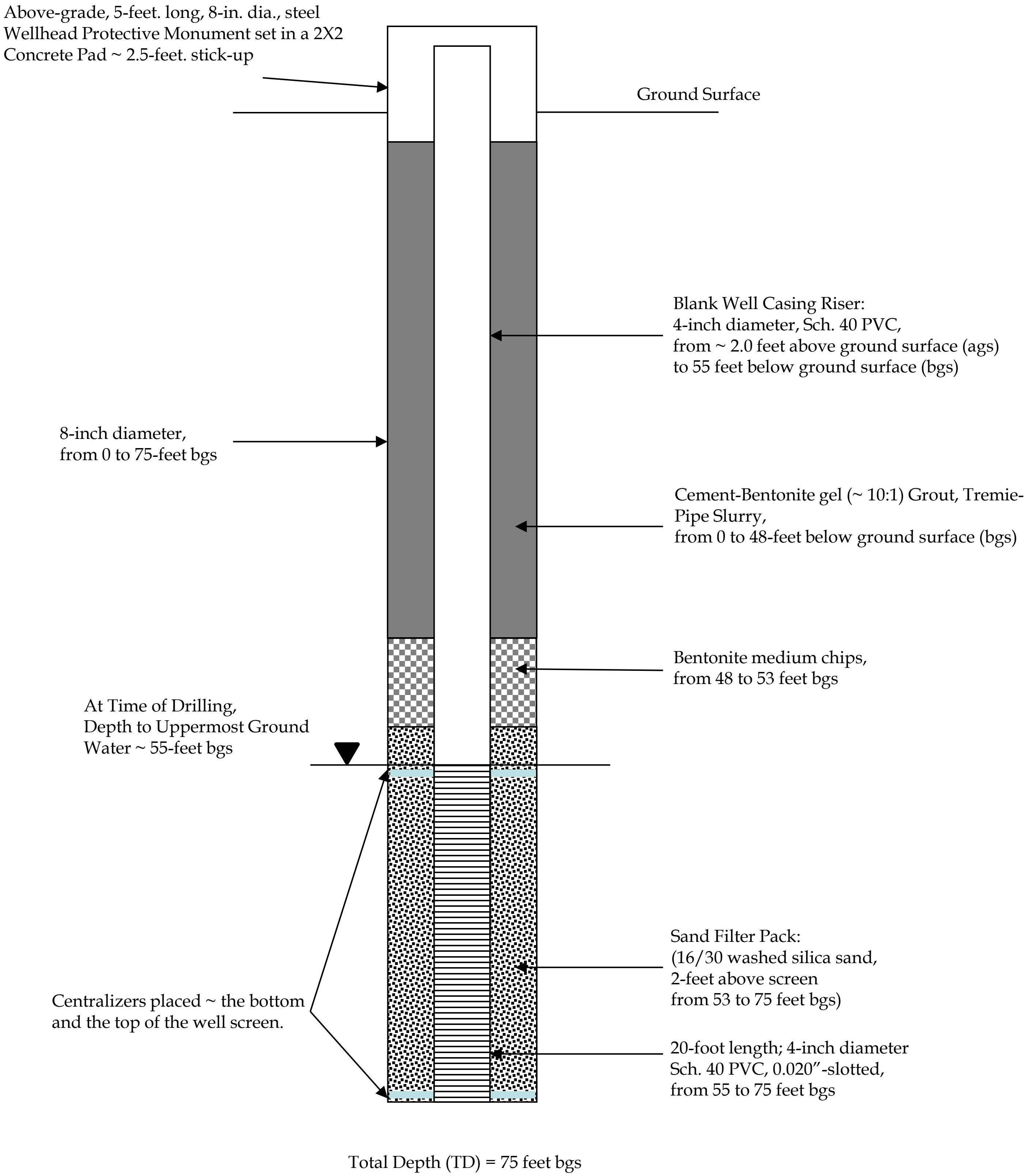
TD = 75'; PVC 4-inch screen from 55 to 75; PVC 4-inch riser from -2.5 to 55

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein



Stantec

IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

Well BAC-4 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/10/15
			Last Revision Date

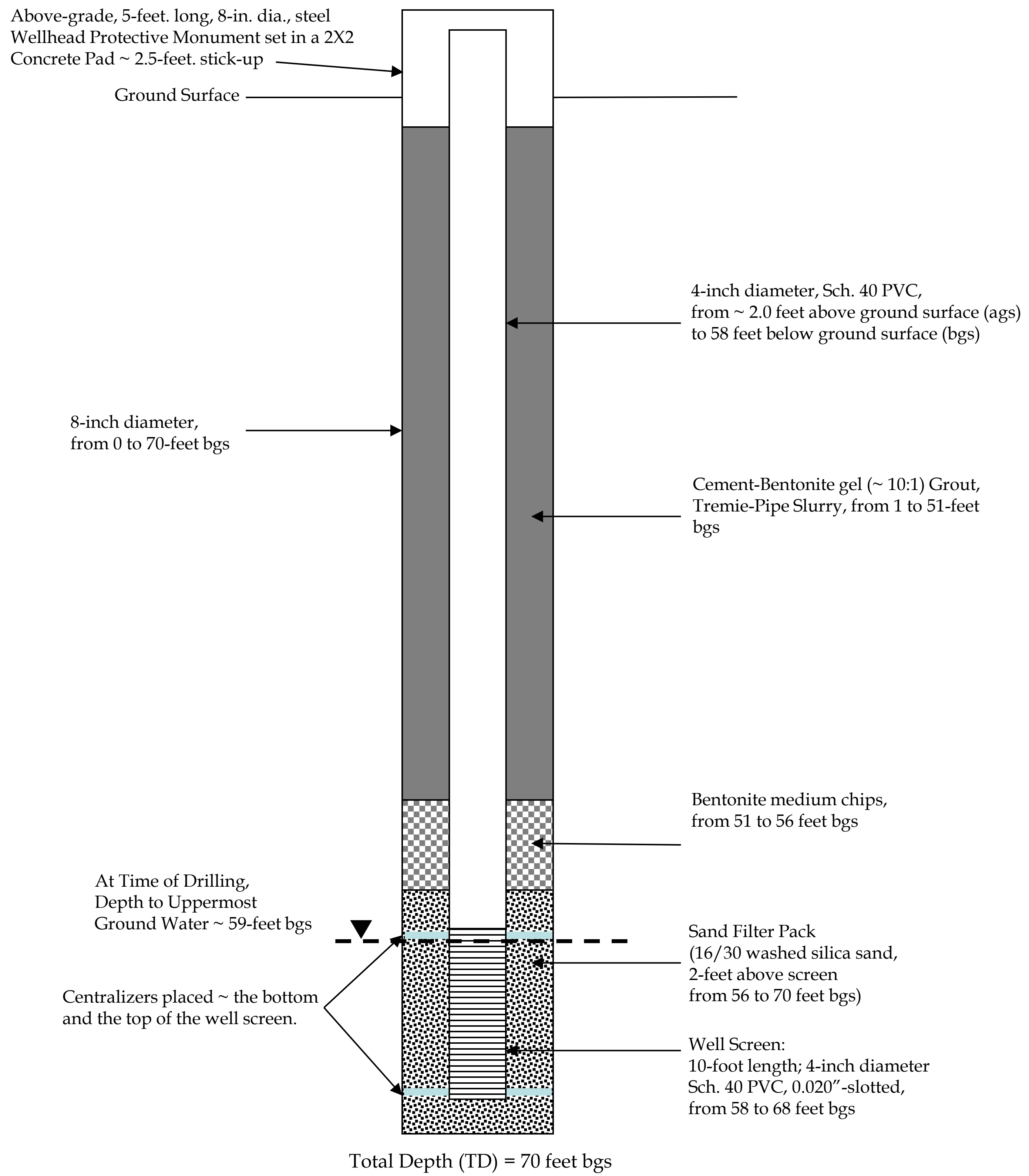
Boring Logs
ISPC
Delta, Utah

BAC-5

Interval (feet)	Drilling Method	USCS	Sample Description
8/9/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-3	8" Sonic	SP	SAND:
3-6.5	8" Sonic		SAND:
6.5-10	8" Sonic		SAND:
10-12.5	8" Sonic		SAND:
12.5-15	8" Sonic	SP/SM	SAND with silt:
15-19	8" Sonic	SM	Silty SAND:
19-19.5	8" Sonic	SC	Clayey SAND:
19.5-20	8" Sonic	SP/SM	SAND with silt:
20-22.5	8" Sonic	CL	Sandy CLAY:
22.5-23.75	8" Sonic		Sandy CLAY:
23.75-25	8" Sonic		Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic	CL/CH	CLAY:
32.5-33.5	8" Sonic	SP	SAND:
33.5-35	8" Sonic		SAND:
35-36	8" Sonic	SC	Clayey SAND:
36-37.5	8" Sonic	ML	Sandy SILT:
37.5-38.5	8" Sonic		Sandy SILT:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-44.25	8" Sonic		Silty SAND with clay:
44.25-45	8" Sonic	CH	CLAY:
45-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50.75	8" Sonic	SM	Silty SAND:
50.75-52.5	8" Sonic	CH	CLAY:
52.5-53.5	8" Sonic		CLAY:
53.5-55.5	8" Sonic	SP	SAND:
55.5-57.5	8" Sonic	CH	CLAY:
57.5-59	8" Sonic		CLAY:
59-60	8" Sonic	SM	Silty SAND with clay:
60-62.5	8" Sonic	SP	SAND:
62.5-63	8" Sonic	SC	Clayey SAND:
63-65	8" Sonic	SP	SAND:
65-65.75	8" Sonic	SC	Clayey SAND:
65.75-66.5	8" Sonic	CH	CLAY:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-69	8" Sonic	CH	CLAY:
69-70	8" Sonic		CLAY:

TD = 70'; PVC 4-inch screen from 58 to 68; PVC 4-inch riser from -2.5 to 58
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT

DELTA, UTAH

Well BAC-5 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/09/15
			Last Revision Date

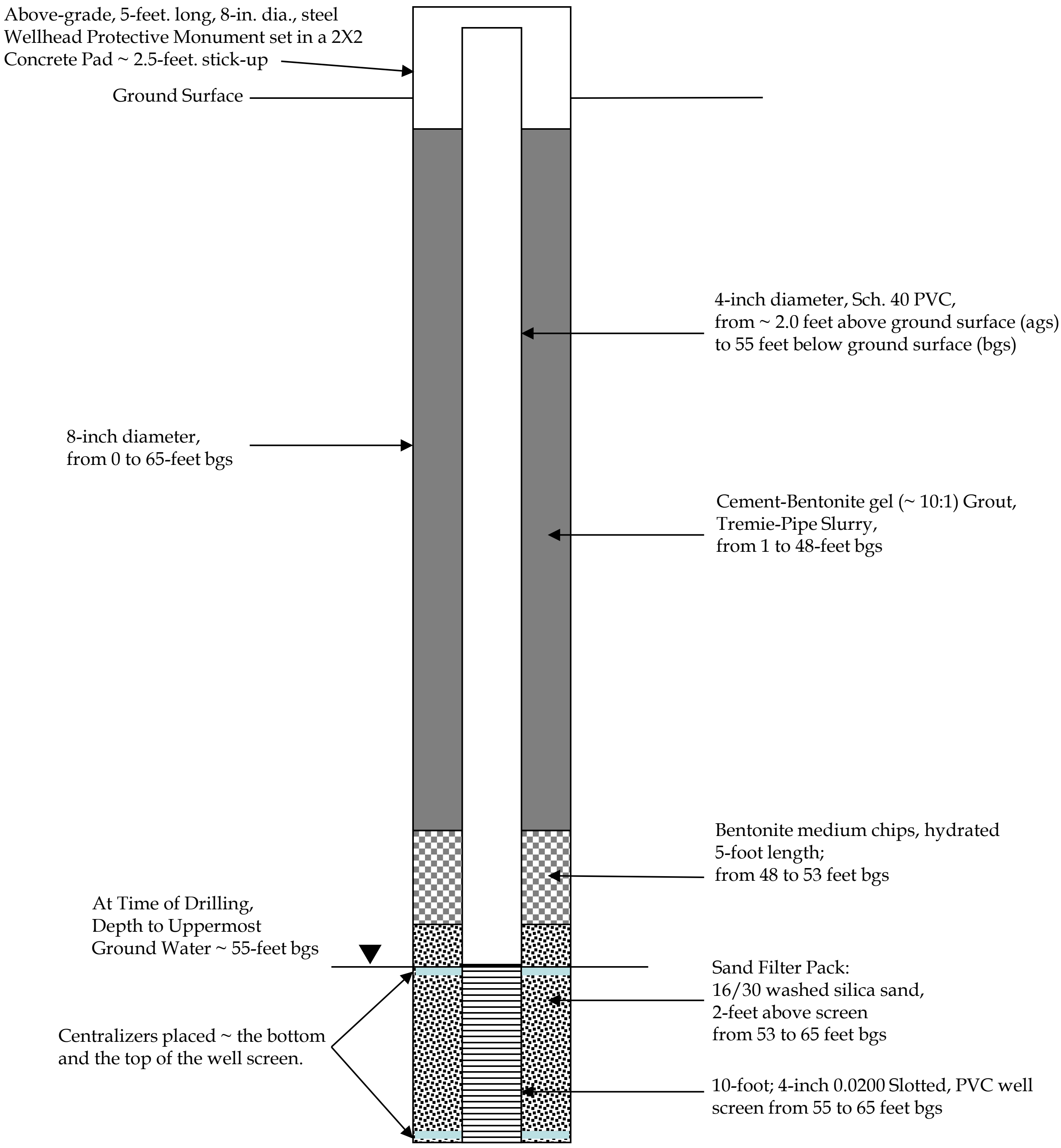
Boring Logs
ISPC
Delta, Utah

BAC-6

Interval (feet)	Drilling Method	USCS	Sample Description
8/8/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	Gravelly SAND with silt:
2.5-5	8" Sonic	SP	SAND:
5-6.5	8" Sonic	SP/SM	SAND with silt:
6.5-7.5	8" Sonic	SP	SAND:
7.5-10	8" Sonic		SAND:
10-13.5	8" Sonic		SAND:
13.5-15	8" Sonic	SM	Silty SAND:
15-16	8" Sonic	SP	SAND:
16-17.5	8" Sonic	SM	Silty SAND:
17.5-18.25	8" Sonic	SP/SM	SAND with silt:
18.25-18.75	8" Sonic	CL	Sandy CLAY:
18.75-20	8" Sonic	SC	Clayey SAND:
20-21.5	8" Sonic	CH	Sandy CLAY:
21.5-23	8" Sonic	SM	Silty SAND:
23-25	8" Sonic	CL	CLAY:
25-27.5	8" Sonic	CH	CLAY:
27.5-30	8" Sonic		CLAY:
30-32.5	8" Sonic		CLAY:
32.5-33.5	8" Sonic		CLAY:
33.5-35	8" Sonic	SW	SAND:
35-36	8" Sonic	SM	Silty SAND:
36-37.5	8" Sonic	SP/SM	SAND with silt:
37.5-38.5	8" Sonic	CH	CLAY:
38.5-40	8" Sonic	SM	Silty SAND with clay:
40-42.5	8" Sonic		Silty SAND:
42.5-43.5	8" Sonic	CH	Sandy CLAY:
43.5-45	8" Sonic		CLAY:
45-45.5	8" Sonic	SC	Clayey SAND:
45.5-47.5	8" Sonic	CH	CLAY:
47.5-48	8" Sonic	SP	SAND:
48-49.5	8" Sonic	SM	Silty SAND with clay:
49.5-50	8" Sonic	CH	Sandy CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic		CLAY:
55-56	8" Sonic	SM	Silty SAND:
56-60	8" Sonic	SW	SAND:
60-61	8" Sonic		SAND:
61-62.5	8" Sonic	CH	Sandy CLAY:
62.5-63.5	8" Sonic		CLAY:
63.5-65	8" Sonic	SC	Clayey SAND:

TD = 65'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Total Depth (TD) = 65 feet bgs

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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

Well BAC-6 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/08/15
			Last Revision Date

Boring Logs

ISPC

Delta, Utah

BAC-7

Interval (feet)	Drilling Method	USCS	Sample Description
8/7/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	SP/SM	Gravelly SAND:
2-2.5	8" Sonic	SP	Gravelly SAND:
2.5-5	8" Sonic		SAND:
5-7	8" Sonic		SAND:
7-8.5	8" Sonic		SAND:
8.5-9	8" Sonic	SP/SM	SAND with silt:
9-9.5	8" Sonic	SP	SAND:
9.5-11	8" Sonic	SP/SM	SAND with silt:
11-13	8" Sonic		SAND with silt:
13-17	8" Sonic	SM	Silty SAND:
17-18.5	8" Sonic		Silty SAND:
18.5-19	8" Sonic	ML	Sandy SILT:
19-20.25	8" Sonic	SP/SM	SAND with silt:
20.25-22	8" Sonic	CL	Sandy CLAY:
22-24	8" Sonic		Sandy CLAY:
24-25	8" Sonic	SC	Clayey SAND:
25-27.5	8" Sonic	CH	CLAY:
27.5-36.5	8" Sonic		CLAY:
36.5-40	8" Sonic	SP	SAND:
40-41.25	8" Sonic		SAND:
41.25-43.75	8" Sonic	SP/SM	SAND with silt:
43.75-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		CLAY:
47.5-49	8" Sonic		CLAY:
49-50	8" Sonic	SM	Silty SAND:
50-57.5	8" Sonic	CH	CLAY:
57.5-60	8" Sonic	SW	SAND:
60-62.5	8" Sonic		SAND:
62.5-64	8" Sonic	SP	SAND:
64-65	8" Sonic	CH	CLAY:
65-66.25	8" Sonic		Sandy CLAY:
66.25-67.5	8" Sonic		CLAY:
67.5-70	8" Sonic		CLAY:

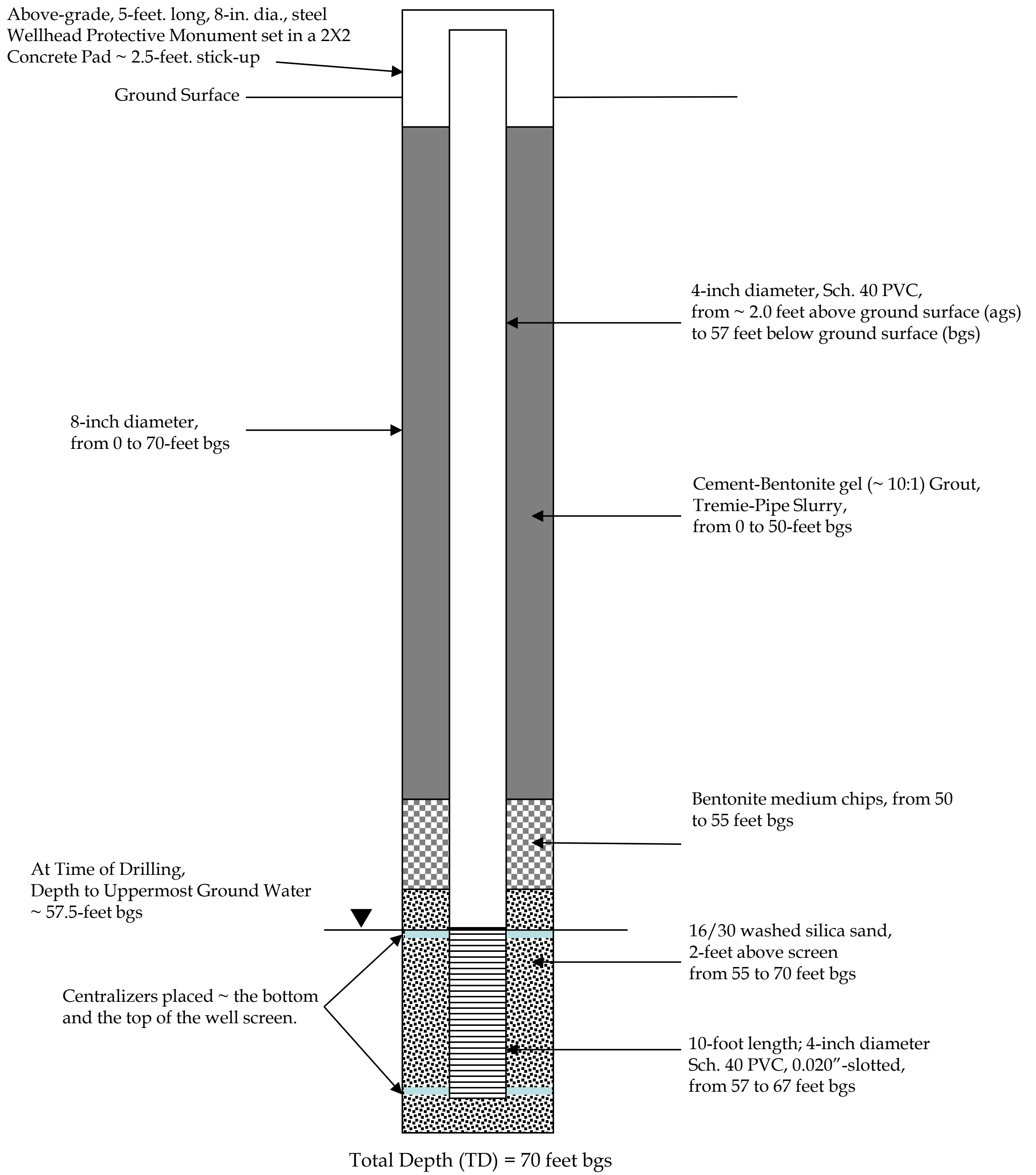
TD = 70'; PVC 4-inch screen from 57 to 67; PVC 4-inch riser from -2.5 to 57

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

Well BAC-7 Schematic

Design by	Drawn by MS	Scale	Date Drawn 8/07/15 Last Revision Date

Project Name: Intermountain Power Service Corporation
Boring Monitor Well: BAC-8

Project No.: 203709098
Completion Date: 2019-04-29

Drilling Firm: Cascade
Boring Method: Sonic
Boring Diameter: 10 inches

Driller: Ryan Miller
Logged by: Rich Pratt
Depth to Water at Drilling: 67 feet
Depth to Water at Drilling (static at 24 hours): 45.59 feet

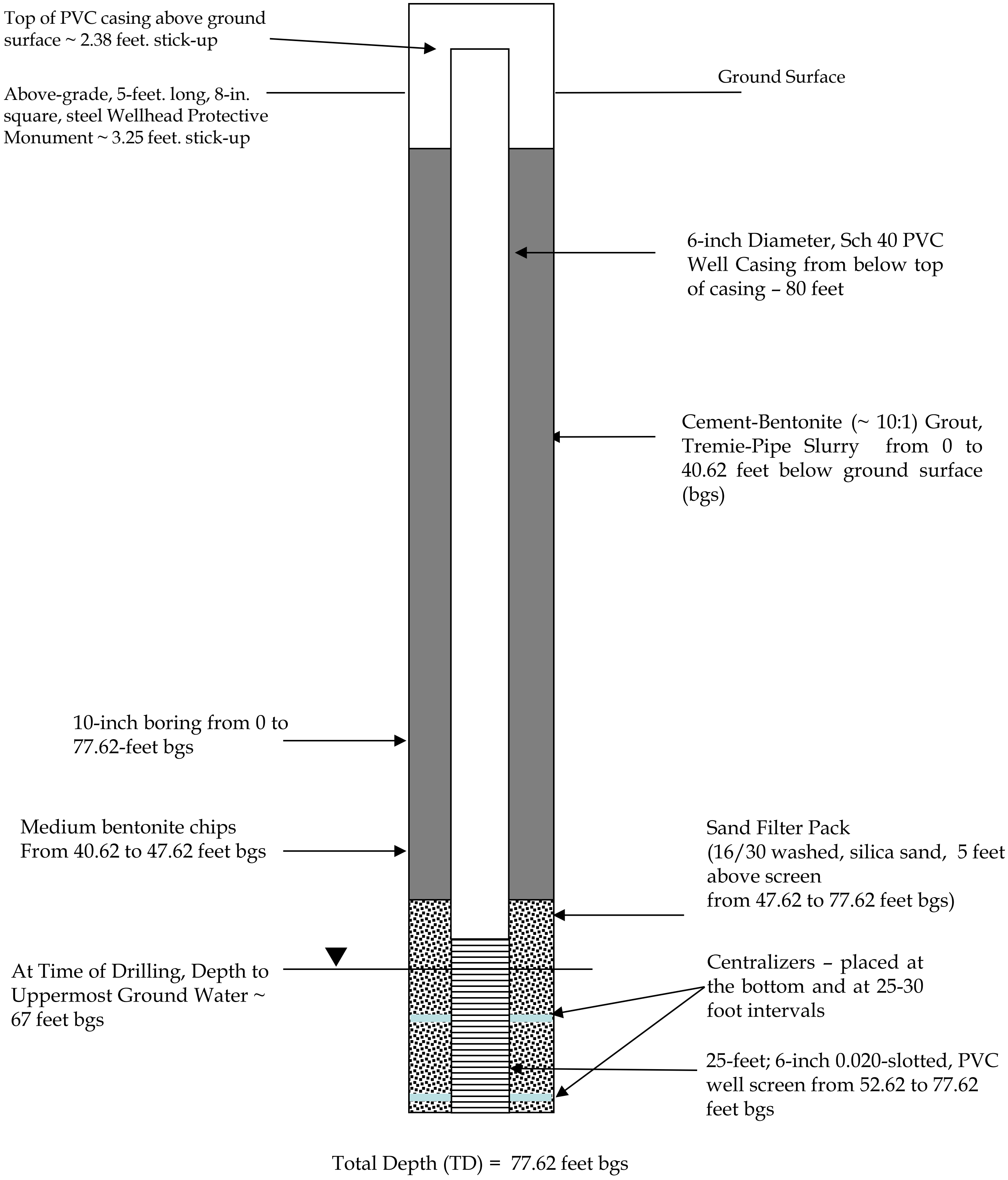
BAC-8

Interval (feet)	Description
0 - 1	Light brown fine-grained sand with clay, dry
1 - 13	Light brown clay with silt, dry
13 - 17	Light brown fine-grained sand with clay, dry
17 - 18	Light brown clay with sand, moist
18 - 19	Medium brown sand, saturated
19 - 21	Light brown clay with sand, moist
21 - 27	Light brown clay with sand, dry
27 - 28	Brown with red clay, moist
28 - 31	Brown clay, moist
31 - 34	Gray clay, moist
34 - 43	Brown clay, moist
43 - 56	Medium brown medium-grained sand, moist
56 – 56.5	Medium brown medium-grained sand with pebbles, moist
56.5 - 57	Medium brown medium-grained sand, moist
57 - 63	Brown clay, moist
63 - 65	Medium brown fine-grained sand, moist
65 – 66.5	Brown clay, moist
66.5 - 67	Medium brown fine-grained sand, moist
67 - 68	Medium brown fine-grained sand, saturated
68 - 69.5	Medium brown fine-grained sand
69.5 - 77	Red and brown clay

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up
Casing, solid (6-inch PVC): 0-52.62 feet
Screen (6 inch, 0.02 slotted, PVC): 52.62-77.62 feet
Sand Pack: 16/30 sand, 47.62-77.62 feet
Bentonite Seal: Hydrolyzed bentonite pellet seal 40.62-47.62 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA
Top of Manhole Cover (Relative Datum Survey): NA



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ISPC BOTTOM ASH SURFACE IMPOUNDMENT

DELTA, UTAH

BAC-8 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

Stantec

Project Name: Intermountain Power Service Corporation
Boring Monitor Well: BAC-9

Project No.: 203709098
Completion Date: 2019-05-1

Drilling Firm: Cascade
Boring Method: Sonic
Boring Diameter: 10 inches

Driller: Ryan Miller
Logged by: John Russell
Depth to Water at Drilling: 60 feet
Depth to Water at Drilling (static at 24 hours): 44.82 feet

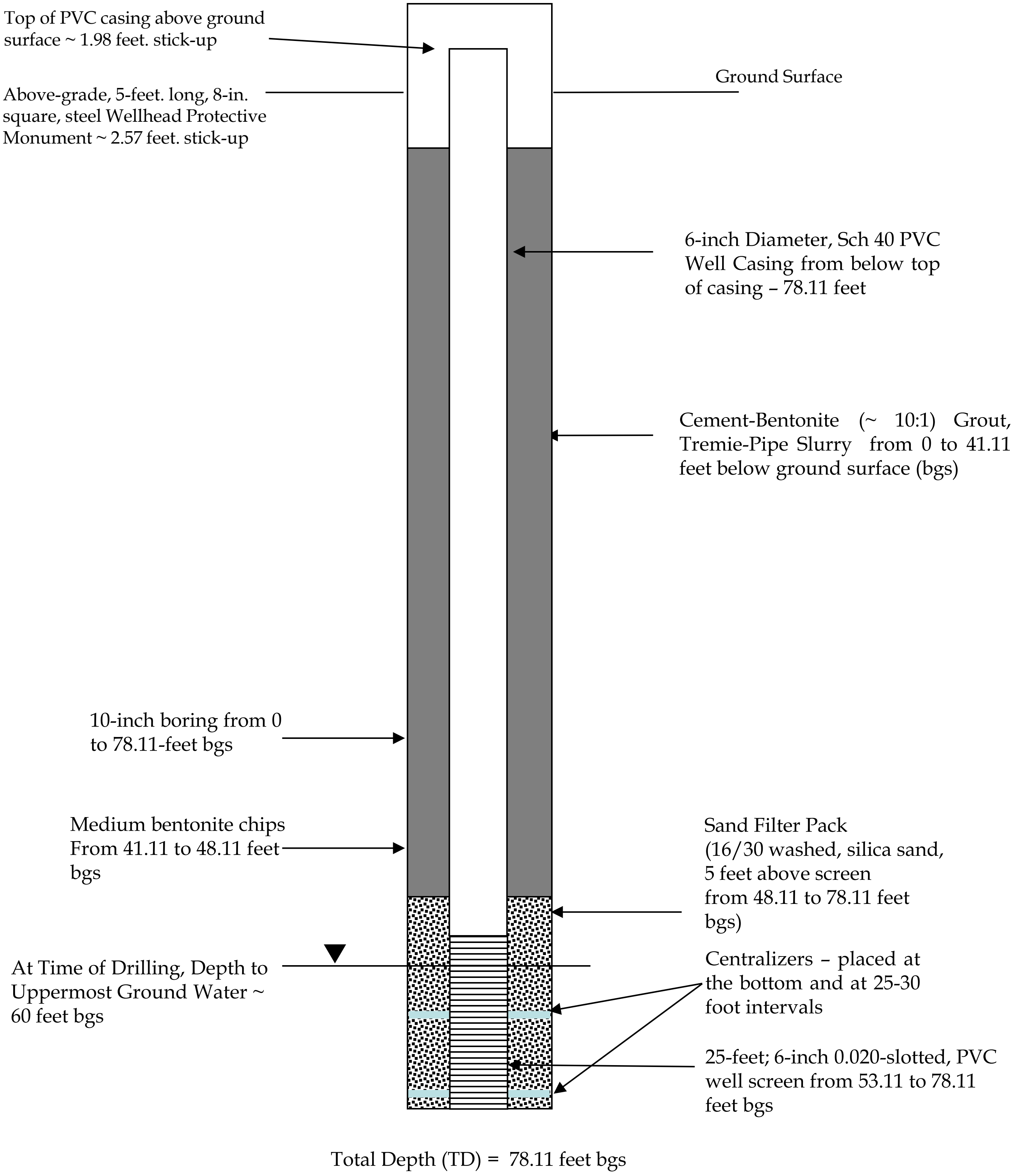
BAC-9

Interval (feet)	Description
0 - 10	Light gray to brown silt with clay to clay with silt, dry
10 - 20	Light gray to brown silt, dry
20 - 30	Light brown silt, dry
30 - 44	Light brown silt, dry
44 - 50	Medium brown clay, dry
50 - 54	Light brown silt to clay with silt, moist
54 – 54.5	Medium brown silt with clay, moist
54.5 - 60	Light brown clay with silt, moist
60 - 77	Medium brown silt with clay and silt stringers, saturated

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up
Casing, solid (6-inch PVC): 0-53.11 feet
Screen (6 inch, 0.02 slotted, PVC): 53.11-78.11 feet
Sand Pack: 16/30 sand, 48.11-78.11 feet
Bentonite Seal: Hydrolyzed bentonite pellet seal 41.11-48.11 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA
Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

BAC-9 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: BAC-10

Project No.: 203709098

Completion Date: 2019-05-3

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 69 feet

Depth to Water at Drilling (static at 24 hours): 63.1 feet

BAC-10

Interval (feet)	Description
0 - 1	Light brown silt, dry
1 - 3	Light brown silt with clay, dry
3 - 14	Light brown clay with silt, dry
14 - 17	Light brown fine-grained sand, dry
17 - 19	Light brown fine-grained sand with clay, moist
19 - 21	Light brown fine-grained sand with clay, moist
21 - 23	Light brown fine-grained sand, moist
23 - 25	Light brown fine-grained sand with clay, moist
25 - 26	Light brown fine-grained sand, moist
26 - 27	Light brown fine-grained sand with clay, moist
27 - 28	Light brown fine-grained sand, moist to moist
27 - 34	Light brown fine-grained sand, moist
34 – 34.5	Light brown silt with clay, dry
34.5 – 40.5	Red brown clay, dry
40.5 - 41	Medium brown medium grained sand, moist to moist
41 - 45	Medium brown clay, moist
45 - 46	Medium brown sand, moist to moist
46 - 48	Medium brown clay, moist
48 – 56.5	Red brown clay, moist
56.5 - 57	Gray clay, moist
57 - 62	Light brown clay, moist to moist
62 - 63	Medium brown medium grained sand, moist
63 - 64	Medium brown medium grained sand with clay, moist
64 - 69	Red, brown, and gray clay, moist
69 – 69.5	Medium brown sand, saturated
69.5 - 77	Red, brown, and gray clay
77 - 79	Medium brown clay with sand
79 - 81	Medium brown clay
81 - 85	Medium brown clay with sand

85 - 87	Medium brown clay, moist

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-62.95 feet

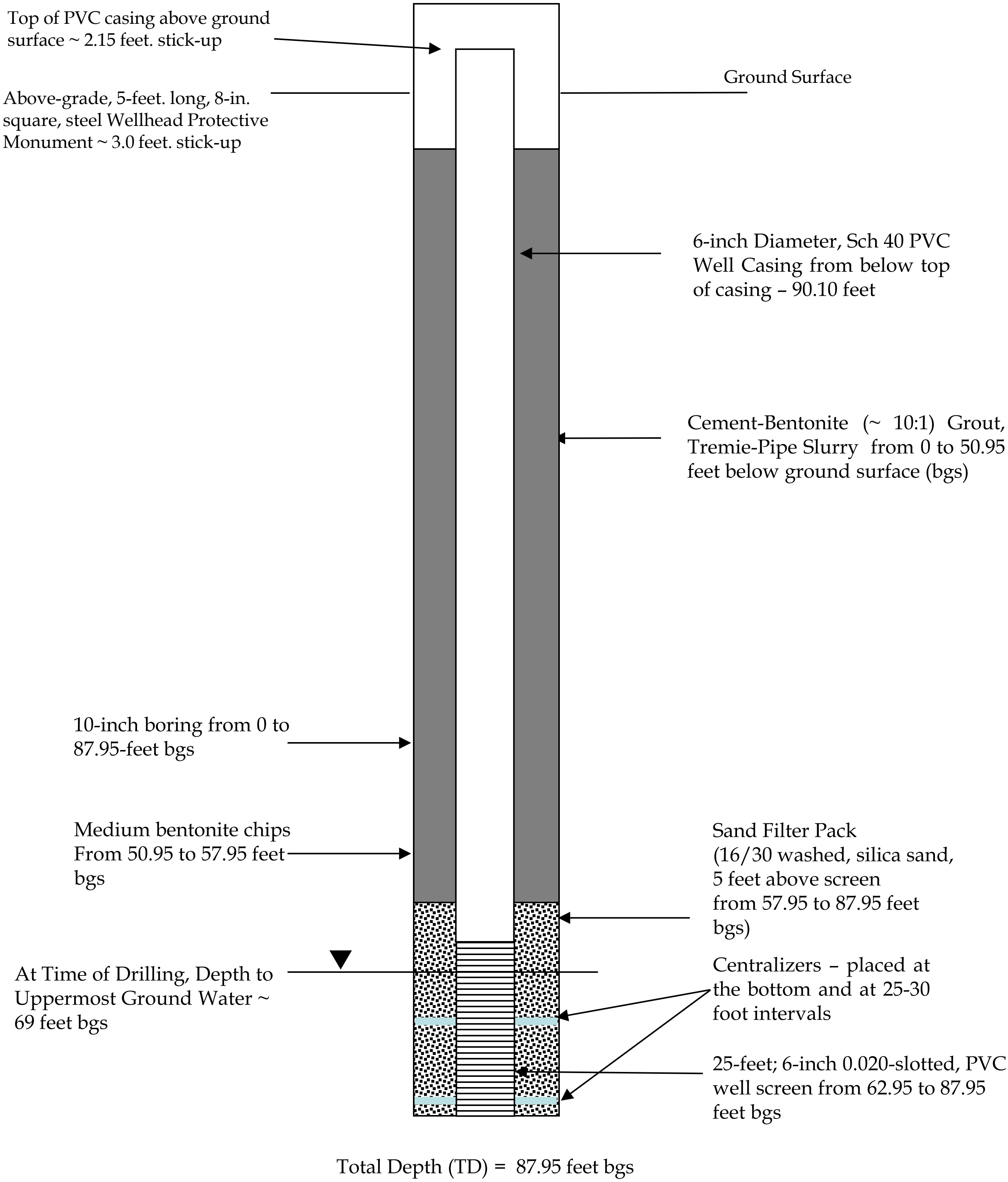
Screen (6 inch, 0.02 slotted, PVC): 62.95-87.95 feet

Sand Pack: 16/30 sand, 57.95-87.95 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 50.95-57.95 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – BOTTOM ASH SURFACE IMPOUNDMENT
DELTA, UTAH

BAC-10 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19	Last Revision Date

MONITORNG WELL ID: **BAC-11**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP.

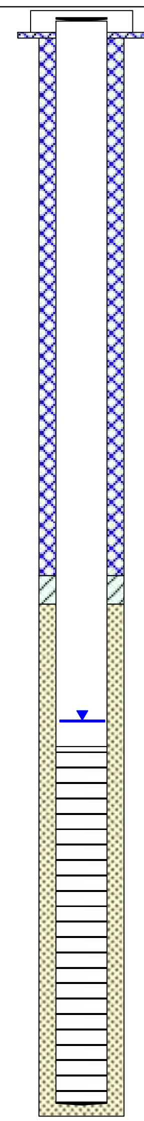
Stantec

DRILLING CONTRACTOR:	Cascade Drilling
DRILLING METHOD:	Sonic
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.

COORDINATE SYSTEM:			
EASTING:		NORTHING:	
ELEVATION:		BOREHOLE ANGLE:	90 degrees
TOTAL DEPTH (ft.):	81	GROUNDWATER LEVEL (ft. btoc.):	48.21
DATE STARTED:	12/6/2019	DATE FINISHED:	12/7/2019
LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Fill
	Poorly Graded Sand with Silt (SP-SM), fine grained sand 100%, loose, soft, dry, very pale brown (10 YR 7/3).
	Clay with Sand (CL), low plasticity, soft to medium density, moist, light brownish gray (10 YR 6/2).
	Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, loose, medium dense, moist, light brownish gray (10 YR 6/2); clay are low plasticity, medium dense.
	Clay (CL), medium plasticity, medium dense, cohesive, moist, light brownish gray (10 YR 6/2), mottled with brownish yellow (10 YR 6/8).
	Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, moist, light yellowish brown (10 YR 6/4); clay low plasticity, soft, non cohesive.
	Same as above, becoming brown (10 YR 5/3).
	Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
	Poorly Graded Sand (SP), fine to medium grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
	Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
	Clay with Sand (CL), low plasticity, soft, wet, pale brown (10 YR 6/3).
	Well Graded Sand (SW), fine to coarse Sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel, subrounded.
	Same as above, increase in coarse grained sand between 65.2 to 65.8 ft bgs.
	Same as 60 ft bgs.
	Clay (CL), medium plasticity, medium dense, moist, cohesive, light yellowish brown (10 YR 6/4).
	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 76 ft bgs., and 4 inches from 76 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 50 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 76 ft bgs.

50 to 75 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-12**

CLIENT: Intermountain Power Service Corporation

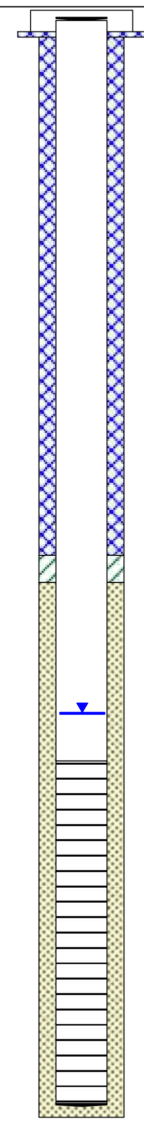
PROJECT: Monitoring Well Installation

SITE LOCATION: Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 49.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/4/2019	DATE FINISHED: 12/6/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), fine grained sand 95%, loose, soft, dry, pale brown (10 YR 6/3).
9	Clay (CL), medium plasticity, medium dense, moist, cohesive, light brownish gray (10 YR 6/2).
10	Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, loose, soft, dry, light brownish gray (10 YR 6/2); clay 10%, low plasticity, soft.
20	Clay (CL), medium plasticity, medium dense, moist, cohesive, very pale brown (10 YR 7/3), mottled with brownish yellow (10 YR 6/8).
25	Poorly Graded Sand with Silt (SP-SM), loose, soft, dry, pale brown (10 YR 6/3).
28.5	Well Graded Sand with Gravel (SW), fine to coarse sand 85%, loose, soft, dry, light brownish gray (10 YR 6/2), gravel 15%, small, subangular to subrounded, assorted matrix.
31	Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, moist, pale brown (10 YR 6/3), 5% clay.
39.5	Clay with Sand (CL), medium plasticity, medium dense, moist, light yellowish brown (10 YR 6/3).
	Clay (CL), medium plasticity, stiff, moist, cohesive, pale brown (10 YR 6/2).
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
	Clay (CL), Same as 39.5 ft bgs.
	Clay with Sand (CL), Same as 38.5 ft bgs.
	Clay (CL), Same as 41.5 ft bgs.
	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
55	Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3), mottled with yellowish brown (10 YR 5/6).
59	Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
62	Well Graded Sand (SW) fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), trace gravel.
66.5	Clay with Sand (CL), low to medium plasticity, medium dense, wet, non cohesive, brown (10 YR 5/3), mottled with light brownish gray (10 YR 6/2).
69	Well Graded Sand with Clay (SW-SC), fine grained sand 90%, loose, soft, wet, brown (10 YR 5/3): clay 10%, low plasticity, non cohesive.
75	Clay (CL), medium plasticity, medium dense, cohesive , moist, brown (10 YR 5/3).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs., and 4 inches from 79 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 79 ft bgs.

53 to 78ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

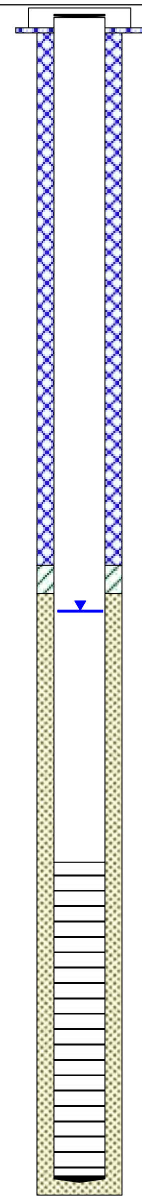
MONITORNG WELL ID:	**BAC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.):	91	GROUNDWATER LEVEL (ft. btoc.):	45.38
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED:	11/16/2019	DATE FINISHED:	11/18/2019
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly Graded Sand with Silt and Gravel (SP-SM), fine grained sand 85%, silts 10%, trace gravel 5%, loose, dry, light gray (10 YR 7/2).
5		Same as above, becoming dense, consolidated.
		Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
10		Same as above, no gravel, sand 100%.
		Clay with Sand (CL), low plasticity, dry to moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
15		Same as above, moist.
		Same as above, medium plasticity.
20		Poorly Graded Sand (SP), fine grained sand 100%, loose, dry, dark brown (10 YR 3/3), thinly bedded.
		Clay with Sand (CL), low plasticity, moist, non cohesive, brown (10 YR 5/3), with small clay interfingering, reddish yellow (5 YR 6/8).
25		
30		
35		Well Graded Sand with Gravel (SW), sand fine to coarse 85%, gravel 15%, loose, soft, dry, pale brown (10 YR 6/3), gravel are subrounded.
		Poorly Graded Sand (SP), medium grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
40		Clay (CL), medium plasticity, medium dense, moist, brownish yellow (10 YR 6/6).
		Clay with Sand (CL), low plasticity, soft density, wet, non cohesive, light yellowish brown (10 YR 6/4).
45		Clay (CL), medium plasticity, medium dense, moist, cohesive, brownish yellow (10 YR 6/6), with mottled clay, brownish yellow (10 YR 6/8).
50		
55		Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, non cohesive, brown (10 YR 6/3).
60		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
		Clay with Sand (CL), low to medium plasticity, soft to medium dense, wet, brown (10 YR 6/3).
65		Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, light brownish gray (10 YR 6/2).
70		Clay (CL), high plasticity, stiff, moist, cohesive, pale brown (10 YR 6/3).
		Poorly Graded Sand (SP), medium grained sand 95%, loose, soft, wet, brown (10 YR 5/3), trace gravel 5%, rounded to subrounded, assorted matrix.
75		
80		
85		Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
		Clay (CL), medium plasticity, medium dense, moist to wet, cohesive, brown gray (10 YR 5/3).
90		
		End of borehole to 91 ft bgs., per scope of work.
95		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

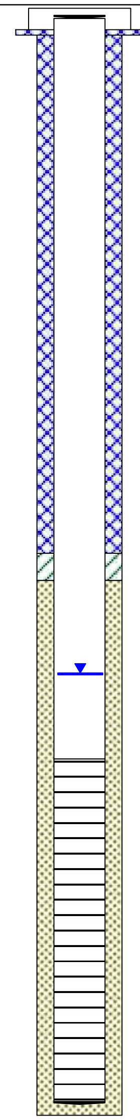
MONITORNG WELL ID:	**BAC-14**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 81 ft bgs., 10 inch sonic core barrel 0 to 78 ft bgs.	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.81
		DATE STARTED: 11/21/2019	DATE FINISHED: 12/4/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand (SW), fine to coarse sand 95%, loose, soft, dry, yellowish brown (10 YR 5/4); 5% gravel, subrounded, small.
5	Well Graded Sand with Clay (SW-SC), fine to coarse sand 95%, medium dense, dry, light gray (10 YR 7/4).
	Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry to moist, very pale brown (10 YR 7/3).
20	Clay (CL), medium plasticity, medium dense, moist, cohesive, pale brown (10 YR 6/3), with trace mottled clay, brownish yellow (10 YR 6/8).
	Poorly Graded Sand (SP), fine sand 100%, loose, soft, light brownish gray (10 YR 6/2).
	Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, light brownish gray (10 YR 6/2); clay 10% low plasticity, soft, non cohesive.
	Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).
	Poorly Graded Sand (SP), fine sand 100%, loose, soft, moist to wet, brown (10 YR 5/4).
	Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
	Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, moist, brown (10 YR 5/3); clay 10% low plasticity.
	Clay (CL), medium plasticity, medium to stiff dense, moist, cohesive, light brownish red (5 YR 6/3), mottled with reddish yellow (5YR 6/6).
	Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
	Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).
65	Poorly Graded Sand with Clay (SP-SC), fine sand 85%, loose medium dense, wet, brown (10 YR 5/3); clay 15% low plasticity, non cohesive, light yellowish brown (10 YR 6/4).
	Clay (CL), medium plasticity, medium dense, wet, cohesive, light yellowish brown (10 YR 6/4).
70	Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
	Clay with Sand (CL), low plasticity, soft, wet, non cohesive, brown (10 YR 5/3).
75	Poorly Graded Sand with Clay (SP-SC), fine sand 90%, loose, soft, wet, brown (10 YR 5/3); clay 10%, low plasticity, soft, non cohesive.
	Poorly Graded Sand (SP), fine grained, loose, soft, wet, brown (10 YR 5/3).
80	Clay (CL), medium plasticity, medium to stiff, moist, brown (10 YR 5/3).
	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.
85	

WELL CONSTUCTION DIAGRAM



- Above ground monument with well cap
- Borehole diameter 10 inches from 0 to 79 ft bgs. 4 inch borehole to 81 ft bgs.
- Grout 0 to 38 ft bgs.
- 0 to 53 ft bgs., 6 in dia., Sch. 40 PVC riser
- Bentonite 38 to 40 ft bgs.
- Filter Pack Sand 40 to 79 ft bgs.
- 53 to 78 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture
- End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-15**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

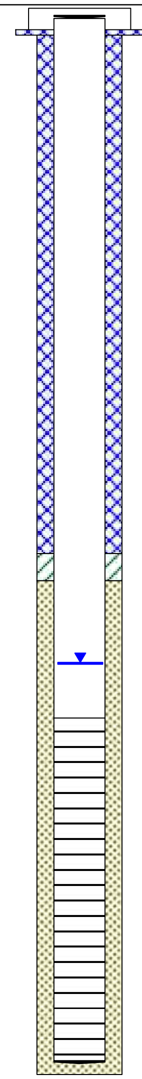
INTERMOUNTAIN POWER SERVICE CORP. | Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 81	GROUNDWATER LEVEL (ft. btoc.): 46.03
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/7/2019	DATE FINISHED: 12/9/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM

0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85

Fill
Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, very pale brown (10 YR 7/3), trace gravel, subrounded.
Clay (CL), medium plasticity, medium dense, cohesive, dry, light brownish gray (10 YR 6/2), trace white (10 YR 8/1), trace calcium carbonate between clay layering, effervesces with HCL.
Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, dry, light gray (10 YR 7/1), trace clay at depth.
Poorly Graded Sand with Clay (SP-SC), fine grained sand 90%, soft to medium dense, dry, pale brown (10 YR 6/3), clay low plasticity, medium dense.
Clay (CL), medium plasticity, medium dense, cohesive, moist, pale brown (10 YR 6/3).
Same as above, becoming light yellowish brown (10 YR 6/4).
Clay with Sand (CL), low plasticity, soft, non cohesive, light yellowish brown (10 YR 6/4).
Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
Well Graded Sand with Gravel (SW), fine to coarse sand 90%, loose, soft, wet, brown (10 YR 5/3), gravel 10%, subrounded.
Same as above, with trace black staining.
Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/6).
Clay with Sand (CL), low plasticity, soft, non cohesive, wet, light yellowish brown (10 YR 6/4).
Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3)
Same as above, with some clay.
Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
Same as above, color change to yellowish brown (10 YR 6/4).
Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
Same as above, with mottled yellowish red (5 YR 5/6).
Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
Clay with Sand (CL), low plasticity, soft, non cohesive, wet, brown (10 YR 5/3).
Poorly Graded Sand (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3).
End of borehole at 81 ft bgs. Installed monitoring well per scope of work.



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 76 ft bgs., and 4 inches from 76 to 81 ft bgs.

Grout 0 to 38 ft bgs.

0 to 50 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 38 to 40 ft bgs.

Filter Pack Sand 40 to 76 ft bgs.

50 to 75 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

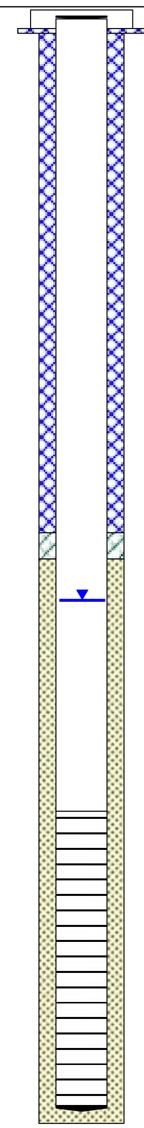
Stantec

MONITORNG WELL ID:	**BAC-16**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 47.45
		DATE STARTED: 11/18/2019	DATE FINISHED: 11/21/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Fill.
		Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
5		
10		No core retrieved from sonic core barrel.
		Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
15		Well Graded Sand (SW), fine to coarse grained sand 95%, loose, soft, light brownish gray (10 YR 6/2), trace gravel 5%, subrounded, small.
		Clay with Sand (CL), low plasticity, soft to medium dense, dry, light gray (10 YR 7/1).
20		
25		
		Clay (CL).
30		Clay with Sand (CL), low to medium plasticity, soft to medium dense, dry, non cohesive, pale brown (10 YR 6/3).
35		Poorly Graded Sand (SP), fine grained 100%, loose to medium dense, dry, light gray (10 YR 7/1).
40		Clay (CL), medium plasticity, medium density, moist, light yellowish brown (10 YR 6/4), with some interfingering clay, brownish yellow (10 YR 6/8).
		Clay with Sand (CL).
45		Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
50		Clay (CL), medium plasticity, medium dense, cohesive, moist, yellowish brown (10 YR 5/4).
		Poorly Graded Sand with clay (SP-SC), fine sand 90%, clay 10%, soft, loose, moist to wet, light yellowish brown (10 YR 6/4).
55		Clay (CL), medium plasticity, medium dense, cohesive, moist, light yellowish brown (10 YR 6/4).
60		Poorly Graded Sand (SP), fine grained sand 95%, loose, soft, brown (10 YR 5/3), with trace interfingering clay 5%, yellowish red (5 YR5/6).
65		Well Graded Sand (SW), fine to coarse sand 98%, loose, soft, wet, brown (10 YR 5/3), 2% gravel, small, subrounded.
70		Clay with Sand (CL), low to medium plasticity, soft to medium density, wet, light brownish gray (10 YR 6/2).
		Clay (CL), medium plasticity, medium to stiff, cohesive, moist, light yellowish gray (10 YR 6/2).
75		Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
80		Clay (CL), medium plasticity, stiff, cohesive, moist to wet, brown (10 YR 5/3).
		Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
85		Clay (CL), same as 73 ft bgs.
		Poorly Graded Sand (SP), same as 82 ft bgs.
		Clay (CL), same as 73 ft bgs.
90		Poorly Graded Sand with Clay (SP-SC), fine grained sand 85%, clay 15% loose, soft, wet, brown (10 YR 5/3).
95		Clay (CL), same as 73 ft bgs., with mottled interbedded clay, yellowish red (5 YR 5/6).
		End of borehole at 91 ft bgs. Installed monitoring well per scope of work.
100		

WELL CONSTUCTION DIAGRAM



- Above ground monument with well cap
- Grout 0 to 42 ft bgs. Borehole diameter 10 inches from 0 to 91 ft bgs.
- 0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser
- Bentonite 42 to 44 ft bgs.
- Filter Pack Sand 44 to 91 ft bgs.
- 64 to 89 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture
- End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-17**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Southwest of Bottom Ash Basin Surface Impoundment

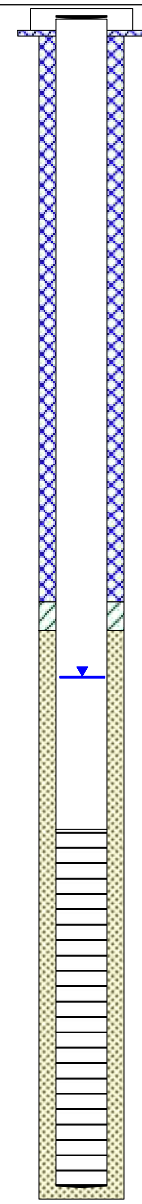
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 82	GROUNDWATER LEVEL (ft. btoc.): 45.3
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 12/12/9/2019	DATE FINISHED: 12/10/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with Silt (SW-SM), fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), fine silts, trace calcium carbonate.
4	Well Graded Sand (SW), fine to coarse sand 100%, loose, soft, pale brown (10 YR 6/3).
18	Well Graded Sand with Gravel and Clay (SW-SC), loose, soft, fine to coarse sand 90%, loose, soft, pale brown (10 YR 6/3), clay low plasticity, soft, gravel, small, subrounded.
19	Well Graded Sand (SW), fine to coarse 98%, loose, soft, light yellowish brown (10 YR 6/4), gravel 2%, small, subrounded.
28.5	Clay (CL), low plasticity, soft, wet, very pale brown (10 YR 7/3), perched groundwater.
30.5	Clay with Sand (CL), low plasticity, soft, moist, light yellowish brown (10 YR 6/4).
39	Clay (CL), medium plasticity, medium dense, cohesive, brown (10 YR 5/3), mottled with some reddish yellow (5 YR 6/6).
57	Clay with Sand (CL), low plasticity, soft, wet non cohesive, brown (10 YR 5/3).
60	Poorly Graded Sand with Clay (SP), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), with trace gravel 2%, subrounded, small.
67.5	Poorly Graded Sand with Clay (SP-SC), fine grained sand 98%, loose, soft, wet, brown (10 YR 5/3), clay, medium plasticity, soft to low density, non cohesive, light yellowish brown (10 YR 5/4).
72	Clay (CL), medium plasticity, medium dense, moist, cohesive, yellowish brown (10 YR 5/4).
73	Poorly Graded Sand with Clay (SP-SC), fine grained sand, loose, soft, wet, brown (10 YR 5/3), clay are low plasticity, soft.
77.5	Clay with Sand (CL), low to medium plasticity, soft, wet, cohesive, brown (10 YR 5/3).
80	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, wet, brown (10 YR 5/3).
81	End of borehole at 81 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 81 ft bgs.

Grout 0 to 40 ft bgs.

0 to 56 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 40 to 42 ft bgs.

Filter Pack Sand 42 to 81 ft bgs.

56 to 81 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

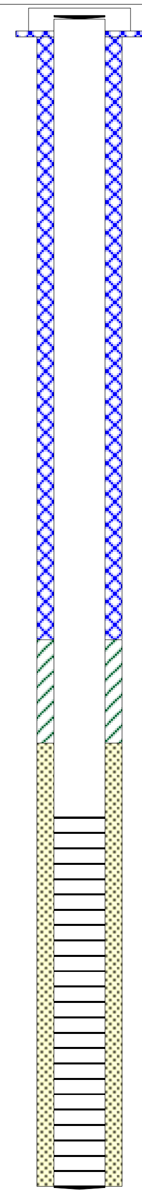
Stantec

MONITORNG WELL ID: **BAC-18**
CLIENT: Intermountain Power Service Corporation
PROJECT: Monitoring Well Installation
SITE LOCATION: Down Gradient North

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/8/2020	DATE FINISHED: 5/9/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
14	Poorly graded Sand with Silt (SP), light brown, moist
16	Well Graded Sand with Gravel (SW), light brown, moist
19	Well Graded Sand with Clay (SW-SC), light brown, moist
26	Well Graded Sand with Clay (SW-SC), light brown, moist
56	Well Graded Sand with Gravel (SW), light brown, wet
58	Well Graded Sand with Gravel (SW), light brown, moist
58	Clay (CL), light brown, moist
66	Clay (CL), with sand, light brown, moist
67	Well Graded Sand with Gravel (SW), light brown, moist
76	Well Graded Sand with Gravel (SW), light brown, wet
78	Well Graded Sand with Gravel (SW), light brown, moist
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

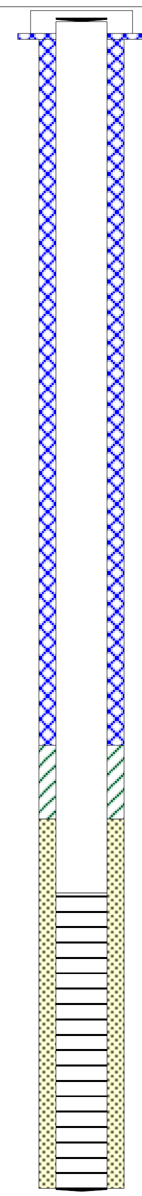
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-19**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	Down Gradient South

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 91 ft bgs.,	DATE STARTED: 5/9/2020	DATE FINISHED: 5/9/2020
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with Silt (SP-SM), fine to coarse sands, loose, soft, dry, very pale brown (10 YR 7/3).
7.5	Sand with Clay (SC), fine to coarse sand, soft, loose, dry to moist, light gray (10 YR 7/1).
10	Poorly Graded Sand (SP) medium grained, loose, soft, unconsolidated, dry, light gray (10 YR 7/2).
13	Clay (CL), moderate plasticity, moist, soft, cohesive, brown (10 YR 5/3).
21	Poorly Graded Sand (SP) medium grained, loose, soft, unconsolidated, moist to dry, brown (10 YR 5/3).
33	Clay (CL), moderate plasticity, moist, soft to medium dense, cohesive, brown (7.5 YR 5/4).
36	Same as above, becoming moist to wet.
38	Poorly Graded Sand (SP), fine grained sands, soft, loose, wet, brown (10 YR 5/3).
41	Same as above, with trace white staining.
45	Clay (CL), moderate plasticity, medium to stiff, cohesive, brown (7.5 YR 5/4).
55	Well Graded Sand (SW), fine to coarse sands, soft, loose, unconsolidated, brown (10 YR 5/3).
61	Clay (CL), moderate plasticity, medium to stiff, cohesive, brown (7.5 YR 5/4).
67	Clayey Sand (SC), fine to medium grained sands, medium dense, wet, brown (10 YR 5/3), with thin trace interbedded black lenses.
70	Well Graded Sand (SW), fine to coarse sands, soft, loose, unconsolidated, brown (10 YR 5/3).
73	Clay (CL), moderate plasticity, medium to stiff, cohesive, brown (7.5 YR 5/4).
74	Well Graded Sand (SW), fine to coarse sands, soft, loose, unconsolidated, brown (10 YR 5/3).
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs.

Grout 0 to 48 ft bgs.

0 to 58 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 48 to 53 ft bgs.

Filter Pack Sand 53 to 78 ft bgs.

58 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID: **BAC-20**

CLIENT: Intermountain Power Service Corporation

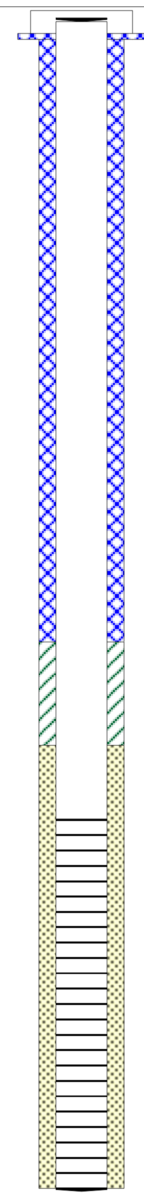
PROJECT: Monitoring Well Installation

SITE LOCATION: South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/9/2020	DATE FINISHED: 5/10/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly graded Sand with Silt (SP), light brown, dry
5		
10		
15		Well Graded Sand with Gravel (SW), moist, dry
		Clay (CL), light brown, moist
20		
25		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
30		
35		
40		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
45		
50		
55		Well Graded Sand with Gravel (SW), wet, light brown
		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
60		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
65		Clay (CL), light brown, moist
70		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
75		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
80		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID: **BAC-21**

CLIENT: Intermountain Power Service Corporation

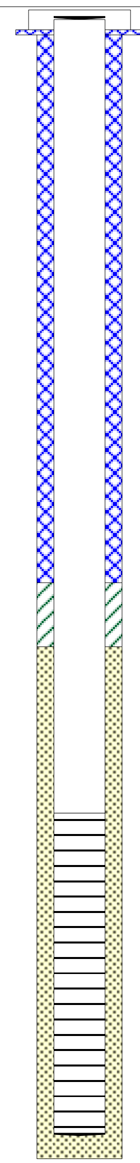
PROJECT: Monitoring Well Installation

SITE LOCATION: South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 91 ft bgs.,	DATE STARTED: 5/10/2020	DATE FINISHED: 5/10/2020
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silt (SP-SM), fine to coarse sand, loose, soft, unconsolidated, very pale brown (10 YR 7/3).
10	Sandy Clay (SC), fine to coarse sands, medium dense, dry, pale brown (10 YR 7/3).
16	Clay (CL), low to medium plasticity, cohesive, medium dense, brown (10 YR 5/3).
30	Well Graded Sand with Clay (SW-SC), fine grained sand, medium dense, dry to moist, very pale brown (10 YR 7/3).
35	Clay (CL), medium plasticity, cohesive, medium dense, light brownish gray (10 YR 6/2).
40	Well Graded Sand (SW), fine grained sand, loose, soft, brown (10 YR 5/3).
41	Clay (CL), medium to high plasticity, stiff, cohesive, pale brown (10 YR 6/3).
44	Same as above, becoming yellowish red (10 YR 5/4).
49	Well Graded Sand (SW), fine grained sand, loose, soft, brown (10 YR 5/3).
50	Clay (CL), medium to high plasticity, stiff, cohesive, pale brown (10 YR 6/3).
52	Sandy Clay (SC), fine grained sand, loose to medium dense, wet, yellowish brown (10 YR 5/4).
60	Clay (CL), medium plasticity, stiff, cohesive, light yellowish brown (10 YR 6/4).
62	Sandy Clay (SC), fine grained sand, loose to medium dense, wet, yellowish brown (10 YR 5/4).
80	Well Graded Sand (SW), medium grained sand, soft, loose, brown (10 YR 5/4).
86	Clay (CL), medium plasticity, medium to stiff density, cohesive, light yellowish brown (10 YR 6/4).
88	End of borehole at 88 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **BAC-22**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: South Wells

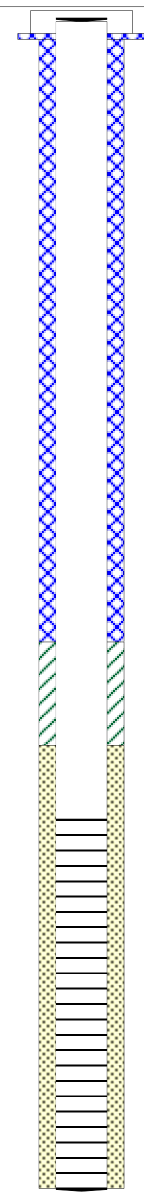
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/10/2020	DATE FINISHED: 5/10/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
10	Poorly graded Sand with Silt and Clay (SP), light brown, dry
18	Clay (CL), light brown, moist
25	Poorly graded Sand with Silt (SP), light brown, dry
28	Well Graded Sand with Clay (SW), light brown, moist
37	Well Graded Sand with Gravel (SW), moist, light brown
40	Well Graded Sand with Gravel (SW), wet, light brown
41	Clay (CL), light brown, moist
50	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), wet, light brown
	Well Graded Sand with Clay (SW), light brown, moist
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
64	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
	Well Graded Sand with Gravel (SW), moist, light brown (black sections)
	Well Graded Sand with Gravel (SW), moist, light brown
75	Clay (CL), light brown, moist
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



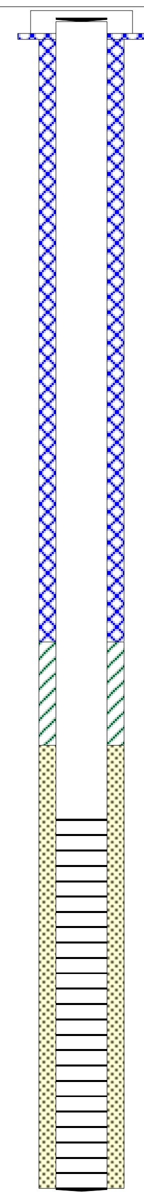
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-23**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/11/2020	DATE FINISHED:	5/11/2020
		LOGGED BY:	Rich Pratt		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
18	Poorly graded Sand with Silt and Clay (SP), light brown, dry
18	Clay (CL), light brown, dry
35	Well Graded Sand with Clay (SW), light brown, dry
	Poorly graded Sand with Silt (SP), light brown, dry
	Poorly graded Sand with Silt (SP), light brown, moist
41	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Well Graded Sand with Gravel (SW), wet, light brown
	Well Graded Sand with Gravel (SW), moist, light brown
48	Clay (CL), light brown, moist
51	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Clay (SW), light brown, wet
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
66	Well Graded Sand with Gravel (SW), moist, light brown
70	Well Graded Sand with Clay (SW), light brown, moist
74	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID: **BAC-24**

CLIENT: Intermountain Power Service Corporation

PROJECT: Monitoring Well Installation

SITE LOCATION: South Wells

DRILLING CONTRACTOR:	Cascade Drilling
DRILLING METHOD:	Sonic
DRILLING EQUIPMENT:	Pro Sonic 600
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs., 10 inch sonic core barrel 0 to 78 ft bgs.,

COORDINATE SYSTEM:			
EASTING:		NORTHING:	
ELEVATION:		BOREHOLE ANGLE:	90 degrees
TOTAL DEPTH (ft.):	76.2	GROUNDWATER LEVEL (ft. btoc.):	
DATE STARTED:	5/12/2020	DATE FINISHED:	5/12/2020
LOGGED BY:	Rich Pratt		

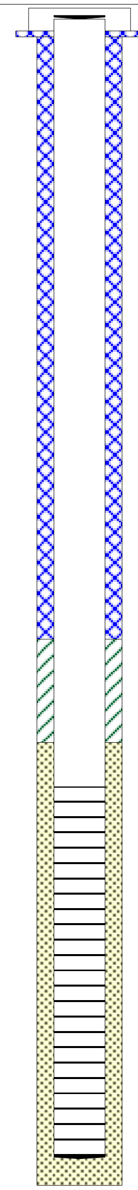
DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale (feet): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80

LITHOLOGICAL DESCRIPTION

- Poorly graded Sand with Silt (SP), light brown, dry
- Well Graded Sand with Gravel (SW), dry, light brown
- Poorly graded Sand with Silt (SP), light brown, dry
- Poorly graded Sand with Silt and Clay (SP), light brown, dry
- Poorly graded Sand with Silt (SP), light brown, dry
- Well Graded Sand with Gravel (SW), moist, light brown
- Clay with well graded sand (SW), light brown, moist
- Clay (CL), light brown, dry
- Well Graded Sand with Gravel (SW), moist, light brown
- Clay (CL), light brown, moist
- Well Graded Sand with Gravel (SW), dry, light brown
- Well Graded Sand with Gravel (SW), moist, light brown
- Clay (CL), light brown, moist
- Clay with well graded sand (SW), light brown, moist
- Well Graded Sand with Gravel (SW), wet, light brown
- Well Graded Sand with Gravel (SW), moist, light brown
- Clay (CL), light brown, moist
- Well Graded Sand with Gravel (SW), moist, light brown
- Clay (CL), light brown, moist
- Clay with well graded sand (SW), light brown, moist
- Clay (CL), light brown, moist
- Well Graded Sand with Gravel (SW), moist, light brown
- End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**BAC-25**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

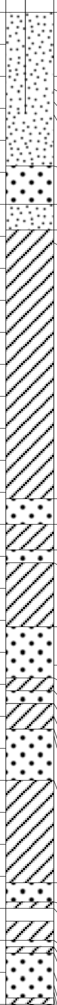
INTERMOUNTAIN POWER SERVICE CORP.

Stantec

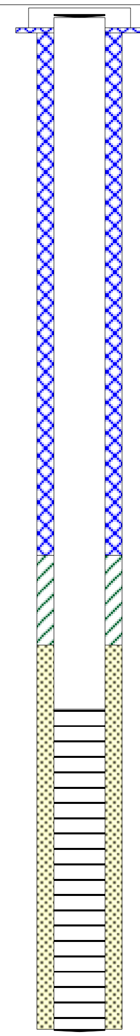
DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/12/2020	DATE FINISHED:	5/12/2020
		LOGGED BY:	Rich Pratt		

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95



Poorly graded Sand with Silt (SP), light brown, dry
Poorly graded Sand with Silt and Clay (SP), light brown, dry
Poorly graded Sand with Silt (SP), light brown, dry
Poorly graded Sand with Silt and Clay (SP), light brown, dry
Poorly graded Sand with Silt (SP), light brown, dry
Poorly Graded Sand with Clay (SW), light brown, dry
Poorly graded Sand with Silt and Clay (SP), light brown, dry
Clay (CL) with sand, light brown, dry
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Clay (SW), light brown, moist
Clay (CL), light brown, moist
Well Graded Sand with Clay (SW), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL) with sand, light brown, dry
Well Graded Sand with Clay (SW), light brown, moist
Clay (CL) with sand, light brown, dry
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), wet, light brown
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Clay (CL), light brown, moist
Well Graded Sand with Gravel (SW), moist, light brown
Well Graded Sand with Gravel (SW), wet, light brown
Well Graded Sand with Gravel (SW), moist, light brown
Well Graded Sand with Clay (SW), light brown, moist
Clay (CL), light brown, moist
Well Graded Sand with Clay (SW), light brown, moist
End of borehole at 78 ft bgs. Installed monitoring well per scope of work.



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.
Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

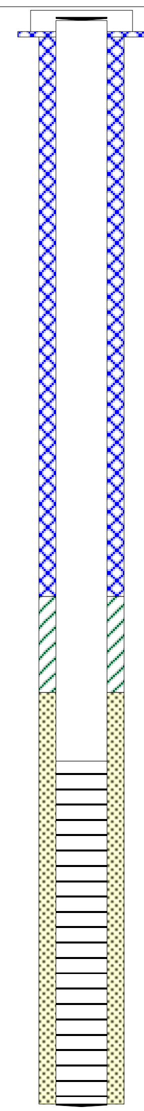
Stantec

MONITORNG WELL ID:	**BAC-26**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/13/2020	DATE FINISHED: 5/13/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
10	Poorly graded Sand with Silt and Clay (SP), light brown, dry
15	Poorly graded Sand with Silt (SP), light brown, dry
20	Poorly Graded Sand (SP), dry, light brown
	Poorly graded Sand with Silt and Clay (SP), light brown, moist
28	Clay (CL), light brown, moist
50	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
57	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
64	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
67	Well Graded Sand with Gravel (SW), moist, light brown
71	Clay (CL), light brown, moist
76	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 41 ft bgs.
Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
End Cap

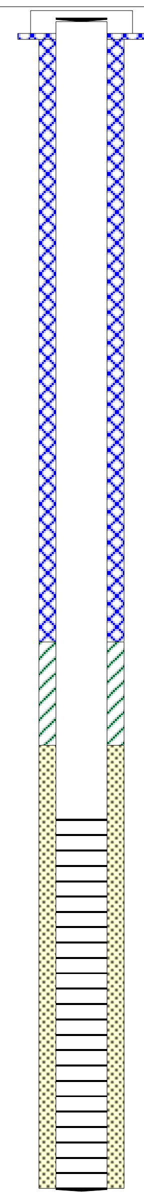
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

	MONITORNG WELL ID:	**BAC-27**	
INTERMOUNTAIN POWER SERVICE CORP.	CLIENT:	Intermountain Power Service Corporation	Stantec
	PROJECT:	Monitoring Well Installation	
	SITE LOCATION:	North Wells	

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/13/2020	DATE FINISHED:	5/13/2020
		LOGGED BY:	Rich Pratt		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly graded Sand with Silt (SP), light brown, dry
16		Poorly graded Sand with Silt and Clay (SP), light brown, dry
26		Clay (CL), light brown, moist
52		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
57		Well Graded Sand with Gravel (SW), moist, light brown
		Well Graded Sand with Gravel (SW), wet, light brown
		Well Graded Sand with Clay (SW), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
66		Well Graded Sand with Gravel (SW), moist, light brown
		Well Graded Sand with Gravel (SW), wet, light brown
		Well Graded Sand with Clay (SW), light brown, moist
71		Clay (CL), light brown, moist
78		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 41 ft bgs.

Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

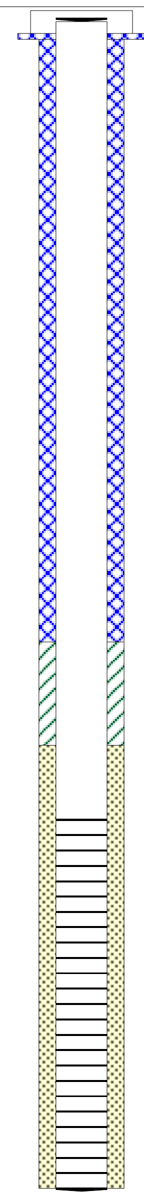
Stantec

MONITORNG WELL ID:	**BAC-28**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/14/2020	DATE FINISHED:	5/14/2020
		LOGGED BY:	Rich Pratt		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly graded Sand with Silt (SP), light brown, dry
15	Poorly graded Sand with Silt and Clay (SP), light brown, dry
	Poorly graded Sand with Silt (SP), light brown, dry
20	Poorly graded Sand with Silt and Clay (SP), light brown, dry
25	Clay (CL), light brown, moist
45	Well Graded Sand with Clay (SW), light brown, moist
	Clay (CL), light brown, moist
55	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Clay (SW), light brown, wet
60	Well Graded Sand with Clay (SW), light brown, moist
	Clay (CL), light brown, moist
70	Well Graded Sand with Clay (SW), light brown, wet
	Well Graded Sand with Clay (SW), light brown, moist
	Clay (CL), light brown, moist
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

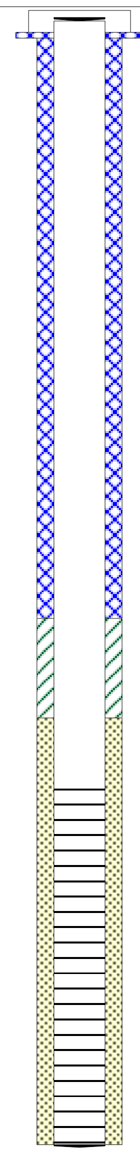
MONITORNG WELL ID:	**BAC-29**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/15/2020	DATE FINISHED: 5/15/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly graded Sand with Silt (SP), light brown, dry
15		Silty Clay, light brown, dry
		Poorly graded Sand with Silt and Clay (SP-SM), light brown, moist
20		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
45		Clay (CL), light brown, moist
50		Well Graded Sand with Clay (SW), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
55		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
		Clay (CL), light brown, moist
60		Well Graded Sand with Gravel (SW), moist, light brown
		Well Graded Sand with Gravel (SW), wet, light brown
		Clay (CL), light brown, moist
		Well Graded Sand with Gravel (SW), moist, light brown
70		Clay (CL), light brown, moist
		Well Graded Sand with Clay (SW), light brown, moist
		Clay (CL), light brown, moist
		Well Graded Sand with Clay (SW), light brown, moist
		Clay (CL), light brown, moist
80		Well Graded Sand with Clay (SW), light brown, moist
		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.
85		

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 41 ft bgs.

Borehole diameter 10 inches from 0 to 78 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter pack sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

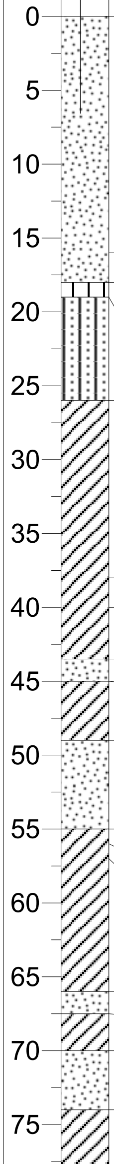
Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

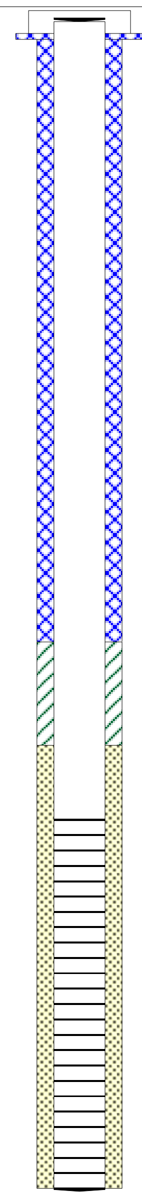
MONITORNG WELL ID:	**BAC-30**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/14/2020	DATE FINISHED: 5/15/2020
		LOGGED BY: Joel Pierson	



DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with some Gravel (SP), sand 90%, gravel 5%, fines 5%, dry, light brown (10 YR 8/2), increasing fines from 11'
16	Sand (SP), sand 90%, fines 10%, loose.
18	Poorly-Graded Clay (ML) increasing from fines 60%, sand 40% to fines 95%, sand 5%, medium plasticity, wet
21	Silty Sand (SM), sand 80%, 20% fines, moist
26	Poorly-Graded Silty Clay (CL), low plasticity, iron staining
38	Poorly-Graded Silty Clay (CL), increasing plasticity, increasing moisture
40	Poorly-Graded Silty Clay (CL), decreasing plasticity
44	Silty Sand (SP), moist
45.5	Clay (CL), moist, low plasticity
49.5	Silty Sand (SP), sand 90%, fines 10%, moist, loose
55.5	Silty Clay (CL), moist, medium-high plasticity, dense and hard
	Sandy Clay (CL) lense
	Silty Clay (CL), moist, medium-high plasticity, dense and hard
66.5	Silty Sand (SP), sand 90%, fines 10%, moist, loose
68	Clay (CL), moist, hard, medium plasticity
70	Silty Sand (SP), sand 90%, fines 10%, moist, loose
74	Sandy Clay (CL), hard, moist, dense, medium-high plasticity
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs.

Grout 0 to 41 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter Pack Sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface
dia. = diameter
ft = feet
Sch. = Schedule
YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

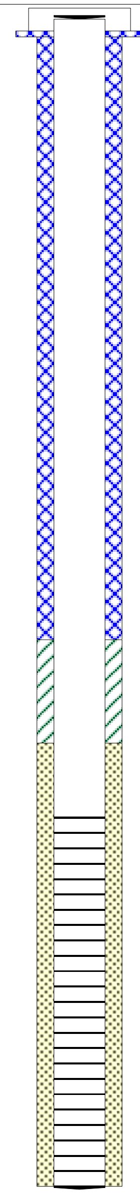
Stantec

MONITORNG WELL ID:	**BAC-31**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/15/2020	DATE FINISHED: 5/18/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Silty Sand (SW), sand 50%, gravel 40%, fines 10%, dry to slightly moist, very loose, pinkish-gray (5YR 7/2)
5		
10		
15		Silty Clay (ML), fines 90%, sand 10%, slightly moist
		Silty Sand (SP), increasing fines from sand 80%, fines 20% to sand 60%, fines 40%.
20		Sandy Clay (CL), fines 60%, sand 40%, moist, dense, iron staining, dark reddish brown (5YR 3/3)
25		
30		
35		
40		Sand (SP), sand 90%, fines 10%, moist, loose, decreasing sand
		Clay (CL), fines 100%, moist, very hard, olive brown 2.5Y 4/3
45		Sandy Clay (CL), moist
		Silty Sand (SP), moist to very moist, increasingly coarse sand
50		Silty Clay (CH), fines 85%, sand 15%
		Silty Sand (SP), moist to very moist
55		Clay (CH), fines 100%, very hard
		Silty Sand (SP), sand 90%, fines 10%, moist, loose
		Clay (CL), fines 100%, moist, very hard, medium-high plasticity
60		
65		Silty Sand (SP), fines vary from 10% to 30%, moist to very moist, some iron staining, ~4-5" clay lense at 65'
70		Clay (CH), moist to very moist, high plasticity from 73' to 74.5', very hard from 74.5' to 76.5'
75		Silty Sand (SP), sand 80%, fines 20%, grayish brown (2.5Y 5/2)
80		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

Stantec

MONITORNG WELL ID: **BAC-32**
CLIENT: Intermountain Power Service Corporation
PROJECT: Monitoring Well Installation
SITE LOCATION: North Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/19/2020	DATE FINISHED: 5/19/2020
		LOGGED BY: Not Available	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85

Lithological Description infered from BAC-26. Poorly graded Sand with Silt (SP), light brown, dry

Poorly graded Sand with Silt and Clay (SP), light brown, dry

Poorly graded Sand with Silt (SP), light brown, dry

Poorly Graded Sand (SP), dry, light brown

Poorly graded Sand with Silt and Clay (SP), light brown, moist

Clay (CL), light brown, moist

Well Graded Sand with Gravel (SW), moist, light brown

Clay (CL), light brown, moist

Well Graded Sand with Gravel (SW), wet, light brown

Clay (CL), light brown, moist

Well Graded Sand with Gravel (SW), moist, light brown

Well Graded Sand with Gravel (SW), wet, light brown

Clay (CL), light brown, moist

Well Graded Sand with Gravel (SW), moist, light brown

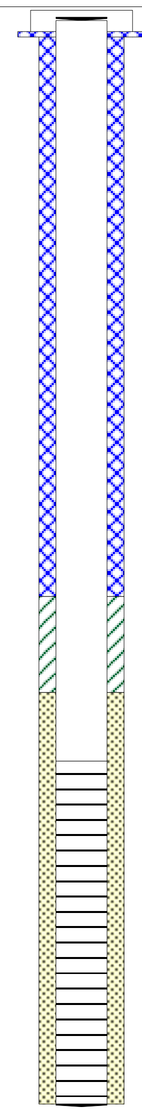
Clay (CL), light brown, moist

Well Graded Sand with Clay (SW), light brown, moist

Well Graded Sand with Gravel (SW), wet, light brown

Clay (CL), light brown, moist

End of borehole at 78 ft bgs. Installed monitoring well per scope of work.



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

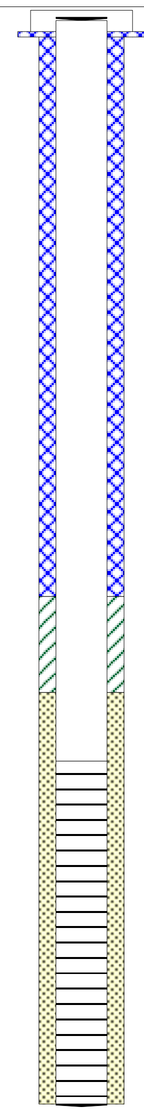
MONITORNG WELL ID:	**BAC-33**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

INTERMOUNTAIN POWER SERVICE CORP. | Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/18/2020	DATE FINISHED:	5/18/2020
		LOGGED BY:	Not Available		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Lithological Description inferred from BAC-26. Poorly graded Sand with Silt (SP), light brown, dry
10	Poorly graded Sand with Silt and Clay (SP), light brown, dry
15	Poorly graded Sand with Silt (SP), light brown, dry
20	Poorly Graded Sand (SP), dry, light brown
	Poorly graded Sand with Silt and Clay (SP), light brown, moist
28	Clay (CL), light brown, moist
50	Well Graded Sand with Gravel (SW), moist, light brown
	Clay (CL), light brown, moist
57	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	Well Graded Sand with Gravel (SW), moist, light brown
64	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
67	Well Graded Sand with Gravel (SW), moist, light brown
71	Clay (CL), light brown, moist
76	Well Graded Sand with Clay (SW), light brown, moist
	Well Graded Sand with Gravel (SW), wet, light brown
	Clay (CL), light brown, moist
	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



- Above ground monument with well cap
- Borehole diameter 10 inches from 0 to 78 ft bgs.
- Grout 0 to 41 ft bgs.
- 0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser
- Bentonite 41 to 48 ft bgs.
- Filter Pack Sand 48 to 78 ft bgs.
- 53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
- End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

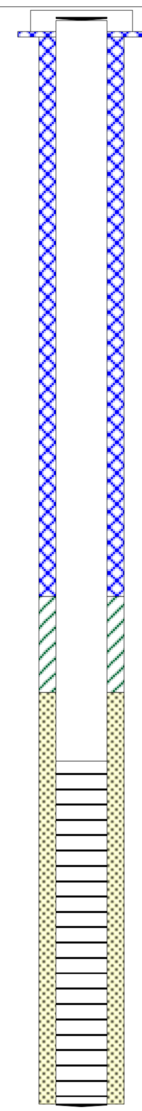
MONITORNG WELL ID:	**BAC-34**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/21/2020	DATE FINISHED: 5/21/2020
		LOGGED BY: Not Available	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0–10		Lithological Description inferred from BAC-26. Poorly graded Sand with Silt (SP), light brown, dry
10–15		Poorly graded Sand with Silt and Clay (SP), light brown, dry
15–19		Poorly graded Sand with Silt (SP), light brown, dry
19–20		Poorly Graded Sand (SP), dry, light brown
20–28		Poorly graded Sand with Silt and Clay (SP), light brown, moist
28–50		Clay (CL), light brown, moist
50		Well Graded Sand with Gravel (SW), moist, light brown
50–57		Clay (CL), light brown, moist
57		Well Graded Sand with Gravel (SW), wet, light brown
58–60		Clay (CL), light brown, moist
60–64		Well Graded Sand with Gravel (SW), moist, light brown
64		Well Graded Sand with Gravel (SW), wet, light brown
64–67		Clay (CL), light brown, moist
67–71		Well Graded Sand with Gravel (SW), moist, light brown
71–76		Clay (CL), light brown, moist
76		Well Graded Sand with Clay (SW), light brown, moist
76–77		Well Graded Sand with Gravel (SW), wet, light brown
77–78		Clay (CL), light brown, moist
		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Borehole diameter 10 inches from 0 to 78 ft bgs.

Grout 0 to 41 ft bgs.

0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 41 to 48 ft bgs.

Filter Pack Sand 48 to 78 ft bgs.

53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

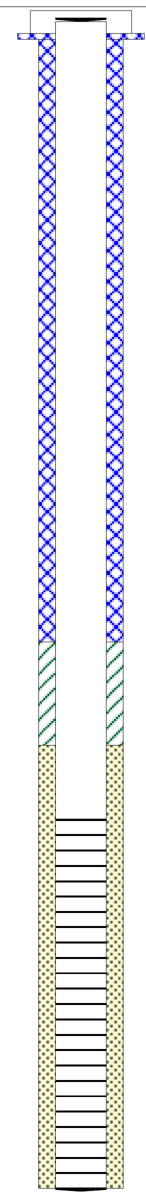
MONITORNG WELL ID:	**BAC-35**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	North Wells

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/28/2020	DATE FINISHED:	5/29/2020
		LOGGED BY:	Joel Pierson		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Silty Sand (SP), sand 90%, fines 10%, very loose, very fine, dry, reddish gray (2.5 YR 7/1)
5	
10	
15	
20	Silty Sand (SM), fines 70%, very fine sand 30%, loose
25	Sandy Silt (ML), fines 70%, very fine sand 30%, medium dense, low plasticity, some oxidation, slightly moist, pale yellow (2.5Y 7/3)
30	Sandy Silty Clay (CL), moist, medium plasticity, dense, moist, some oxidation, light brownish gray (2.5 YR 6/2), yellow (2.5 YR 7/6), hard
35	
40	
45	
50	Sandy Silty Clay (CL), fines 60%, very fine sand 40%, small sand increase, weak, loose
55	Sandy Silty Clay (CL), moist, medium plasticity, dense, moist, some oxidation, light brownish gray (2.5 YR 6/2), yellow (2.5 YR 7/6), hard
60	Fine Sand (SP), sand 90%, fines 10%, loose, weak, moist, very dark grayish brown (2.5Y 3/2), sand lense at 64.5' with medium sand 100%
65	Silty Sandy Clay (CL), fines 90%, sand 10%, moist, dense, low to medium plasticity
70	Silty Sand (SP), sand 80%, fines 20%, moist, loose, very dark grayish brown (2.5 Y 3/2), Clay lense (CL), very fine sand 90%, fines 10% Silty Sand (SP), sand 80%, fines 20%, moist, loose, very dark grayish brown (2.5 Y 3/2),
75	Sandy Silty Clay (CL), fines 90%, very fine sand 10%, moist, dense, low plasticity, reddish gray (5YR 5/2)
80	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

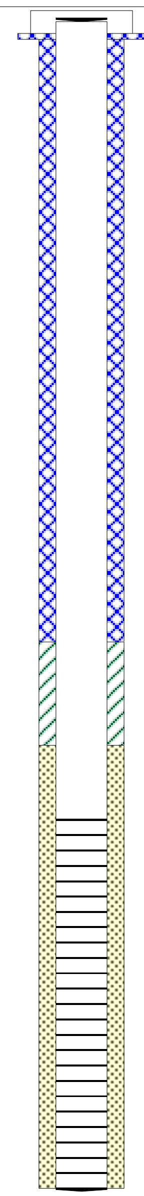
Stantec

MONITORNG WELL ID: **BAC-36**
CLIENT: Intermountain Power Service Corporation
PROJECT: Monitoring Well Installation
SITE LOCATION: South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/30/2020	DATE FINISHED: 5/31/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Silty Sand (SM), sand 80%, fines 15%, gravel 5%, dry, very loose, subangular clasts, light gray (2.5Y 7/2)
5		
10		
15		
20		Silty Sandy Clay (CL), fines 80%, fine sand 20%, dense, moist, low to medium plasticity, light olive brown (2.5Y 5/3). Small fracture with iron oxidation, reddish yellow (7.5YR 6/6).
25		
30		
35		No recovery from 33 to 38 ft bgs
40		Silty Sand (SM), fine sand 70%, fines 30%, loose, moist, olive brown (2.5Y 5/3), increasing fines from 45' to 46' with sand 50%, fines 50%
45		
		Silty Clay (CL), fines 100%, dense, moist, medium plasticity, brown (7.5YR 5/3/)
50		Silty Clay (CL), fines 70%, very fine sand 30%
		Silty Clay (CL), fines 100%, dense, moist, medium plasticity, brown (7.5YR 5/3/)
55		
60		Gravelly Silty Sand (SM), sand 80%, gravel 10%, fines 10%, loose, moist, light yellowish brown (2.5YR 6/4), gravel lense at 59', decreasing fines
		Silty Clay (CL), fines 90%, very fine sand 10%, moist, dense, low plasticity, brown (7.5YR 5/4).
65		
70		Silty Sand (SM), very fine sand 70%, fines 30%, reddish yellow (7.5YR 7/6), moist, loose
75		
80		End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

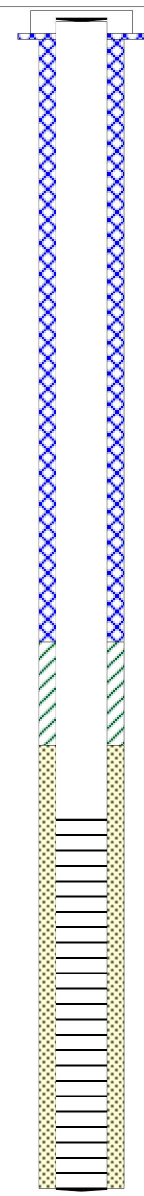
Stantec

MONITORNG WELL ID:	**BAC-37**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.):	78	GROUNDWATER LEVEL (ft. btoc.):	
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED:	5/29/2020	DATE FINISHED:	5/30/2020
		LOGGED BY:	Joel Pierson		

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Silty Fine Sand (SM), sand 80%, fines 20%, dry, loose, light gray (2.5Y 7/2)
18	Silty Sandy Clay (CL), fines 90%, sand 10%, slightly moist, low plasticity, dense, hard, pale yellow (2.5Y 7/3)
21	Silty Sandy Clay (CL), fines 70%, fine sand 30%, loose
25	Silty Sandy Clay (CL), fines 90%, sand 10%, slightly moist, low plasticity, dense, hard, iron staining, yellow (2.5Y 7/3)
34	Silty Fine Sand (SM), fine sand 70%, fines 30%, moist, loose
38.5	Fine Gravel (GM), sand 60%, gravel 30%, fines 10%, angular to subangular clasts
40	Silty Fine Sand (SM), fine sand 70%, fines 30%, moist, loose
43	Sandy Clay (CL), fines 90%, sand 10%, moist, medium dense, low plasticity, light brownish gray (2.5 YR 6/2)
50	Fine Silty Sand (SM), sand 80%, fines 20%, moist, loose
52	Silty Clay (CL), 100% fines, moist, hard, low plasticity, reddish
55	Silty Sand (SP), sand 90%, fines 10% , reddish gray (5YR 5/2)
56.5	Silty Sand (SP), sand 70%, fines 30%, reddish gray (5YR 5/2)
62.5	Silty Clay (CL), fines 100%, dense, moist, medium-high plasticity
66	Fine Silty Sand (SM), sand 80%, fines 20%, moist, loose
75	Fine Silty Sand (SM), sand 60%, fines 40%, moist, loose
76	Fine Silty Sand (SM), sand 80%, fines 20%, moist, loose
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

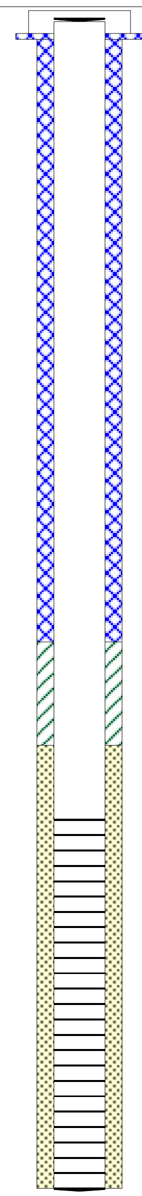
MONITORNG WELL ID:	**BAC-38**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South Wells

INTERMOUNTAIN POWER SERVICE CORP. | Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 78 ft bgs.,	TOTAL DEPTH (ft.): 78	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 78 ft bgs.,	DATE STARTED: 5/31/2020	DATE FINISHED: 5/31/2020
		LOGGED BY: Joel Pierson	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0–11	Silty Fine Sand (SM), sand 70%, fines 30%, dry, very loose, light yellowish brown (2.5Y 6/3)
11–22	Silty Sandy Clay (CL), fines 80%, sand 20%, slightly moist, low plasticity, dense, olive brown (2.5Y 7/3). Fracture-like facies with iron oxidation
22–28	Gravel Sand (SP), sand 80%, gravel 20%, very loose, dry, light yellowish brown (2.5Y 6/3)
28–36	Silty Clay (CL), fines 100%, slightly moist, low plasticity, dense, red (2.5YR 5/8)
36–43	Silty Sand (SP), sand 90%, fines 10%, loose, moist, light olive brown (2.5Y 5/3)
43–54	Silty Clay (CL), fines 100%, moist, medium-high plasticity, dense, red (2.5YR 5/4)
54–59	Silty Sand (SM), sand 80%, fines 20%, loose, moist, light olive brown (2.5Y 5/3)
59–64	Silty Clay (CL), transitioning from fines 90%, sand 10% to fines 60%, sand 40%, moist, medium-high plasticity, dense, red (2.5YR 5/8)
64–78	Fine sand (SP), sand 100%, moist, very loose, dark grayish brown (2.5Y 3/2)
78	End of borehole at 78 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



- Above ground monument with well cap
- Borehole diameter 10 inches from 0 to 78 ft bgs.
- Grout 0 to 41 ft bgs.
- 0 to 53 ft bgs., 6 in dia., Sch. 80 PVC riser
- Bentonite 41 to 48 ft bgs.
- Filter Pack Sand 48 to 78 ft bgs.
- 53 to 78 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
- End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

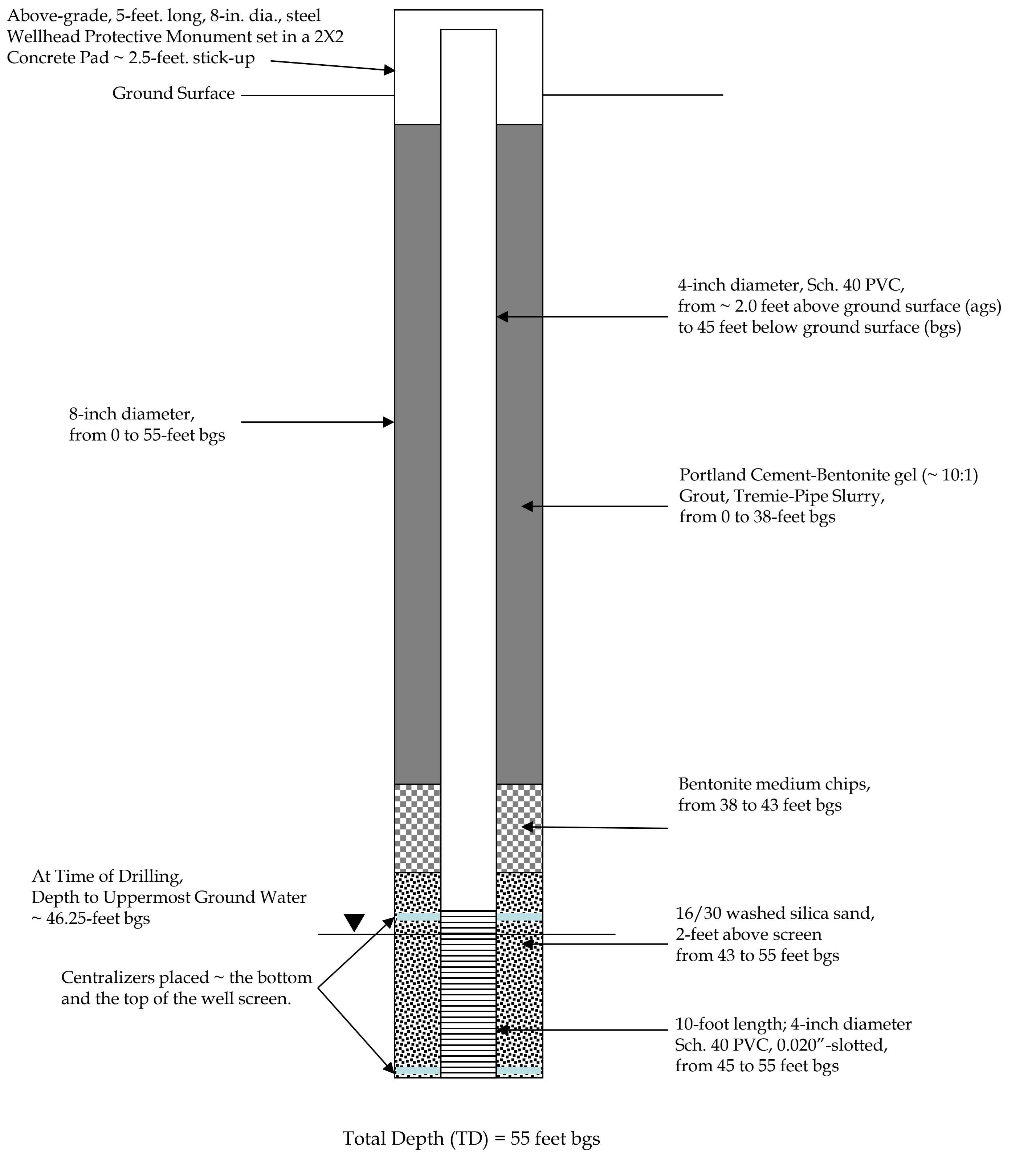
Boring Logs
ISPC
Delta, Utah

BA-U-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/24/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SC	Clayey SAND:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-5	8" Sonic	SM/ML	Silty SAND/Sandy Silt:
5-6	8" Sonic	SP	SAND:
6-9.5	8" Sonic		SAND:
9.5-11	8" Sonic		SAND:
11-11.5	8" Sonic	SM	Silty SAND:
11.5-12	8" Sonic		Silty SAND:
12-13	8" Sonic	SP/SM	SAND with silt:
13-17	8" Sonic	SP	SAND:
17-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22.5	8" Sonic		SAND:
22.5-25	8" Sonic	SM	Silty SAND:
25-26	8" Sonic	SP	SAND:
26-27.5	8" Sonic	SP/SM	SAND with silt:
27.5-28.25	8" Sonic	SM	Silty SAND with clay:
28.25-29.25	8" Sonic	SP/SM	SAND with silt:
29.25-30	8" Sonic	CL	CLAY:
30-31.5	8" Sonic		Sandy CLAY:
31.5-33	8" Sonic	ML	Sandy SILT:
33-35	8" Sonic	SM	Silty SAND with clay:
35-36.25	8" Sonic	SP/SM	SAND with silt:
36.25-40	8" Sonic	CH	CLAY:
40-46.5	8" Sonic		CLAY:
46.5-47.5	8" Sonic	SP/SM	SAND with silt:
47.5-50	8" Sonic	SM	Silty SAND with clay:
50-51	8" Sonic	SC	Clayey SAND:
51-51.75	8" Sonic	SW	SAND:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53	8" Sonic	CH	Sandy CLAY:
53-54	8" Sonic		Sandy CLAY:
54-55	8" Sonic		CLAY:

TD = 55'; PVC 4-inch screen from 45 to 55; PVC 4-inch riser from -2.5 to 45
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec	IPSC – BOTTOM ASH BASIN AREA DELTA, UTAH			
	Well BA-U-1 Schematic			
				Date Drawn 7/24/15
	Design by	Drawn by MS	Scale	Last Revision Date

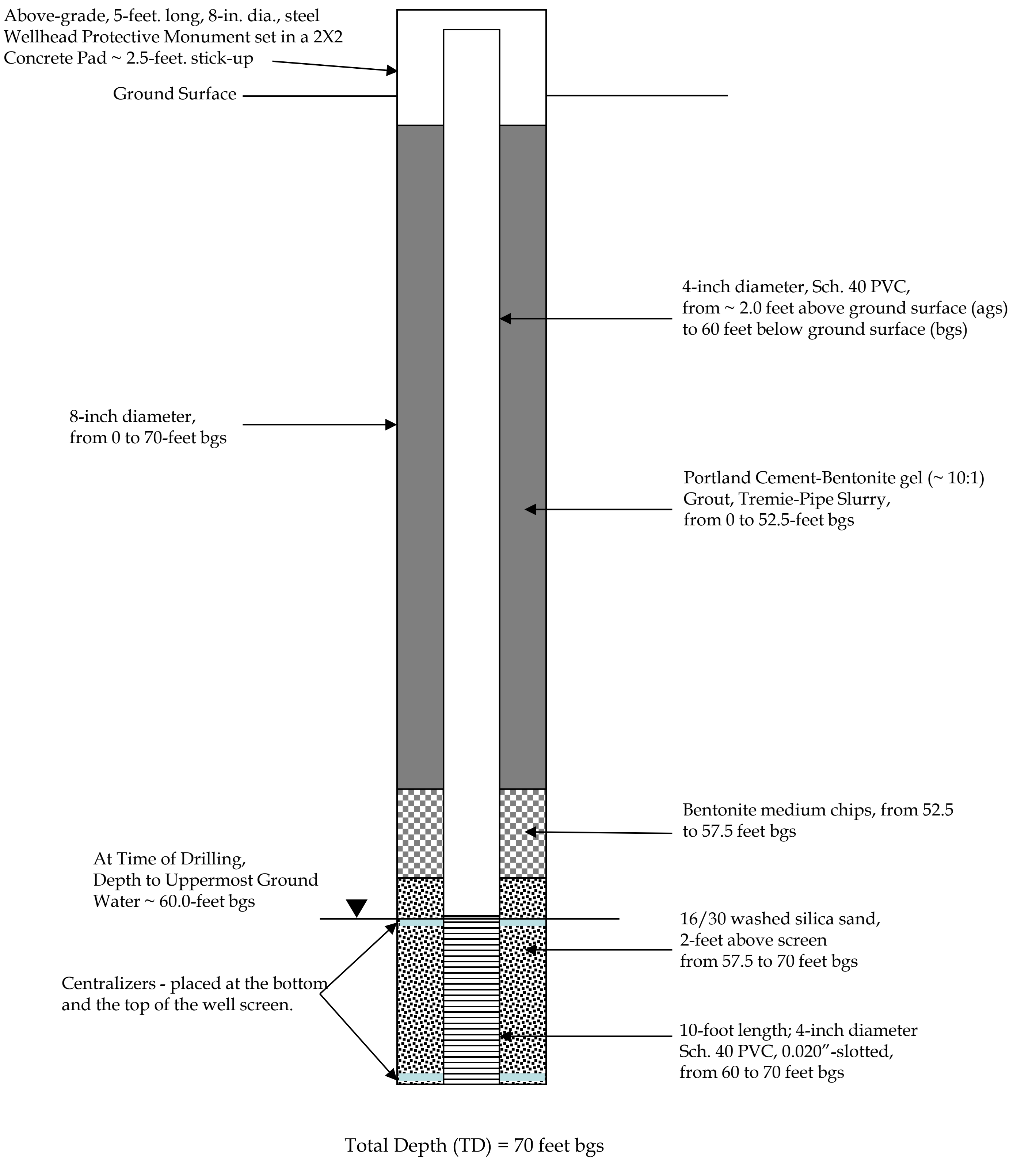
Boring Logs
ISPC
Delta, Utah

BA-U-2

Interval (feet)	Drilling Method	USCS	Sample Description
7/25/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1.5	8" Sonic	ML	Sandy SILT:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4	8" Sonic		SAND with silt:
4-5	8" Sonic	ML	SILT with sand and clay:
5-6	8" Sonic	SP/SM	SAND with silt:
6-7	8" Sonic	SP	SAND:
7-9	8" Sonic	SW	Gravelly SAND:
9-9.75	8" Sonic		Gravelly SAND:
9.75-10.25	8" Sonic	SP	Gravelly SAND:
10.25-11	8" Sonic	SP/SM	SAND with silt:
11-12.5	8" Sonic	CL	CLAY:
12.5-13	8" Sonic	SP	SAND:
13-15.5	8" Sonic		SAND:
15.5-18	8" Sonic		SAND:
18-22.5	8" Sonic		SAND:
22.5-23	8" Sonic		SAND:
23-23.5	8" Sonic	SM	Silty SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-30	8" Sonic	SM	Silty SAND:
30-32.5	8" Sonic	SC	Clayey SAND:
32.5-35	8" Sonic	SM	Silty SAND with clay:
35-37.5	8" Sonic		Silty SAND:
37.5-40	8" Sonic	CL	Sandy CLAY:
40-42	8" Sonic	SC	Clayey SAND:
42-45	8" Sonic	CH	CLAY:
45-47.5	8" Sonic		Sandy CLAY:
47.5-51.75	8" Sonic		CLAY:
51.75-53	8" Sonic	SM	Silty SAND:
53-54	8" Sonic		Silty SAND:
54-55	8" Sonic	SC/SM	Clayey SAND with silt:
55-56.5	8" Sonic	CH	CLAY:
56.5-57.5	8" Sonic		CLAY:
57.5-60	8" Sonic	SC	Clayey SAND:
60-60.75	8" Sonic	SM	Silty SAND with clay:
60.75-61.5	8" Sonic	SC	Clayey SAND:
61.5-62.5	8" Sonic	SP	SAND:
62.5-63.5	8" Sonic		SAND:
63.5-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-70	8" Sonic		SAND:

TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec

IPSC – BOTTOM ASH BASIN AREA

DELTA, UTAH

Well BA-U-2 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/25/15 / Last Revision Date

Boring Logs

IPSC

Delta, Utah

WWC-1

Interval (feet)	Drilling Method	USCS	Sample Description
7/26/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP	SAND:
2.5-5	8" Sonic		SAND:
5-6.75	8" Sonic	SM	Silty SAND:
6.75-7.5	8" Sonic	ML	Sandy SILT:
7.5-10	8" Sonic		Sandy SILT:
10-12	8" Sonic		Sandy SILT:
12-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	CL	Silty CLAY:
15-17.5	8" Sonic		Silty CLAY:
17.5-18.5	8" Sonic		Silty CLAY:
18.5-19	8" Sonic		Sandy CLAY:
19-20	8" Sonic		Silty CLAY:
20-22	8" Sonic	CH	CLAY:
22-24.5	8" Sonic		Sandy CLAY:
24.5-25.5	8" Sonic		Sandy CLAY:
25.5-27	8" Sonic		Sandy CLAY:
27-31	8" Sonic		CLAY:
31-31.5	8" Sonic		CLAY:
31.5-33	8" Sonic		CLAY:
33-34.5	8" Sonic		Sandy CLAY:
34.5-35	8" Sonic		Sandy CLAY:
35-37.5	8" Sonic	SM	Silty SAND:
37.5-40	8" Sonic		Silty SAND:
40-41.5	8" Sonic	SP	SAND:
41.5-42.5	8" Sonic		SAND:
42.5-44	8" Sonic		SAND:
44-45	8" Sonic		SAND:
45-46.5	8" Sonic	CH	CLAY:
46.5-47.5	8" Sonic		Sandy CLAY:
47.5-50.5	8" Sonic	SC/SM	SAND with silt and clay:
50.5-52.5	8" Sonic	SW	SAND:
52.5-53.5	8" Sonic		SAND:
53.5-55	8" Sonic	SM	Silty SAND:
55-57	8" Sonic		Silty SAND:
57-57.5	8" Sonic	CH	CLAY:
57.5-60			CLAY:

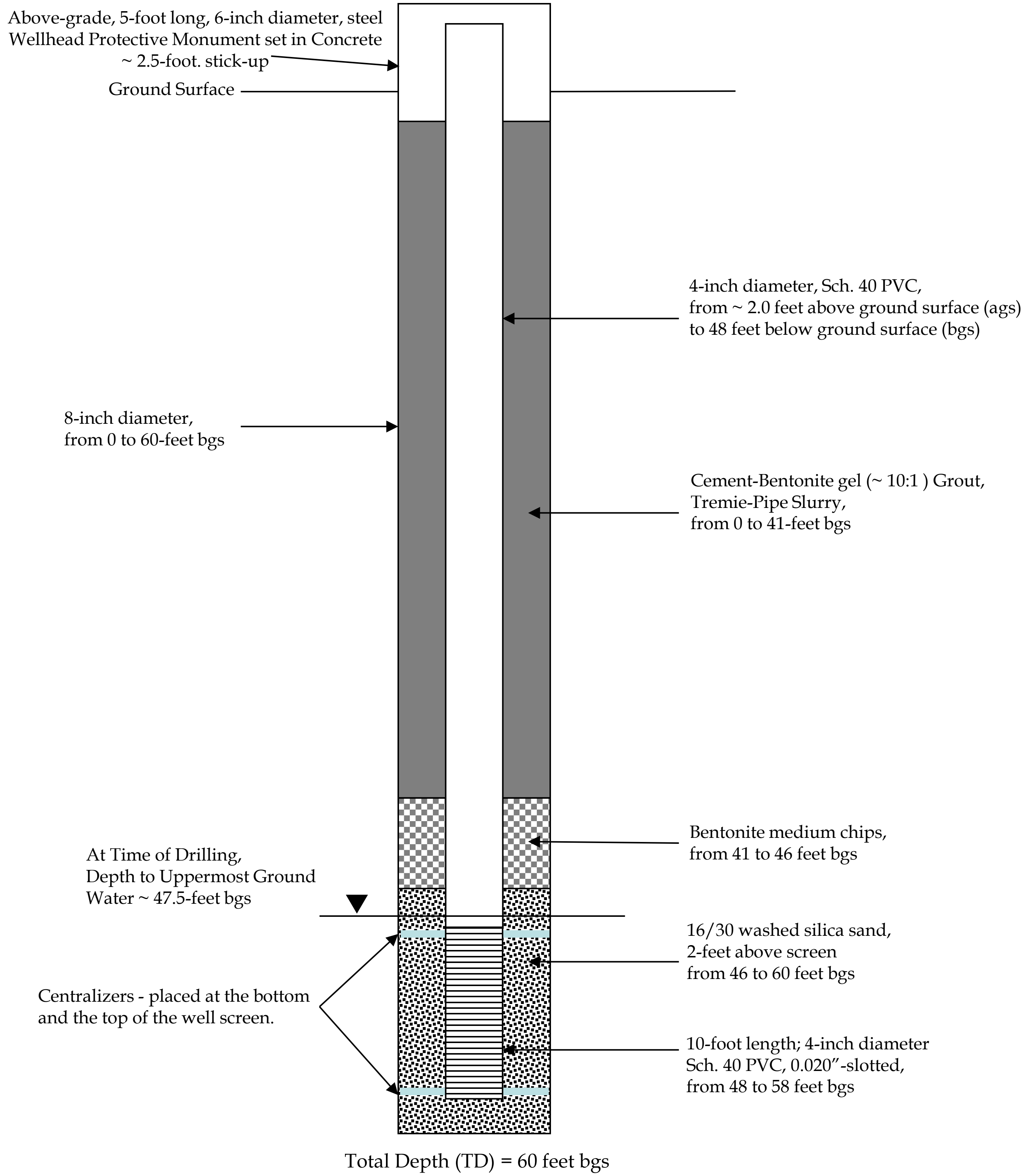
TD = 60'; PVC 4-inch screen from 48 to 58; PVC 4-inch riser from -2.5 to 48

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-1 Schematic

Date Drawn	7/26/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	

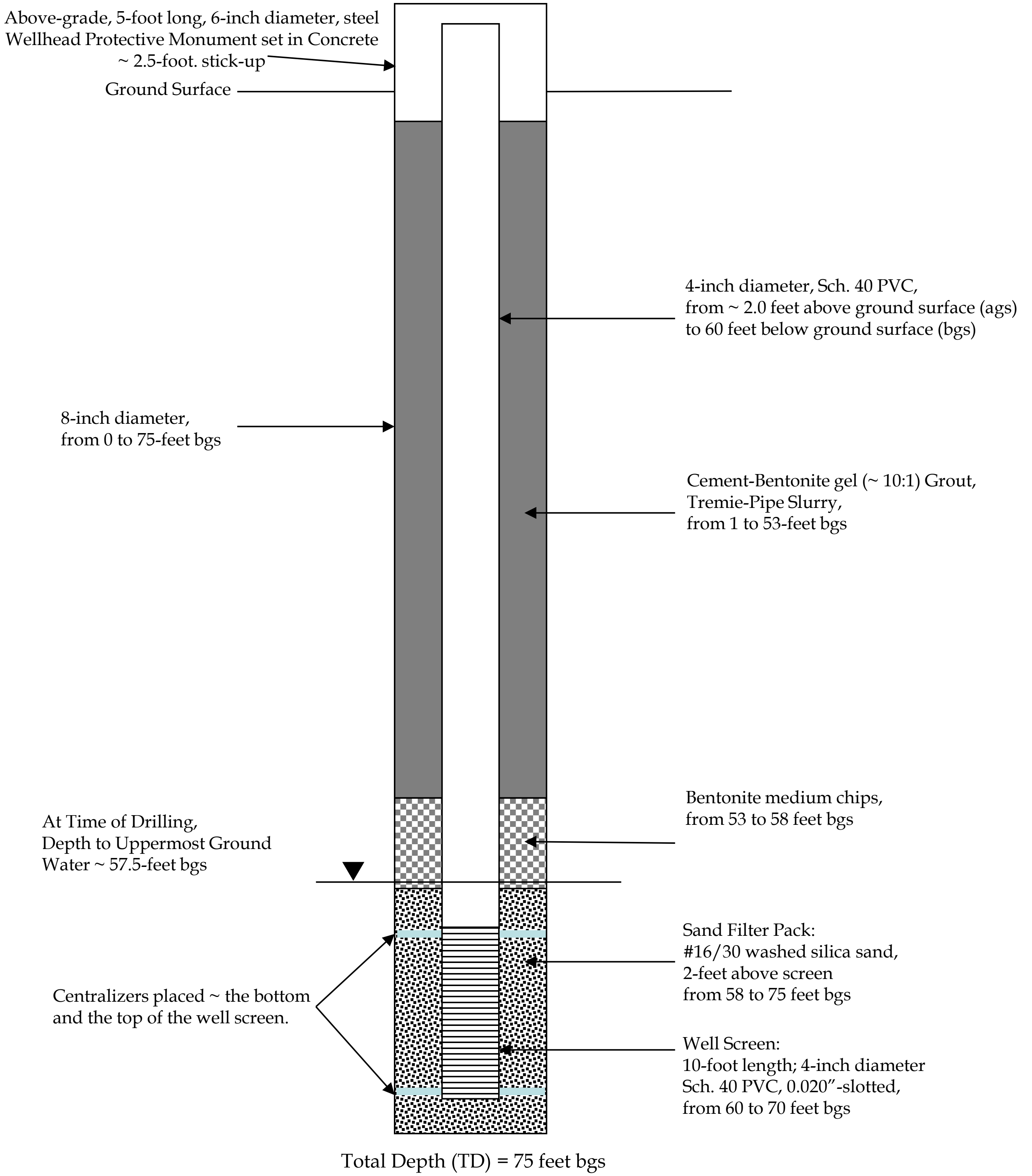
Boring Logs
IPSC
Delta, Utah

WWC-2

Interval (feet)	Driling Method	USCS	Sample Description
7/27/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SM	Silty SAND:
2.5-5	8" Sonic	SP	SAND:
5-7	8" Sonic		SAND:
7-9.5	8" Sonic	SW	Gravelly SAND:
9.5-10	8" Sonic	SW/SP	SAND:
10-12	8" Sonic	SP	SAND:
12-12.5	8" Sonic	SP/SW	Gravelly SAND:
12.5-14.5	8" Sonic	SW	Gravelly SAND:
14.5-15	8" Sonic	SP	SAND with gravel:
15-16	8" Sonic		SAND:
16-17.5	8" Sonic	CL	Sandy CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20	8" Sonic		Clayey SAND:
20-21	8" Sonic		Clayey SAND:
21-22	8" Sonic	CH	CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND with clay:
25-26.5	8" Sonic	SM/SC	Silty SAND and clay:
26.5-27.5	8" Sonic	SC	Clayey SAND with silt:
27.5-31.5	8" Sonic	CH	CLAY:
31.5-34	8" Sonic		Silty CLAY:
34-35.5	8" Sonic	SP	SAND:
35.5-37	8" Sonic	ML	Sandy SILT with clay:
37-38.5	8" Sonic	CL	Silty CLAY:
38.5-40	8" Sonic	SM	Silty SAND:
40-42	8" Sonic	CH	CLAY:
42-42.5	8" Sonic		Silty CLAY:
42.5-45	8" Sonic	SC	Clayey SAND:
45-46.25	8" Sonic	CH	CLAY:
46.25-46.75	8" Sonic	SW/SM	SAND with silt:
46.75-47	8" Sonic	ML	Sandy SILT:
47-47.5	8" Sonic	SM	Silty SAND:
47.5-50	8" Sonic	CH	CLAY:
50-51.5	8" Sonic	SM	Silty SAND:
51.5-52	8" Sonic	CH	Sandy CLAY:
52-52.5	8" Sonic	SM	CLAY:
52.5-53.5	8" Sonic	CH	Sandy CLAY:
53.5-55	8" Sonic	SM	Silty SAND:
55-56.25	8" Sonic	ML	Sandy SILT:
56.25-57.5	8" Sonic		SILT:
57.5-60	8" Sonic	SP/SM	SAND with silt:
60-61.5	8" Sonic	SM	Silty SAND:
61.5-62.5	8" Sonic	CH	CLAY:
62.5-63.75	8" Sonic	SP/SM	SAND with silt:
63.75-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND:
67.5-70	8" Sonic		Gravelly SAND:
70-70.5	8" Sonic	SC/SM	Silty SAND and clay:
70.5-72.5	8" Sonic	CH	CLAY:
72.5-75	8" Sonic		CLAY:

TD = 75'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-2 Schematic

			Date Drawn 7/27/15
Design by	Drawn by MS	Scale	Last Revision Date

Boring Logs

ISPC

Delta, Utah

WWC-3

Interval (feet)	Drilling Method	USCS	Sample Description
7/30/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-1	8" Sonic	SP	Gravelly SAND:
1-2.5	8" Sonic	SM	Silty SAND:
2.5-3.5	8" Sonic		Silty SAND:
3.5-5	8" Sonic	SP/SM	SAND with silt:
5-6.5	8" Sonic	ML	Sandy SILT:
6.5-7.5	8" Sonic	CL	Sandy CLAY:
7.5-8	8" Sonic	SM	Silty SAND:
8-10	8" Sonic	SC	Clayey SAND:
10-11	8" Sonic	SM	Silty SAND:
11-12.5	8" Sonic		Silty SAND with clay:
12.5-13.5	8" Sonic		Silty SAND:
13.5-14	8" Sonic	SC	Clayey SAND:
14-15	8" Sonic	SM	Silty SAND:
15-15.5	8" Sonic	CH	CLAY:
15.5-16	8" Sonic		CLAY:
16-16.5	8" Sonic		Sandy CLAY:
16.5-17.5	8" Sonic		Sandy CLAY:
17.5-20	8" Sonic		CLAY:
20-21	8" Sonic		CLAY:
21-22	8" Sonic		CLAY:
22-24	8" Sonic		CLAY:
24-25	8" Sonic	SM	Silty SAND:
25-26.25	8" Sonic	SP/SM	SAND with silt:
26.25-27	8" Sonic	SP	SAND:
27-29	8" Sonic	SM	Silty SAND:
29-30	8" Sonic	CH	CLAY:
30-31	8" Sonic		CLAY:
31-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-36	8" Sonic	CH	CLAY:
36-37	8" Sonic		CLAY:
37-39.5	8" Sonic	SP/SM	SAND with silt:
39.5-40.5	8" Sonic	SP	SAND:
40.5-41.5	8" Sonic		SAND:
41.5-43	8" Sonic	CH	CLAY:
43-44	8" Sonic	SP/SM	SAND with silt:
44-45	8" Sonic	SM	Silty SAND:
45-47.5	8" Sonic	SP	SAND:
47.5-50	8" Sonic	CH	CLAY:
50-52.5	8" Sonic		CLAY:
52.5-55	8" Sonic	SP	SAND:
55-61	8" Sonic		SAND:
61-62.5	8" Sonic	SW	SAND:
62.5-65	8" Sonic		SAND:
65-67.5	8" Sonic	SP	SAND:
67.5-69.5	8" Sonic	SW	SAND:
69.5-70	8" Sonic	CH	CLAY:

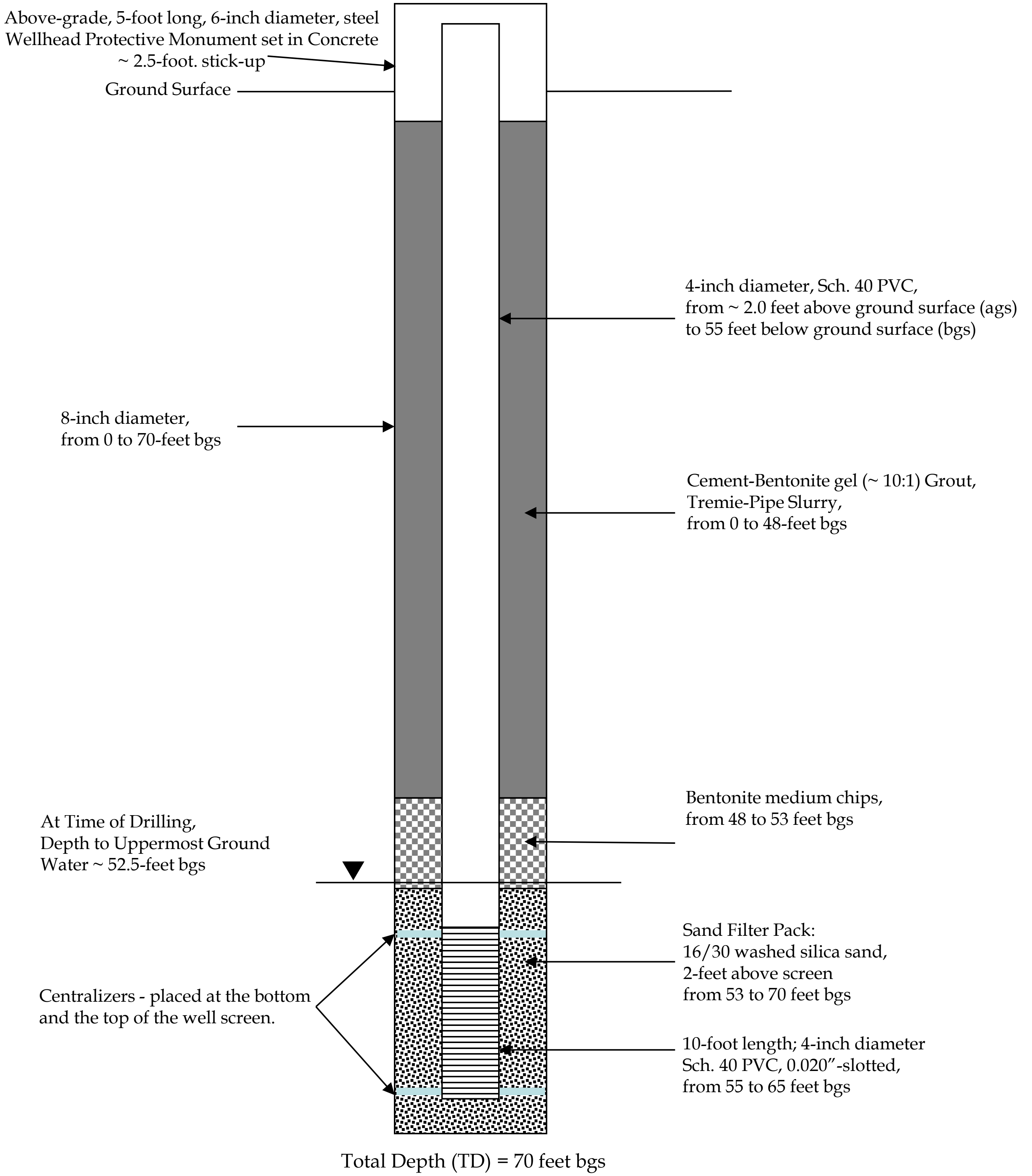
TD = 70'; PVC 4-inch screen from 55 to 65; PVC 4-inch riser from -2.5 to 55

Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Daniel Dodge

Geologist - Michael Sauerwein



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH UTAH

Well WWC-3 Schematic

Design by	Drawn by MS	Scale	Date Drawn 7/30/15 Last Revision Date

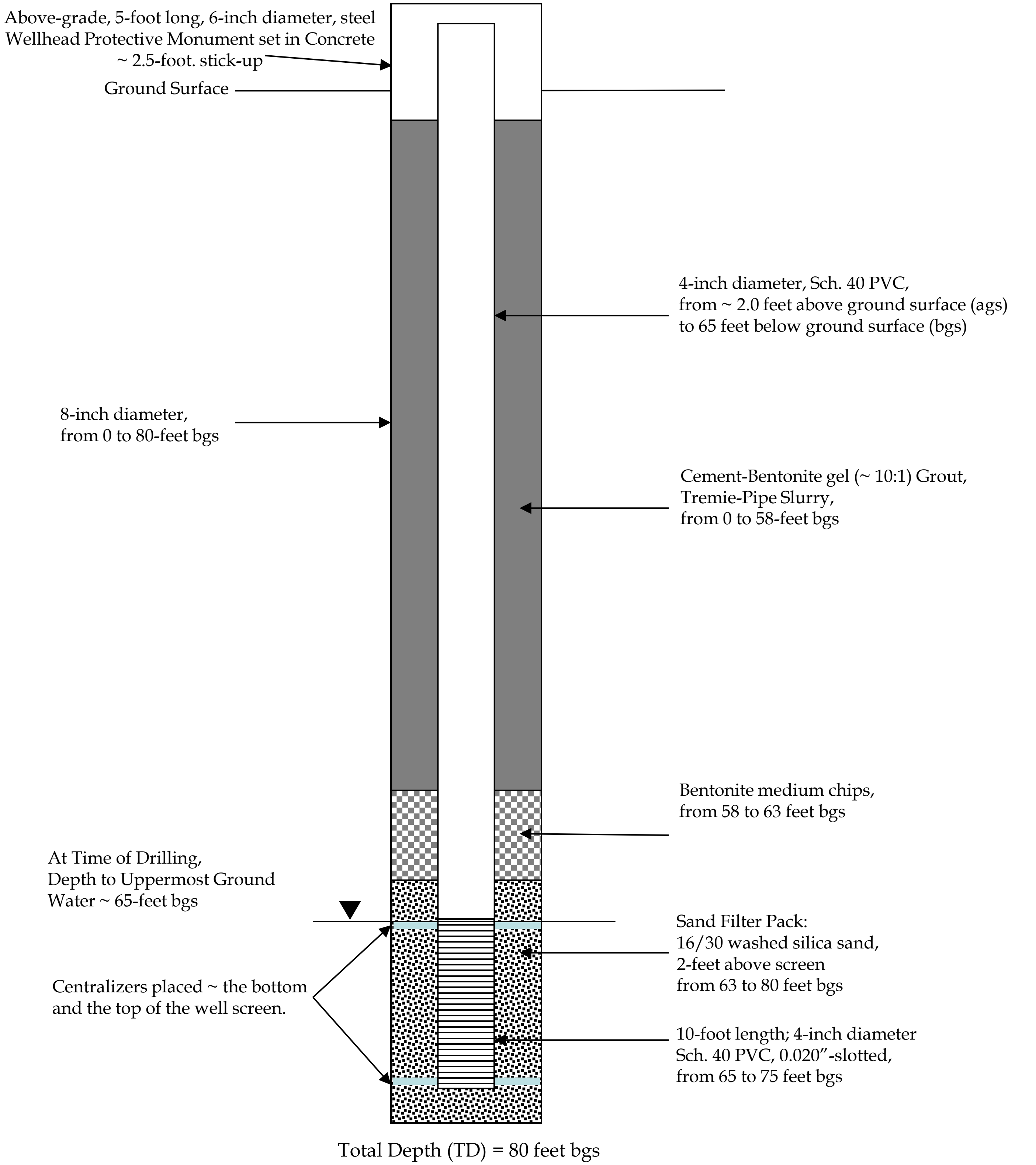
Boring Logs
ISPC
Delta, Utah

WWC-4

Interval (feet)	Drilling Method	USCS	Sample Description
7/29/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-5	8" Sonic		SAND with silt:
5-6.25	8" Sonic	ML	Sandy SILT:
6.25-7.25	8" Sonic	CL	CLAY:
7.25-8	8" Sonic	SC	Clayey SAND:
8-9	8" Sonic	SP/SC	SAND with clay:
9-10	8" Sonic	SP	SAND:
10-11	8" Sonic	ML	SILT:
11-12.5	8" Sonic	ML/CL	Clayey SILT:
12.5-14	8" Sonic	CL	CLAY:
14-15	8" Sonic		Sandy CLAY:
15-16	8" Sonic	SC	Clayey SAND:
16-18	8" Sonic		Clayey SAND:
18-19.5	8" Sonic	SM	Silty SAND:
19.5-20	8" Sonic	CH	CLAY:
20-21.25	8" Sonic		Sandy CLAY:
21.25-22.5	8" Sonic	SM	Silty SAND:
22.5-23.75	8" Sonic	CH	CLAY:
23.75-25	8" Sonic	SM	Silty SAND:
25-25.75	8" Sonic	SC	Clayey SAND:
25.75-27.5	8" Sonic	CL	Sandy CLAY:
27.5-29	8" Sonic	CH	CLAY:
29-30.5	8" Sonic		CLAY:
30.5-31.5	8" Sonic	SM	Silty SAND:
31.5-32.25	8" Sonic	CL	Sandy CLAY:
32.25-32.5	8" Sonic		Sandy CLAY:
32.5-33	8" Sonic	CH	CLAY:
33-36	8" Sonic	SP/SM	SAND with silt:
36-37	8" Sonic	SM	Silty SAND:
37-40	8" Sonic	SP	SAND:
40-42.5	8" Sonic		SAND:
42.5-45	8" Sonic		SAND:
45-46	8" Sonic	SP/SW	SAND:
46-46.5	8" Sonic	CH	CLAY:
45.5-47.5	8" Sonic		Sandy CLAY:
47.5-48.5	8" Sonic		CLAY:
48.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		CLAY:
50.5-52.5	8" Sonic	SM	Silty SAND:
52.5-54	8" Sonic	CH	CLAY:
54-55	8" Sonic	SP	SAND:
55-57	8" Sonic	CH	Sandy CLAY:
57-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic	SM	Silty SAND:
60-62	8" Sonic		Silty SAND:
62-62.5	8" Sonic	SC	Clayey SAND:
62.5-63	8" Sonic	CH	Sandy CLAY:
63-65	8" Sonic	SM	Silty SAND:
65-67.5	8" Sonic	SW	SAND:
67.5-69.5	8" Sonic	SP	SAND:
69.5-70	8" Sonic	SW	SAND:
70-72	8" Sonic		SAND:
72-72.5	8" Sonic	SP/SM	SAND with silt:
72.5-75	8" Sonic	SM	Silty SAND:
75-80	8" Sonic	CH	CLAY:

TD = 80'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-4 Schematic

Date Drawn 7/29/15

Last Revision Date

Design by

Drawn by MS

Scale

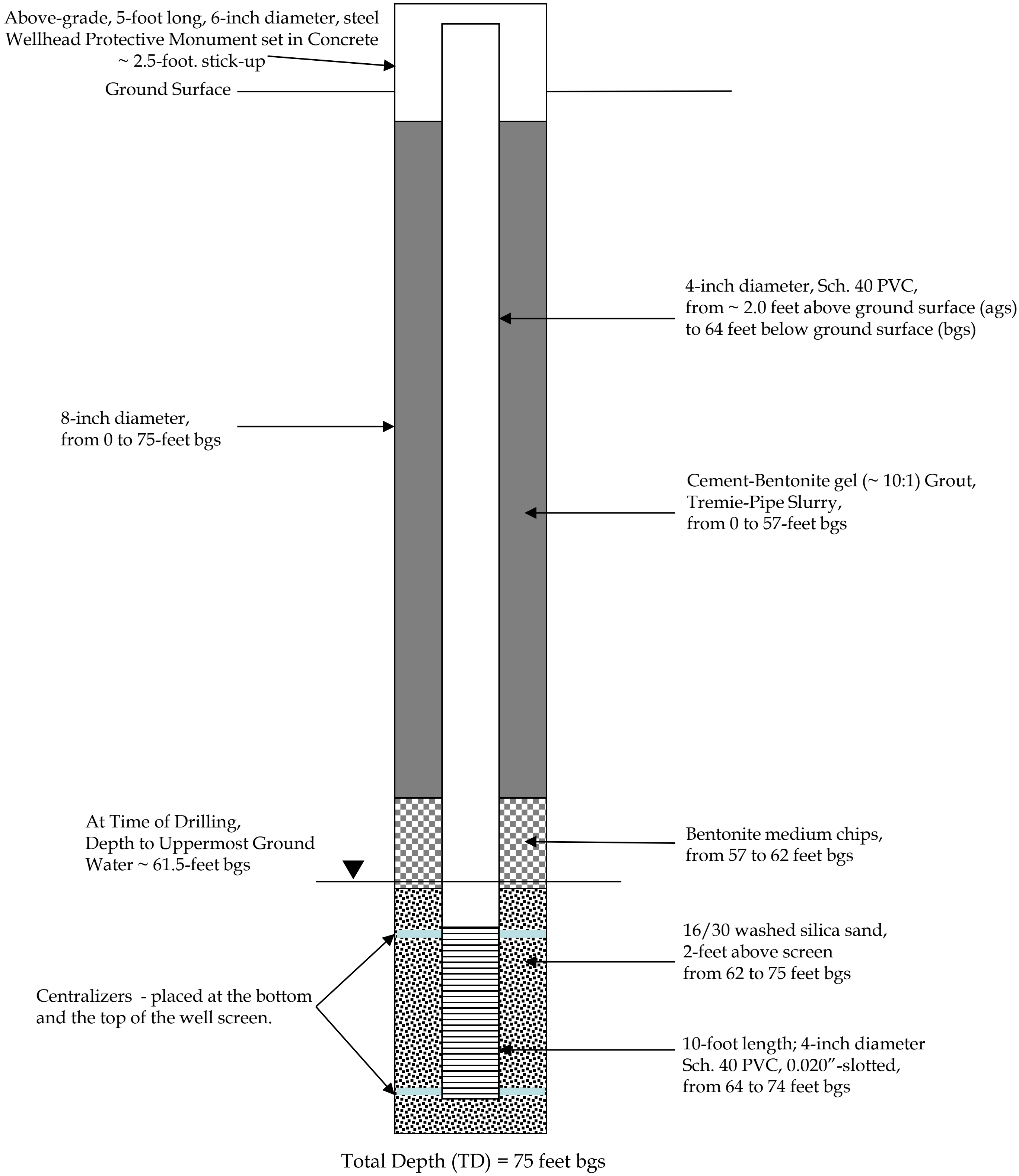
Boring Logs
ISPC
Delta, Utah

WWC-5

Interval (feet)	Drilling Method	USCS	Sample Description
			7/28/2015
0-0.5	8" Sonic	TOPSOIL	Surface - Sand, Gravel, roots, coal ash.
0.5-2	8" Sonic	ML	Sandy SILT:
2-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-4.25	8" Sonic	SM	Silty SAND:
4.25-5	8" Sonic	SP	SAND:
5-7.5	8" Sonic	ML	Clayey SILT:
7.5-9	8" Sonic	CL	Silty CLAY:
9-10	8" Sonic		Sandy CLAY:
10-10.5	8" Sonic	SC	Clayey SAND:
10.5-11.25	8" Sonic	CL	CLAY:
11.25-12.5	8" Sonic	ML	Clayey SILT:
12.5-13.25	8" Sonic	SM	Silty SAND:
13.25-13.75	8" Sonic	SC	Clayey SAND:
13.75-15	8" Sonic	CL	CLAY:
15-16	8" Sonic		CLAY:
16-17.5	8" Sonic	CH	CLAY:
17.5-19	8" Sonic	SC	Clayey SAND:
19-20.5	8" Sonic	CH	CLAY:
20.5-21.25	8" Sonic		Sandy CLAY:
21.25-22	8" Sonic		CLAY:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-24	8" Sonic	SM	Silty SAND:
24-25	8" Sonic	CH	CLAY:
25-26	8" Sonic	SM/CH	Silty SAND / CLAY:
26-27.5	8" Sonic	CH	CLAY:
27.5-28	8" Sonic		Sandy CLAY:
28-28.25	8" Sonic	SM	Silty SAND:
28.25-30	8" Sonic	CH	CLAY:
30-32.5	8" Sonic	SP	SAND:
32.5-34	8" Sonic		SAND:
34-37.5	8" Sonic		SAND:
37.5-40	8" Sonic	SP/SM	SAND with silt:
40-42.5	8" Sonic	CH	CLAY:
42.5-42.75	8" Sonic	SM	Silty SAND:
42.75-44	8" Sonic	CH	Sandy CLAY:
44-44.5	8" Sonic	SM	Silty SAND:
44.5-45	8" Sonic		Silty SAND:
45-45.5	8" Sonic		Silty SAND:
45.5-46.75	8" Sonic		Silty SAND:
46.75-47.5	8" Sonic	CH	CLAY:
47.5-50	8" Sonic		CLAY:
50-50.5	8" Sonic		Sandy CLAY:
50.5-51.5	8" Sonic		CLAY:
51.5-52	8" Sonic	SM	Silty SAND:
52-53.25	8" Sonic	CH	CLAY:
53.25-53.5	8" Sonic		CLAY:
53.5-54	8" Sonic	SC	Clayey SAND:
54-55	8" Sonic	SM/SC	Silty SAND and clay:
55-57.5	8" Sonic	SP	SAND:
57.5-60	8" Sonic		SAND:
60-60.75	8" Sonic		SAND:
60.75-61.5	8" Sonic	CH	CLAY:
61.5-62.5	8" Sonic	SP/SM	SAND with silt:
62.5-64	8" Sonic		SAND with silt:
64-65	8" Sonic	SW	SAND:
65-67.5	8" Sonic		SAND with gravel:
67.5-70	8" Sonic		Gravelly SAND:
70-72.5	8" Sonic		SAND:
72.5-75	8" Sonic		SAND:

TD = 75'; PVC 4-inch screen from 64 to 74; PVC 4-inch riser from -2.5 to 64
Drilling Method: Guspech GS24-300RS, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Daniel Dodge
Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-5 Schematic

			Date Drawn 7/28/15
Design by	Drawn by MS	Scale	Last Revision Date

Boring Logs

ISPC

Delta, Utah

WWC-6

Interval (feet)	Drilling Method	USCS	Sample Description
03/23/2018 - 03/24/2018			
0-0.5	8" Sonic	SM	Silty sand
0.7-7	8" Sonic	SP	Sand, poorly graded, dry
7-12.5	8" Sonic	CH	Silty clay
12.5-15.5	8" Sonic	SM	Sand, some silt
15.5-19.5	8" Sonic	SP	Sand, poorly graded
19.5-21.5	8" Sonic	SW/GW	Sand and gravel
21.5-27	8" Sonic	SP	Sand, poorly graded, running sands @ ~26
27-29.5	8" Sonic	SP	Sand, poorly graded, running sands
29.5-30	8" Sonic	SW	Sand with gravel
30.37	8" Sonic	CH	Clay, stiff
37-41	8" Sonic	CH	Clay, trace silt, moist, stiff
41-47	8" Sonic	CH	Clay, stiff, moist
47-48	8" Sonic	SP	Sand
48-57	8" Sonic	SW	Sand, silt and gravel
57-59	8" Sonic	SP	Sand
59-60.5	8" Sonic	CH	Clay wet
60.5-64.5	8" Sonic	MH	Silt, trace clay
64.5-67	8" Sonic	CH	Clay wet
67-72	8" Sonic	CH	Clay wet
72-77	8" Sonic	SP	Sand, saturated
77-87	8" Sonic	CH	Clay

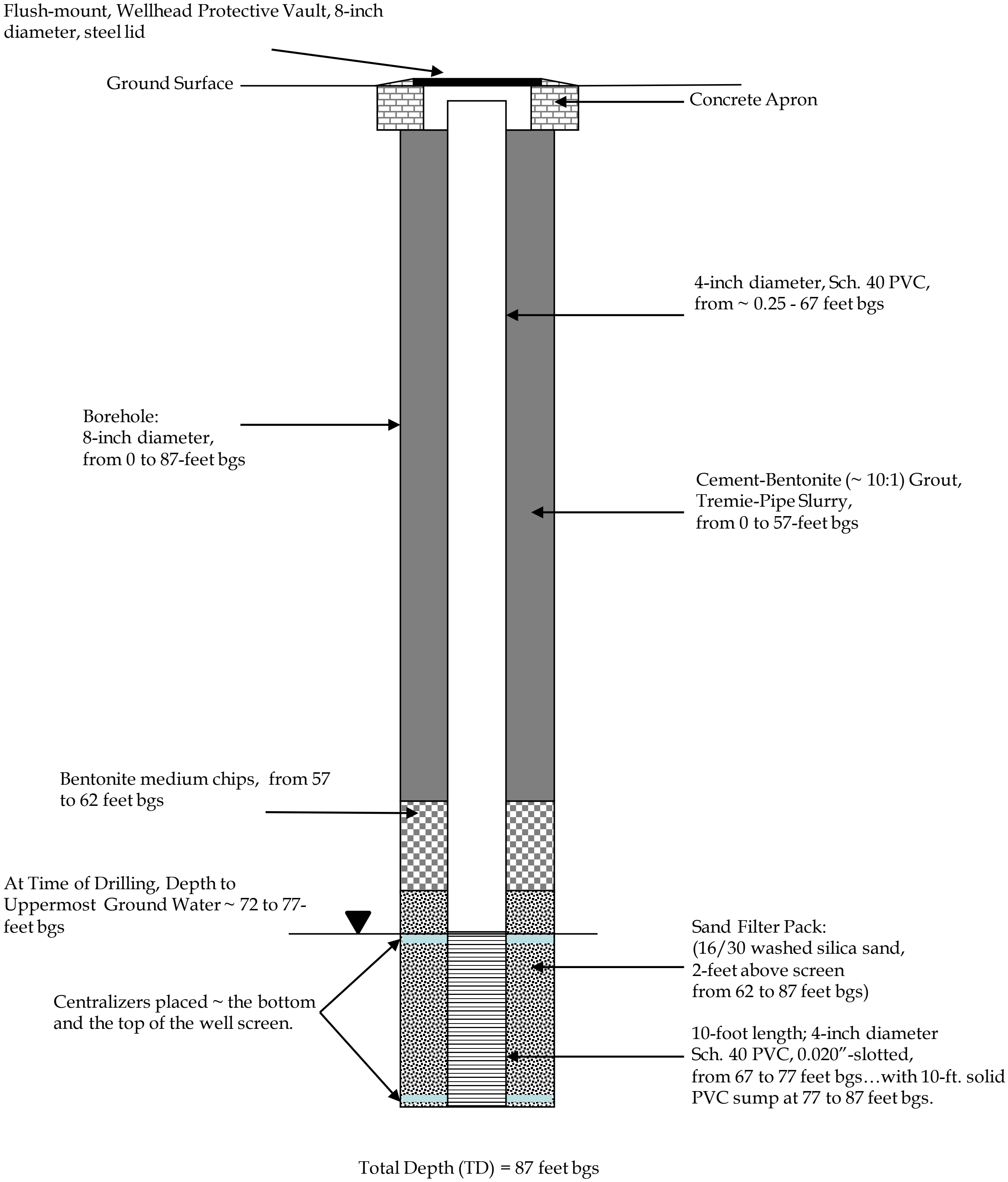
TD = 87'; PVC sump 87-77; 4" screen 77-67; sand 87-62 centralizers 67.5 and 76.5

Drilling Method: Sonic

Drilling Company - Cascade Drilling

Driller - David Donnely

Geologist - Tom Fendler



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
Delta, Utah

Well WWC-6 Schematic

Design by	Drawn by JR	Scale	Date Drawn 10/24/18
			Last Revision Date

Boring Logs

ISPC

Delta, Utah

WWC-7

Interval (feet)	Drilling Method	USCS	Sample Description
03/20/2018 - 03/23/2018			
0-1.5	8" Sonic	SM	Silty sand, dry
1.5-8.5	8" Sonic	SP	Sand, poorly graded, saturated at 7.5
8.5-9	8" Sonic	CH	Sandy clay
9-14	8" Sonic	SC	Clay with trace sand
14-24	8" Sonic	SP	Sand, poorly graded, saturated with heaving sands at 17 '
24-25	8" Sonic	SW/GW	Gravel/sand and gravel
25-27	8" Sonic	CH	Clay, moist
27-34.5	8" Sonic	SP	Sandy, wet
34.5-35.5	8" Sonic	SW/GW	Sand, some gravel
35.5-37	8" Sonic	CH	Clay, moist, stiff
37-47	8" Sonic	CH	Clay, moist, stiff
47-49.5	8" Sonic	CH	Clay, moist, stiff
49.5-50.5	8" Sonic	SP	Sand, poorly softed, moist
50.5-57	8" Sonic	CH	Clay, moist, stiff
57-67	8" Sonic	CH	Clay, moist, stiff
67-72	8" Sonic	CH	Clay, moist, stiff
72-77	8" Sonic	SP	Sand, poorly graded, saturated @76.5
77-87	8" Sonic	SP	Sand, poorly graded, saturated

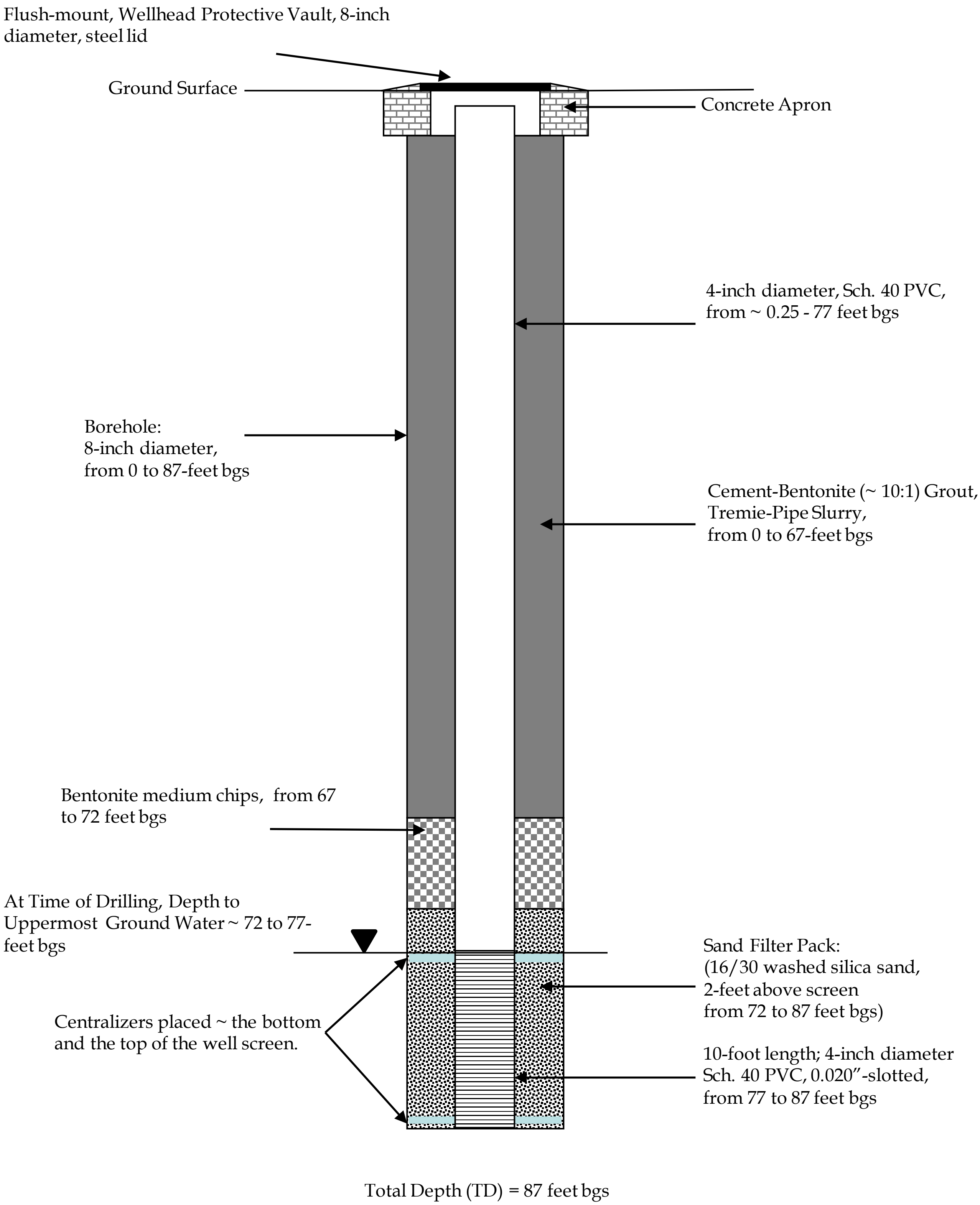
TD = 87'; PVC 4-inch screen from 77 to 87; sand pack 72-87; bentonite pellets 67-72; grout 67-grade

Drilling Method: Sonic

Drilling Company - Cascade Drilling

Driller - David Donnely

Geologist - Tom Fendler



Stantec

IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

Well WWC-7 Schematic

Design by	Drawn by JR	Scale	Date Drawn 10/24/18
			Last Revision Date

Project Name: Intermountain Power Service Corporation
Boring Monitor Well: WWC-8

Project No.: 203709098
Completion Date: 2019-04-25

Drilling Firm: Cascade
Boring Method: Sonic
Boring Diameter: 10 inches

Driller: Ryan Miller
Logged by: Rich Pratt
Depth to Water at Drilling: 77 feet
Depth to Water at Drilling (static at 24 hours): 27 feet

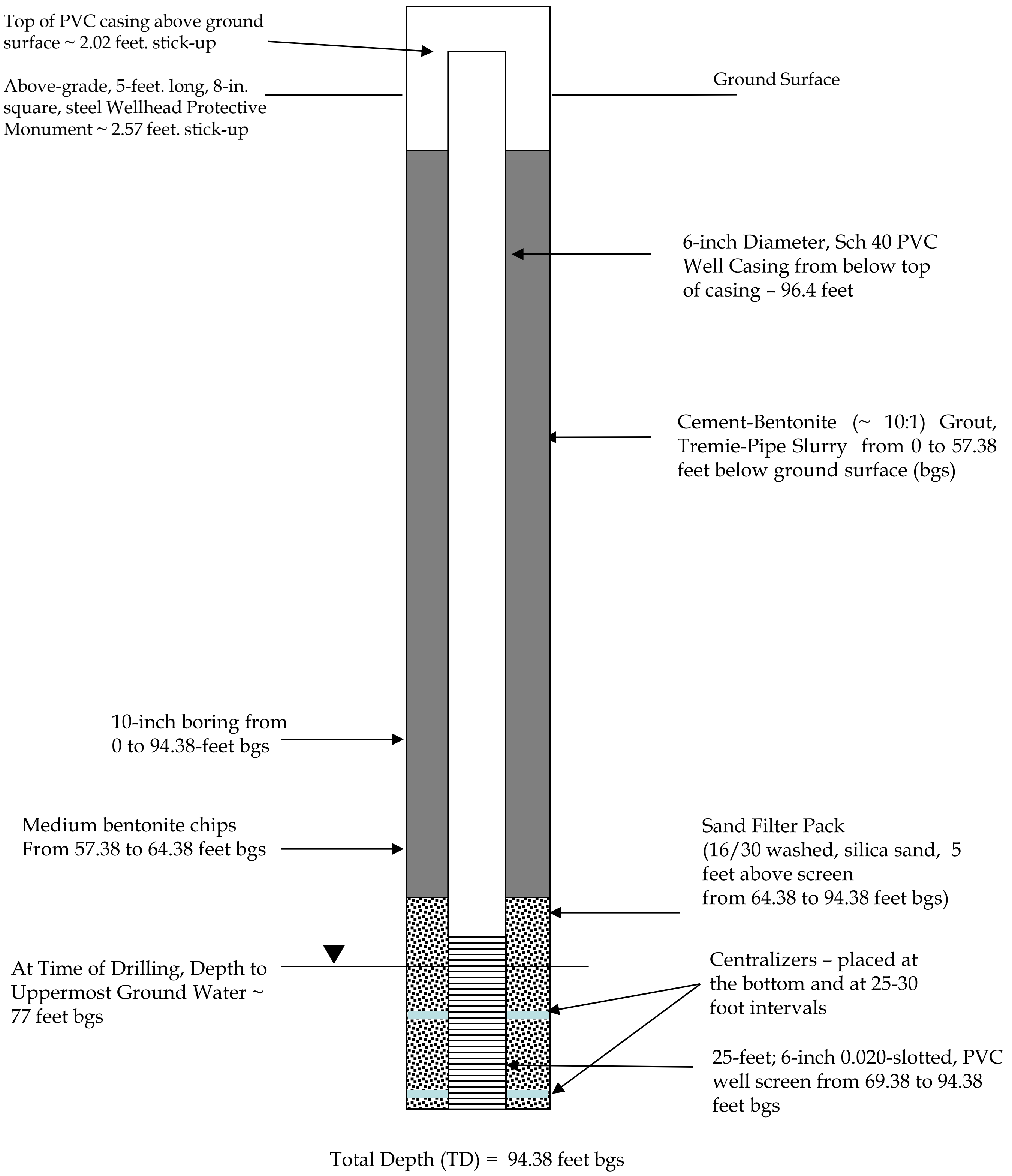
WWC-8

Interval (feet)	Description
0 - 3	Light brown sand, moist
3 - 7	Light brown sand with silt, dry
7 - 9	Medium brown clay with sand, moist
9 - 13	Medium brown clay, moist
13 - 15	Light brown clay, moist
15 - 17	Light brown clay, dry
17 - 26	Light brown clay, moist
26 - 35	Light brown clay with sand, moist
35 - 37	Light brown clay, moist
37 - 41	Medium brown medium grained sand, moist
41 - 43	Medium brown medium grained sand, moist
43 - 55	Medium brown medium grained sand, moist
55 - 59	Light brown clay, moist
59 - 63	Light brown clay with sand, moist
63 - 66	Light brown clay, moist
66 - 67	Light brown clay with sand, moist
67 - 68	Light brown sand, moist
68 - 77	Light brown clay with sand, moist
77 - 88	Medium brown sand, saturated
88 - 93	Light brown clay
93 - 94	Light brown clay with sand
94 - 96	Light brown clay
96 - 97	Medium brown sand

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up
Casing, solid (6-inch PVC): 0-69.38 feet
Screen (6 inch, 0.02 slotted, PVC): 69.38-94.38 feet
Sand Pack: 16/30 sand, 64.38-94.38 feet
Bentonite Seal: Hydrolyzed bentonite pellet seal 57.38-64.38 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA
Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

WWC-8 Schematic

Date Drawn 6-4-19

Last Revision Date

Design by

Drawn by RP

Scale

Stantec

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: WWC-9

Project No.: 203709098

Completion Date: 2019-04-28

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 67 feet

Depth to Water at Drilling (static at 24 hours): 23.75 feet

WWC-9

Interval (feet)	Description
0 - 0.5	Medium brown silt, dry
0.5 - 1	Medium brown clay, dry
1 - 4	Light brown fine-grained sand, dry
4 - 8	Light brown clay, dry
8 - 13	Light brown fine-grained sand, dry
13 - 15	Light brown clay, dry
15 - 16	Light brown clay with sand, dry
16 - 17	Light brown clay, dry
17 - 18	Light brown clay with sand, moist
18 – 21.5	Light brown clay, moist
21.5 - 22	Light brown clay with sand, moist
22 - 23	Light brown clay, moist
23 - 26	Light brown clay with sand, moist
26 - 27	Light brown clay, moist
27 - 30	Light brown clay, moist
30 - 31	Light brown clay, saturated
31 - 32	Light brown clay with sand, moist
32 - 36	Light brown clay, moist
36 - 37	Light brown clay with sand, moist
37 - 38	Light brown clay with sand, moist
38 - 51	Medium brown medium grained sand, moist
51 - 54	Light brown clay, moist
54 - 58	Medium brown medium grained sand, moist
58 - 59	Medium brown medium grained sand, moist
59 - 62	Medium brown medium grained sand, moist
62 - 63	Light brown clay, moist to moist
63 - 66	Light brown clay with sand, moist
66 - 67	Light brown clay, moist
67 - 69	Light brown clay with sand, saturated

Interval (feet)	Description
69 – 69.5	Medium brown sand
69.5 - 70	Light brown clay with sand
70 - 71	Light brown clay
71 - 74	Light brown clay with sand
74 - 75	Medium brown sand
75 - 77	Light brown clay
77 - 83	Medium brown sand
83 - 85	Light brown clay
85 - 87	Light brown clay with sand

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-61.7 feet

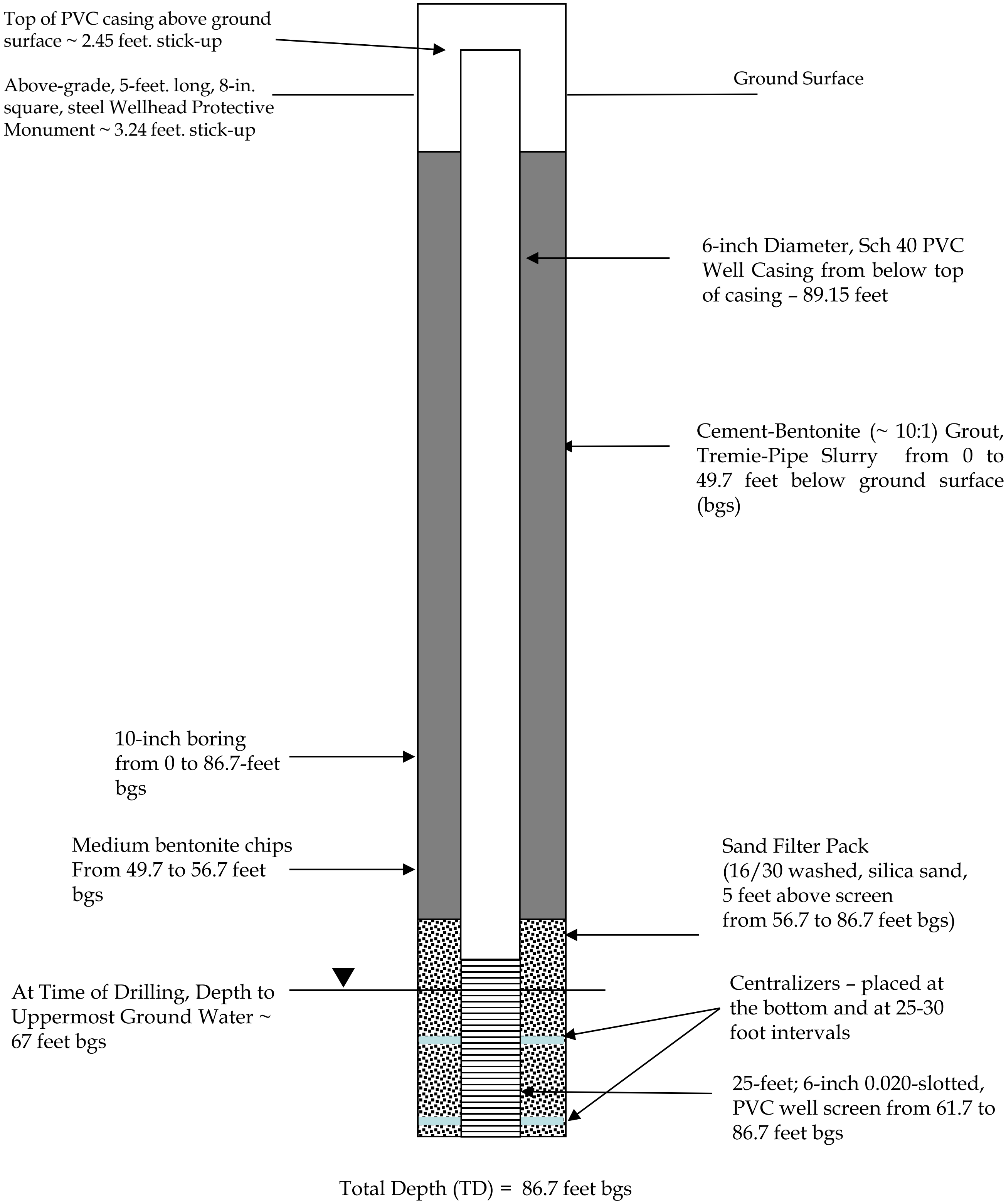
Screen (6 inch, 0.02 slotted, PVC): 61.7-86.7 feet

Sand Pack: 16/30 sand, 56.7-86.7 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 49.7-56.7 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA



Stantec	IPSC – WASTEWATER SURFACE IMPOUNDMENT Delta, Utah		
	WWC-9 Schematic		
			Date Drawn 6-4-19
	Design by	Drawn by RP	Scale	Last Revision Date

Stantec

Project Name: Intermountain Power Service Corporation

Boring Monitor Well: WWC-10

Project No.: 203709098

Completion Date: 2019-04-26

Drilling Firm: Cascade

Boring Method: Sonic

Boring Diameter: 10 inches

Driller: Ryan Miller

Logged by: Rich Pratt

Depth to Water at Drilling: 67 feet

Depth to Water at Drilling (static at 24 hours): 17.65 feet

WWC-10

Interval (feet)	Description
0 - 5	Light brown sand, moist
5 – 9.5	Light brown clay with sand, moist
9.5 - 13	Dark gray clay, moist
13 - 14	Dark brown silt with organic plant matter, moist
14 - 15	Dark gray clay, moist
15 - 17	Gray medium grained sand, moist
17 - 34	Gray medium grained sand, moist
34 - 45	Brown medium grained sand, moist
45 - 47	Medium brown clay, moist
47 - 49	Medium brown clay with sand, moist
49 - 50	Medium brown medium grained sand, moist
50 - 51	Medium brown clay with sand, moist
51 - 52	Medium brown medium grained sand, moist
52 - 53	Medium brown clay with sand, moist
53 - 54	Medium brown medium grained sand, moist
54 - 60	Medium brown clay, moist
60 - 61	Medium brown clay with sand, moist
61 - 67	Medium brown clay, moist
67 - 68	Medium brown clay, saturated
68 - 69	Medium brown clay with sand
69 - 70	Medium brown clay
70 - 76	Medium brown clay with sand
76 - 87	Medium brown clay

Well Completion materials and Depth Intervals (feet) Below Ground Surface

Surface Completion: Stick-up

Casing, solid (6-inch PVC): 0-62.75 feet

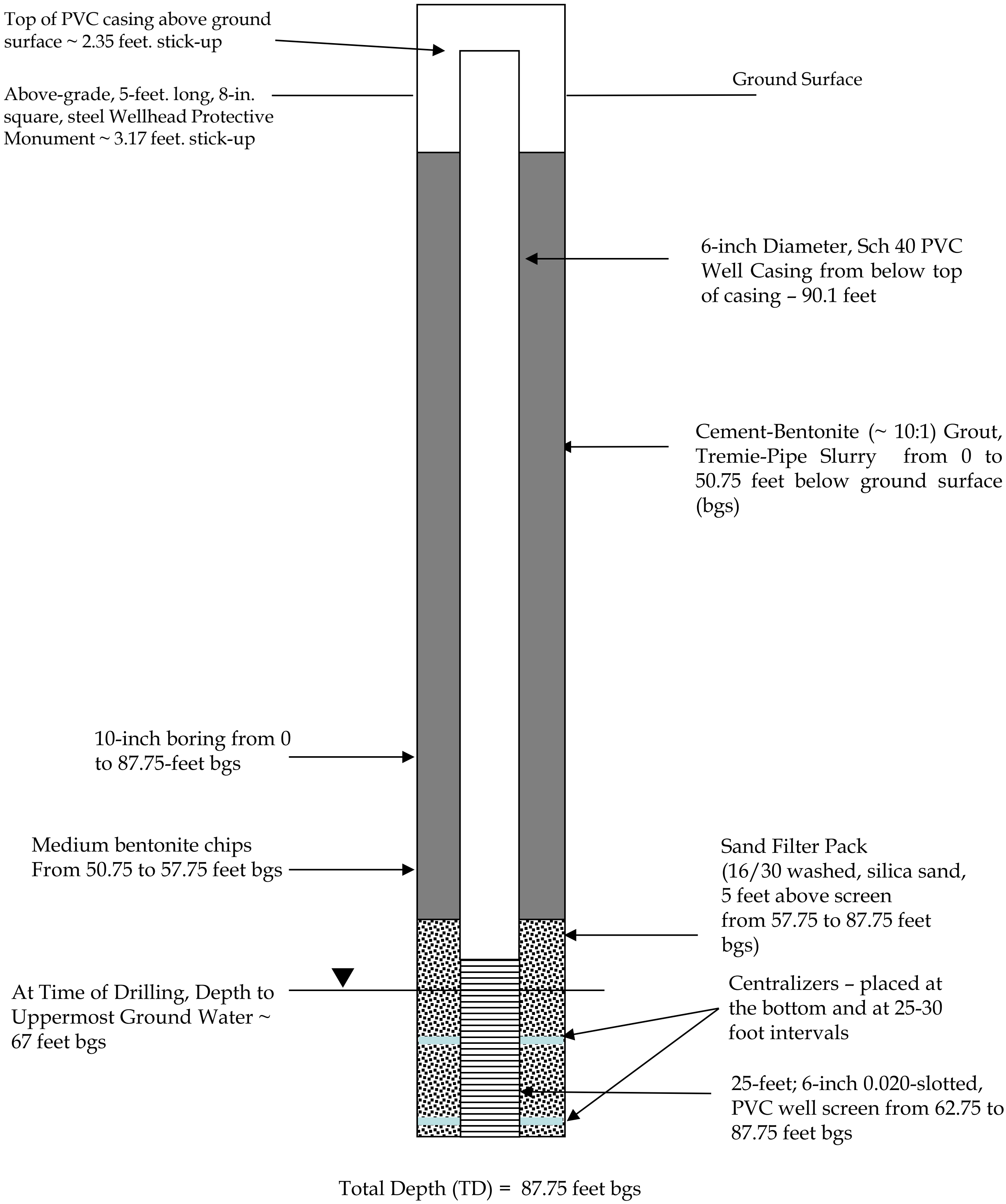
Screen (6 inch, 0.02 slotted, PVC): 62.75-87.75 feet

Sand Pack: 16/30 sand, 57.75-87.75 feet

Bentonite Seal: Hydrolyzed bentonite pellet seal 50.75-57.75 feet

Top of 6 in. PVC Casing Elevation (Relative Datum Survey): NA

Top of Manhole Cover (Relative Datum Survey): NA



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IPSC – WASTEWATER SURFACE IMPOUNDMENT
DELTA, UTAH

WWC-10 Schematic

Design by	Drawn by RP	Scale	Date Drawn 6-4-19
			Last Revision Date

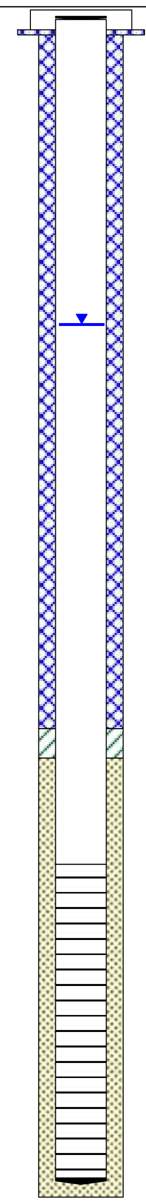
MONITORNG WELL ID:	**WWC-11**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:			
DRILLING METHOD:	Sonic	EASTING:		NORTHING:	
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:		BOREHOLE ANGLE:	90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.):	91	GROUNDWATER LEVEL (ft. btoc.):	22.82
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED:	11/15/2019	DATE FINISHED:	11/16/2019
		LOGGED BY:	Michael Ward		

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Poorly graded Sand with Silt (SP), fine sand 95%, loose, soft, dry, very pale brown (10 YR 7/4), trace gravel 5%.
5		
		Clay (CL), medium plasticity, cohesive, moist, soft to medium density, light gray (10 YR 7/1), mottled with some trace interfingered clay, brownish yellow (10 YR 6/8).
10		Well Graded Sand with Clay (SW-SC), medium grained sand 85%, gravel 10%, clay 5%, moist, loose, pale brown (10 YR 6/3).
15		Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, dry to moist, brown (10 YR 5/3).
		Same as above, Clay (CL), no sand.
20		Poorly Graded Sand (SP), fine sand 98%, loose soft, dry, pale brown (10 YR 6/3), 2% gravel, subrounded.
25		
30		
35		Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, moist, brown (10 YR 5/3), gravel are subangular to subrounded, assorted gravel matrix.
40		
45		Clay (CL), medium plasticity, medium density, moist to wet, cohesive, pale brown (10 YR 6/3).
		Well Graded Sand with gravel (SW), fine to coarse sand 90%, gravel 10%, loose, soft, brown (10 YR 5/3).
50		
		Same as above, becoming wet.
55		Clay (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
60		Clay with Sand (CL), low to medium plasticity, soft to medium density, non cohesive, moist, pale brown (10 YR 6/3).
		Same as above, fine grained sand, saturated, low plasticity, non cohesive.
65		Same as above, with trace interfingering clay, reddish yellow (5 YR 6/6).
70		Well Graded Sand with Gravel (SW), fine to coarse sand 90%, small gravel 10%, loose, wet, brown (10 YR 5/3), gravel are subrounded, assorted matrix.
75		
80		
85		
90		Clay with Sand (CL), medium plasticity, medium density, wet, cohesive, pale brown (10 YR 6/3).
95		End of borehole to 91 ft bgs., per scope of work.

WELL CONSTUCTION DIAGRAM



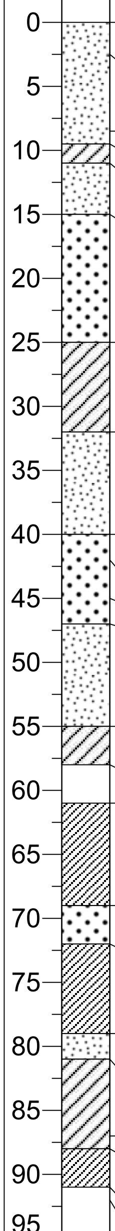
Notes: bgs. = below ground surface; Sch. = Schedule; dia. = diameter; YR = Yellow-Red; ft = feet

MONITORNG WELL ID:	**WWC-12**		
CLIENT:	Intermountain Power Service Corporation		
PROJECT:	Monitoring Well Installation		
SITE LOCATION:	South of Waste Water Basin Surface Impoundment		

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs., 10 inch sonic core barrel 0 to 91 ft bgs.	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 20.46
		DATE STARTED: 11/11/2019	DATE FINISHED: 11/12/2019
		LOGGED BY: Michael Ward	

DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM



Poorly Graded Sand with Silt (SP-SM), 90% sand, 10% silts, light gray (7.5 YR 7/1), soft, loose, fine grained, dry, sand are mostly quartz, subangular quartz grains.
Same as above, becoming light yellowish brown (10 YR 6/4).

Same as above, becoming wet at 8.5 ft bgs., perched groundwater.
Clay (CL), medium plasticity, medium stiff, cohesive, very pale brown (10 YR 7/4).
Poorly Graded Sand with Silt (SP-SM), 95% fine grained sand, 5% silts, loose, soft, moist, brown (10 YR 4/3), trace gravel.
Well Graded Sand with Gravel (SW), 80% sand, 20% gravel, fine to coarse sand, moist, loose soft, dark yellowish brown (10YR 4/4), gravel are subrounded to rounded, small.

Clay (CL), medium plasticity, medium density, moist, cohesive, light yellowish brown (10 YR 6/4), thickly bedded, sharp contact at 25 ft bgs.

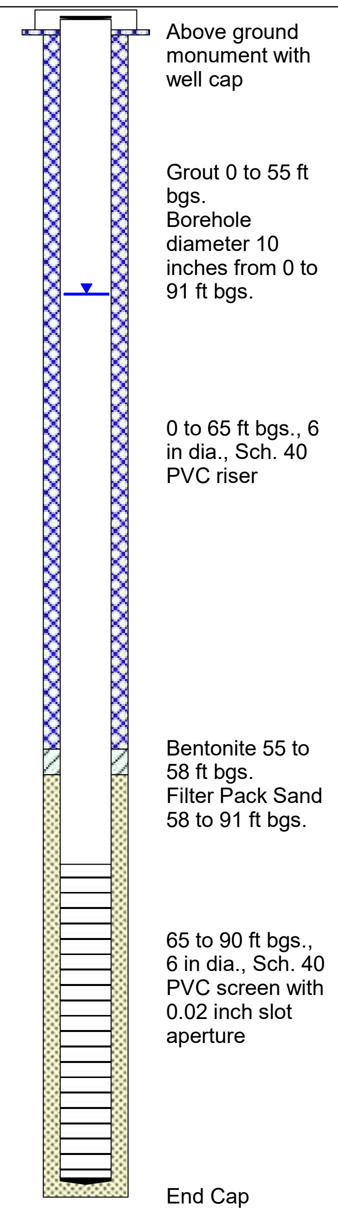
Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10YR 5/3).

Well Graded Sand with Gravel (SW), fine to coarse grained sand 90%, small gravel 10%, loose, soft, moist, dark yellowish brown (10 YR 4/4).
Same as above, increase in gravel to 30%.
Same as above, decrease in gravel to 10%.
Poorly Graded Sand (SP), fined grained sand 100%, loose, moist, brown (10YR 4/3). Sharp contact.

Clay (CL), high plasticity, stiff, moist, cohesive, light yellowish brown (10 YR 6/4), sharp contact.
Lost core sample from sonic casing.
Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).

Well Graded Sand with Silt and Clay (SW-SM), fine or medium grained sand 100%, soft, loose, brown (10 YR 4/3).
Clay (CH), high plasticity, stiff, moist, cohesive, yellowish brown (10 YR 5/4).

Poorly Graded Sand with Silts and Clay (SP-SC), fine grained sand 95%s, soft, loose, wet, light yellowish brown (10 YR 6/4), trace clay.
Clay with Sand (CL), medium plasticity, soft to medium density, wet, pale brown (10YR 6/3), sand are fine grained.
Same as above with gradational transition to clay.
Clay (CH), high plasticity, mottled, wet, cohesive, pale brown (10 YR 6/3), mottled color is reddish yellow (7.5 YR 7/6).
End of borehole to 91 ft bgs., per scope of work.



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

INTERMOUNTAIN POWER SERVICE CORP.

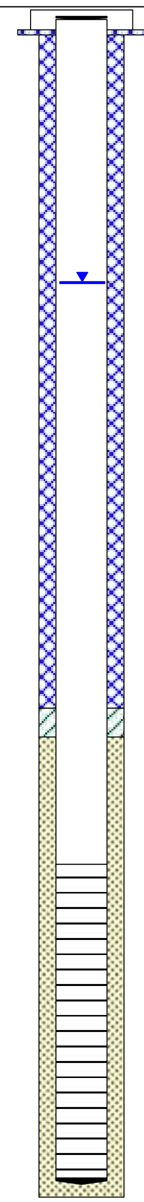
Stantec

MONITORNG WELL ID:	**WWC-13**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600 11-77287	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 91	GROUNDWATER LEVEL (ft. btoc.): 19.55
	10 inch sonic core barrel 0 to 91 ft bgs.	DATE STARTED: 11/13/2019	DATE FINISHED: 11/15/2019
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Poorly Graded Sand with Silts (SP-SM), fine sand 95%, 5% silts, soft, loose, dry, light gray (7.5 YR 7/1).
5	Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, dry, pinkish gray (7.5 YR 7/2), trace gravel, small gravel, assorted matrix, subrounded.
	Same as above, with clay, increase gravel 10%, wet.
10	Clay with Sand (CL), low to medium plasticity, moist, cohesive, very pale brown (10 YR 7/4).
	Well Graded Sand (SW), fine to medium grained sand 95%, soft, loose, , moist, pale brown (10 YR 6/3), trace gravel 5%, subrounded.
15	
20	
	Same as above, with clay (SW-SC) at 10%, wet, soft, low plasticity clay.
25	Clay with Sand (CL), medium plasticity, moist cohesive, thick bedded, fine sand, sharp contact at 23 ft, bgs,
	Same as above, Clay (CL), trace black staining.
30	Clay with Sand (CL), medium plasticity, moist cohesive, fine sand.
	Poorly Graded Sand (SP), fine grained sand 100%, loose, soft, moist, brown (10 YR 5/3).
35	
40	
	Well Graded Sand with gravel (SW), fine to coarse sand 85%, 15% gravel, loose, soft, moist, brown (10 YR 5/3), gravel are small, subrounded, assorted matrix.
45	Poorly Graded Sand (SP), fine to medium grained sand 98%, loose, soft, moist, brown (10 YR 5/3), trace small gravel 2%, subrounded.
50	Same as above, trace clay.
	Clay with Sand (CL), low to medium plasticity, soft to medium density, moist, yellowish brown (10 YR 5/4), secondary sand are fine grained.
55	
60	Clay (CL), medium to high plasticity, medium to stiff density, moist, thickly bedded, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
65	
	Clay with Sand (CL) , medium plasticity, moist to wet, cohesive, brown (10 YR 5/3).
70	Clay (CL), medium plasticity, medium to stiff density, moist, cohesive, brown (10 YR 5/3), mottled, reddish yellow (5 YR 6/6).
75	
	Poorly Graded Sand with Clay (SP-SC), fine grained sand 95%, loose, soft, wet, brown (10 YR 5/3), some trace interfingering clay 5%, reddish yellow (5 YR 5/3).
80	Clay with Sand (CL), low plasticity, soft, wet, non cohesive, pale brown (10 YR 6/3).
85	Clay (CL), medium to high plasticity, wet, cohesive, pale brown (10 YR 6/3), interfingering clay reddish yellow (5 YR 6/6), trace sand.
90	Same as above, becoming medium plasticity.
	End of borehole to 91 ft bgs., per scope of work.
95	

WELL CONSTUCTION DIAGRAM



Above ground monument with well cap

Grout 0 to 52.8 ft bgs.
Borehole diameter 10 inches from 0 to 91 ft bgs.

0 to 65 ft bgs., 6 in dia., Sch. 40 PVC riser

Bentonite 52.8 to 55 ft bgs.

Filter pack sand 55 to 91 ft bgs.

65 to 90 ft bgs., 6 in dia., Sch. 40 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID: **WWC-14**

CLIENT: Intermountain Power Service Corporation

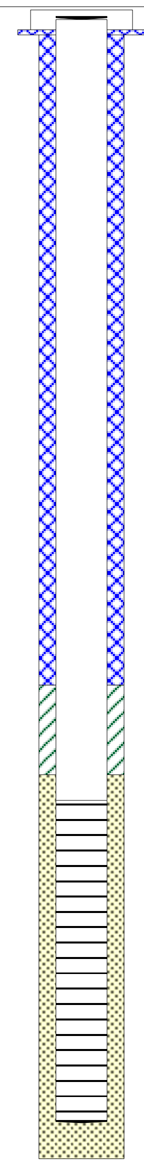
PROJECT: Monitoring Well Installation

SITE LOCATION: South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 88 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 88 ft bgs.,	DATE STARTED: 5/6/2020	DATE FINISHED: 5/7/2020
		LOGGED BY: Rich Pratt	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION	WELL CONSTUCTION DIAGRAM
0	Poorly graded Sand with Silt (SP), light brown, dry	Above ground monument with well cap
	Well Graded Sand with Clay (SW-SC), light and dark brown, dry	
5	Poorly graded Sand with Silt (SP), light brown, dry	
10	Well Graded Sand with Clay (SW-SC), light and dark brown, dry	Grout 0 to 51 ft bgs.
15	Well Graded Sand with Gravel (SW), moist, dark brown	Borehole diameter 10 inches from 0 to 88 ft bgs.
	Well Graded Sand with Gravel (SW), moist, light brown	
20		
25	Well Graded Sand with Gravel (SW), moist, dark brown	
	Clay (CL), light brown, moist	
30	Well Graded Sand with Clay (SW-SC), light brown, moist	0 to 60 ft bgs., 6 in dia., Sch. 80 PVC riser
	Well Graded Sand with Gravel (SW), moist, dark brown	
35		
40		
45		
50		
55	Well Graded Sand with Clay (SW-SC), light brown, moist	Bentonite 51 to 58 ft bgs.
60		Filter pack sand 58 to 88 ft bgs.
	Clay (CL), light brown, moist	
65		
70	Well Graded Sand with Clay (SW-SC), light brown, moist	
	Well Graded Sand with Gravel (SW), moist, dark brown	60 to 85 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture
75	Clay (CL), light brown, moist	
	Well Graded Sand with Gravel (SW), moist, dark brown	
80	Well Graded Sand with Clay (SW-SC), light brown, moist	
85	Clay (CL), light brown, moist	End Cap
	End of borehole to 88 ft bgs., per scope of work.	
90		
95		



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

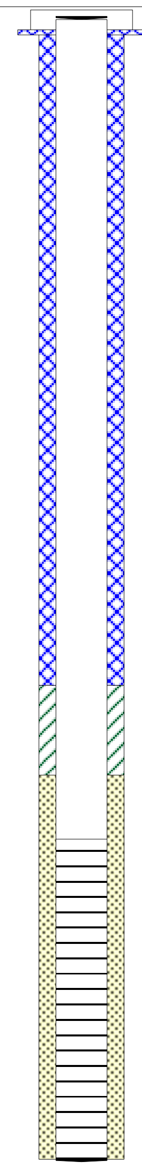
MONITORNG WELL ID:	**WWC-15**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 88 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 88 ft bgs.,	DATE STARTED: 5/6/2020	DATE FINISHED: 5/7/2020
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL GRAPHIC	LITHOLOGICAL DESCRIPTION
0		Well graded sand with silt (SW-SM), fine to medium grained sands, loose, soft, dry, unconsolidated, light yellowish brown (10 YR 6/4).
5		Poorly graded sand (SP), fine to medium grained, dry, soft, loose, light brownish gray (10 YR 6/2).
10		
15		Poorly Graded Sand with Clay (SP-SC), fine grained, moist, clays are soft, dark yellowish brown (10 YR 5/4).
20		Well Graded Sand (SW), fine to coarse sand, loose, soft, unconsolidated, dark yellowish brown (10 YR 4/4), trace gravels.
25		Poorly graded sand (SP), fine to medium grained, dry, soft, loose, brown (10 YR 4/3).
30		Clay (CL), stiff, medium to high plasticity, moist, cohesive, light yellowish brown (10 YR 6/4).
35		Poorly Graded Sand with Clay (SP-SC), fine to medium grained, moist to wet, soft, noncohesive, pale brown (10 YR 6/3).
40		Clay (CL), stiff, medium to high plasticity, moist, cohesive, light yellowish brown (10 YR 6/4).
45		Poorly Graded Sand (SP), fine or medium grained, loose, soft, moist, brown (10 YR 5/3), trace gravels.
50		Well Graded Sand (SW), fine to coarse sand, loose, soft, unconsolidated, moist, brown (10 YR 5/3).
55		Clays (CL), stiff, medium to high plasticity, moist.
60		Well Graded Sand (SW), fine to coarse sand, loose, soft, unconsolidated, moist, brown (10 YR 5/3), trace gravels, rounded.
65		Clay (CL), medium plasticity, stiff, cohesive, brown (7.5 YR 5/4).
		Same as above, becoming high plasticity.
70		Poorly Graded Sand (SW), fine or medium grained, wet, saturated, loose, soft, brown (10 YR 5/3).
		Clay (CL), medium plasticity, stiff, cohesive, brown (7.5 YR 5/4).
75		Poorly Graded Sand (SW), fine or medium grained, wet, saturated, loose, soft, brown (10 YR 5/3).
		Clay (CL), medium plasticity, stiff, cohesive, brown (7.5 YR 5/4).
80		Clay with Sand (CL), wet, non cohesive, low plasticity, brown (10 YR 5/3).
85		
90		End of borehole at 88 ft bgs. Installed monitoring well per scope of work.
95		

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

MONITORNG WELL ID:	**WWC-16**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 88 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 88 ft bgs.,	DATE STARTED: 5/7/2020	DATE FINISHED: 5/8/2020
		LOGGED BY: Rich Pratt	

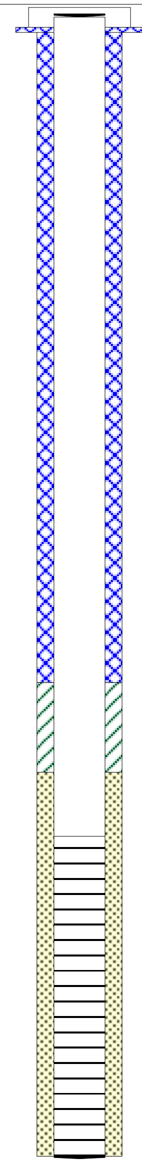
DEPTH (feet) | LITHOLOGICAL GRAPHIC | LITHOLOGICAL DESCRIPTION | WELL CONSTUCTION DIAGRAM

Depth scale: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95

Lithological Description

- Poorly graded Sand with Silt (SP), light brown, dry
- Clay (CL), light brown, dry
- Well Graded Sand with Clay (SW-SC), light brown, dry
- Clay (CL) with sand, light brown, dry
- Clay (CL), light brown, moist
- Well Graded Sand with Gravel (SW), moist, brown
- Clay (CL), light brown, moist
- Well Graded Sand with Clay (SW-SC), light brown, moist
- Clay (CL), light brown, moist
- Well Graded Sand with Gravel (SW), light brown, moist
- Clay (CL), light brown, moist
- Well Graded Sand with Clay (SW-SC), light brown, moist
- Clay (CL), light brown, moist
- Well Graded Sand with Clay (SW-SC), light brown, moist
- Clay (CL), light brown, moist
- Well Graded Sand with Gravel (SW), light brown, moist
- Clay (CL), light brown, moist
- Well Graded Sand with Gravel (SW), moist, brown
- Clay (CL), light brown, moist
- Well Graded Sand with Clay (SW-SC), light brown, moist
- End of borehole at 88 bgs. Installed monitoring well per scope of work.

Well Construction Diagram



Above ground monument with well cap

Grout 0 to 51 ft bgs.
Borehole diameter 10 inches from 0 to 88 ft bgs.

0 to 63 ft bgs., 6 in dia., Sch. 80 PVC riser

Bentonite 51 to 58 ft bgs.
Filter pack sand 58 to 88 ft bgs.

63 to 88 ft bgs., 6 in dia., Sch. 80 PVC screen with 0.02 inch slot aperture

End Cap

Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

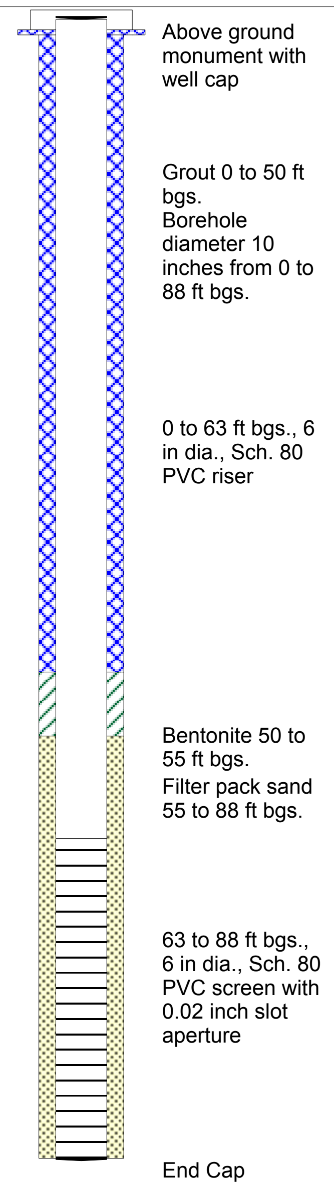
MONITORNG WELL ID:	**WWC-17**
CLIENT:	Intermountain Power Service Corporation
PROJECT:	Monitoring Well Installation
SITE LOCATION:	South of Waste Water Basin Surface Impoundment

INTERMOUNTAIN POWER SERVICE CORP. — Stantec

DRILLING CONTRACTOR:	Cascade Drilling	COORDINATE SYSTEM:	
DRILLING METHOD:	Sonic	EASTING:	NORTHING:
DRILLING EQUIPMENT:	Pro Sonic 600	ELEVATION:	BOREHOLE ANGLE: 90 degrees
SAMPLING METHOD:	4 inch sonic core barrel 0 to 91 ft bgs.,	TOTAL DEPTH (ft.): 88	GROUNDWATER LEVEL (ft. btoc.):
	10 inch sonic core barrel 0 to 91 ft bgs.,	DATE STARTED: 5/8/2020	DATE FINISHED: 5/8/2020
		LOGGED BY: Michael Ward	

DEPTH (feet)	LITHOLOGICAL DESCRIPTION
0	Well Graded Sand with Silt (SW-SM), fine or medium grained sand, loose, soft, dry, very pale brown (10 YR 7/4).
	Poorly Graded Sand (SP), fine to coarse, loose, soft, dry, unconsolidated, light gray (10 YR 7/2).
	Clays (CL), low to medium plasticity, medium dense, moist, light yellowish brown (10 YR 7/4).
10	Poorly Graded Sand (SP), fine to coarse, loose, soft, dry, unconsolidated, light gray (10 YR 7/2).
	Clay (CL), medium plasticity, medium dense, cohesive, dark red (2.5 YR 4/6).
	Well Graded Sand (SW), fine grained , loose, soft, moist, yellowish brown (10 YR 5/4).
20	Clay (CL), medium plasticity, medium dense, cohesive, dark red (2.5 YR 4/6).
30	Well Graded Sand (SW), fine grained , loose, soft, brown (10 YR 4/3).
	Clay (CL), medium plasticity, medium dense, cohesive, dark red (2.5 YR 4/6), mottled with gray (10 YR 6/1).
35	Well Graded Sand (SW), fine grained, loose, soft, wet, brown (10 YR 4/3), with thin black lenses.
50	Sandy Lean Clay (CL), low plasticity, soft to medium dense, wet, yellowish brown (10 YR 6/1).
55	Well Graded Sand with Clay (SW-SC), fine grained sand, wet, loose, soft, yellowish brown (10 YR 5/4).
	Sandy Lean Clay (CL), low plasticity, soft to medium dense, wet, brown (10 YR 5/3).
	Well Graded Sand (SW), fine or medium grained sand, loose, soft, wet, brown (10 YR 5/3)
	Clay (CL), moderate plasticity, medium dense, consolidated, brown (10 YR 5/3).
75	Well Graded Sand (SW), fine or medium grained sand, loose, soft, wet, brown (10 YR 5/3)
	Clay (CL), medium to high plasticity, stiff, dense, consolidated, brown (10 YR 5/3).
	Well Graded Sand (SW), fine or medium grained sand, loose, soft, wet, brown (10 YR 5/3)
88	End of borehole at 88 ft bgs. Installed monitoring well per scope of work.

WELL CONSTUCTION DIAGRAM



Notes: bgs. = below ground surface; dia. = diameter; ft = feet; Sch. = Schedule; YR = Yellow-Red

Boring Log

ISPC

Delta, Utah

WWU-1

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-1.5	8" Sonic	SM	Silty SAND:
1.5-2.5	8" Sonic	SP/SM	SAND with silt:
2.5-3.5	8" Sonic	ML	Sandy SILT:
3.5-4.75	8" Sonic	SP	SAND:
4.75-5	8" Sonic	SC	Clayey SAND:
5-7	8" Sonic	SP/SM	SAND with silt:
7-10.75	8" Sonic	SC	Clayey SAND:
10.75-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SC	Clayey SAND:
13-14	8" Sonic	SM	Silty SAND:
14-15	8" Sonic	SP	SAND:
15-17.5	8" Sonic	SP/SM	SAND with silt:
17.5-20	8" Sonic	SP	SAND:
20-22	8" Sonic	SP/SM	SAND with silt:
22-22.5	8" Sonic	SC	Clayey SAND:
22.5-25	8" Sonic	CL	Sandy CLAY:
25-27.5	8" Sonic		Sandy CLAY:
27.5-28	8" Sonic	SC	Clayey SAND:
28-30	8" Sonic	SW	Gravelly SAND:
30-32.5	8" Sonic	SP/SM	SAND with silt:
32.5-35	8" Sonic	SM	Silty SAND:
35-37.5	8" Sonic	SP	SAND:
37.5-40	8" Sonic		SAND:
40-42.5	8" Sonic	SW/SM	SAND with silt:
42.5-43.25	8" Sonic	SM	Silty SAND:
43.25-44.25	8" Sonic		Silty SAND:
44.25-45	8" Sonic	SP/SW	SAND:
45-47.5	8" Sonic	SW	SAND:
47.5-50	8" Sonic	SP	SAND:
50-50.5	8" Sonic		SAND:
50.5-51.75	8" Sonic	ML	Sandy SILT:
51.75-52.5	8" Sonic	SP	SAND:
52.5-53.25	8" Sonic	SC	Clayey SAND:
53.25-55	8" Sonic		Clayey SAND:
55-56.5	8" Sonic		Clayey SAND:
56.5-57.5	8" Sonic		Clayey SAND:
57.5-60	8" Sonic		Clayey SAND:
60-61	8" Sonic	ML	Clayey SILT with sand:
61-62.5	8" Sonic	SM	Silty SAND:
62.5-63.75	8" Sonic	CL	Sandy CLAY:
63.75-64.75	8" Sonic	SM	Silty SAND:
64.75-65.5	8" Sonic	SP	SAND:
65.5-66.5	8" Sonic	ML	Clayey SILT with sand:
66.5-67.5	8" Sonic	SC	Clayey SAND:
67.5-70	8" Sonic	SM	Silty SAND with clay:

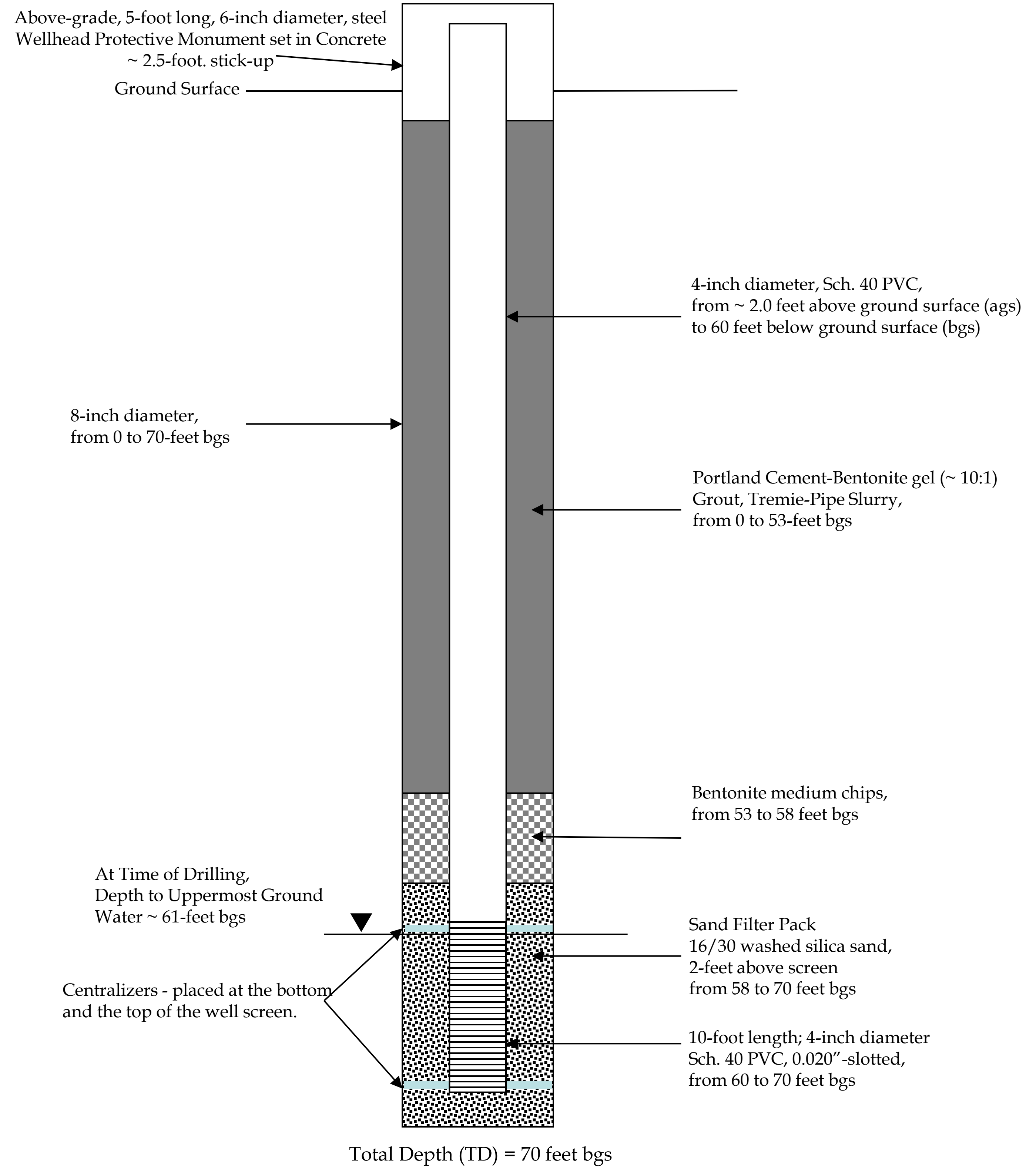
TD = 70'; PVC 4-inch screen from 60 to 70; PVC 4-inch riser from -2.5 to 60

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein



Stantec	IPSC – WASTEWATER HOLDING BASIN AREA DELTA, UTAH		
	Well WW-U-1 Schematic		
			Date Drawn 8/11/15
	Design by	Drawn by MS	Scale	Last Revision Date

Boring Logs

ISPC

Delta, Utah

WWU-2

Interval (feet)	Drilling Method	USCS	Sample Description
8/11/2015			
0-0.5	8" Sonic	TOPSOIL	Surface - Sand and Gravel.
0.5-2.5	8" Sonic	ML	Gravelly SILT with sand:
2.5-4	8" Sonic	SP	SAND:
4-5	8" Sonic		SAND:
5-5.5	8" Sonic		SAND:
5.5-7.5	8" Sonic		SAND:
7.5-9.5	8" Sonic	SP/SW	SAND:
9.5-10	8" Sonic	SP	SAND:
10-11	8" Sonic	SW	SAND:
11-12.5	8" Sonic	SP/SM	SAND with silt:
12.5-13	8" Sonic	SM	Silty SAND:
13-15	8" Sonic	ML	Sandy SILT:
15-15.5	8" Sonic	SP	SAND:
15.5-17	8" Sonic	SC	Clayey SAND with gravel:
17-17.5	8" Sonic	SW	Gravelly SAND with sand:
17.5-19	8" Sonic		SAND:
19-20	8" Sonic		SAND:
20-22.5	8" Sonic	GW	Sandy GRAVEL:
22.5-23.5	8" Sonic	SW	SAND:
23.5-25	8" Sonic	SP/SM	SAND with silt:
25-32.5	8" Sonic		SAND with silt:
32.5-33.5	8" Sonic	SW/SC	Gravelly SAND with clay:
33.5-35	8" Sonic	SP/SM	SAND with silt:
35-37.5	8" Sonic		SAND with silt:
37.5-39	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
39-40	8" Sonic	SC	Clayey SAND:
40-45	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
45-45.5	8" Sonic	SM	Silty SAND with clay:
45.5-47.5	8" Sonic	SC/CL	Clayey SAND/Sandy CLAY:
47.5-49.5	8" Sonic	CH/SC	Sandy CLAY/Clayey SAND:
49.5-50	8" Sonic	SP/SM	SAND with silt:
50-51.5	8" Sonic	SC	Clayey SAND:
51.5-52.5	8" Sonic	SP/SC	SAND with clay:
52.5-55	8" Sonic	SP	SAND:
55-56.5	8" Sonic	CH	Sandy CLAY:
56.5-57.5	8" Sonic	SC	Clayey SAND:
57.5-59	8" Sonic	ML	Clayey SILT with sand:
59-60	8" Sonic	CH	Sandy CLAY:
60-62.5	8" Sonic	SC	Clayey SAND:
62.5-64	8" Sonic	CH	Sandy CLAY:
64-65	8" Sonic	SM	Silty SAND:
65-66.5	8" Sonic	SP	SAND:
66.5-67.5	8" Sonic	SM	Silty SAND:
67.5-75	8" Sonic	SW	SAND:

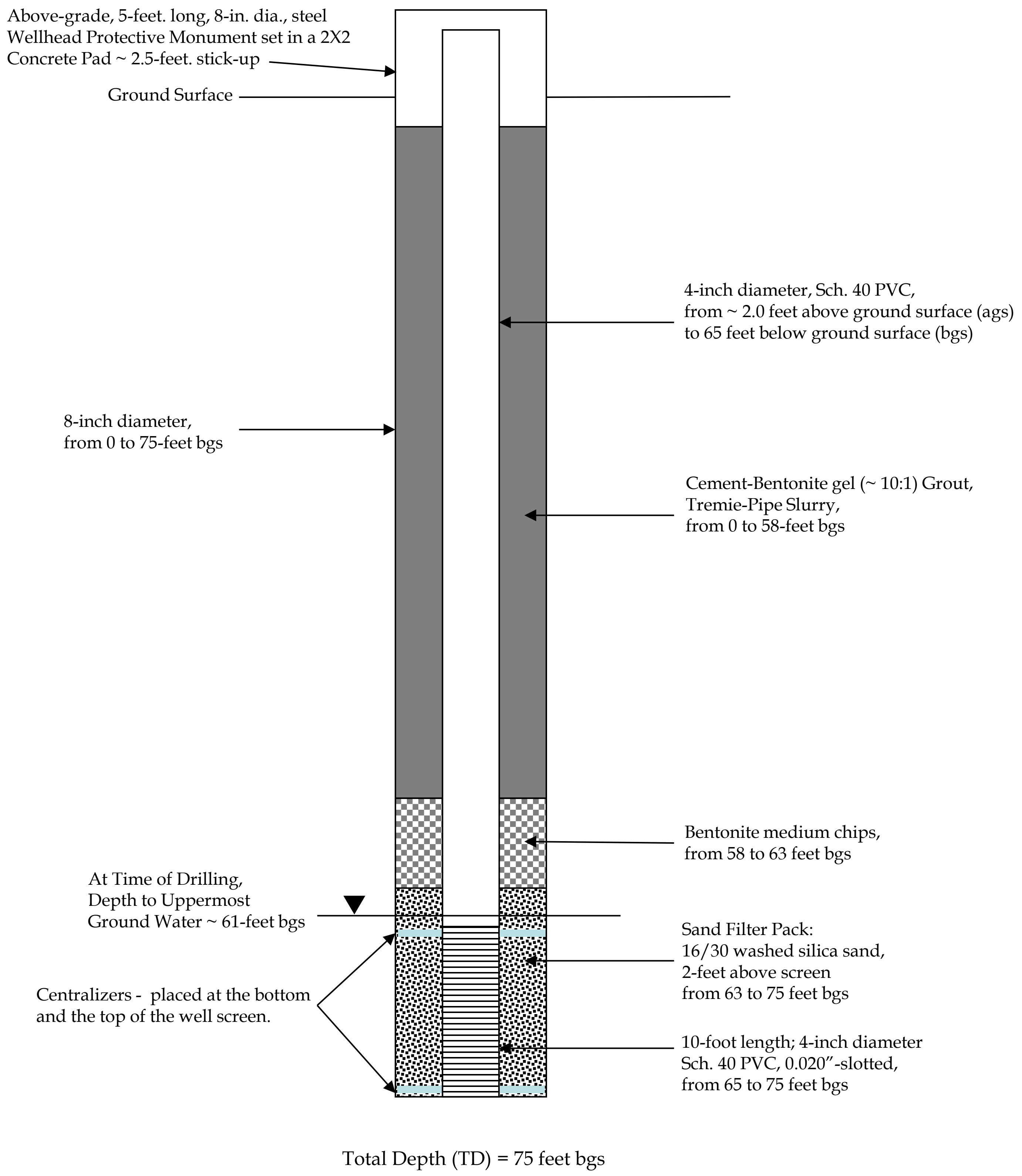
TD = 75'; PVC 4-inch screen from 65 to 75; PVC 4-inch riser from -2.5 to 65

Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling

Driller - Rick Mallett

Geologist - Michael Sauerwein



Stantec

IPSC – WASTEWATER HOLDING BASIN AREA
DELTA, UTAH

Well WW-U-2 Schematic

Date Drawn	8/11/15
Last Revision Date	
Design by	
Drawn by	MS
Scale	

Boring Logs

ISPC

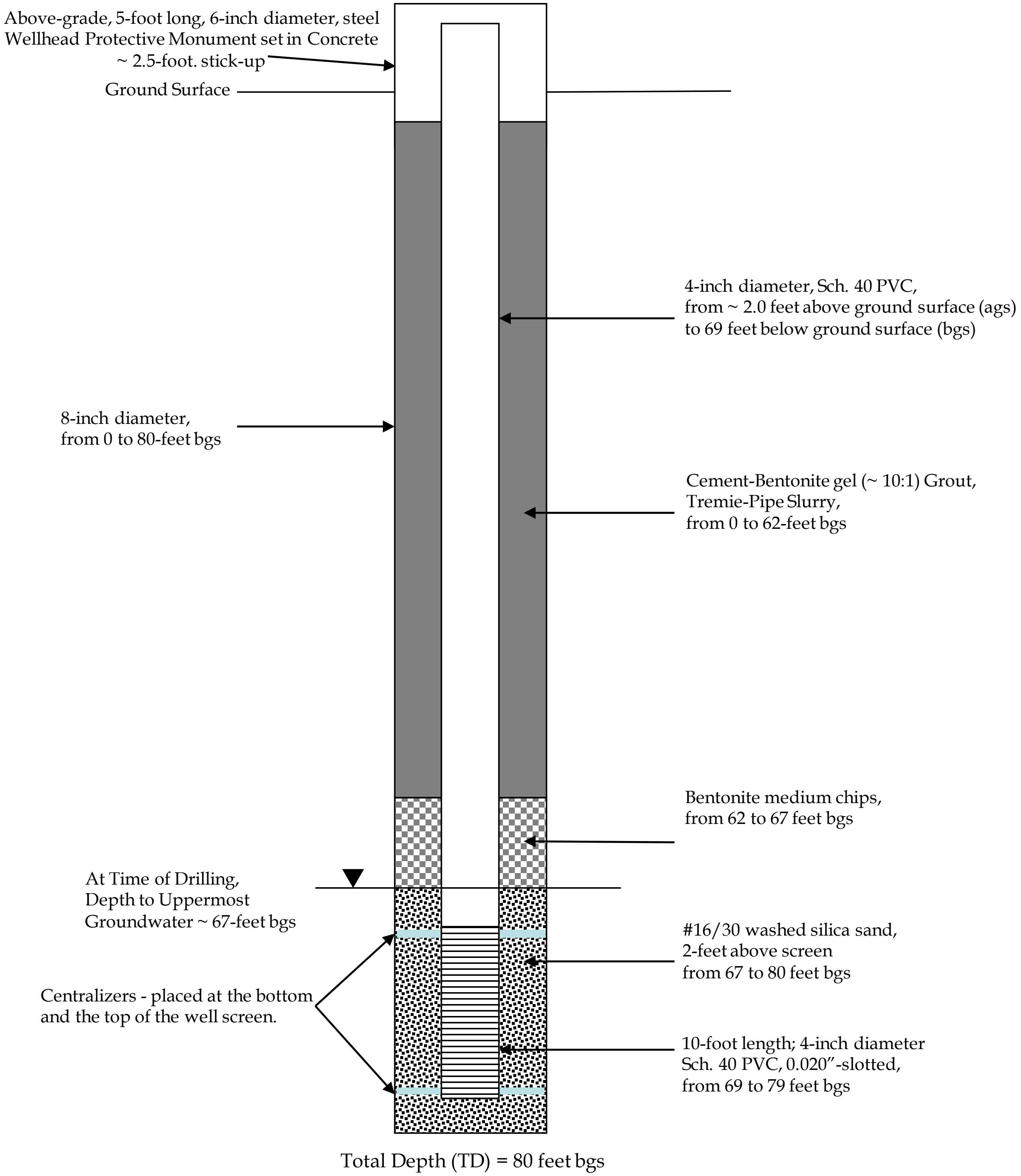
Delta, Utah

SI-U-1

Interval (feet)	USCS	Sample Description
8/12/2015		
0-0.5	TOPSOIL	Surface - Sand and Gravel, roots and grass.
0.5-2.5	SP/SM	SAND with silt:
2.5-5	SP	SAND:
5-6.5	SP/SM	SAND with silt:
6.5-7.5	SW/SM	SAND with silt:
7.5-8	SW	SAND:
8-12.5	SP	SAND:
12.5-17.5		SAND:
17.5-18	SP/SM	SAND with silt:
18-19	SM	Silty SAND:
19-20	CL	CLAY:
20-21.5	SP	SAND:
21.5-22.5	SP/SM	Gravelly SAND with silt:
22.5-26.5	SW	SAND:
26.5-27.5	SW/SC	SAND with clay:
27.5-29.5	ML	Sandy SILT with clay:
29.5-30	SP	SAND:
30-32	ML	Sandy SILT with clay:
32-32.5	SW	SAND with gravel:
32.5-38	SC	Clayey SAND:
38-40	SM	Silty SAND:
40-42.5	SP/SM	SAND with silt:
42.5-44.25	GW	Sandy GRAVEL with clay:
44.25-45	SM	Silty SAND:
45-46.5	SC	Clayey SAND:
46.5-47.75	SP/SC	SAND with clay:
47.75-52.5	SP	SAND:
52.5-54	CH	CLAY:
54-55	SC/CH	Clayey SAND/Sandy CLAY:
55-60		CLAY:
60-62.5	CH	CLAY:
62.5-66		CLAY:
66-70	SC	Clayey SAND:
70-70.75	ML	Clayey SILT with sand:
70.75-71.5	CH	CLAY:
71.5-72.5	SP/SC	SAND with clay:
72.5-75	SP/SM	SAND with silt:
75-75.75	SM	Silty SAND:
75.75-77	SC	Clayey SAND:
77-80	SP/SM	SAND with silt:

TD = 80'; PVC 4-inch screen from 69 to 79; PVC 4-inch riser from -2.5 to 69
Drilling Method: Prosonic T600, 8" Rotosonic

Drilling Company - Cascade Drilling
Driller - Rick Mallett
Geologist - Michael Sauerwein



IPSC – COAL STORAGE AND UNLOADING AREA
DELTA, UTAH

Well SI-U-1 Schematic

			Date Drawn 8/12/15
Design by	Drawn by MS	Scale	Last Revision Date

jbr environmental consultants, inc.

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
BORING/MONITORING WELL: WR-101 / RW-2
DRILLING FIRM: Boart Longyear
BORING METHOD: Sonic
BORING DIAMETER: 10.0-inch

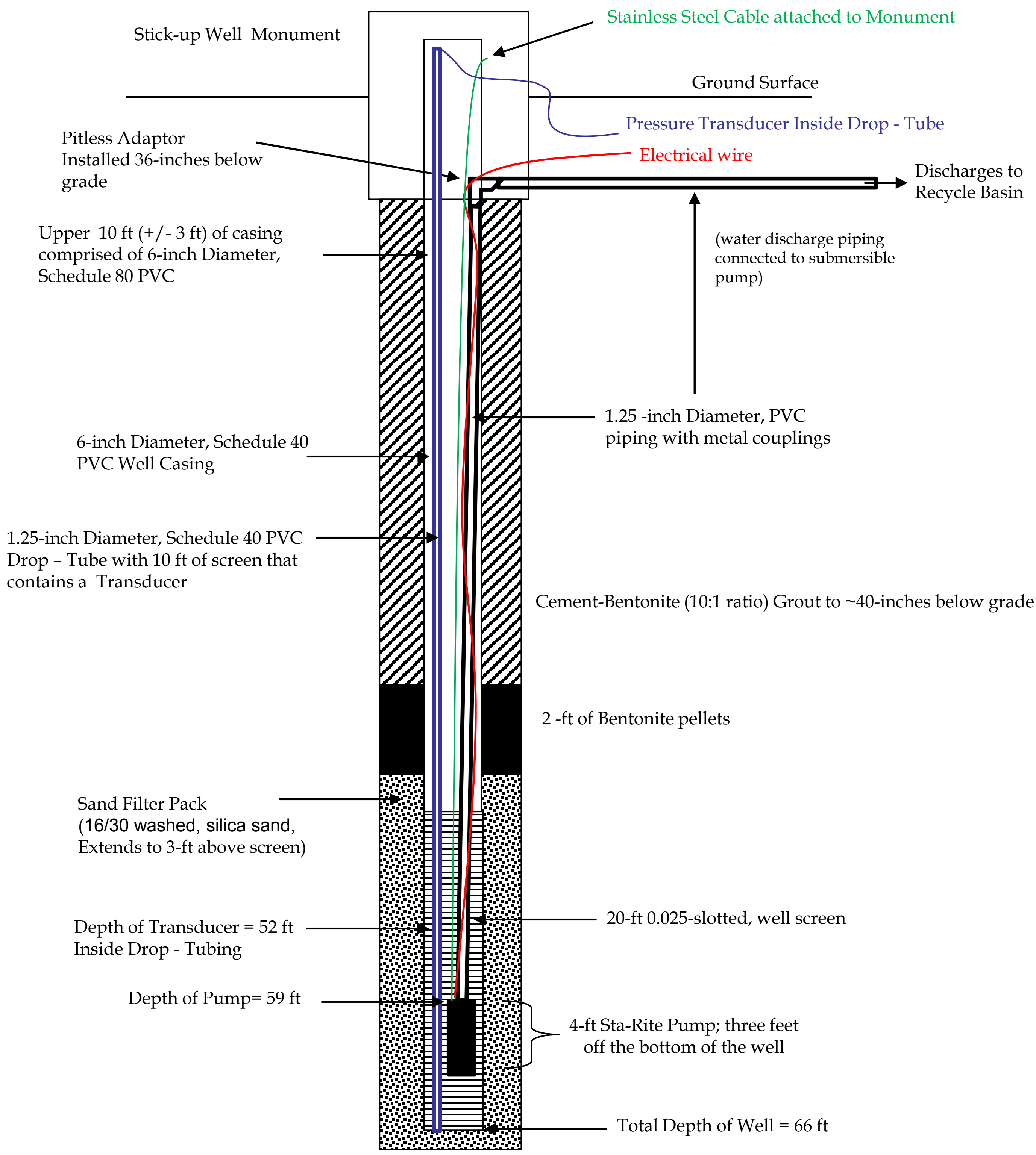
PROJECT No.: 07.00408.01
COMPLETION DATE: 12/11/2007
DRILLER: Robert
LOGGED BY: Thomas Hedrick
DEPTH TO WATER (at drilling): ~ 40 ft.
DEPTH TO WATER (static > 24-hrs.): 36.09 ft.

WR-101 / RW-2

Interval (feet)	Drilling Method	Sample Description
0 - 9	SDM	Light Brown fine grained SAND with clay matrix
9 - 17	SDM	Light Brown clayey SILT
17 - 20	SDM	Light Brown silty CLAY
20 - 25	SDM	Brown medium grained SAND with pebbles, Dry and loose
25 - 28	SDM	Light Brown silty CLAY, very tight, MOIST
28 - 38	SDM	Light Brown CLAY, Moist
38 - 42	SDM	Brown fine grained SAND, Moist
42 - 50	SDM	Brownish/Red CLAY, Dry
50 - 56	SDM	Brown medium grained SAND with clay matrix, very moist/saturated
56 - 58	SDM	Brown silty CLAY, moist
60 - 66	SDM	Brown medium grained SAND, Saturated
		Total Depth = 66 feet BGS, Screened from 66 – 46’, Sand 40-66', Bentonite 36-40', Grout 0-36’

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Casing, solid: 6 inch diameter sch. 80 PVC casing, 0-7 ft.
Casing, solid: 6 inch diameter sch. 40 PVC casing, 7 -46 ft.
Screen: 6 inch diameter sch. 40 PVC well screen 0.025-slotted, 46-66 ft.
Sand Pack: 16/30 washed, silica sand, 40-66 ft.
Bentonite Seal: “Pure Gold” Bentonite Pellets, 36-40 ft.
Cement-Bentonite (10:1 ratio) Grout: 0-36 ft.



INTERMOUNTAIN POWER PLANT

850 WEST BRUSH WELLMAN ROAD – DELTA, MILLARD COUNTY, UTAH

Ground Water Recovery Well WR-101 Schematic

			Date Drawn
Design by	Drawn by	Scale	Last Revision Date

jbr environmental consultants, inc.

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
BORING/MONITORING WELL: WR-102

PROJECT No.: 08.00463.01
COMPLETION DATE: 3/30/2009

DRILLING FIRM: Boart Longyear
BORING METHOD: Sonic Drilling Method
BORING DIAMETER: 10.0-inch

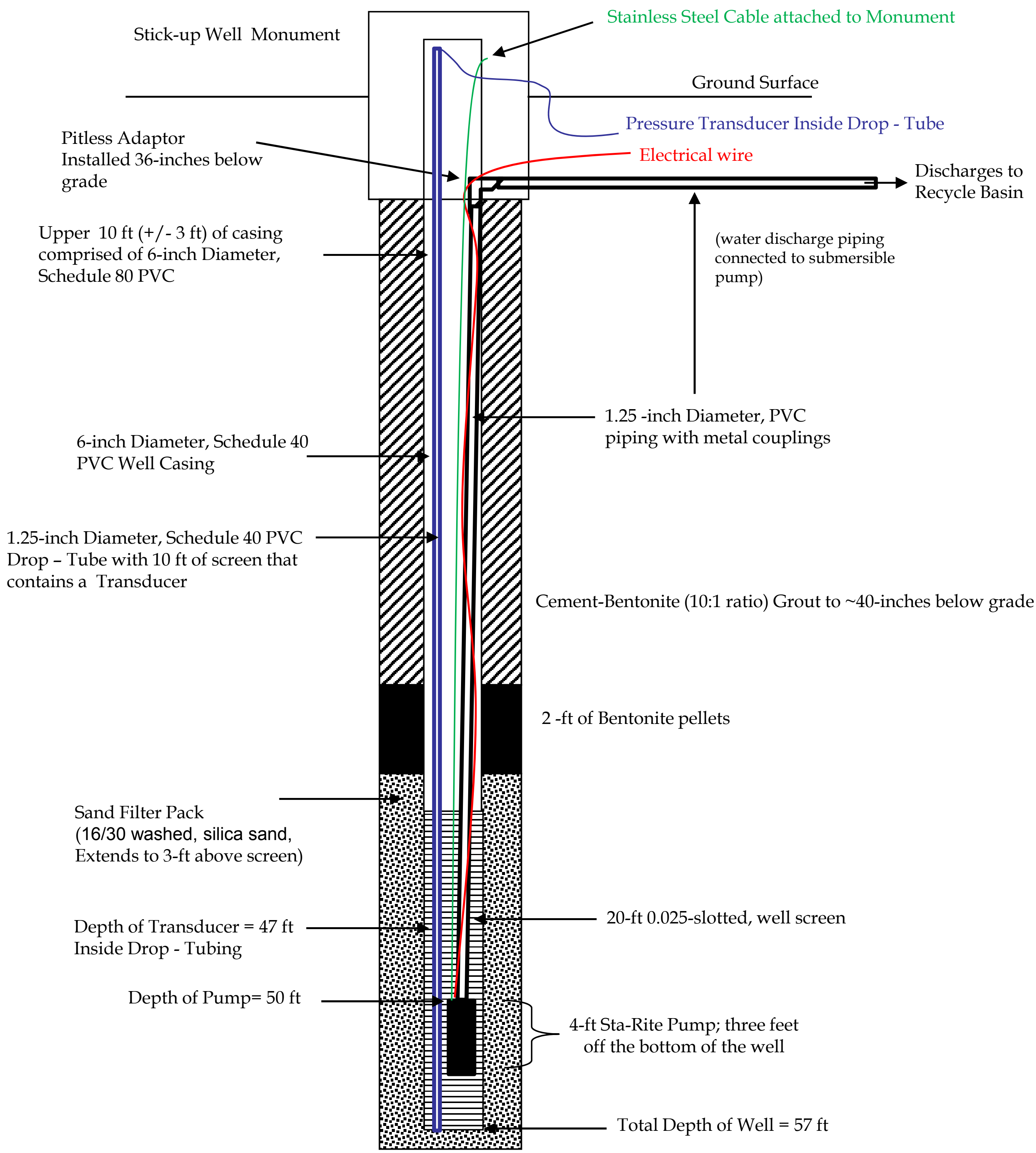
DRILLER: Chato
LOGGED BY: Thomas Hedrick
DEPTH TO WATER (at drilling): ~ 40 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 27 ft.

WR-102

Interval (feet)	Drilling Method	Sample Description
0 - 11	SDM	Light Brown fine grained SAND with pebbles present from 3 - 7 feet, Dry
11 - 16	SDM	Light Brown fine grained SAND with interbeds of brown CLAY, Dry
16 - 35	SDM	Light Gray CLAY, moist at ~ 35 feet,
35 - 37	SDM	Light Gray Clay with a fine to medium grained sandy matrix, very moist
37 - 48	SDM	Brown fine to medium grained SAND, saturated
48 - 50	SDM	Brown CLAY, dry
50 - 53	SDM	Brown to Black medium grained SAND, saturated
53 - 57	SDM	Brown CLAY with two fine grained sand layer present
		Total Depth = 57 feet BGS, Screened from 37 – 57', Sand 34-57', Bentonite 31-34, Grout 0-31'

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Casing, solid: 6 inch diameter sch. 80 PVC casing, 0-9 ft.
Casing, solid: 6 inch diameter sch. 40 PVC casing, 9 -37 ft.
Screen: 6 inch diameter sch. 40 PVC well screen 0.025-slotted, 37-57 ft.
Sand Pack: 16/30 washed, silica sand, 34-57 ft.
Bentonite Seal: "Pure Gold" Bentonite Pellets, 31-34 ft.
Cement-Bentonite (10:1 ratio) Grout: 0-31 ft.



INTERMOUNTAIN POWER PLANT

850 WEST BRUSH WELLMAN ROAD – DELTA, MILLARD COUNTY, UTAH

Ground Water Recovery Well WR-102 Schematic

Design by	Drawn by	Scale	Date Drawn	Last Revision Date

DRILLING LOG

PROJECT NAME: Intermountain Power Plant
BORING/MONITORING WELL: WR-103
PROJECT No.: 08.00463.01
COMPLETION DATE: 3/31/2009

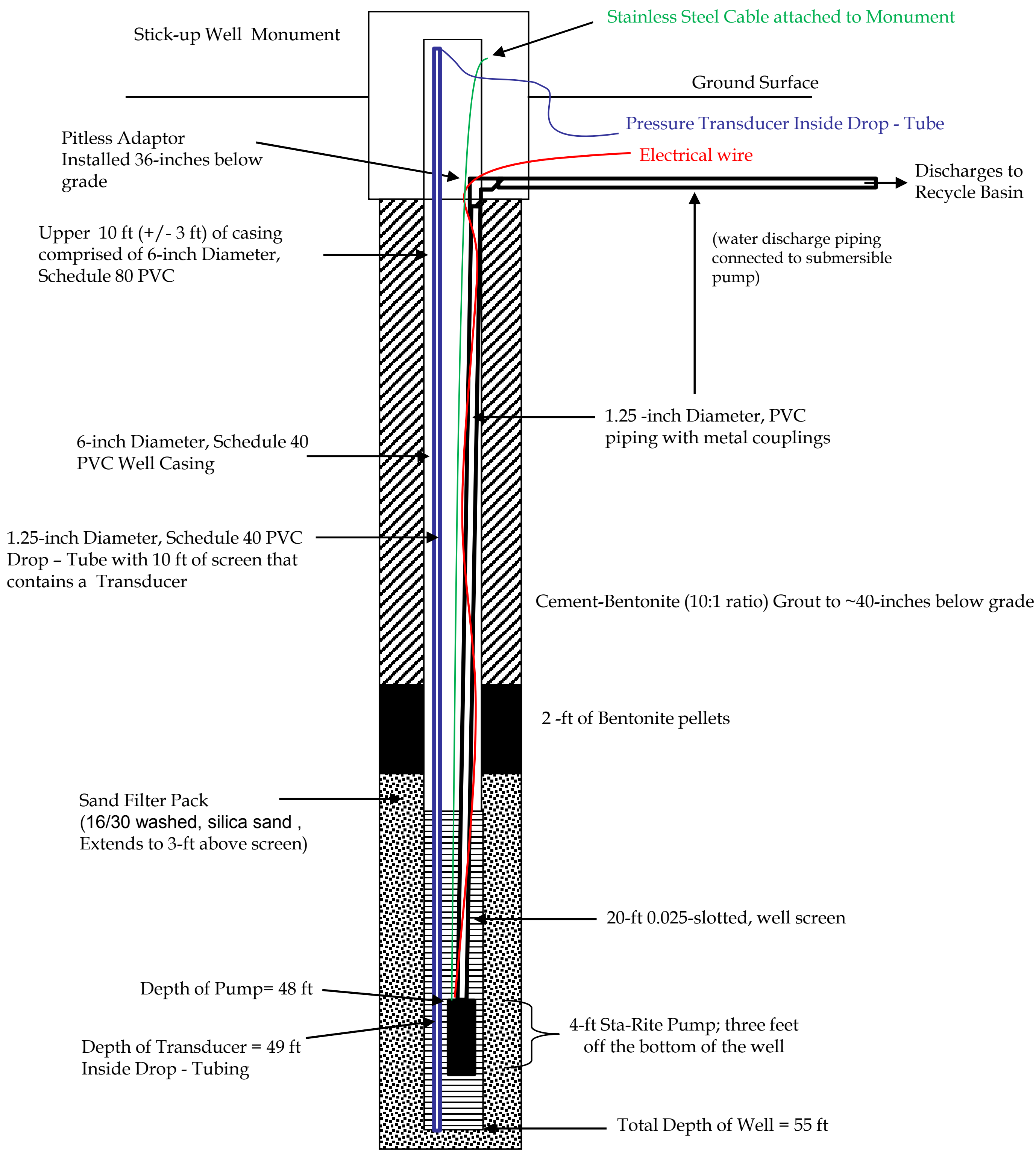
DRILLING FIRM: Boart Longyear
BORING METHOD: Sonic
BORING DIAMETER: 10.0-inch
DRILLER: Chato
LOGGED BY: Thomas Hedrick
DEPTH TO WATER (at drilling): ~ 40 ft.
DEPTH TO WATER (static > 24-hrs.): ~ 30 ft.

WR-103

Interval (feet)	Drilling Method	Sample Description
0 - 3	SDM	Brown to Light brown fine grained SAND to silt, Dry
3 - 15	SDM	Light brown fine to medium grained SAND, pebbles present from 3 - 5 feet, Dry
15 - 17	SDM	Light brown fine to medium grained SAND, with interbeds of light brown CLAY with a sandy matrix, Dry
17 - 24	SDM	Light brown CLAY, Dry
24 - 37	SDM	Reddish Gray CLAY, Dry
37 - 45	SDM	Brown to Black medium fine to medium grained SAND, very moist
45 - 47	SDM	Brown fine grained SAND with a CLAY matrix, very moist
47 - 52	SDM	Brown Fine to medium grained SAND, saturated
52 - 55	SDM	Red CLAY, dry
		Total Depth = 55 feet BGS, Screened from 35 – 55’, Sand 32-55', Bentonite 29-32, Grout 0-29’

Well Completion Materials and Depth Intervals (ft.)

Surface Completion: Stick-up
Casing, solid: 6 inch diameter sch. 80 PVC casing, 0-6.5 ft.
Casing, solid: 6 inch diameter sch. 40 PVC casing, 6.5 -35 ft.
Screen: 6 inch diameter sch. 40 PVC well screen 0.025-slotted, 35-55 ft.
Sand Pack: 16/30 washed, silica sand, 32-55 ft.
Bentonite Seal: “Pure Gold” Bentonite Pellets, 29-32 ft.
Cement-Bentonite (10:1 ratio) Grout: 0-29 ft.



JBR™

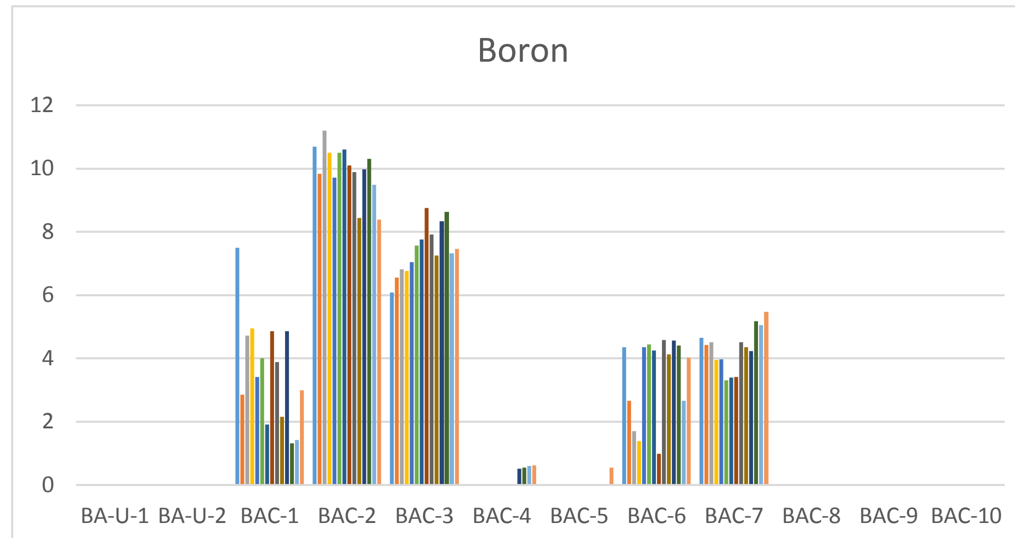
INTERMOUNTAIN POWER PLANT
850 WEST BRUSH WELLMAN ROAD – DELTA, MILLARD COUNTY, UTAH

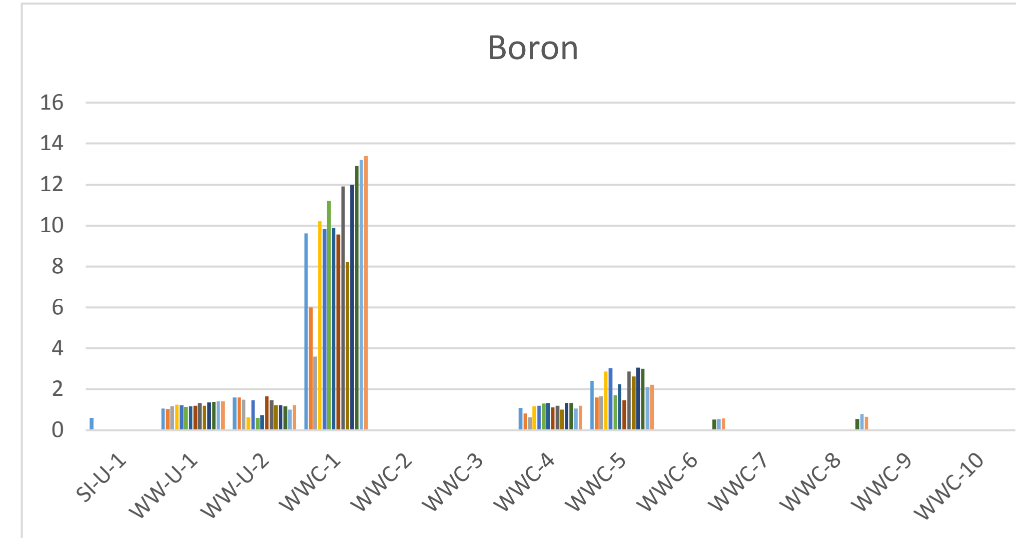
Ground Water Recovery Well WR-103 Schematic

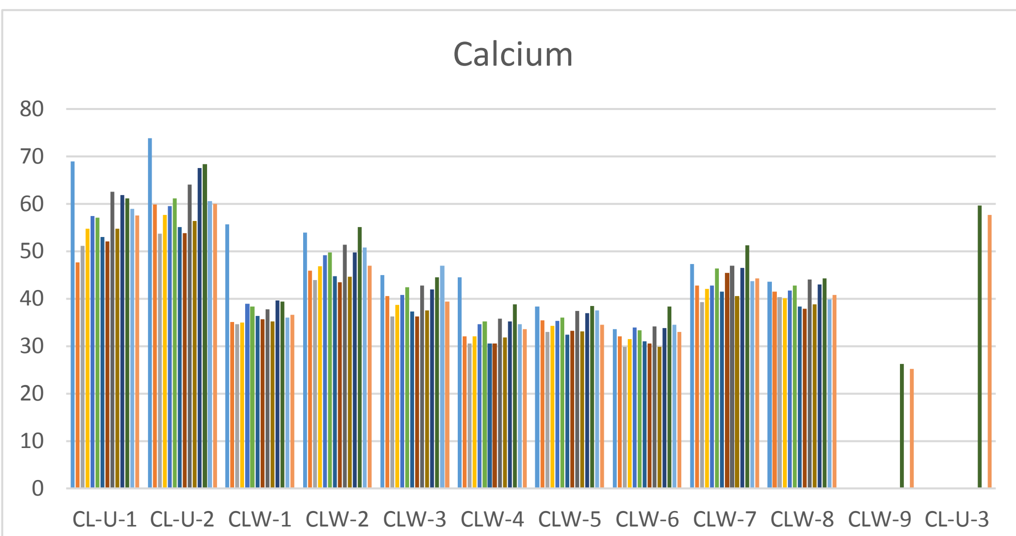
			Date Drawn
Design by	Drawn by	Scale	Last Revision Date

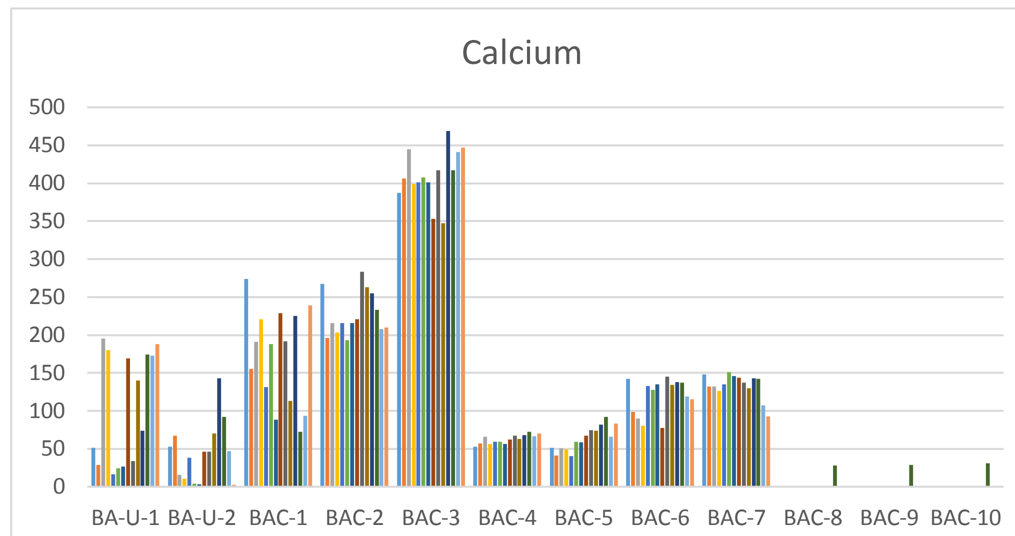
ATTACHMENT 10. TABULATED CCR GROUNDWATER MONITORING DATA

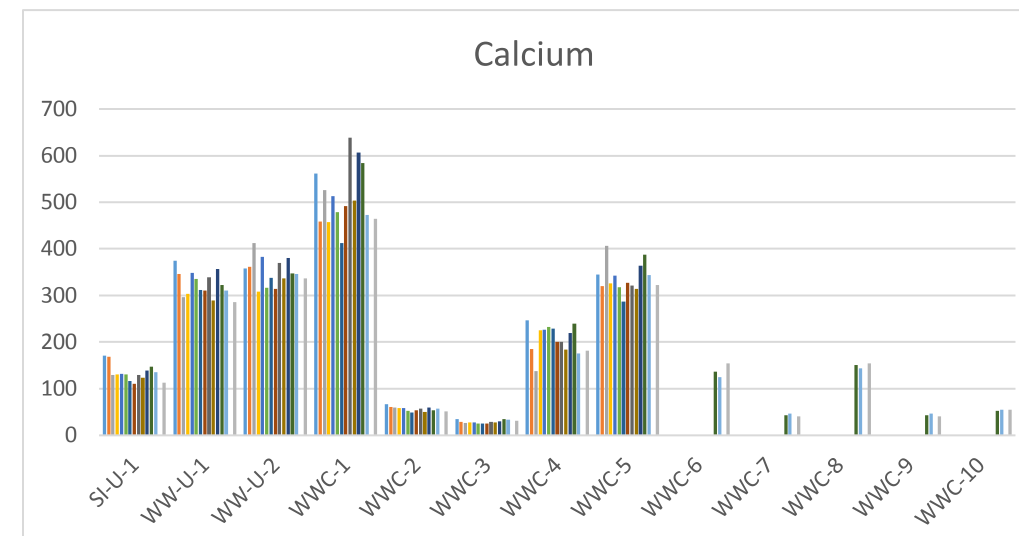
Appendix III (mg/L - pCi/L)

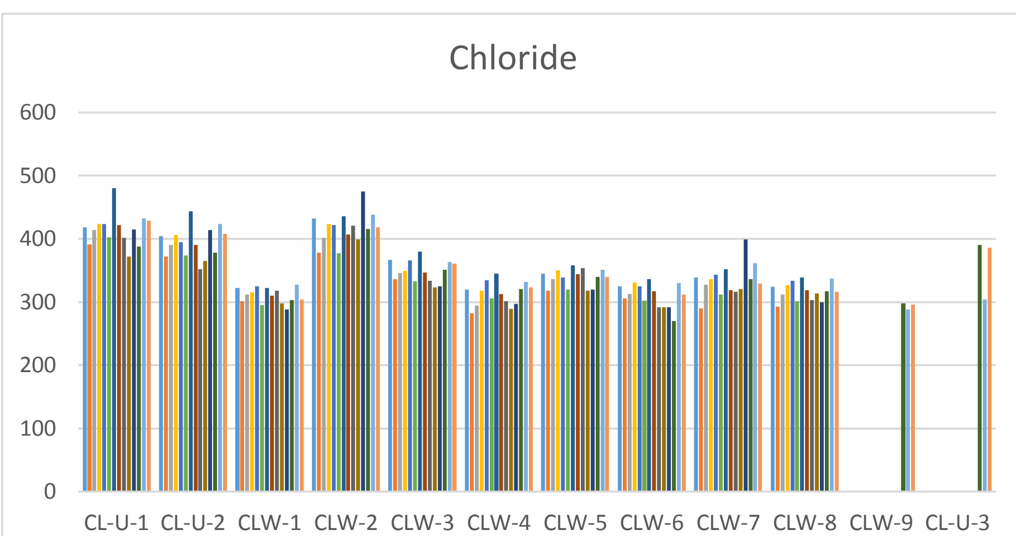


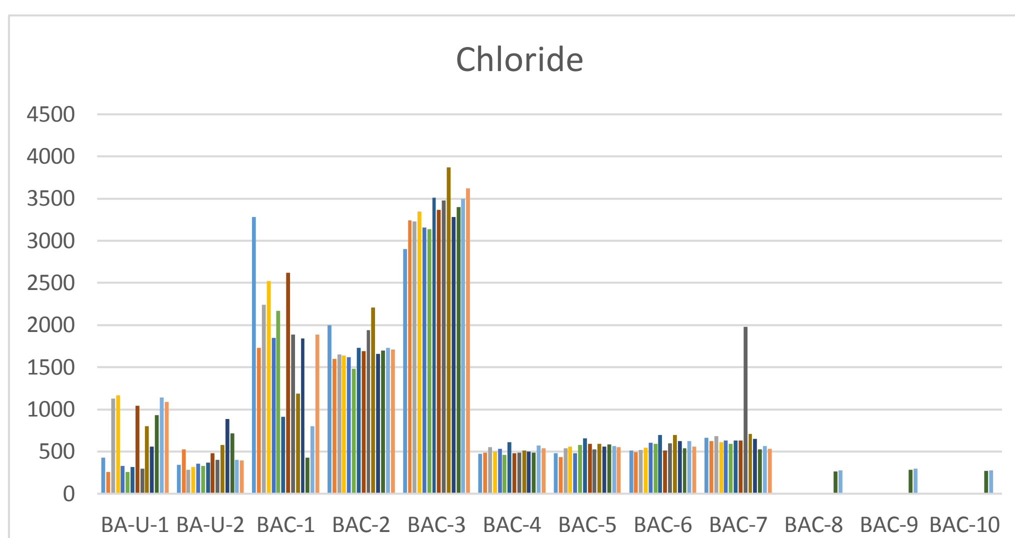


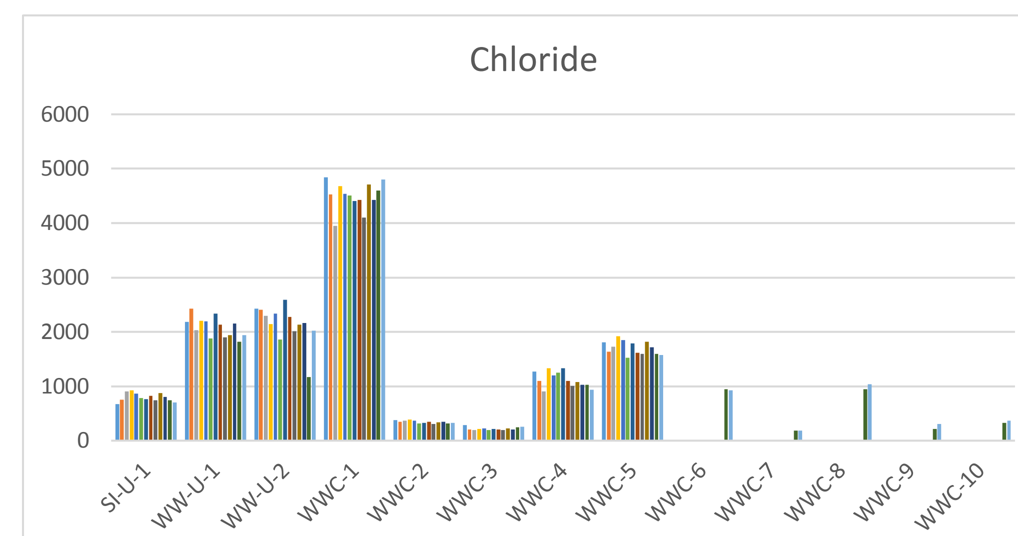


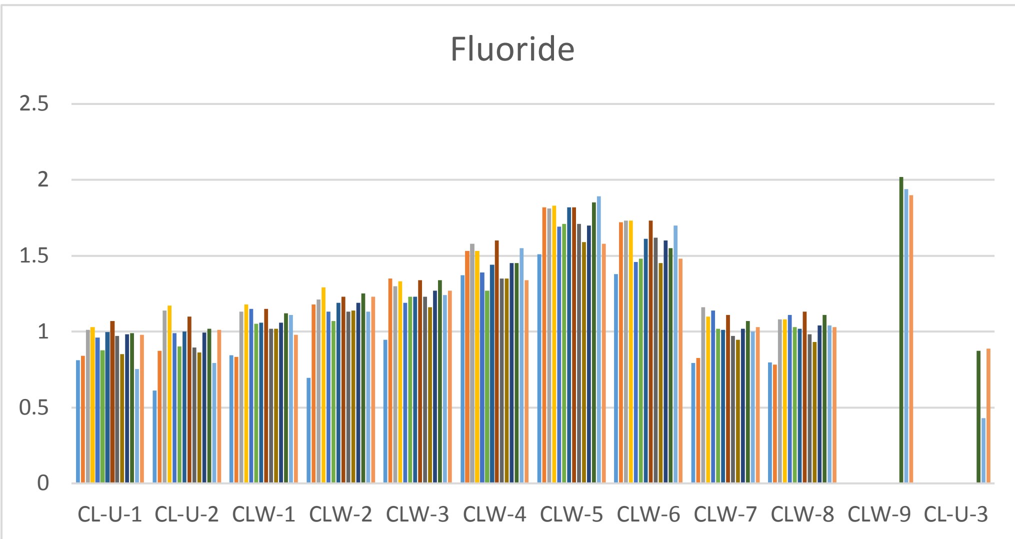


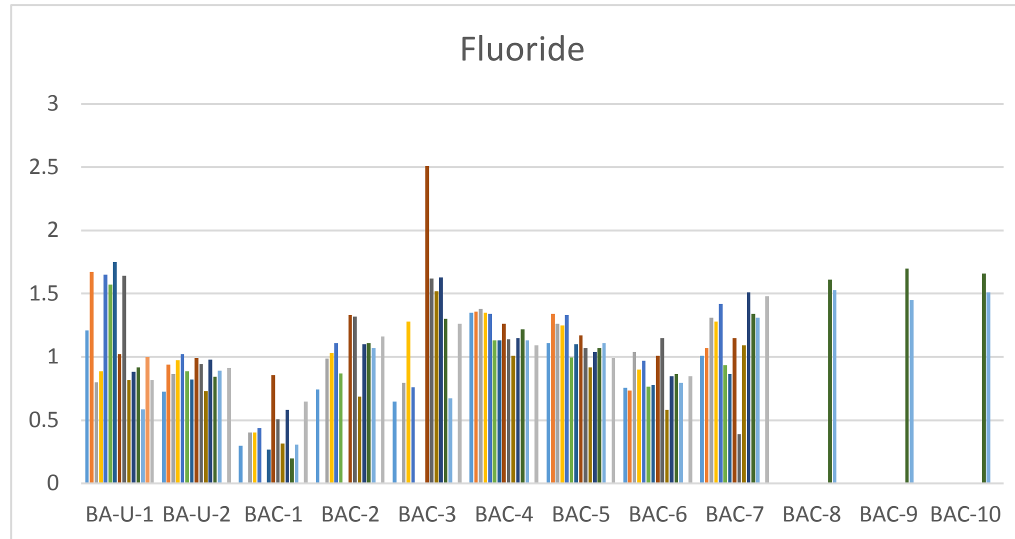


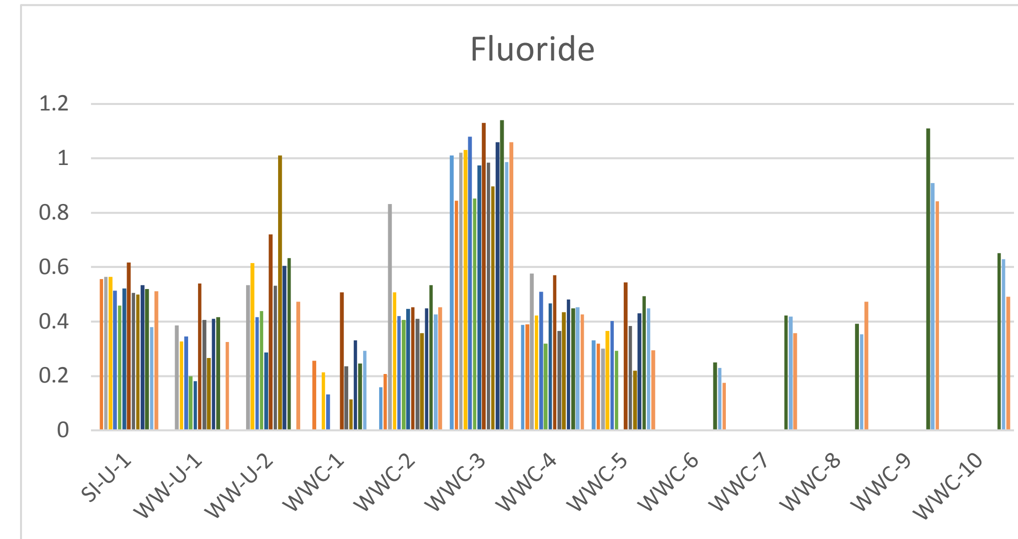


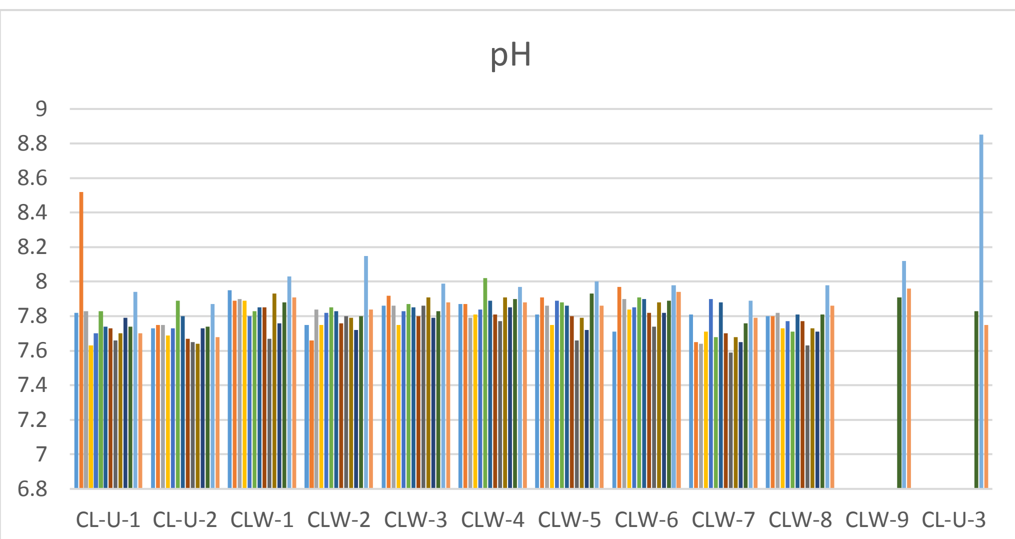


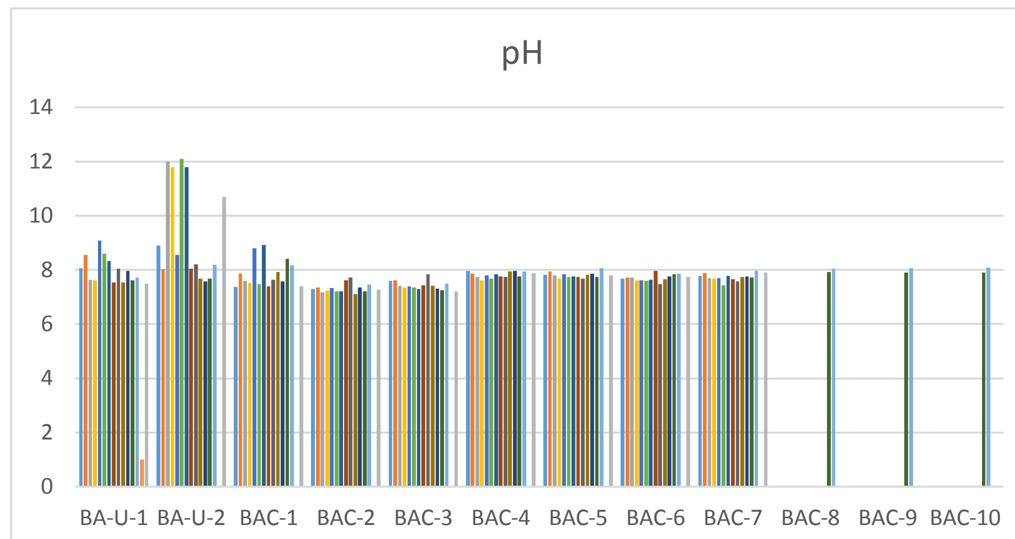


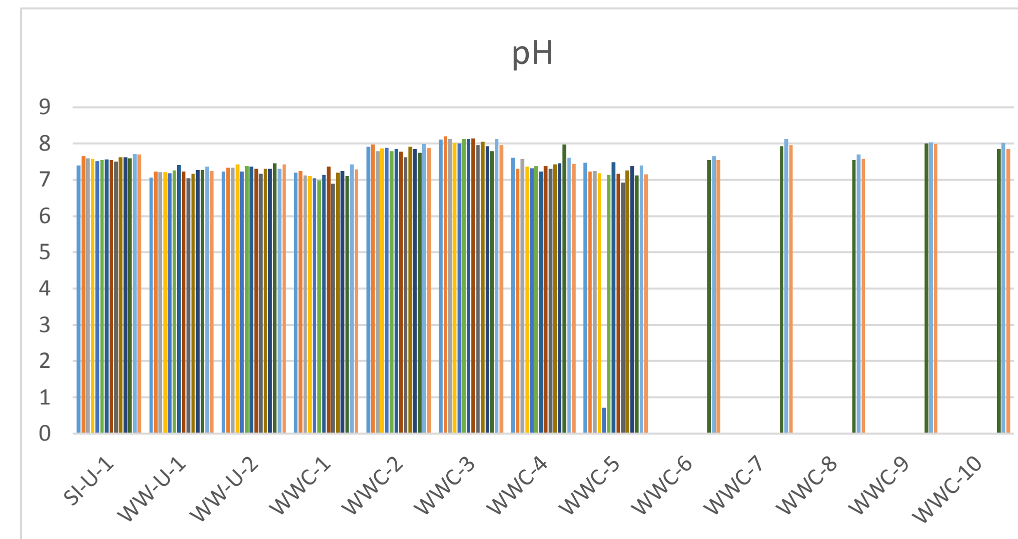

Fluoride
2.5
2
1.5
1
0.5
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

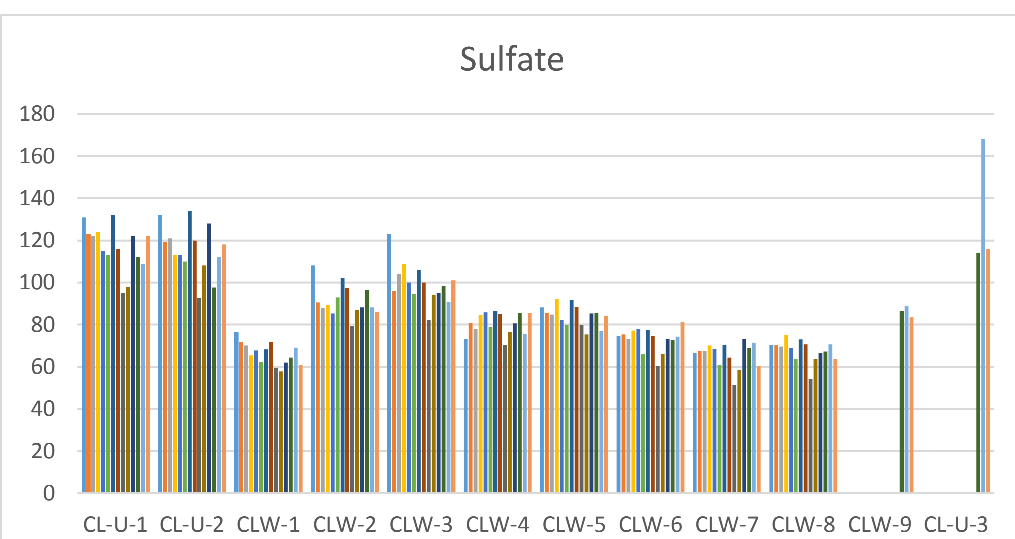

Fluoride
3
2.5
2
1.5
1
0.5
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

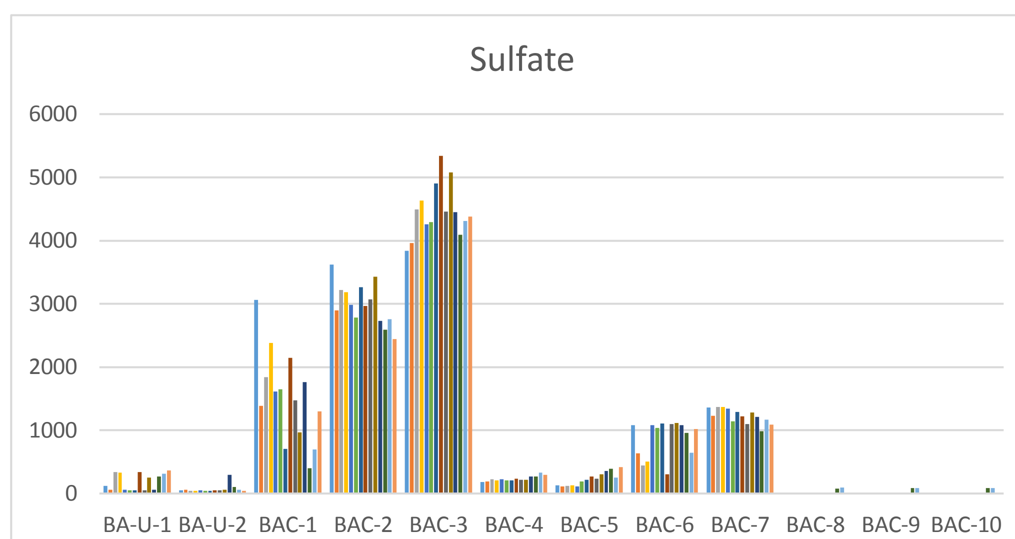

Fluoride
1.2
1
0.8
0.6
0.4
0.2
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

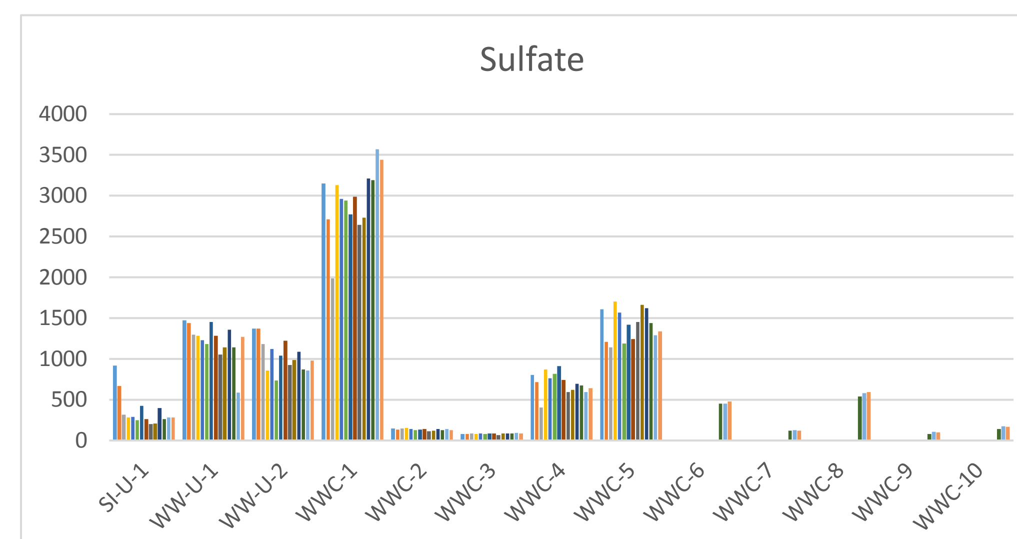

pH
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
6.8
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

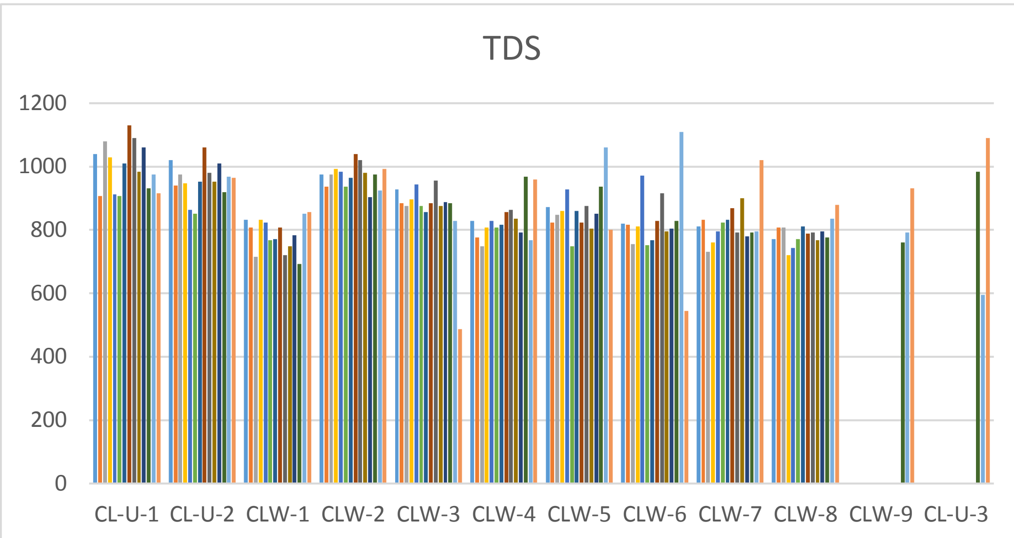

pH
14
12
10
8
6
4
2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

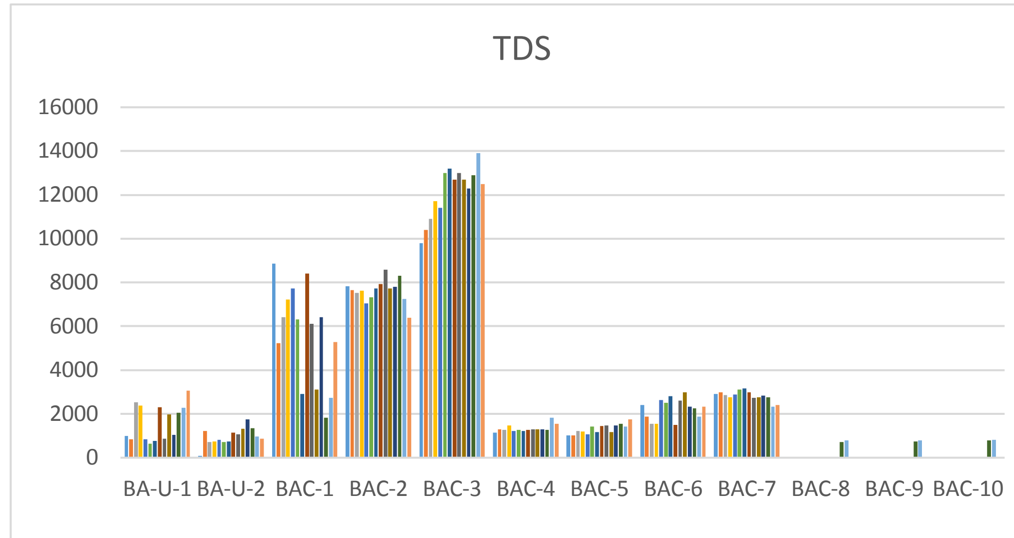

pH
9
8
7
6
5
4
3
2
1
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10


Sulfate
180
160
140
120
100
80
60
40
20
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3


Sulfate
6000
5000
4000
3000
2000
1000
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10


Sulfate
4000
3500
3000
2500
2000
1500
1000
500
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10


TDS
1200
1000
800
600
400
200
0
CL-U-1
CL-U-2
CLW-1
CLW-2
CLW-3
CLW-4
CLW-5
CLW-6
CLW-7
CLW-8
CLW-9
CL-U-3


TDS
16000
14000
12000
10000
8000
6000
4000
2000
0
BA-U-1
BA-U-2
BAC-1
BAC-2
BAC-3
BAC-4
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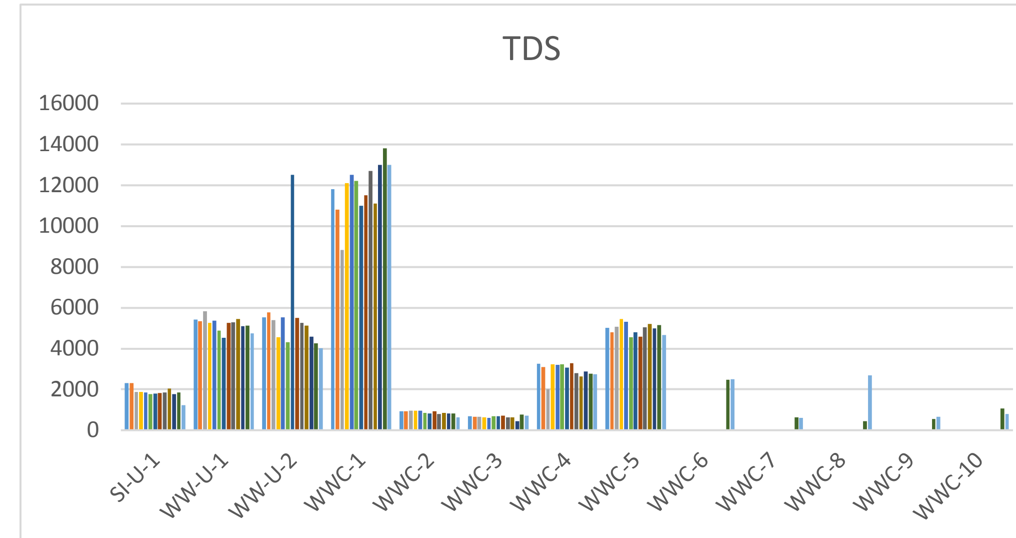
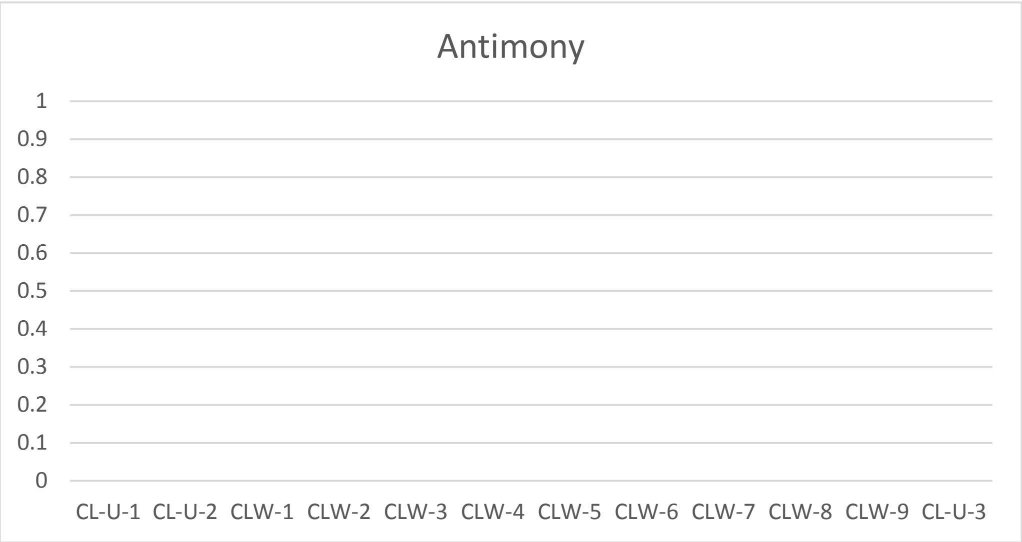
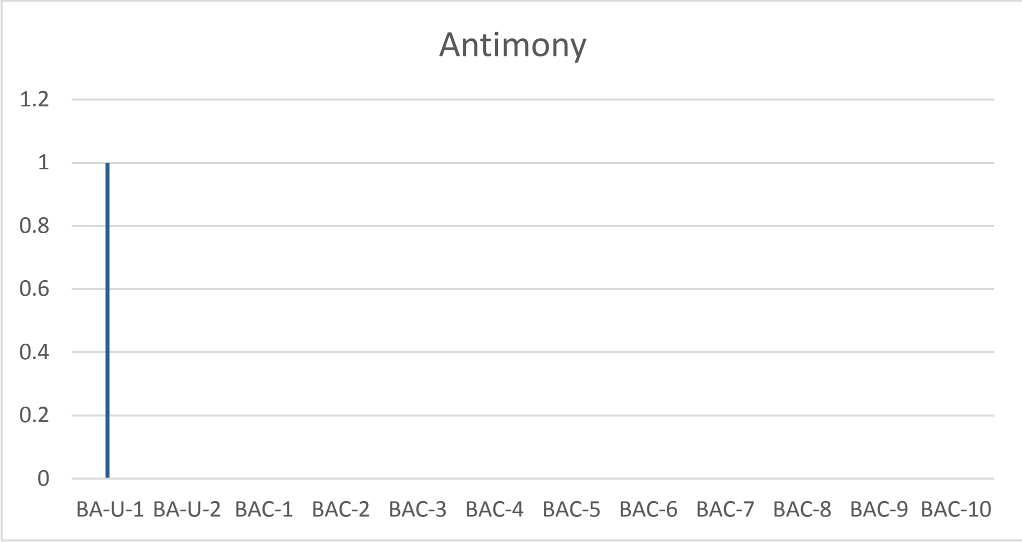
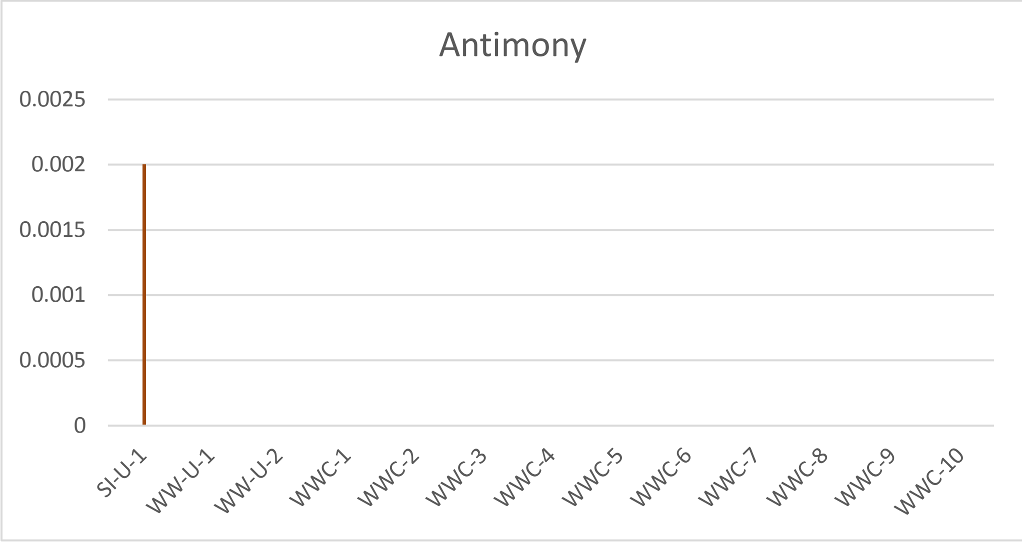
BAC-7
BAC-8
BAC-9
BAC-10

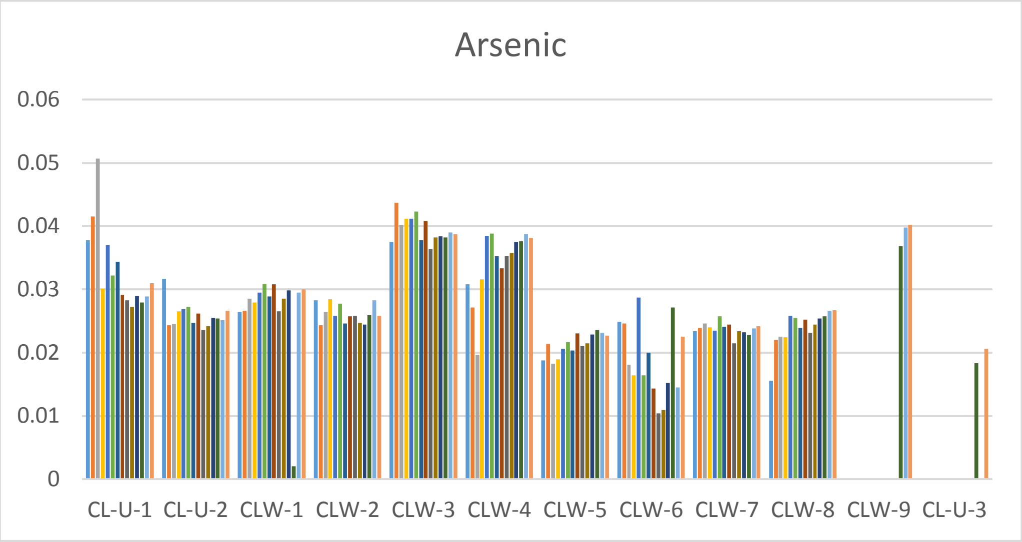

TDS
16000
14000
12000
10000
8000
6000
4000
2000
0
SI-U-1
WW-U-1
WW-U-2
WWC-1
WWC-2
WWC-3
WWC-4
WWC-5
WWC-6
WWC-7
WWC-8
WWC-9
WWC-10

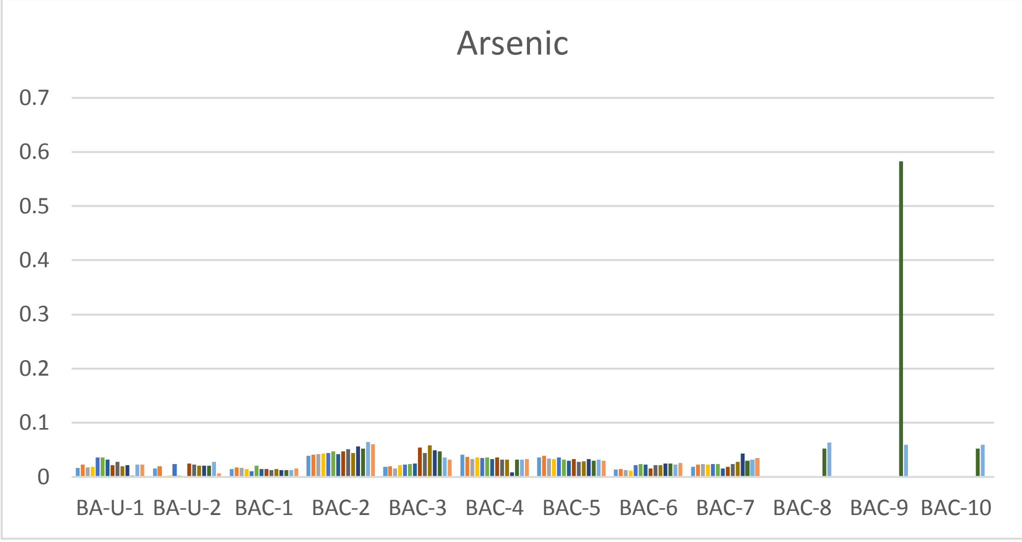
Appendix IV (mg/L - pCi/L)

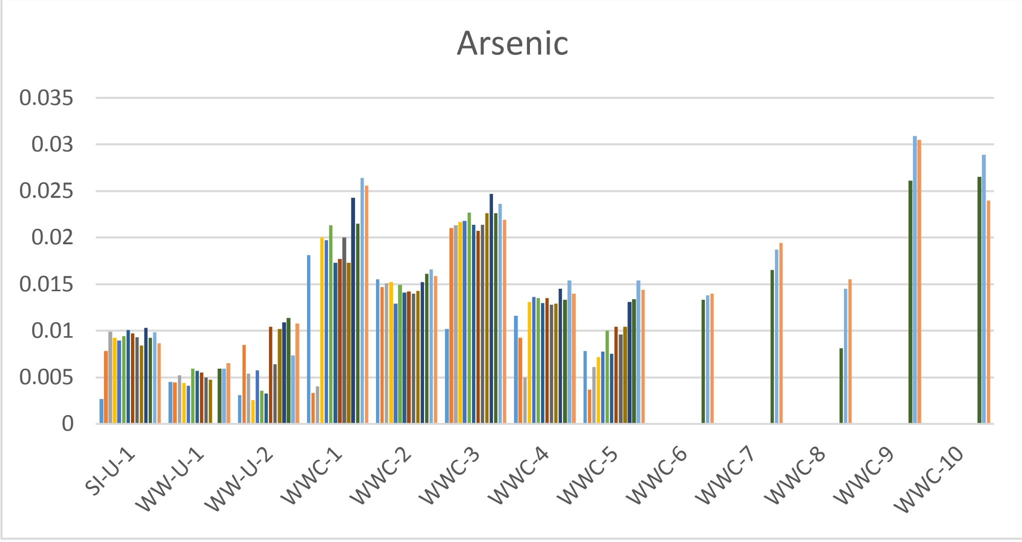


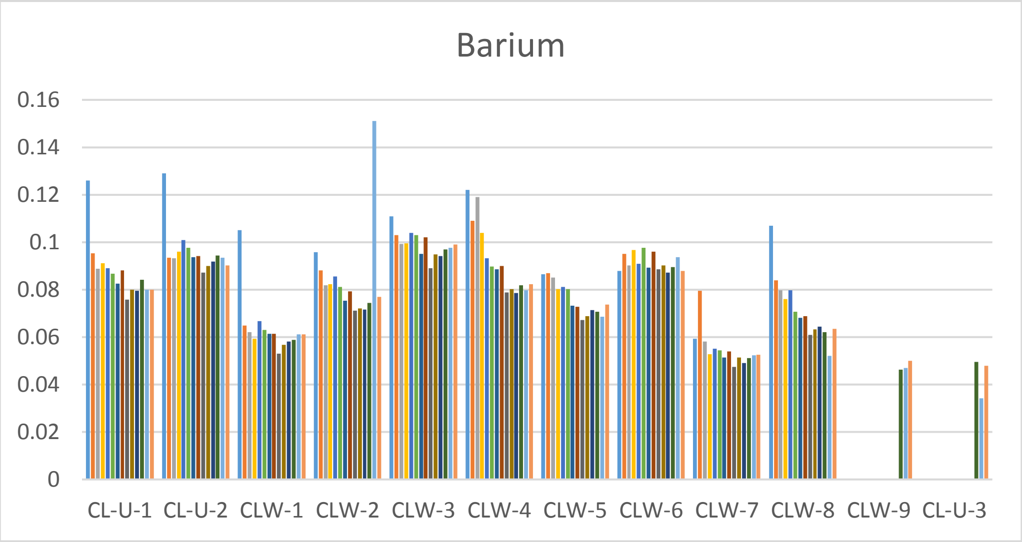


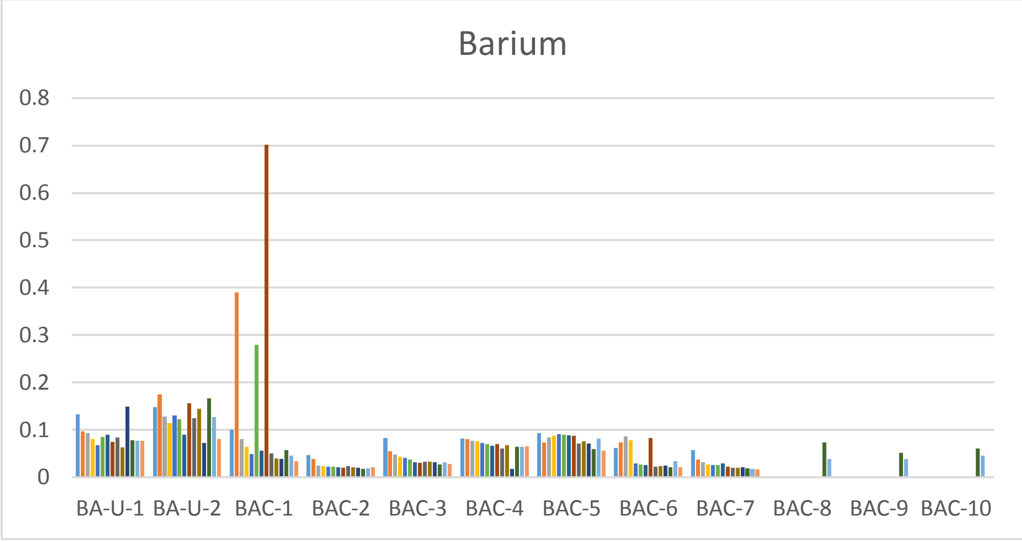


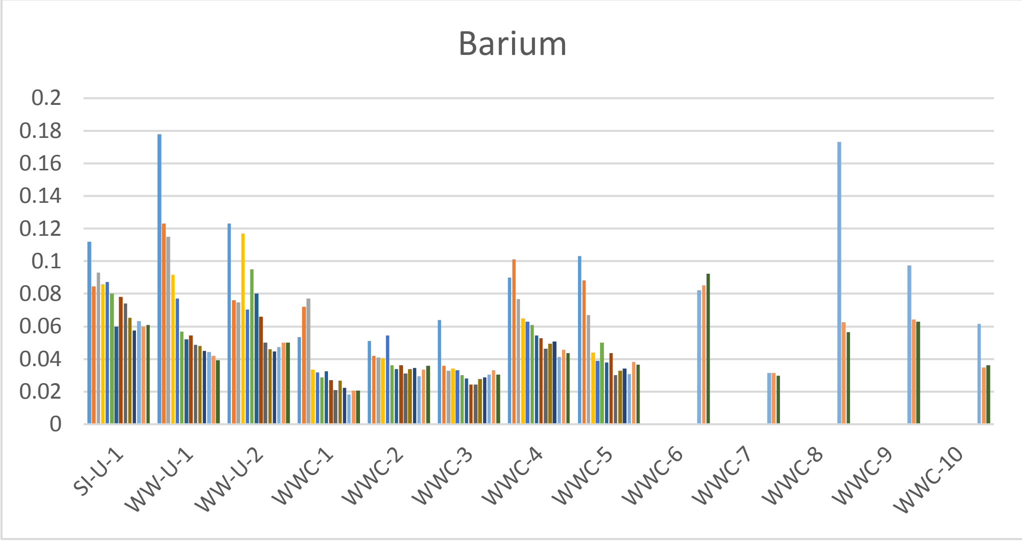


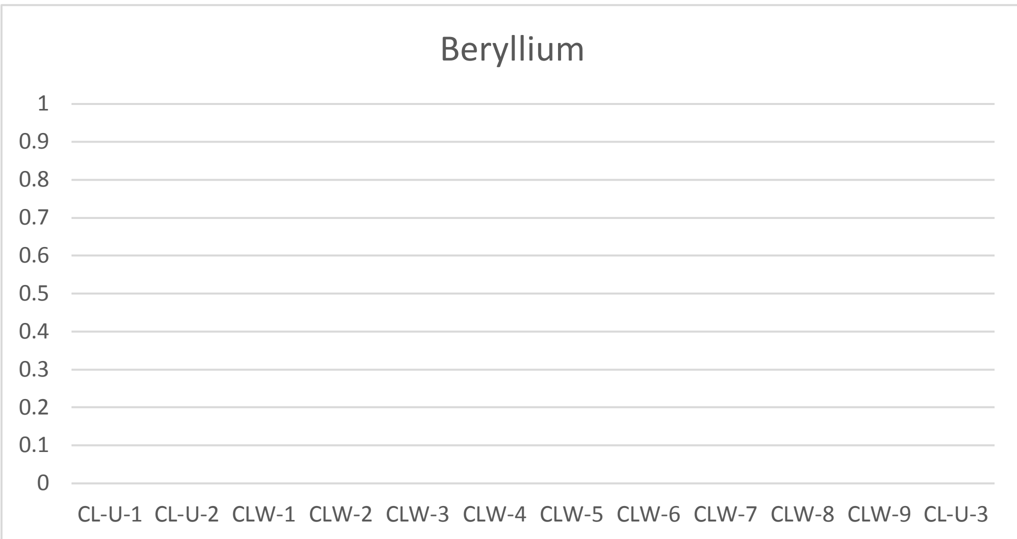




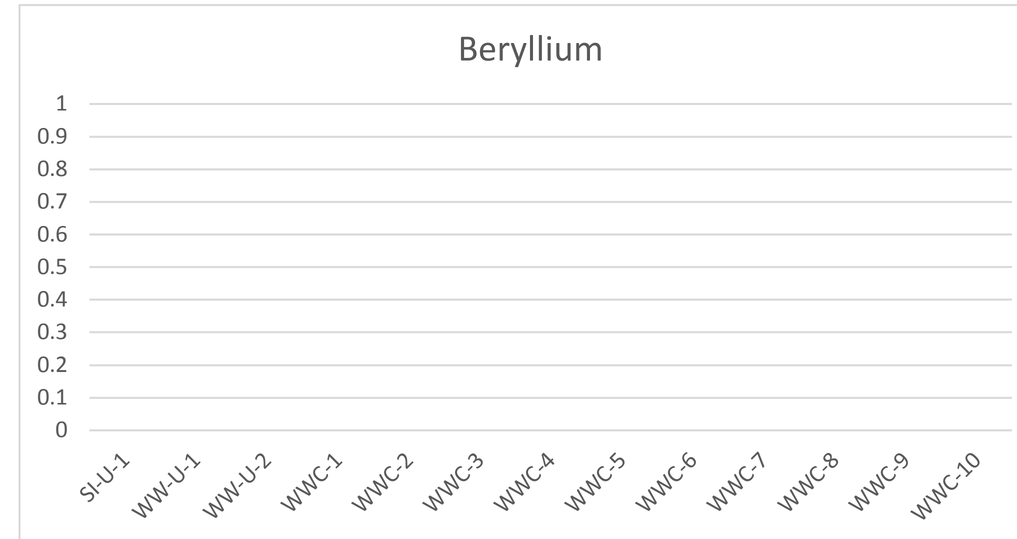


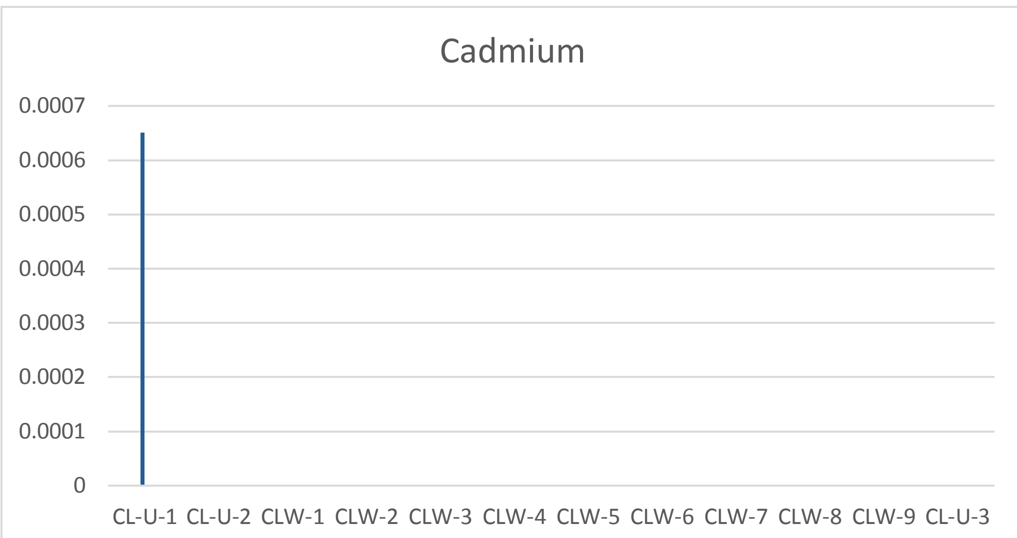


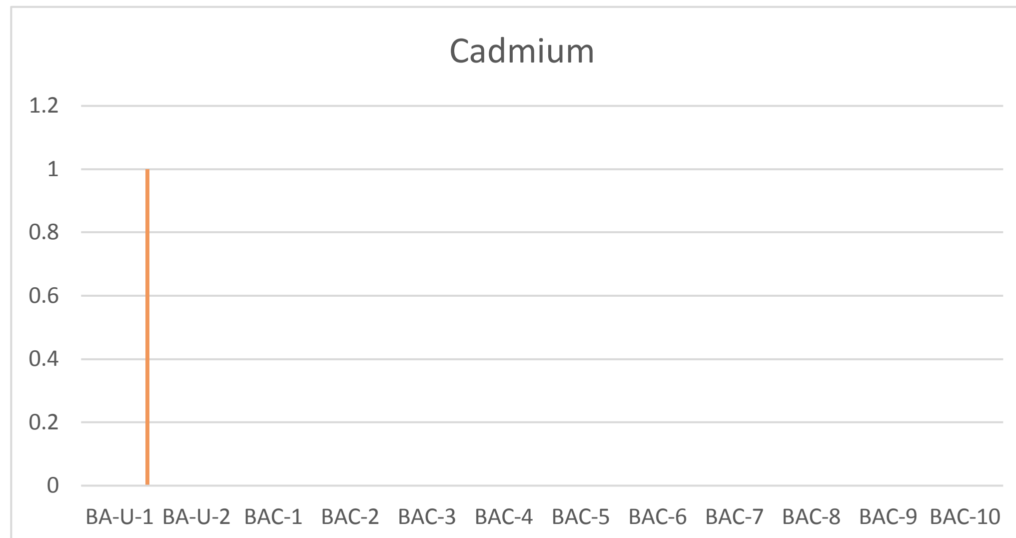


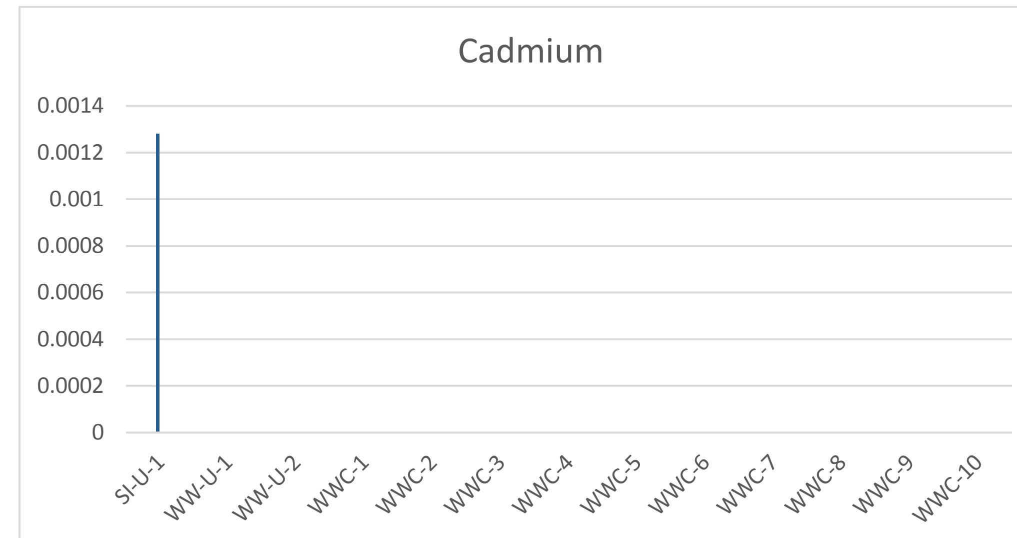

Beryllium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

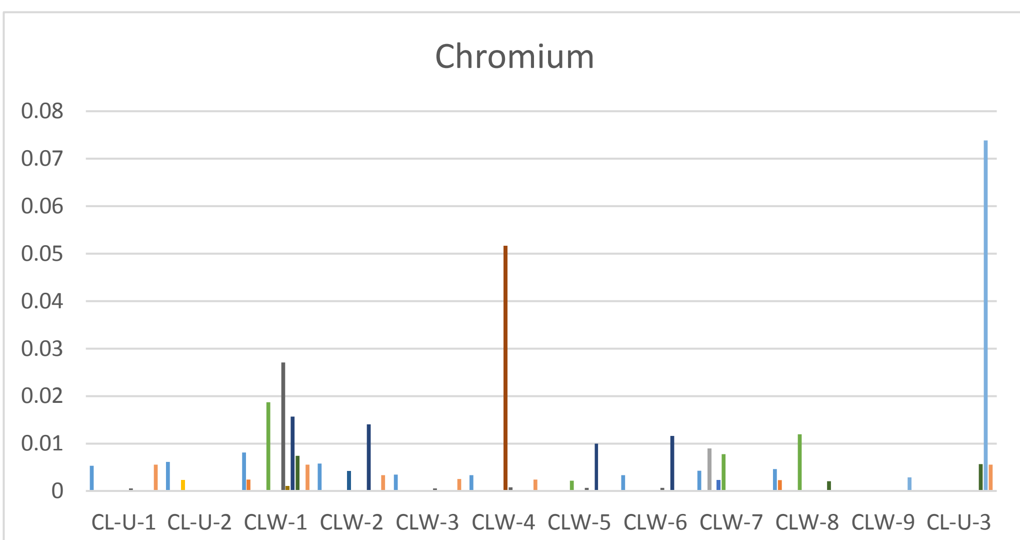

Beryllium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

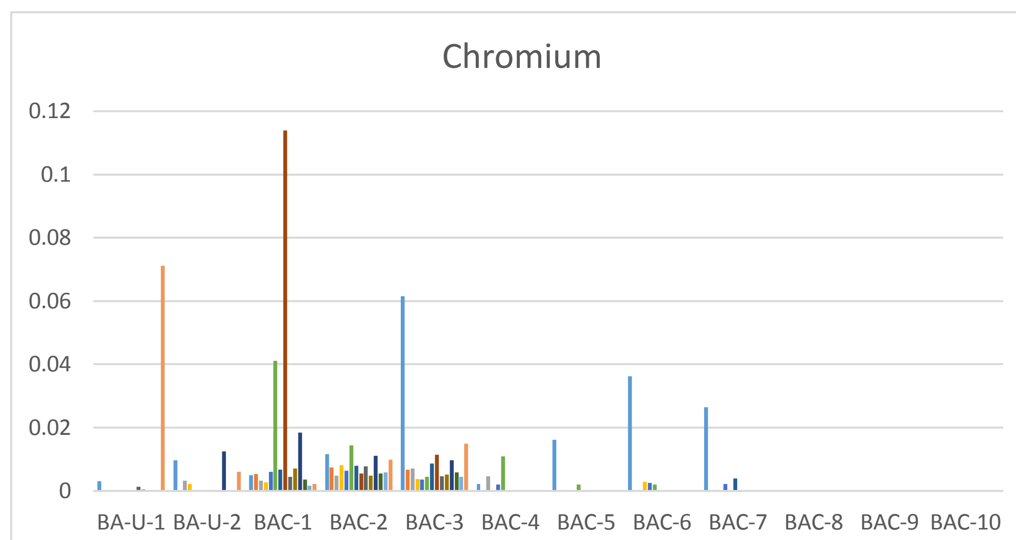

Beryllium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

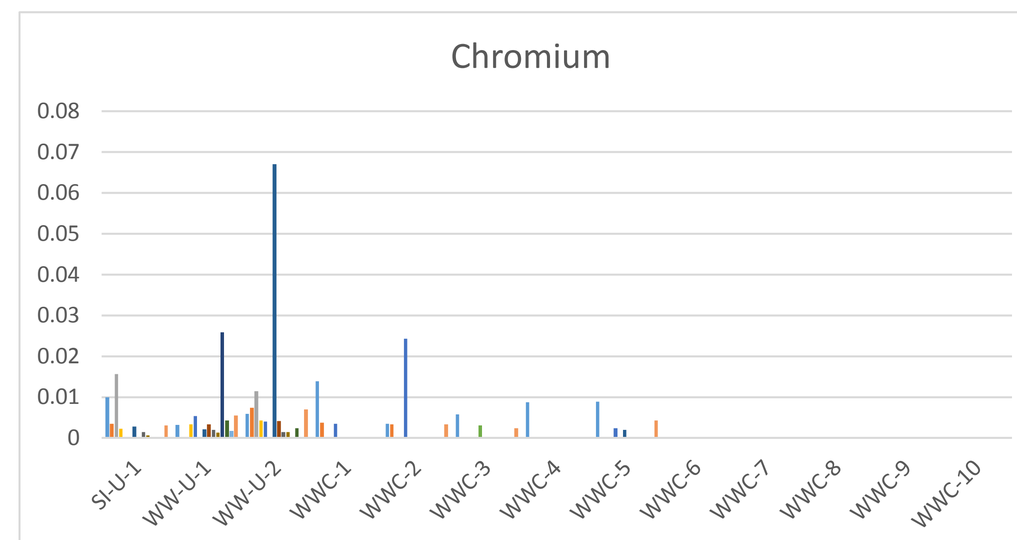

Cadmium
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3


Cadmium
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

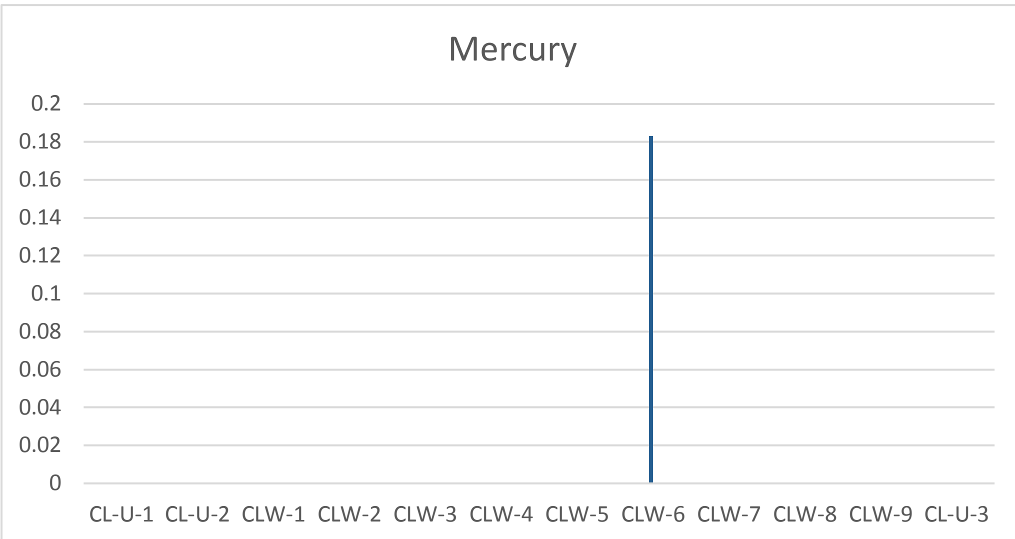

Cadmium
0.0014
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

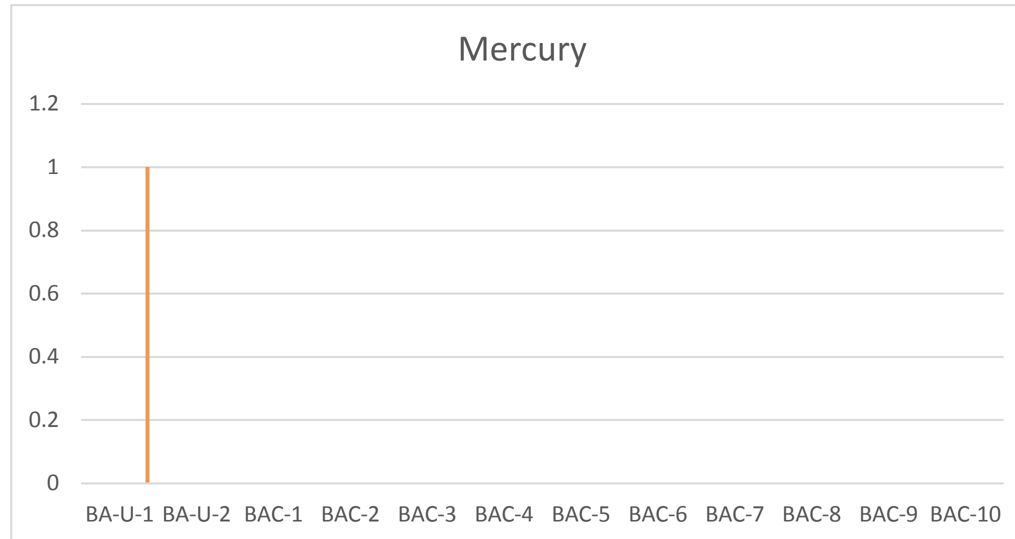

Chromium
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

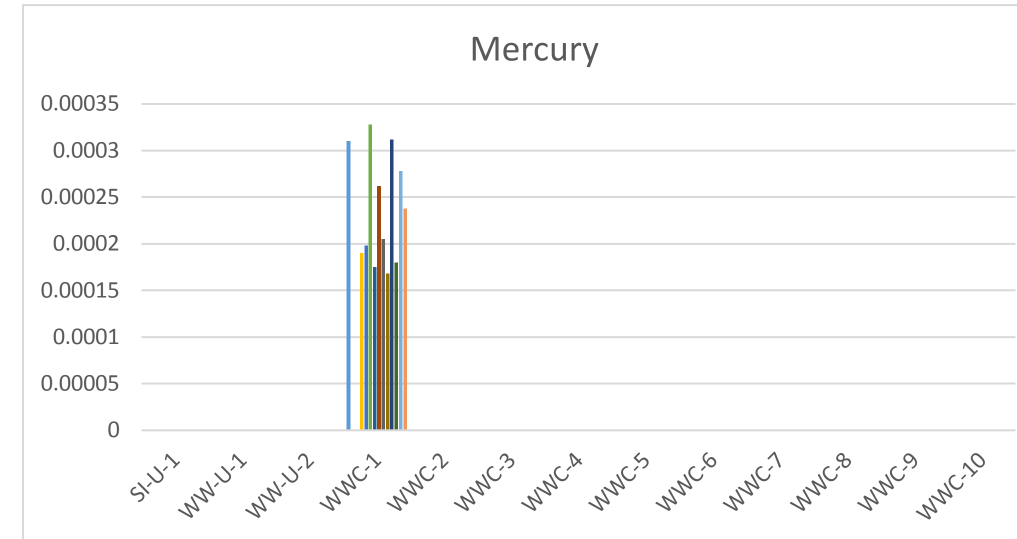

Chromium
0.12
0.1
0.08
0.06
0.04
0.02
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

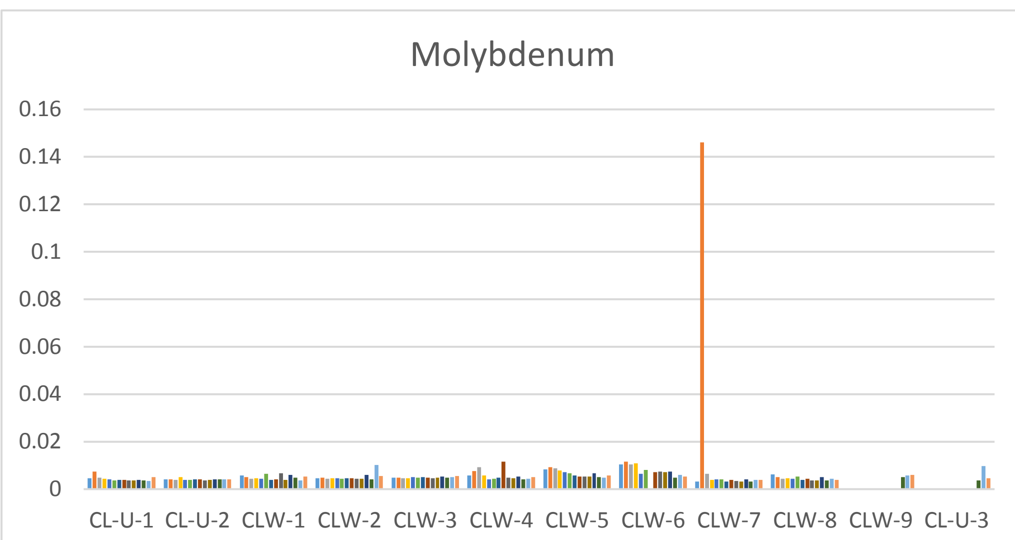

Chromium
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

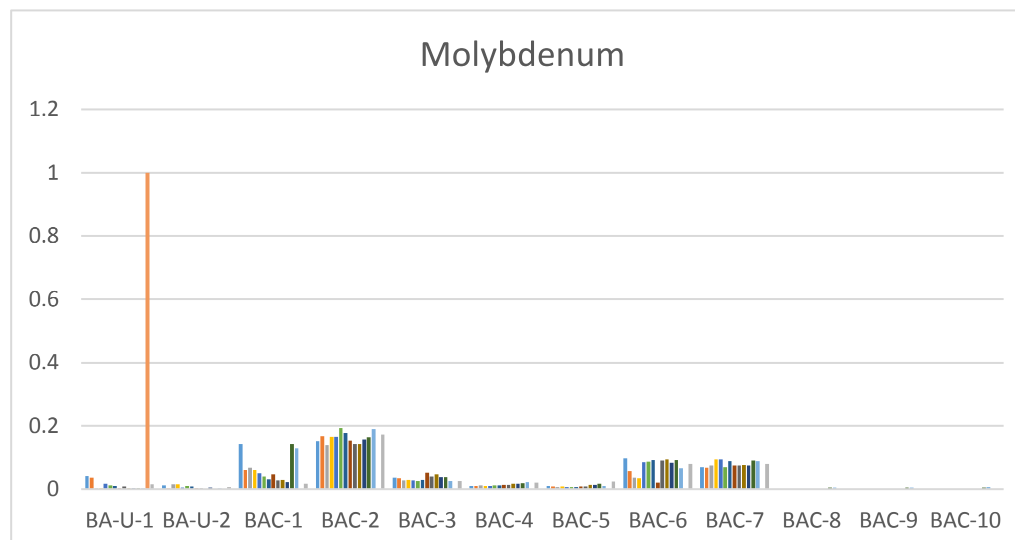

Cobalt
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3
Cobalt
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7
Cobalt
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10
Lead
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3
Lead
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10
Lead
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10
Lithium
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3
Lithium
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10
Lithium
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

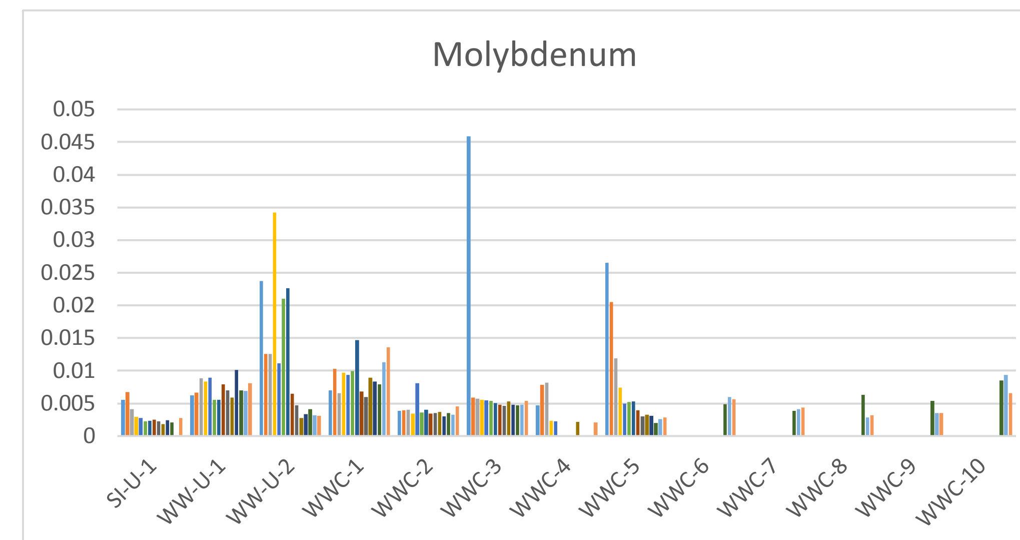

Mercury
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3

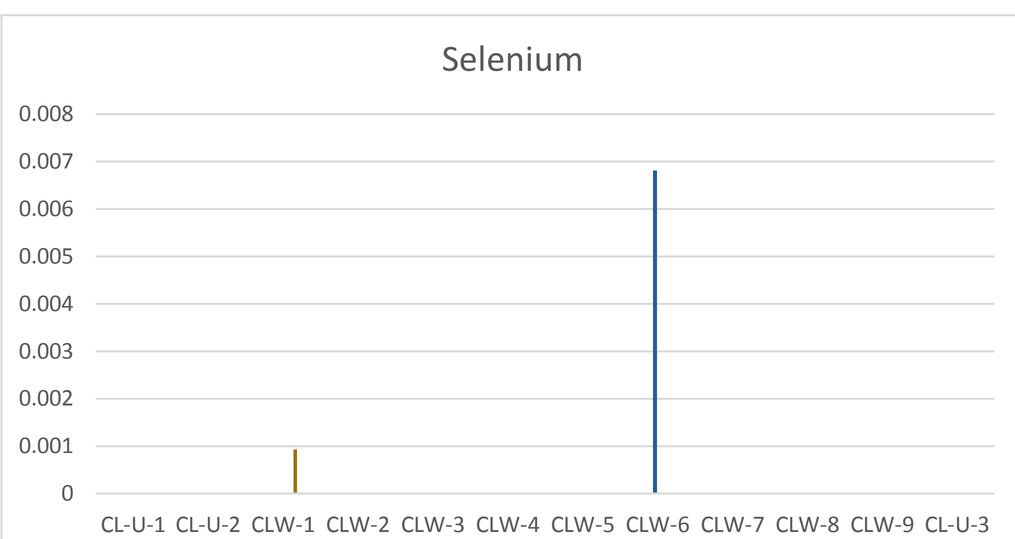

Mercury
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10

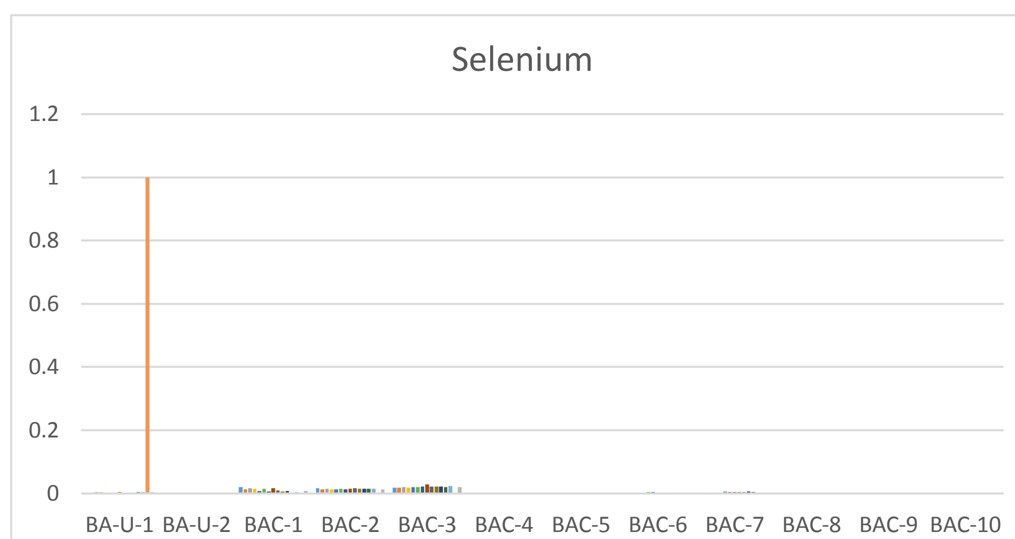

Mercury
0.00035
0.0003
0.00025
0.0002
0.00015
0.0001
0.00005
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10

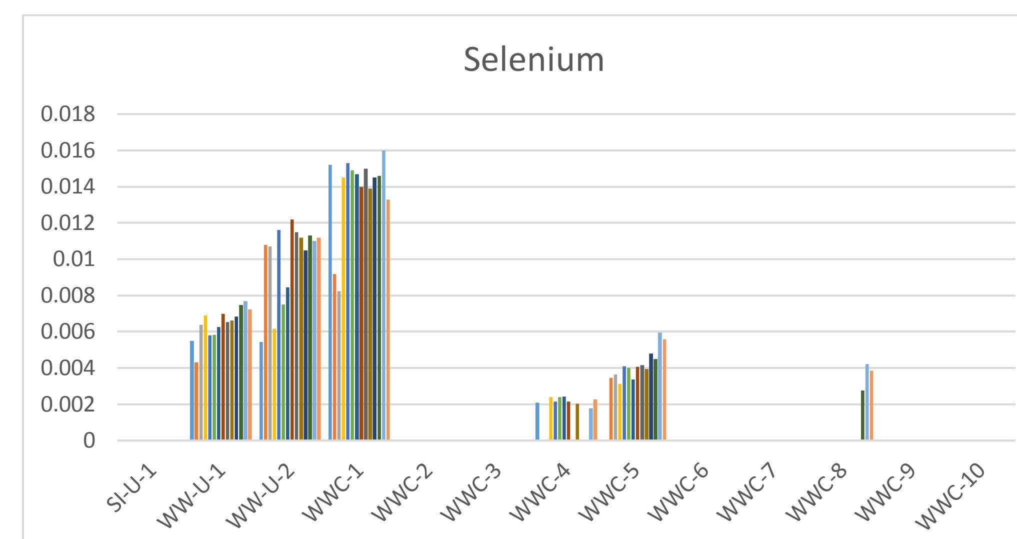

Molybdenum
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3


Molybdenum
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10


Molybdenum
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10


Selenium
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
CL-U-1 CL-U-2 CLW-1 CLW-2 CLW-3 CLW-4 CLW-5 CLW-6 CLW-7 CLW-8 CLW-9 CL-U-3


Selenium
1.2
1
0.8
0.6
0.4
0.2
0
BA-U-1 BA-U-2 BAC-1 BAC-2 BAC-3 BAC-4 BAC-5 BAC-6 BAC-7 BAC-8 BAC-9 BAC-10


Selenium
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
SI-U-1 WW-U-1 WW-U-2 WWC-1 WWC-2 WWC-3 WWC-4 WWC-5 WWC-6 WWC-7 WWC-8 WWC-9 WWC-10


Thallium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CL-U-1
CL-U-2
CLW-1
CLW-2
CLW-3
CLW-4
CLW-5
CLW-6
CLW-7
CLW-8
CLW-9
CL-U-3


Thallium
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
BA-U-1
BA-U-2
BAC-1
BAC-2
BAC-3
BAC-4
BAC-5
BAC-6
BAC-7
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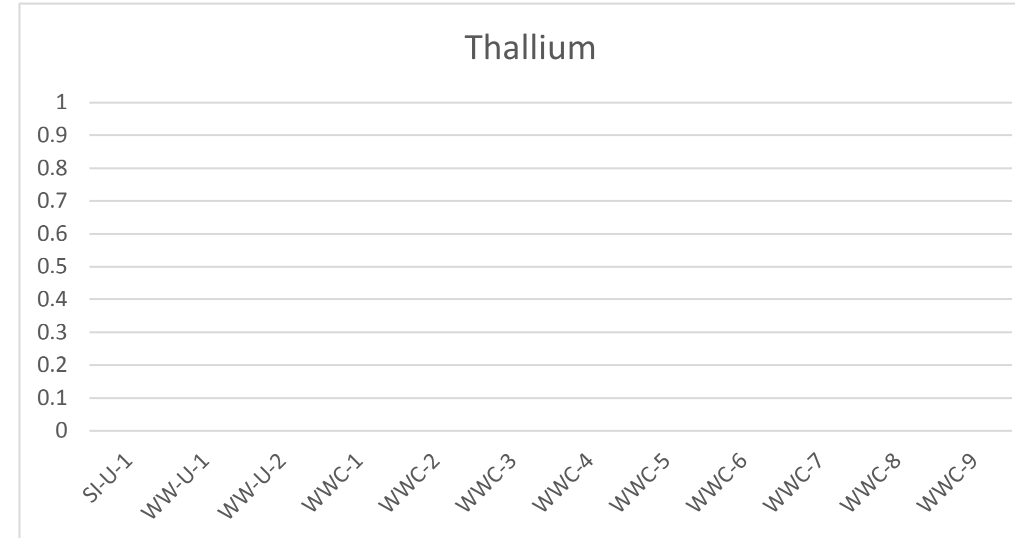
BAC-9
BAC-10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0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
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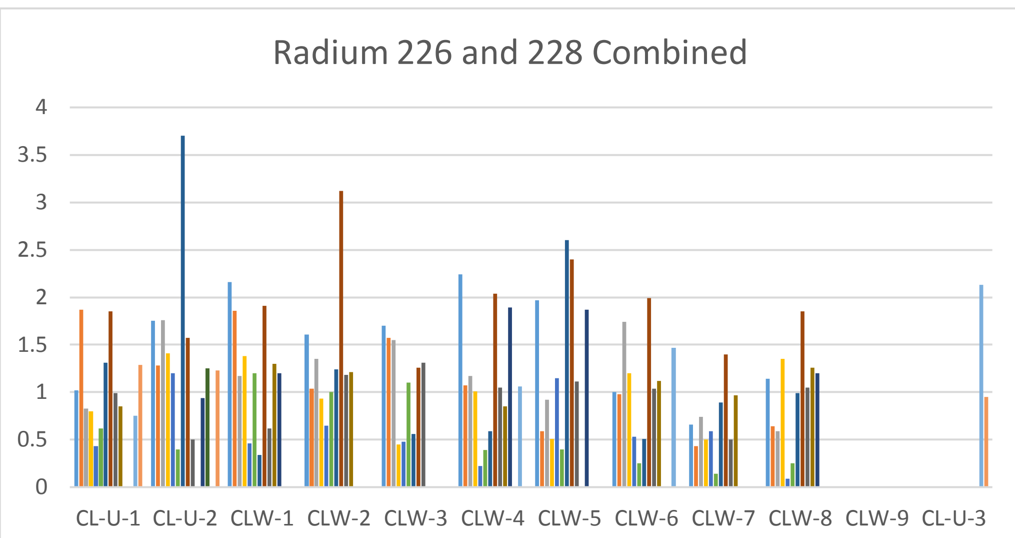
WW-U-1
WW-U-2
WWC-1
WWC-2
WWC-3
WWC-4
WWC-5
WWC-6
WWC-7
WWC-8
WWC-9


Radium 226 and 228 Combined
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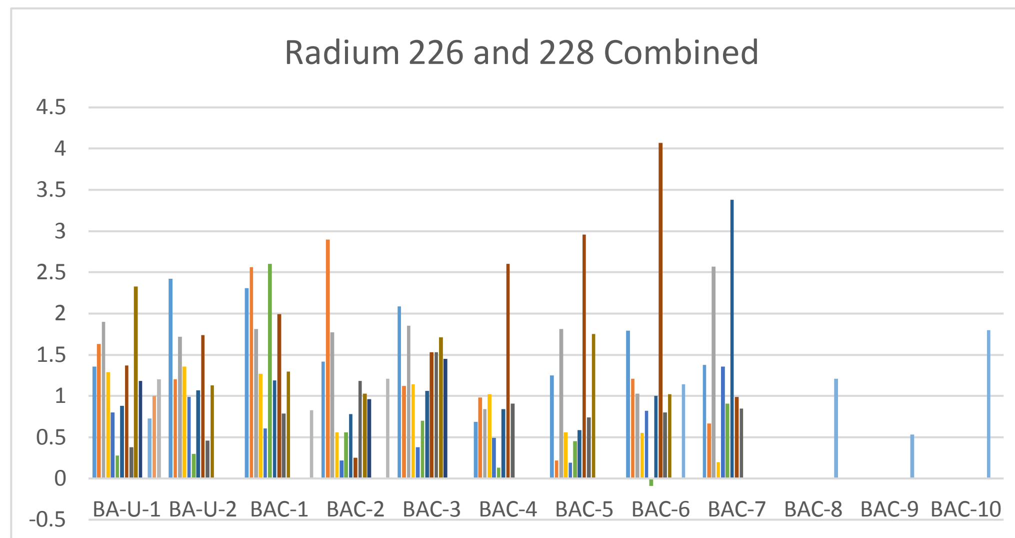
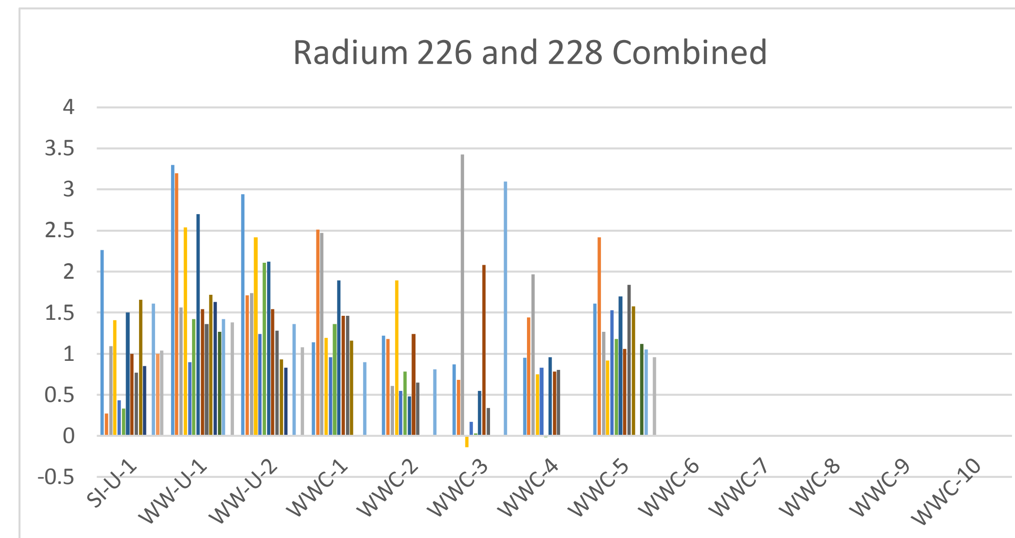
3.5
3
2.5
2
1.5
1
0.5
0
CL-U-1
CL-U-2
CLW-1
CLW-2
CLW-3
CLW-4
CLW-5
CLW-6
CLW-7
CLW-8
CLW-9
CL-U-3


Radium 226 and 228 Combined
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
BA-U-1
BA-U-2
BAC-1
BAC-2
BAC-3
BAC-4
BAC-5
BAC-6
BAC-7
BAC-8
BAC-9
BAC-10


Radium 226 and 228 Combined
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
SI-U-1
WW-U-1
WW-U-2
WWC-1
WWC-2
WWC-3
WWC-4
WWC-5
WWC-6
WWC-7
WWC-8
WWC-9
WWC-10

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	33.23	12/7/2015	12:54
WW-U-2	23.42	12/7/2015	12:59
SI-U-1	32.47	12/7/2015	13:09
CL-U-1	32.02	12/7/2015	13:35
CL-U-2	37.55	12/7/2015	13:32
CL-W-1	31.05	12/7/2015	13:49
CL-W-2	33.14	12/7/2015	15:55
CL-W-3	31.54	12/7/2015	9:50
CL-W-4	30.56	12/7/2015	11:34
CL-W-5	29.76	12/7/2015	13:21
CL-W-6	28.71	12/7/2015	15:00
CL-W-7	35.23	12/7/2015	13:41
CL-W-8	32.37	12/7/2015	13:47
BA-U-1	39.21	12/7/2015	13:15
BA-U-2	33.26	12/7/2015	13:22
BAC-1	39.32	12/7/2015	16:58
BAC-2	51.38	12/7/2015	17:22
BAC-3	51.02	12/7/2015	17:34
BAC-4	35.35	12/7/2015	17:44
BAC-5	32.62	12/7/2015	17:47
BAC-6	29.76	12/7/2015	17:51
BAC-7	31.26	12/7/2015	17:54
WWC-1	21.16	12/7/2015	17:35
WWC-2	22.16	12/7/2015	17:40
WWC-3	16.42	12/7/2015	17:45
WWC-4	17.85	12/7/2015	17:50
WWC-5	18.78	12/7/2015	17:55

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	33.08	3/3/2016	10:23
WW-U-2	23.52	3/3/2016	9:21
SI-U-1	32.45	3/3/2016	10:27
CL-U-1	31.53	3/3/2016	9:33
CL-U-2	37.09	3/3/2016	9:31
CL-W-1	31.56	3/3/2016	10:36
CL-W-2	32.59	3/3/2016	10:34
CL-W-3	30.91	3/3/2016	13:05
CL-W-4	30.02	3/3/2016	13:02
CL-W-5	28.17	3/3/2016	13:00
CL-W-6	28.13	3/3/2016	12:57
CL-W-7	34.75	3/3/2016	10:40
CL-W-8	31.89	3/3/2016	10:38
BA-U-1	38.82	3/3/2016	9:27
BA-U-2	33.05	3/3/2016	9:24
BAC-1	39.85	3/3/2016	9:16
BAC-2	51.31	3/3/2016	9:11
BAC-3	51.29	3/3/2016	9:07
BAC-4	34.97	3/3/2016	8:59
BAC-5	32.07	3/3/2016	8:57
BAC-6	29.27	3/3/2016	8:55
BAC-7	29.78	3/3/2016	8:48
WWC-1	20.92	3/3/2016	10:21
WWC-2	21.79	3/3/2016	10:17
WWC-3	16.12	3/3/2016	10:12
WWC-4	17.56	3/3/2016	10:11
WWC-5	18.5	3/3/2016	10:09

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.2	6/24/2016	9:18
WW-U-2	24.21	6/24/2016	9:40
SI-U-1	32.93	6/24/2016	9:23
CL-U-1	31.88	6/24/2016	9:52
CL-U-2	37.41	6/24/2016	9:49
CL-W-1	30.67	6/24/2016	10:20
CL-W-2	32.49	6/24/2016	10:02
CL-W-3	30.78	6/24/2016	10:15
CL-W-4	29.86	6/24/2016	10:13
CL-W-5	27.97	6/24/2016	10:10
CL-W-6	27.9	6/24/2016	10:06
CL-W-7	34.98	6/24/2016	10:28
CL-W-8	32.07	6/24/2016	10:25
BA-U-1	39.13	6/24/2016	9:44
BA-U-2	33.49	6/24/2016	9:34
BAC-1	40.42	6/24/2016	11:40
BAC-2	51.38	6/24/2016	11:46
BAC-3	51.35	6/24/2016	11:52
BAC-4	34.85	6/24/2016	10:38
BAC-5	31.79	6/24/2016	10:41
BAC-6	28.86	6/24/2016	10:44
BAC-7	30.26	6/24/2016	10:47
WWC-1	21.47	6/24/2016	11:25
WWC-2	22.33	6/24/2016	11:22
WWC-3	16.63	6/24/2016	11:17
WWC-4	18.07	6/24/2016	11:14
WWC-5	19.03	6/24/2016	11:12

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.42	8/30/2016	9:22
WW-U-2	24.57	8/30/2016	9:27
SI-U-1	33.49	8/30/2016	9:41
CL-U-1	32.74	8/30/2016	16:16
CL-U-2	38.31	8/30/2016	16:17
CL-W-1	31.52	8/30/2016	16:28
CL-W-2	33.5	8/30/2016	16:31
CL-W-3	31.81	8/30/2016	16:34
CL-W-4	30.89	8/30/2016	16:38
CL-W-5	28.99	8/30/2016	16:39
CL-W-6	28.95	8/30/2016	16:43
CL-W-7	35.84	8/30/2016	16:23
CL-W-8	32.93	8/30/2016	16:25
BA-U-1	39.95	8/30/2016	10.:11
BA-U-2	34.24	8/30/2016	10:20
BAC-1	40.97	8/30/2016	11:42
BAC-2	52.1	8/30/2016	13:03
BAC-3	51.94	8/30/2016	14:40
BAC-4	35.68	8/30/2016	9:41
BAC-5	32.67	8/30/2016	9:36
BAC-6	29.64	8/30/2016	9:30
BAC-7	31.09	8/30/2016	8:33
WWC-1	22.4	8/30/2016	10:27
WWC-2	22.87	8/30/2016	10:31
WWC-3	17.17	8/30/2016	10:36
WWC-4	18.61	8/30/2016	10:39
WWC-5	19.6	8/30/2016	10:45

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.74	11/9/2016	13:36
WW-U-2	24.81	11/9/2016	13:39
SI-U-1	33.74	11/9/2016	13:42
CL-U-1	33.04	11/9/2016	13:56
CL-U-2	38.59	11/9/2016	13:54
CL-W-1	31.89	11/9/2016	14:07
CL-W-2	34.00	11/9/2016	14:10
CL-W-3	32.34	11/9/2016	14:15
CL-W-4	31.43	11/9/2016	14:18
CL-W-5	29.58	11/9/2016	14:19
CL-W-6	29.55	11/9/2016	14:20
CL-W-7	36.20	11/9/2016	14:03
CL-W-8	33.28	11/9/2016	14:06
BA-U-1	40.27	11/9/2016	13:49
BA-U-2	34.59	11/9/2016	13:47
BAC-1	41.51	11/9/2016	10:00
BAC-2	52.61	11/9/2016	10:02
BAC-3	52.10	11/9/2016	10:04
BAC-4	35.98	11/9/2016	14:36
BAC-5	32.90	11/9/2016	14:34
BAC-6	29.81	11/9/2016	14:31
BAC-7	30.92	11/9/2016	14:28
WWC-1	22.27	11/9/2016	13:28
WWC-2	23.22	11/9/2016	13:30
WWC-3	17.43	11/9/2016	13:23
WWC-4	18.88	11/9/2016	13:20
WWC-5	19.85	11/9/2016	13:18

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	33.88	3/30/2017	10:22
WW-U-2	22.19	3/30/2017	10:32
SI-U-1	32.89	3/30/2017	10:39
CL-U-1	31.99	3/30/2017	10:53
CL-U-2	37.56	3/30/2017	10:51
CL-W-1	32.84	3/30/2017	11:58
CL-W-2	32.72	3/30/2017	11:35
CL-W-3	31.08	3/30/2017	11:38
CL-W-4	30.25	3/30/2017	11:40
CL-W-5	28.41	3/30/2017	11:43
CL-W-6	28.40	3/30/2017	11:45
CL-W-7	35.15	3/30/2017	11:50
CL-W-8	32.04	3/30/2017	11:54
BA-U-1	39.29	3/30/2017	10:47
BA-U-2	33.67	3/30/2017	10:43
BAC-1	40.89	3/30/2017	12:23
BAC-2	51.32	3/30/2017	12:28
BAC-3	51.94	3/30/2017	12:33
BAC-4	34.73	3/30/2017	11:09
BAC-5	31.71	3/30/2017	11:07
BAC-6	28.74	3/30/2017	11:03
BAC-7	30.03	3/30/2017	11:01
WWC-1	18.91	3/30/2017	11:22
WWC-2	22.21	3/30/2017	11:27
WWC-3	16.53	3/30/2017	11:17
WWC-4	17.97	3/30/2017	11:20
WWC-5	17.94	3/30/2017	11:22

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	34.70	6/21/2017	8:10
WW-U-2	24.75	6/21/2017	8:19
SI-U-1	33.46	6/21/2017	8:24
CL-U-1	32.13	6/21/2017	8:42
CL-U-2	37.72	6/21/2017	8:38
CL-W-1	30.74	6/21/2017	9:24
CL-W-2	32.35	6/21/2017	9:27
CL-W-3	30.72	6/21/2017	9:29
CL-W-4	29.90	6/21/2017	9:32
CL-W-5	28.06	6/21/2017	9:34
CL-W-6	28.01	6/21/2017	9:36
CL-W-7	35.16	6/21/2017	9:20
CL-W-8	32.21	6/21/2017	9:22
BA-U-1	39.41	6/21/2017	8:32
BA-U-2	33.90	6/21/2017	8:29
BAC-1	41.29	6/21/2017	11:30
BAC-2	50.94	6/21/2017	11:36
BAC-3	51.14	6/21/2017	11:41
BAC-4	34.08	6/21/2017	9:50
BAC-5	30.98	6/21/2017	9:47
BAC-6	28.03	6/21/2017	9:46
BAC-7	29.30	6/21/2017	9:44
WWC-1	21.95	6/21/2017	13:16
WWC-2	22.74	6/21/2017	8:01
WWC-3	17.04	6/21/2017	11:51
WWC-4	18.48	6/21/2017	11:48
WWC-5	19.44	6/21/2017	11:46

CCR Well Levels

Well	Depth	Date	Time
WW-U-1	35.43	10/4/2017	12:47
WW-U-2	25.49	10/5/2017	12:53
SI-U-1	34.28	10/6/2017	12:59
CL-U-1	33.25	10/7/2017	13:13
CL-U-2	38.81	10/8/2017	13:10
CL-W-1	31.80	10/9/2017	13:31
CL-W-2	33.60	10/10/2017	13:27
CL-W-3	31.93	10/11/2017	13:35
CL-W-4	31.09	10/12/2017	13:23
CL-W-5	29.26	10/13/2017	13:20
CL-W-6	29.26	10/14/2017	13:19
CL-W-7	36.23	10/15/2017	13:34
CL-W-8	33.28	10/16/2017	13:32
BA-U-1	40.42	10/17/2017	13:05
BA-U-2	34.85	10/18/2017	13:04
BAC-1	41.78	10/19/2017	13:16
BAC-2	52.03	10/20/2017	13:11
BAC-3	52.31	10/21/2017	13:07
BAC-4	35.29	10/22/2017	13:18
BAC-5	32.19	10/23/2017	13:22
BAC-6	29.24	10/24/2017	13:27
BAC-7	30.48	10/25/2017	13:33
WWC-1	22.69	10/26/2017	9:42
WWC-2	23.51	10/27/2017	13:43
WWC-3	17.80	10/28/2017	13:44
WWC-4	19.27	10/29/2017	13:42
WWC-5	20.26	10/30/2017	13:40

CCR Well Levels

Well	Depth	Date
WW-U-1	36.14	3/26/2018
WW-U-2	25.79	3/26/2018
SI-U-1	34.04	3/26/2018
CL-U-1	32.64	3/26/2018
CL-U-2	38.22	3/26/2018
CL-W-1	31.73	3/26/2018
CL-W-2	33.49	3/26/2018
CL-W-3	31.73	3/26/2018
CL-W-4	30.94	3/26/2018
CL-W-5	29.00	3/26/2018
CL-W-6	28.96	3/26/2018
CL-W-7	35.99	3/26/2018
CL-W-8	33.11	3/26/2018
BA-U-1	40.28	3/26/2018
BA-U-2	34.74	3/26/2018
BAC-1	42.05	3/26/2018
BAC-2	34.62	3/26/2018
BAC-3	52.76	3/26/2018
BAC-4	35.82	3/26/2018
BAC-5	33.28	3/26/2018
BAC-6	30.53	3/26/2018
BAC-7	31.88	3/26/2018
WWC-1	22.56	3/26/2018
WWC-2	23.31	3/26/2018
WWC-3	17.55	3/26/2018
WWC-4	19.04	3/26/2018
WWC-5	20.08	3/26/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.20	6/13/2018
WW-U-2	25.95	6/13/2018
SI-U-1	34.27	6/13/2018
CL-U-1	32.83	6/13/2018
CL-U-2	38.42	6/13/2018
CL-W-1	31.92	6/13/2018
CL-W-2	33.53	6/13/2018
CL-W-3	31.72	6/13/2018
CL-W-4	30.79	6/13/2018
CL-W-5	28.95	6/13/2018
CL-W-6	29.12	6/13/2018
CL-W-7	36.19	6/13/2018
CL-W-8	33.31	6/13/2018
BA-U-1	40.54	6/13/2018
BA-U-2	35.00	6/13/2018
BAC-1	42.29	6/13/2018
BAC-2	52.68	6/13/2018
BAC-3	53.92	6/13/2018
BAC-4	35.83	6/13/2018
BAC-5	33.32	6/13/2018
BAC-6	30.52	6/13/2018
BAC-7	31.83	6/13/2018
WWC-1	22.89	6/13/2018
WWC-2	23.64	6/13/2018
WWC-3	17.92	6/13/2018
WWC-4	19.34	6/13/2018
WWC-5	20.19	6/13/2018

CCR Well Levels

Well	Depth	Date
WW-U-1	36.74	10/24/2018
WW-U-2	26.65	10/24/2018
SI-U-1	35.25	10/24/2018
CL-U-1	34.43	10/24/2018
CL-U-2	40.02	10/24/2018
CL-W-1	33.69	10/24/2018
CL-W-2	35.53	10/24/2018
CL-W-3	33.67	10/24/2018
CL-W-4	32.74	10/24/2018
CL-W-5	30.84	10/24/2018
CL-W-6	30.79	10/24/2018
CL-W-7	37.82	10/24/2018
CL-W-8	35.01	10/24/2018
BA-U-1	42.07	10/24/2018
BA-U-2	36.40	10/24/2018
BAC-1	43.46	10/24/2018
BAC-2	54.24	10/24/2018
BAC-3	54.22	10/24/2018
BAC-4	35.66	10/24/2018
BAC-5	35.70	10/24/2018
BAC-6	33.22	10/24/2018
BAC-7	34.85	10/24/2018
WWC-1	23.70	10/24/2018
WWC-2	24.48	10/24/2018
WWC-3	18.74	10/24/2018
WWC-4	20.22	10/24/2018
WWC-5	21.23	10/24/2018

Original CCR Wells
Appendix III and IV Constituents
America West COC #1

CCR Wells	Level	Date
WW-U-1	35.34	5/20/19
WW-U-2	25.90	5/20/19
SI-U-1	34.60	5/20/19
CL-U-1	33.35	5/20/19
CL-U-2	38.93	5/20/19
CL-W-1	32.93	5/20/19
CL-W-2	34.76	5/20/19
CL-W-3	32.86	5/20/19
CL-W-4	31.89	5/20/19
CL-W-5	29.99	5/20/19
CL-W-6	29.91	5/20/19
CL-W-7	36.94	5/20/19
CL-W-8	34.18	5/20/19
BA-U-1	41.22	5/20/19
BA-U-2	35.55	5/20/19
BAC-1	43.02	5/20/19
BAC-2	54.19	5/20/19
BAC-3	54.69	5/20/19
BAC-4	37.62	5/20/19
BAC-5	35.66	5/20/19
BAC-6	33.08	5/20/19
BAC-7	34.69	5/20/19
WWC-1	22.95	5/20/19
WWC-2	24.70	5/20/19
WWC-3	18.01	5/20/19
WWC-4	19.47	5/20/19
WWC-5	20.47	5/20/19

CCR New Wells
Appendix III and IV Constituents
America West COC #2

Investigative W	Level	Date
RW-4	19.85	5/20/19
RW-5	45.41	5/20/19
RW-7	13.80	5/20/19
WDB-19	28.00	5/20/19

New CCR Wells
Appendix III and IV Constituents
America West COC #1

Investigative W	Level	Date
CLW-9	18.37	5/20/19
WWC-6	35.74	5/20/19
WWC-7	17.47	5/20/19
WWC-8	27.06	5/20/19
WWC-9	23.80	5/20/19
WWC-10	17.80	5/20/19
BAC-8	45.65	5/20/19
BAC-9	46.70	5/20/19
BAC-10	47.21	5/20/19
CLU-3	41.49	5/20/19

Appendix IV - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226 and 228 combined

State Discharge Permit Wells
Chemtech COC #3

(All Constituents* - N	Level	Date
WR-101	54.61	5/20/19
WR-102	44.76	5/20/19
WR-103	47.30	5/20/19
EP-W-19	32.61	5/20/19

(TBS/Boron	Level	Date
RW-6	44.17	5/20/19
RW-9	42.91	5/20/19
WDB-7	41.72	5/20/19
EP-W-23	30.71	5/20/19
EP-W-27	28.92	5/20/19
WDB-19	28.00	5/20/19

* TDS, Boron, Chloride, Sulfate, Alkalinity, Sodium, Magnesium, Potassium, Calcium

Corrective Action Plan Well
Chemtech COC #4

(TDS)	Level	Date
RW-5	45.41	5/20/19

Appendix III - Boron, Calcium, Chloride, Fluoride, pH, Sulfate, TDS

Original CCR Wells
Appendix III and IV Constituents
America West COC #1

CCR Wells	Level	Date
WW-U-1	35.91	10/17/19
WW-U-2	26.64	10/17/19
SI-U-1	35.35	10/17/19
CL-U-1	34.52	10/17/19
CL-U-2	40.08	10/17/19
CL-W-1	33.81	10/17/19
CL-W-2	35.70	10/17/19
CL-W-3	33.85	10/17/19
CL-W-4	32.90	10/17/19
CL-W-5	31.02	10/17/19
CL-W-6	30.99	10/17/19
CL-W-7	37.98	10/17/19
CL-W-8	35.11	10/17/19
BA-U-1	42.09	10/17/19
BA-U-2	36.42	10/17/19
BAC-1	43.71	10/17/19
BAC-2	54.62	10/17/19
BAC-3	55.01	10/17/19
BAC-4	38.14	10/17/19
BAC-5	36.01	10/17/19
BAC-6	33.01	10/17/19
BAC-7	35.06	10/17/19
WWC-1	23.81	10/17/19
WWC-2	24.61	10/17/19
WWC-3	18.90	10/17/19
WWC-4	20.37	10/17/19
WWC-5	21.37	10/17/19

CCR New Wells
Appendix III and IV Constituents
America West COC #2

Investigative W	Level	Date
RW-4	20.69	10/17/19
RW-5	46.31	10/17/19
RW-7	14.74	10/17/19
WDB-19	29.11	10/17/19

New CCR Wells
Appendix III and IV Constituents
America West COC #1

Investigative W	Level	Date
CLW-9	36.97	10/17/19
WWC-6	19.57	10/17/19
WWC-7	19.20	10/17/19
WWC-8	28.15	10/17/19
WWC-9	24.86	10/17/19
WWC-10	19.40	10/17/19
BAC-8	46.07	10/17/19
BAC-9	47.18	10/17/19
BAC-10	47.80	10/17/19
CLU-3	42.49	10/17/19

Appendix IV - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226 and 228 combined

State Discharge Permit Wells
Chemtech COC #3

(All Constituents* - I	Level	Date
WR-101	54.60	10/17/19
WR-102	43.14	10/17/19
WR-103	45.40	10/17/19
EP-W-19	33.52	10/17/19

(TBS/Boron	Level	Date
RW-6	44.69	10/17/19
RW-9	43.16	10/17/19
WDB-7	42.55	10/17/19
EP-W-23	31.66	10/17/19
EP-W-27	29.89	10/17/19
WDB-19	29.11	10/17/19

* TDS, Boron, Chloride, Sulfate, Alkalinity, Sodium, Magnesium, Potassium, Calcium

Corrective Action Plan Well
Chemtech COC #4

(TDS)	Level	Date
RW-5	46.31	10/17/19

Appendix III - Boron, Calcium, Chloride, Fluoride, pH, Sulfate, TDS

Original CCR Wells
Appendix III and IV Constituents
America West COC #1

	Level	Date
WW-U-1	30.42	3/23/2020
WW-U-2	22.31	3/23/2020
SI-U-1	33.78	3/23/2020
CL-U-1	33.46	3/23/2020
CL-U-2	38.92	3/23/2020
CL-W-1	32.75	3/23/2020
CL-W-2	34.71	3/23/2020
CL-W-3	32.87	3/23/2020
CL-W-4	31.99	3/23/2020
CL-W-5	30.09	3/23/2020
CL-W-6	30.08	3/23/2020
CL-W-7	36.70	3/23/2020
CL-W-8	33.95	3/23/2020
BA-U-1	40.76	3/23/2020
BA-U-2	34.81	3/23/2020
BAC-1	41.89	3/23/2020
BAC-2	53.88	3/23/2020
BAC-3	54.42	3/23/2020
BAC-4	37.21	3/23/2020
BAC-5	35.05	3/23/2020
BAC-6	32.35	3/23/2020
BAC-7	33.95	3/23/2020
WWC-1	22.85	3/23/2020
WWC-2	23.80	3/23/2020
WWC-3	18.02	3/23/2020
WWC-4	19.42	3/23/2020
WWC-5	20.39	3/23/2020

Appendix IV - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium 226 and 228 combined

Investigative Wells
Appendix III and IV Constituents
America West COC #2

	Level	Date
RW-4	19.80	3/23/2020
RW-5	45.88	3/23/2020
RW-7	14.01	3/23/2020
WDB-19	28.19	3/23/2020
RW-1		3/23/2020
EPW-15	43.84	3/23/2020

New CCR Wells
Appendix III and IV Constituents
America West COC #1

	Level	Date
CLW-9	36.13	3/23/2020
WWC-6	18.48	3/23/2020
WWC-7	17.68	3/23/2020
WWC-8	27.11	3/23/2020
WWC-9	23.98	3/23/2020
WWC-10	17.92	3/23/2020
WWC-11	22.01	3/23/2020
WWC-12	19.59	3/23/2020
WWC-13	18.66	3/23/2020
~~BAC-8~~	46.08	3/23/2020
~~BAC-9~~	47.08	3/23/2020
~~BAC-10~~	47.60	3/23/2020
BAC-11	47.73	3/23/2020
BAC-12	48.07	3/23/2020
BAC-13	45.11	3/23/2020
BAC-14	46.62	3/23/2020
BAC-15	45.92	3/23/2020
BAC-16	47.19	3/23/2020
~~BAC-17~~	45.33	3/23/2020
CLU-3	41.32	3/23/2020

State Discharge Permit Wells
Chemtech COC #3

	Level	Date
WR-101	35.91	3/23/2020
WR-102	32.16	3/23/2020
WR-103	45.40	3/23/2020
EP-W-19	32.81	3/23/2020

(TBS/Boron	Level	Date
~~RW-6~~	44.55	3/23/2020
RW-9	43.32	3/23/2020
WDB-7	42.13	3/23/2020
EP-W-23	30.75	3/23/2020
EP-W-27	28.79	3/23/2020
WDB-19	28.19	3/23/2020

* TDS, Boron, Chloride, Sulfate, Alkalinity, Sodium, Magnesium, Potassium, Calcium

Corrective Action Plan Well
Chemtech COC #4

(TDS)	Level	Date
RW-5	45.88	3/23/2020

Appendix III - Boron, Calcium, Chloride, Fluoride, pH, Sulfate, TDS

Round 1 Detection Monitoring - December 2-10, 2015

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	68.9	418	0.813	7.82	131	1040	<0.00200	0.0378	0.126	<0.00200	<0.000500	0.00537	<0.00400	<0.00200	0.346	<0.000150	0.00459	<0.00200	<0.00200	0.52	0.5	1.02
CL-U-2	< 0.500	73.8	404	0.611	7.73	132	1020	<0.00200	0.0317	0.129	<0.00200	<0.000500	0.00613	<0.00400	<0.00200	0.325	<0.000150	0.00406	<0.00200	<0.00200	0.55	1.2	1.75
CLW-1	< 0.500	55.7	322	0.844	7.95	76.5	832	<0.00200	0.0264	0.105	<0.00200	<0.000500	0.00814	<0.00400	<0.00200	0.3	<0.000150	0.00574	<0.00200	<0.00200	0.56	1.6	2.16
CLW-2	< 0.500	53.9	432	0.695	7.75	108	976	<0.00200	0.0283	0.0957	<0.00200	<0.000500	0.00576	<0.00400	<0.00200	0.36	<0.000150	0.00472	<0.00200	<0.00200	0.51	1.1	1.61
CLW-3	< 0.500	45	367	0.948	7.86	123	928	<0.00200	0.0375	0.111	<0.00200	<0.000500	0.00346	<0.00400	<0.00200	0.337	<0.000150	0.00492	<0.00200	<0.00200	0.4	1.3	1.7
CLW-4	< 0.500	44.5	320	1.37	7.87	73.3	828	<0.00200	0.0308	0.122	<0.00200	<0.000500	0.00336	<0.00400	<0.00200	0.319	<0.000150	0.00584	<0.00200	<0.00200	0.34	1.9	2.24
CLW-5	< 0.500	38.4	345	1.51	7.81	88.3	872	<0.00200	0.0188	0.0864	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.0325	<0.000150	0.00841	<0.00200	<0.00200	0.37	1.6	1.97
CLW-6	< 0.500	33.6	325	1.38	7.71	74.5	820	<0.00200	0.0249	0.0879	<0.00200	<0.000500	0.00335	<0.00400	<0.00200	0.316	<0.000150	0.0104	<0.00200	<0.00200	0.37	0.63	1
CLW-7	< 0.500	47.3	339	0.792	7.81	66.4	812	<0.00200	0.0234	0.0593	<0.00200	<0.000500	0.00421	<0.00400	<0.00200	0.282	<0.000150	0.00331	<0.00200	<0.00200	0.14	0.52	0.66
CLW-8	< 0.500	43.6	324	0.797	7.8	70.5	772	<0.00200	0.0155	0.107	<0.00200	<0.000500	0.00463	<0.00400	<0.00200	0.285	<0.000150	0.00626	<0.00200	<0.00200	0.4	0.74	1.14

Round 1

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	13.46	7.74	-42	1720	443	2.12	-
CL-U-2	14.72	6.92	-38	1750	604	2.6	-
CLW-1	14.84	7.69	-45	1490	383	2.28	0.952
CLW-2	9.95	7.86	-144	1810	99.6	1.76	1.16
CLW-3	11.24	7.95	-158	1740	128	1.9	1.11
CLW-4	14.9	7.95	-165	1540	25.1	1.67	0.98
CLW-5	15.12	7.96	-134	1620	46.4	1.6	1.04
CLW-6	15.3	8	-193	1550	30.8	0.98	0.998
CLW-7	16.38	7.54	8	1430	90.9	7.01	0.917
CLW-8	15.01	7.58	0	1530	11.3	2.09	0.976

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	51.4	430	1.21	8.06	121	984	<0.00200	0.0163	0.133	<0.00200	<0.000500	0.00305	<0.00400	<0.00200	0.313	<0.000150	0.0408	<0.00200	<0.00200	0.66	0.7	1.36
BA-U-2	< 0.500	53	343	0.727	8.9	48.9	82.4	<0.00200	0.0154	0.148	<0.00200	<0.000500	0.00971	<0.00400	<0.00200	0.297	<0.000150	0.0121	<0.00200	<0.00200	0.32	2.1	2.42
BAC-1	7.49	274	3280	0.299	7.37	3060	8860	0.00237	0.0146	0.1	<0.00200	<0.000500	0.00503	0.00605	<0.00200	1.52	<0.000150	0.143	0.0204	<0.00200	0.71	1.6	2.31
BAC-2	10.7	267	2000	0.741	7.29	3620	7820	<0.00200	0.0386	0.0472	<0.00200	<0.000500	0.0116	<0.00400	<0.00200	1.38	<0.000150	0.151	0.0164	<0.00200	0.48	0.94	1.42
BAC-3	6.09	387	2900	0.648	7.6	3840	9800	<0.00200	0.0191	0.0827	<0.00200	<0.000500	0.0615	<0.00400	<0.00200	2.13	<0.000150	0.0367	0.019	<0.00200	0.99	1.1	2.09
BAC-4	< 0.500	53	473	1.35	7.96	181	1150	<0.00200	0.0407	0.0821	<0.00200	<0.000500	0.0022	<0.00400	<0.00200	0.476	<0.000150	0.0104	<0.00200	<0.00200	0.19	0.5	0.69
BAC-5	< 0.500	51.1	483	1.11	7.83	129	1010	<0.00200	0.0357	0.0928	<0.00200	<0.000500	0.0161	<0.00400	<0.00200	0.479	<0.000150	0.00926	<0.00200	<0.00200	0.29	0.96	1.25
BAC-6	4.36	142	516	0.754	7.68	1080	2410	<0.00200	0.0134	0.0622	<0.00200	<0.000500	0.0363	<0.00400	<0.00200	0.599	<0.000150	0.0968	<0.00200	<0.00200	0.39	1.4	1.79
BAC-7	4.65	148	665	1.01	7.77	1360	2910	<0.00200	0.0191	0.0577	<0.00200	<0.000500	0.0264	<0.00400	<0.00200	0.681	<0.000150	0.0699	0.00276	<0.00200	0.46	0.92	1.38

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	14.56	7.93	-67	1590	106	2.51	-
BA-U-2	13.58	8.33	-85	1510	96.4	2.9	-
BAC-1	11.8	7.32	111	15100	54.8	1.84	9.35
BAC-2	15.7	7.12	79	11800	100	1.82	7.33
BAC-3	16.24	7.51	75	15000	34.2	1.36	9.28
BAC-4	14.36	7.93	12	2230	12.5	2.07	1.43
BAC-5	13.96	7.88	-18	2020	113	0.97	1.29
BAC-6	12.49	7.69	-157	3610	96.1	1.2	2.31
BAC-7	14.17	7.76	-96	4430	789	1.12	2.84

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	0.594	171	667	<0.100	7.4	918	2300	<0.00200	0.00266	0.112	<0.00200	<0.000500	0.0099	<0.00400	<0.00200	0.49	<0.000150	0.00554	<0.00200	<0.00200	0.56	1.7	2.26
WW-U-1	1.05	374	2180	<0.100	7.06	1470	5430	<0.00200	0.00453	0.178	<0.00200	<0.000500	0.0032	<0.00400	<0.00200	0.983	<0.000150	0.00619	0.00549	<0.00200	1	2.3	3.3
WW-U-2	1.6	358	2430	<0.100	7.23	1370	5540	<0.00200	0.00309	0.123	<0.00200	<0.000500	0.00582	0.0072	<0.00200	0.934	<0.000150	0.0237	0.00543	<0.00200	0.84	2.1	2.94
WWC-1	9.62	561	4840	<0.100	7.19	3150	11800	<0.00200	0.0181	0.0536	<0.00200	<0.000500	0.0139	<0.00400	<0.00200	2.69	0.00031	0.00701	0.0152	<0.00200	0.31	0.83	1.14
WWC-2	< 0.500	66.5	381	0.158	7.91	147	940	<0.00200	0.0155	0.0511	<0.00200	<0.000500	0.00348	<0.00400	<0.00200	0.241	<0.000150	0.00383	<0.00200	<0.00200	0.12	1.1	1.22
WWC-3	< 0.500	34.5	284	1.01	8.11	82.2	688	<0.00200	0.0102	0.0638	<0.00200	<0.000500	0.00577	<0.00400	<0.00200	0.243	<0.000150	0.0459	<0.00200	<0.00200	0.32	0.55	0.87
WWC-4	1.09	247	1270	0.387	7.61	800	3250	<0.00200	0.0116	0.09	<0.00200	<0.000500	0.00877	<0.00400	<0.00200	0.909	<0.000150	0.00467	0.00207	<0.00200	0.5	0.45	0.95
WWC-5	2.4	345	1810	0.331	7.47	1610	5020	<0.00200	0.00783	0.103	<0.00200	<0.000500	0.00892	0.0055	<0.00200	4.41	<0.000150	0.0265	<0.00200	<0.00200	0.51	1.1	1.61

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	10.79	7.27	-14	3720	74	6.93	-
WW-U-1	13.11	7.01	2	7920	32.9	3.2	-
WW-U-2	12.59	7.23	-11	7920	93.4	5.09	-
WWC-1	14.94	7.06	15	1850	110	1.28	11.5
WWC-2	17.36	7.88	-44	1680	79.9	1.08	1.07
WWC-3	13.92	8.1	-249	1430	121	1.29	0.918
WWC-4	14.73	7.4	-20	5230	61.1	1.52	3.3
WWC-5	15.35	7.3	-122	7740	348	0.97	4.88

Round 2 Detection Monitoring - February 23-March 8, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	47.7	391	0.839	8.52	123	908	<0.00200	0.0415	0.0953	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.401	<0.000150	0.00733	<0.00200	<0.00200	0.27	1.6	1.87
CL-U-2	< 0.500	59.9	372	0.873	7.75	119	940	<0.00200	0.0243	0.0934	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.387	<0.000150	0.00414	<0.00200	<0.00200	0.28	1	1.28
CLW-1	< 0.500	35.1	301	0.834	7.89	71.6	808	<0.00200	0.0266	0.0648	<0.00200	<0.000500	0.00235	<0.00400	<0.00200	0.361	<0.000150	0.00506	<0.00200	<0.00200	0.36	1.5	1.86
CLW-2	< 0.500	45.9	378	1.18	7.66	90.5	936	<0.00200	0.0243	0.0882	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.438	<0.000150	0.00481	<0.00200	<0.00200	0.51	0.53	1.04
CLW-3	< 0.500	40.5	336	1.35	7.92	96	884	<0.00200	0.0437	0.103	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.435	<0.000150	0.0049	<0.00200	<0.00200	0.47	1.1	1.57
CLW-4	< 0.500	32.1	282	1.53	7.87	80.9	776	<0.00200	0.0271	0.109	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.375	<0.000150	0.00762	<0.00200	<0.00200	0.37	0.7	1.07
CLW-5	< 0.500	35.4	318	1.82	7.91	85.7	824	<0.00200	0.0214	0.0869	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.411	<0.000150	0.00922	<0.00200	<0.00200	0.27	0.32	0.59
CLW-6	< 0.500	32.1	306	1.72	7.97	75.4	816	<0.00200	0.0246	0.095	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.4	<0.000150	0.0117	<0.00200	<0.00200	0.02	0.96	0.98
CLW-7	< 0.500	42.8	290	0.825	7.65	67.6	832	<0.00200	0.0239	0.0794	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.327	<0.000150	0.146	<0.00200	<0.00200	0.14	0.29	0.43
CLW-8	< 0.500	41.5	293	0.782	7.8	70.3	808	<0.00200	0.022	0.0839	<0.00200	<0.000500	0.00224	<0.00400	<0.00200	0.35	<0.000150	0.00499	<0.00200	<0.00200	0.32	0.32	0.64

Round 2

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	14.18	8.74	-209	1750	4.3	2.15	1.12
CL-U-2	14.41	7.75	-89	1820	4.6	1.85	1.17
CLW-1	15.84	7.95	-60	1560	3.8	1.4	0.996
CLW-2	17.53	7.81	-137	1840	2	9.35	1.17
CLW-3	14.99	7.87	-203	1710	0	3.96	1.09
CLW-4	17.08	7.81	-211	1490	11.5	1.82	0.955
CLW-5	17.06	7.82	-168	1650	10.9	8.45	1.06
CLW-6	15.83	7.91	-194	1600	6.2	0.95	1.02
CLW-7	16.53	7.75	9	1560	3.5	2.67	0.996
CLW-8	15.86	7.81	-25	1560	8	1.92	0.996

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	28.7	258	1.67	8.55	64.2	852	<0.00200	0.023	0.0969	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.376	<0.000150	0.0359	<0.00200	<0.00200	0.33	1.3	1.63
BA-U-2	< 0.500	67.4	529	0.938	8.02	55.7	1230	<0.00200	0.0199	0.175	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.514	<0.000150	0.00298	<0.00200	<0.00200	0.2	1	1.2
BAC-1	2.85	155	1730	<0.100	7.86	1390	5240	<0.00200	0.0174	0.39	<0.00200	<0.000500	0.00536	<0.00400	<0.00200	0.63	<0.000150	0.0607	0.0131	<0.00200	0.96	1.6	2.56
BAC-2	9.83	196	1600	<0.100	7.35	2900	7640	<0.00200	0.0411	0.0385	<0.00200	<0.000500	0.00742	<0.00400	0.00221	1.22	<0.000150	0.167	0.0128	<0.00200	0.4	2.5	2.9
BAC-3	6.55	406	3240	<0.100	7.62	3960	10400	<0.00200	0.0192	0.0553	<0.00200	<0.000500	0.00676	<0.00400	<0.00200	1.12	<0.000150	0.0337	0.0184	<0.00200	0.44	0.68	1.12
BAC-4	< 0.500	57.4	488	1.36	7.87	191	1290	<0.00200	0.0371	0.0806	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.532	<0.000150	0.0106	<0.00200	<0.00200	0.48	0.5	0.98
BAC-5	< 0.500	41.3	433	1.34	7.95	111	1010	<0.00200	0.0392	0.0736	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.476	<0.000150	0.00758	<0.00200	<0.00200	0.25	-0.03	0.22
BAC-6	2.67	98.4	491	0.734	7.72	636	1880	<0.00200	0.0144	0.0736	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.597	<0.000150	0.0569	<0.00200	<0.00200	0.61	0.6	1.21
BAC-7	4.43	132	623	1.07	7.89	1230	2980	<0.00200	0.0225	0.0372	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.699	<0.000150	0.0681	0.00274	<0.00200	0.16	0.51	0.67

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	13.53	8.63	5	1550	11.3	2.59	0.995
BA-U-2	15.78	7.94	-167	2240	19.7	1.06	1.44
BAC-1	17.51	8.16	39	6.5	10.7	3	4.11
BAC-2	16.74	7.2	322	9.96	3.2	2.59	6.26
BAC-3	14.4	7.36	29	1590	3.8	3.35	9.84
BAC-4	15.9	7.81	-55	2370	3.9	2.08	1.51
BAC-5	16.34	7.92	-23	1980	4	2.89	1.27
BAC-6	18.19	7.67	-8	2.94	0	1.73	1.88
BAC-7	14.22	7.9	-9	4560	3.9	2.46	2.92

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	168	752	0.557	7.65	665	2320	<0.00200	0.00781	0.0846	<0.00200	<0.000500	0.00346	<0.00400	<0.00200	0.634	<0.000150	0.00671	<0.00200	<0.00200	0.43	-0.16	0.27
WW-U-1	1.03	346	2430	<0.100	7.23	1440	5330	<0.00200	0.00446	0.123	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.33	<0.000150	0.00669	0.00432	<0.00200	1	2.2	3.2
WW-U-2	1.59	362	2410	<0.100	7.34	1370	5780	<0.00200	0.00846	0.0761	<0.00200	<0.000500	0.00735	<0.00400	<0.00200	1.35	<0.000150	0.0126	0.0108	<0.00200	0.51	1.2	1.71
WWC-1	6.01	458	4530	0.256	7.24	2710	10800	<0.00200	0.00331	0.072	<0.00200	<0.000500	0.00369	0.00842	<0.00200	1.08	<0.000150	0.0103	0.00919	<0.00200	0.91	1.6	2.51
WWC-2	< 0.500	61.3	352	0.208	7.97	131	932	<0.00200	0.0147	0.0421	<0.00200	<0.000500	0.00335	<0.00400	<0.00200	0.162	<0.000150	0.00391	<0.00200	<0.00200	0.18	1	1.18
WWC-3	< 0.500	29.2	203	0.845	8.2	78.5	660	<0.00200	0.021	0.0357	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.172	<0.000150	0.00593	<0.00200	<0.00200	0.16	0.52	0.68
WWC-4	0.826	185	1100	0.39	7.31	716	3100	<0.00200	0.00923	0.101	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.75	<0.000150	0.00783	<0.00200	<0.00200	0.6	0.84	1.44
WWC-5	1.59	320	1640	0.319	7.22	1210	4790	<0.00200	0.00371	0.0882	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.41	<0.000150	0.0205	0.00345	<0.00200	0.52	1.9	2.42

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	12.99	7.49	11	3790	7.4	1.37	2.42
WW-U-1	15.75	7.21	-117	8030	19.6	4.07	5.06
WW-U-2	14.5	7.34	-22	9240	12.9	2.4	5.82
WWC-1	15.29	7.11	-108	1400	11.8	7.82	8.62
WWC-2	14.19	7.75	-86	1720	9.1	2.37	1.1
WWC-3	15.63	8.1	-183	1190	2	1.36	0.759
WWC-4	15.58	7.37	-8	5004	4.7	1.61	3.18
WWC-5	15	7.22	19	7510	6.4	2	4.75

Date: 2/29/2016

Round 3 Detection Monitoring - June 6-15, 2016

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	51.2	414	1.01	7.83	122	1080	<0.00200	0.0507	0.0887	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.378	<0.000150	0.00491	<0.00200	<0.00200	0.11	0.72	0.83
CL-U-2	< 0.500	53.7	390	1.14	7.75	121	976	<0.00200	0.0245	0.0933	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.346	<0.000150	0.00391	<0.00200	<0.00200	0.26	1.5	1.76
CLW-1	< 0.500	34.6	312	1.13	7.9	70.1	716	<0.00200	0.0285	0.0621	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.318	<0.000150	0.00438	<0.00200	<0.00200	0.28	0.89	1.17
CLW-2	< 0.500	43.9	402	1.21	7.84	87.9	976	<0.00200	0.0264	0.0819	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.396	<0.000150	0.00427	<0.00200	<0.00200	0.25	1.1	1.35
CLW-3	< 0.500	36.2	346	1.3	7.86	104	876	<0.00200	0.0402	0.0992	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.375	<0.000150	0.00463	<0.00200	<0.00200	0.35	1.2	1.55
CLW-4	< 0.500	30.6	294	1.58	7.79	77.9	748	<0.00200	0.0196	0.119	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.338	<0.000150	0.0092	<0.00200	<0.00200	0.45	0.72	1.17
CLW-5	< 0.500	33	336	1.81	7.86	84.9	848	<0.00200	0.0182	0.0851	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.352	<0.000150	0.00868	<0.00200	<0.00200	0.27	0.65	0.92
CLW-6	< 0.500	29.8	313	1.73	7.9	73.2	756	<0.00200	0.0181	0.0901	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.333	<0.000150	0.0105	<0.00200	<0.00200	0.34	1.4	1.74
CLW-7	< 0.500	39.3	328	1.16	7.64	67.4	732	<0.00200	0.0246	0.0581	<0.00200	<0.000500	0.00891	<0.00400	<0.00200	0.331	<0.000150	0.00638	<0.00200	<0.00200	0.19	0.55	0.74
CLW-8	< 0.500	40.3	312	1.08	7.82	69.7	808	<0.00200	0.0225	0.0797	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.32	<0.000150	0.00435	<0.00200	<0.00200	0.27	0.32	0.59

Round 3

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	18.94	8.04	-204	1910	22.6	1.2	1.22
CL-U-2	18.47	7.7	-136	1900	1	2.72	1.22
CLW-1	23.71	7.77	62	1550	0	1.34	0.99
CLW-2	22.15	7.66	-169	1840	0	1.31	1.17
CLW-3	20.8	7.71	-225	1720	0.8	1.8	1.1
CLW-4	19.51	7.8	-235	1480	0	4.39	0.95
CLW-5	21.24	7.77	-209	1570	11.5	4.22	1.01
CLW-6	18.81	7.87	-235	1600	0	1.7	1.02
CLW-7	16.73	7.62	66	1580	8.9	3.82	1.01
CLW-8	20.93	7.66	55	1510	0	12.58	0.966

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	195	1130	0.801	7.63	339	2520	<0.00200	0.0177	0.0935	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.773	<0.000150	0.00317	0.00426	<0.00200	0.3	1.6	1.9
BA-U-2	< 0.500	15.9	284	0.865	12	40.6	720	<0.00200	<0.00200	0.128	<0.00200	<0.000500	0.0032	<0.00400	<0.00200	0.315	<0.000150	0.016	<0.00200	<0.00200	0.22	1.5	1.72
BAC-1	4.73	191	2240	0.402	7.59	1840	6420	<0.00200	0.0164	0.081	<0.00200	<0.000500	0.0033	<0.00400	<0.00200	1.3	<0.000150	0.0669	0.0168	<0.00200	0.51	1.3	1.81
BAC-2	11.2	216	1650	0.986	7.17	3220	7520	<0.00200	0.0416	0.0248	<0.00200	<0.000500	0.00488	<0.00400	<0.00200	1.32	<0.000150	0.14	0.0142	<0.00200	0.17	1.6	1.77
BAC-3	6.82	445	3230	0.794	7.42	4490	10900	<0.00200	0.0158	0.048	<0.00200	<0.000500	0.00707	<0.00400	<0.00200	2.53	<0.000150	0.0269	0.0198	<0.00200	0.25	1.6	1.85
BAC-4	< 0.500	66.1	551	1.38	7.73	223	1280	<0.00200	0.0334	0.0772	<0.00200	<0.000500	0.00461	<0.00400	<0.00200	0.509	<0.000150	0.0122	<0.00200	<0.00200	0.16	0.68	0.84
BAC-5	< 0.500	50.4	541	1.26	7.79	122	1220	<0.00200	0.0337	0.0839	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.494	<0.000150	0.00738	<0.00200	<0.00200	0.11	1.7	1.81
BAC-6	1.7	89.5	521	1.04	7.72	448	1560	<0.00200	0.0122	0.0859	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.542	<0.000150	0.0359	<0.00200	<0.00200	0.27	0.76	1.03
BAC-7	4.51	132	685	1.31	7.69	1370	2870	<0.00200	0.0234	0.0315	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.674	<0.000150	0.0749	0.00319	<0.00200	0.17	2.4	2.57

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.51	7.48	-114	4730	4.9	1.73	3.03
BA-U-2	20.17	11.9	-206	1980	5.1	4.04	1.26
BAC-1	20.91	7.43	-5	10.3	33.2	3.43	6.41
BAC-2	19.81	7.01	33	11.6	2	0.69	7.18
BAC-3	18.81	7.19	16	16.6	2.6	1.26	10.3
BAC-4	18.21	7.71	83	2490	2.6	3.05	1.59
BAC-5	18.58	7.75	51	2260	0	1320	1.45
BAC-6	20.42	7.7	50	2740	0.4	21.84	1.75
BAC-7	21.43	7.63	-7	4510	8	15.04	2.89

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	129	901	0.564	7.6	318	1880	<0.00200	0.00989	0.0929	<0.00200	<0.000500	0.0156	<0.00400	<0.00200	0.499	<0.000150	0.00411	<0.00200	<0.00200	0.45	0.64	1.09
WW-U-1	1.18	296	2030	0.386	7.21	1300	5820	<0.00200	0.0052	0.115	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1	<0.000150	0.00888	0.00637	<0.00200	0.64	0.92	1.56
WW-U-2	1.49	412	2300	0.534	7.33	1180	5400	<0.00200	0.00538	0.0746	<0.00200	<0.000500	0.0114	<0.00400	<0.00200	1.08	<0.000150	0.0126	0.0107	<0.00200	0.64	1.1	1.74
WWC-1	3.59	526	3950	<0.100	7.12	1990	8820	<0.00200	0.00401	0.077	<0.00200	<0.000500	<0.00200	0.00532	<0.00200	2.18	<0.000150	0.00653	0.00824	<0.00200	0.47	2	2.47
WWC-2	< 0.500	59.1	369	0.833	7.79	145	956	<0.00200	0.0151	0.0408	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.225	<0.000150	0.00402	<0.00200	<0.00200	0.22	0.39	0.61
WWC-3	< 0.500	26.4	197	1.02	8.12	85.6	664	<0.00200	0.0213	0.0328	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.23	<0.000150	0.00574	<0.00200	<0.00200	0.13	3.3	3.43
WWC-4	0.627	138	902	0.576	7.57	406	2010	<0.00200	0.00498	0.0768	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.606	<0.000150	0.0082	<0.00200	<0.00200	0.27	1.7	1.97
WWC-5	1.65	406	1730	0.3	7.24	1140	5060	<0.00200	0.00608	0.067	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.4	<0.000150	0.0119	0.00363	<0.00200	0.42	0.85	1.27

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	18	7.54	-69	3350	0.3	8.11	2.14
WW-U-1	22.73	7.15	34	7560	0	4.74	4.76
WW-U-2	18.42	7.25	-66	8820	25.9	1.6	5.56
WWC-1	18.38	6.9	62	14.7	1.6	1.86	9.13
WWC-2	18.22	7.74	-101	1.74	1.9	5.2	1.12
WWC-3	16.62	7.99	-168	1.2	0	0.59	0.765
WWC-4	16.85	7.43	-8	3.63	1.2	0.85	2.32
WWC-5	17.35	7.01	15	7.44	1	0.78	4.69

Date: 6/13/2016

Round 4 Detection Monitoring - August 22-September 1, 2016

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	54.8	424	1.03	7.63	124	1030	<0.00200	0.0301	0.0911	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.375	<0.000150	0.00428	<0.00200	<0.00200	0.36	0.44	0.8
CL-U-2	< 0.500	57.7	406	1.17	7.69	113	948	<0.00200	0.0265	0.0961	<0.00200	<0.000500	0.00227	<0.00400	<0.00200	0.351	<0.000150	0.00508	<0.00200	<0.00200	0.31	1.1	1.41
CLW-1	< 0.500	35	315	1.18	7.89	65.4	832	<0.00200	0.0279	0.0594	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.316	<0.000150	0.00454	<0.00200	<0.00200	0.52	0.86	1.38
CLW-2	< 0.500	46.8	424	1.29	7.75	89.2	992	<0.00200	0.0284	0.0823	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.391	<0.000150	0.00462	<0.00200	<0.00200	0.31	0.62	0.93
CLW-3	< 0.500	38.7	349	1.33	7.75	109	896	<0.00200	0.0412	0.0995	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.368	<0.000150	0.00472	<0.00200	<0.00200	0.3	0.15	0.45
CLW-4	< 0.500	32.1	318	1.53	7.81	84.5	808	<0.00200	0.0316	0.104	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.336	<0.000150	0.00577	<0.00200	<0.00200	0.39	0.62	1.01
CLW-5	< 0.500	34.3	350	1.83	7.75	92.1	860	<0.00200	0.0189	0.0803	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.346	<0.000150	0.00798	<0.00200	<0.00200	0.24	0.27	0.51
CLW-6	< 0.500	31.5	331	1.73	7.84	77.1	812	<0.00200	0.0164	0.0966	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.342	<0.000150	0.011	<0.00200	<0.00200	0.2	1	1.2
CLW-7	< 0.500	42.1	336	1.1	7.71	70	760	<0.00200	0.024	0.0529	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.302	<0.000150	0.00396	<0.00200	<0.00200	0.17	0.33	0.5
CLW-8	< 0.500	40.1	327	1.08	7.73	75	720	<0.00200	0.0224	0.0761	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.308	<0.000150	0.00459	<0.00200	<0.00200	0.35	1	1.35

Round 4

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.53	7.66	-180	1.84	4.1	1.72	1.18
CL-U-2	19.27	7.65	-151	1.81	0	9.25	1.16
CLW-1	18.96	7.85	34	1.55	0	5.66	0.992
CLW-2	19.41	7.7	-177	1.81	0	10.68	1.16
CLW-3	19.1	7.74	-225	1.66	0	10.74	1.07
CLW-4	21.52	7.8	-244	1.54	0	5.07	0.985
CLW-5	20.36	7.74	-195	1.67	45.2	9.17	1.07
CLW-6	18.53	7.79	-235	1.61	0	4.22	1.03
CLW-7	19.86	7.62	-71	1.57	0.01	12.06	1.01
CLW-8	20.81	7.7	-78	1.53	0	5.02	0.976

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	180	1170	0.888	7.62	327	2390	<0.00200	0.0191	0.0802	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.684	<0.000150	0.00386	0.00384	<0.00200	0.45	0.84	1.29
BA-U-2	< 0.500	10.4	317	0.975	11.8	39.9	748	<0.00200	0.00225	0.114	<0.00200	<0.000500	0.00216	<0.00400	<0.00200	0.337	<0.000150	0.0147	<0.00200	<0.00200	0.26	1.1	1.36
BAC-1	4.95	221	2520	0.401	7.52	2380	7210	<0.00200	0.0146	0.0643	<0.00200	<0.000500	0.0028	<0.00400	<0.00200	1.42	<0.000150	0.0603	0.0148	<0.00200	0.63	0.64	1.27
BAC-2	10.5	203	1640	1.03	7.22	3180	7620	<0.00200	0.0431	0.0237	<0.00200	<0.000500	0.0081	<0.00400	<0.00200	1.17	<0.000150	0.166	0.0136	<0.00200	0.33	0.23	0.56
BAC-3	6.77	399	3350	1.28	7.36	4630	11700	<0.00200	0.0213	0.0436	<0.00200	<0.000500	0.00386	<0.00400	<0.00200	2.37	<0.000150	0.0294	0.019	<0.00200	0.38	0.76	1.14
BAC-4	< 0.500	56.1	498	1.35	7.62	210	1460	<0.00200	0.0358	0.0757	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.508	<0.000150	0.0103	<0.00200	<0.00200	0.19	0.83	1.02
BAC-5	< 0.500	49.4	561	1.25	7.68	127	1200	<0.00200	0.0331	0.0879	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.538	<0.000150	0.0077	<0.00200	<0.00200	0.1	0.46	0.56
BAC-6	1.38	80.2	546	0.901	7.61	502	1540	<0.00200	0.0115	0.0781	<0.00200	0.000677	0.00283	<0.00400	<0.00200	0.54	<0.000150	0.034	<0.00200	<0.00200	0.31	0.24	0.55
BAC-7	3.96	126	612	1.28	7.68	1370	2770	<0.00200	0.0232	0.0274	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.669	<0.000150	0.0942	0.00257	<0.00200	0.37	-0.17	0.2

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	20.11	7.46	-160	4.24	0	3.38	2.72
BA-U-2	17.77	11.83	-224	2.11	9.1	8.94	1.35
BAC-1	22.39	7.33	10	11.8	8.7	2.54	7.3
BAC-2	21.36	7.04	0	10200	0	2.17	6.33
BAC-3	22.52	7.22	34	15.4	0	2.18	9.58
BAC-4	19.45	7.62	-94	2350	0	11.45	1.51
BAC-5	19.21	7.62	-96	2340	0	10.71	1.5
BAC-6	19.95	7.59	9	2650	0	24.99	1.7
BAC-7	19.38	7.56	-77	4270	0	2.75	2.73

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	131	922	0.564	7.57	281	1880	<0.00200	0.00926	0.0858	<0.00200	<0.000500	0.00217	<0.00400	<0.00200	0.467	<0.000150	0.00295	<0.00200	<0.00200	0.45	0.96	1.41
WW-U-1	1.25	304	2200	0.327	7.21	1280	5270	<0.00200	0.00439	0.0916	<0.00200	<0.000500	0.00337	<0.00400	<0.00200	1.01	<0.000150	0.00835	0.00689	<0.00200	0.54	2	2.54
WW-U-2	0.641	308	2140	0.614	7.42	854	4550	<0.00200	0.00258	0.117	<0.00200	<0.000500	0.00424	<0.00400	<0.00200	0.994	<0.000150	0.0342	0.00617	<0.00200	0.82	1.6	2.42
WWC-1	10.2	457	4680	0.213	7.11	3130	12100	<0.00200	0.02	0.0335	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.41	0.00019	0.00966	0.0145	<0.00200	0.33	0.86	1.19
WWC-2	< 0.500	57.9	389	0.508	7.86	151	960	<0.00200	0.0152	0.0406	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.243	<0.000150	0.0034	<0.00200	<0.00200	0.69	1.2	1.89
WWC-3	< 0.500	27.3	220	1.03	8.02	78	628	<0.00200	0.0217	0.0342	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.241	<0.000150	0.00559	<0.00200	<0.00200	0.2	-0.34	-0.14
WWC-4	1.17	225	1330	0.422	7.37	868	3230	<0.00200	0.0131	0.065	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.879	<0.000150	0.00237	0.00238	<0.00200	0.27	0.48	0.75
WWC-5	2.87	326	1920	0.366	7.18	1700	5440	<0.00200	0.00717	0.0439	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.33	<0.000150	0.00742	0.00312	<0.00200	0.41	0.51	0.92

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	21.31	7.57	-21	3.25	1.6	14.7	2.08
WW-U-1	20.96	7.12	34	8.06	10.9	3.52	5.08
WW-U-2	19.51	7.41	-63	7.34	4.7	8.24	4.62
WWC-1	20.69	6.94	-34	18400	0	0.54	11.4
WWC-2	17.91	7.64	-153	1720	2.6	3.57	1.1
WWC-3	17.39	7.97	-176	1200	0	0.54	0.766
WWC-4	17.14	7.22	-68	5320	0	2.25	3.35
WWC-5	17.85	7.01	-89	7790	0.9	0.59	4.91

Date: 8/26/2016

Round 5 Detection Monitoring - October 17-26, 2016

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	< 0.500	57.4	424	0.959	7.7	115	912	<0.00200	0.037	0.089	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.217	<0.000150	0.00404	<0.00200	<0.00200	0.25	0.18	0.43
CL-U-2	< 0.500	59.5	395	0.99	7.73	113	864	<0.00200	0.0269	0.101	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.206	<0.000150	0.00401	<0.00200	<0.00200	0.36	0.84	1.2
CLW-1	< 0.500	38.9	325	1.15	7.8	67.8	824	<0.00200	0.0295	0.0668	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.189	<0.000150	0.0043	<0.00200	<0.00200	0.27	0.19	0.46
CLW-2	< 0.500	49.2	422	1.13	7.82	85.3	984	<0.00200	0.0258	0.0855	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.223	<0.000150	0.00456	<0.00200	<0.00200	0.31	0.34	0.65
CLW-3	< 0.500	40.8	366	1.19	7.83	100	944	<0.00200	0.0412	0.104	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.214	<0.000150	0.00508	<0.00200	<0.00200	0.35	0.13	0.48
CLW-4	< 0.500	34.6	335	1.39	7.84	85.9	828	<0.00200	0.0385	0.0932	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.203	<0.000150	0.00414	<0.00200	<0.00200	0.59	-0.37	0.22
CLW-5	< 0.500	35.3	339	1.69	7.89	82.1	928	<0.00200	0.0206	0.0812	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.204	<0.000150	0.00723	<0.00200	<0.00200	0.31	0.84	1.15
CLW-6	< 0.500	33.9	325	1.46	7.85	77.9	972	<0.00200	0.0287	0.0908	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.203	<0.000150	0.00638	<0.00200	<0.00200	0.35	0.18	0.53
CLW-7	< 0.500	42.8	343	1.14	7.9	68.6	796	<0.00200	0.0235	0.0551	<0.00200	<0.000500	0.00234	<0.00400	<0.00200	0.182	<0.000150	0.00413	<0.00200	<0.00200	0.27	0.32	0.59
CLW-8	< 0.500	41.7	334	1.11	7.77	68.9	744	<0.00200	0.0258	0.0797	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.189	<0.000150	0.00428	<0.00200	<0.00200	0.37	-0.28	0.09

Round 5

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	16.15	7.72	-195	1900	0.7	2.79	1.22
CL-U-2	16.89	7.67	-102	1820	0.4	0.82	1.17
CLW-1	16.85	7.77	-50	1520	2	1.57	0.974
CLW-2	17.05	7.76	-202	1900	0.4	3.82	1.21
CLW-3	15.28	7.75	-231	1720	1.8	1.29	1.1
CLW-4	14.67	7.78	-235	1620	7	1.4	1.04
CLW-5	17.4	7.71	-209	1690	8.1	1.41	1.08
CLW-6	15.85	7.83	-249	1620	1.1	1.72	1.04
CLW-7	17.42	7.7	-73	564	0	13.65	0.361
CLW-8	17.18	7.7	-100	1530	2.2	1.03	0.978

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	< 0.500	16.7	327	1.65	9.08	60.2	832	<0.00200	0.0362	0.0679	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.215	<0.000150	0.0163	<0.00200	<0.00200	0.67	0.13	0.8
BA-U-2	< 0.500	38.1	357	1.02	8.56	51.9	824	<0.00200	0.0234	0.131	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.21	<0.000150	0.00449	<0.00200	<0.00200	0.57	0.42	0.99
BAC-1	3.42	131	1850	0.437	8.8	1610	7720	<0.00200	0.0103	0.049	<0.00200	<0.000500	0.00612	<0.00400	<0.00200	0.402	<0.000150	0.0498	0.00852	<0.00200	0.34	0.27	0.61
BAC-2	9.71	216	1620	1.11	7.34	2980	7040	<0.00200	0.0444	0.0228	<0.00200	<0.000500	0.00644	<0.00400	<0.00200	0.414	<0.000150	0.165	0.0131	<0.00200	0.25	-0.03	0.22
BAC-3	7.04	401	3160	0.76	7.39	4260	11400	<0.00200	0.0226	0.0404	<0.00200	<0.000500	0.00362	<0.00400	<0.00200	0.812	<0.000150	0.0275	0.0195	<0.00200	0.24	0.14	0.38
BAC-4	< 0.500	59.2	534	1.34	7.8	222	1230	<0.00200	0.0352	0.0723	<0.00200	<0.000500	0.00212	<0.00400	<0.00200	0.243	<0.000150	0.00992	<0.00200	<0.00200	0.09	0.4	0.49
BAC-5	< 0.500	40.5	479	1.33	7.85	110	1070	<0.00200	0.0359	0.0909	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.219	<0.000150	0.00715	<0.00200	<0.00200	0.2	-0.01	0.19
BAC-6	4.35	133	606	0.97	7.61	1080	2620	<0.00200	0.022	0.0287	<0.00200	<0.000500	0.00257	<0.00400	<0.00200	0.266	<0.000150	0.0858	0.00369	<0.00200	0.13	0.69	0.82
BAC-7	3.97	135	628	1.42	7.69	1340	2880	<0.00200	0.0241	0.026	<0.00200	<0.000500	0.00217	<0.00400	<0.00200	0.279	<0.000150	0.0944	0.00279	<0.00200	0.26	1.1	1.36

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	16.41	9.07	6	1660	3.2	1.88	1.06
BA-U-2	16.67	8.77	-318	1600	1.7	1.76	1.03
BAC-1	18.66	7.57	-144	8800	7.7	0.55	6.19
BAC-2	19.51	7.01	-2	10200	0.6	0.46	6.34
BAC-3	18.63	7.15	2	16700	20	4.99	10.4
BAC-4	16.35	7.72	-120	0.859	3	4.2	0.55
BAC-5	16.43	7.85	-64	726	1.4	12.41	0.464
BAC-6	16.07	7.62	-86	1370	11.4	1.77	0.879
BAC-7	16.64	7.59	-67	1560	4.6	12.42	0.998

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	< 0.500	132	863	0.514	7.52	286	1850	<0.00200	0.00895	0.0871	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.254	<0.000150	0.00276	<0.00200	<0.00200	0.32	0.11	0.43
WW-U-1	1.23	348	2190	0.346	7.18	1230	5370	<0.00200	0.0041	0.0771	<0.00200	<0.000500	0.00538	<0.00400	<0.00200	0.479	<0.000150	0.00891	0.00579	<0.00200	0.73	0.17	0.9
WW-U-2	1.47	383	2340	0.416	7.22	1120	5540	<0.00200	0.00573	0.0704	<0.00200	<0.000500	0.00396	<0.00400	<0.00200	0.512	<0.000150	0.0111	0.0116	<0.00200	0.78	0.46	1.24
WWC-1	9.83	513	4540	0.133	7.04	2960	12500	<0.00200	0.0197	0.0317	<0.00200	<0.000500	0.00348	<0.00400	<0.00200	0.819	0.000198	0.00936	0.0153	<0.00200	0.23	0.73	0.96
WWC-2	< 0.500	58.5	369	0.42	7.88	140	960	<0.00200	0.0129	0.0543	<0.00200	<0.000500	0.0243	<0.00400	<0.00200	0.112	<0.000150	0.00809	<0.00200	<0.00200	0.1	0.45	0.55
WWC-3	< 0.500	27.7	224	1.08	8.01	86.1	612	<0.00200	0.0218	0.0332	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.123	<0.000150	0.00543	<0.00200	<0.00200	0.07	0.1	0.17
WWC-4	1.19	227	1200	0.509	7.32	763	3200	<0.00200	0.0136	0.0629	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.351	<0.000150	0.00222	0.00216	<0.00200	0.08	0.75	0.83
WWC-5	3.02	343	1850	0.401	0.71	1570	5300	<0.00200	0.00778	0.0389	<0.00200	<0.000500	0.00238	<0.00400	<0.00200	0.497	<0.000150	0.00498	0.0041	<0.00200	0.43	1.1	1.53

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	16.62	7.47	-22	3370	1	9	2.16
WW-U-1	17.72	6.99	7	8330	3	1.89	5.25
WW-U-2	17.84	7.19	-10	8400	2.6	1.89	5.29
WWC-1	15.78	6.93	-22	18600	0	0.51	11.6
WWC-2	15.91	7.75	-210	1680	6	1.08	1.07
WWC-3	16.26	7.94	-166	1210	0	0.24	0.772
WWC-4	16.51	7.22	-41	5140	0.2	1.09	3.24
WWC-5	15.83	7.02	-87	7930	0.2	0.37	4.99

Date: 10/17/2016

Round 6 Detection Monitoring - March 20-30, 2017

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	57.1	403	0.876	7.83	113	908	<0.00200	0.0322	0.0867	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.214	<0.000150	0.00365	<0.00200	<0.00200	0.62	0.22	0.62
CL-U-2	< 0.500	61.2	374	0.903	7.89	110	852	<0.00200	0.0272	0.0976	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.208	<0.000150	0.00386	<0.00200	<0.00200	0.4	0.39	0.4
CLW-1	< 0.500	38.4	295	1.05	7.83	62.4	768	<0.00200	0.0309	0.0631	<0.00200	<0.000500	0.0187	<0.00400	<0.00200	0.185	<0.000150	0.00654	<0.00200	<0.00200	0.41	0.78	1.2
CLW-2	< 0.500	49.7	377	1.07	7.85	92.9	936	<0.00200	0.0277	0.0811	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.219	<0.000150	0.00437	<0.00200	<0.00200	0.31	0.72	1
CLW-3	< 0.500	42.4	333	1.23	7.87	94.4	876	<0.00200	0.0423	0.103	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.214	<0.000150	0.00473	<0.00200	<0.00200	0.35	0.7	1.1
CLW-4	< 0.500	35.2	306	1.27	8.02	79.1	808	<0.00200	0.0388	0.0898	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.202	<0.000150	0.00439	<0.00200	<0.00200	0.39	0.12	0.39
CLW-5	< 0.500	36	320	1.71	7.88	79.9	748	<0.00200	0.0216	0.0801	<0.00200	<0.000500	0.00214	<0.00400	<0.00200	0.025	<0.000150	0.00666	<0.00200	<0.00200	0.4	0.38	0.4
CLW-6	< 0.500	33.4	302	1.48	7.91	66	752	<0.00200	0.0164	0.0976	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.193	<0.000150	0.00805	<0.00200	<0.00200	0.25	-0.35	0.25
CLW-7	< 0.500	46.4	312	1.02	7.68	61	824	<0.00200	0.0257	0.0545	<0.00200	<0.000500	0.00772	<0.00400	<0.00200	0.182	<0.000150	0.00425	<0.00200	<0.00200	0.14	0.18	0.14
CLW-8	< 0.500	42.8	301	1.03	7.71	63.8	772	<0.00200	0.0255	0.0707	<0.00200	<0.000500	0.012	<0.00400	<0.00200	0.189	<0.000150	0.00526	<0.00200	<0.00200	0.25	0.29	0.25

Round 6

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.27	7.52	-194	957	4.2	2.53	0.613
CL-U-2	15.81	7.48	-139	929	0	10.45	0.598
CLW-1	14.45	7.6	-173	1540	0	5.98	0.984
CLW-2	16.63	7.58	-221	950	0	9.29	0.609
CLW-3	16.58	7.66	-235	840	0	10.64	0.539
CLW-4	16.67	7.68	-253	785	0	2.14	0.502
CLW-5	16.63	7.6	-222	834	0	2.29	0.534
CLW-6	15.51	7.65	-245	790	0	8.85	0.505
CLW-7	15.48	7.52	-150	1600	0	1.94	1.02
CLW-8	15.08	7.57	-159	1550	0	1.55	0.991

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	24.5	259	1.57	8.59	48.8	648	<0.00200	0.0359	0.0856	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.193	<0.000150	0.0124	<0.00200	<0.00200	0.28	0.15	0.28
BA-U-2	< 0.500	3.76	328	0.886	12.1	39.2	728	<0.00200	0.00254	0.122	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.221	<0.000150	0.00986	<0.00200	<0.00200	0.3	0.47	0.3
BAC-1	4.01	188	2170	<0.100	7.47	1650	6320	<0.00200	0.0202	0.279	<0.00200	<0.000500	0.0412	<0.00400	<0.00200	0.429	<0.000150	0.0391	0.0152	<0.00200	1.1	1.5	2.6
BAC-2	10.5	193	1480	0.871	7.2	2780	7320	<0.00200	0.0469	0.022	<0.00200	<0.000500	0.0145	<0.00400	<0.00200	0.44	<0.000150	0.194	0.0144	<0.00200	0.34	0.22	0.56
BAC-3	7.57	408	3140	<0.100	7.36	4290	13000	<0.00200	0.0239	0.0376	<0.00200	<0.000500	0.00447	<0.00400	<0.00200	0.974	<0.000150	0.026	0.0211	<0.00200	0.2	0.5	0.7
BAC-4	< 0.500	59	461	1.13	7.68	206	1260	<0.00200	0.0362	0.0705	<0.00200	<0.000500	0.011	<0.00400	<0.00200	0.237	<0.000150	0.012	<0.00200	<0.00200	0.13	0.18	0.13
BAC-5	< 0.500	59.5	576	0.994	7.73	190	1430	<0.00200	0.032	0.0893	<0.00200	<0.000500	0.00204	<0.00400	<0.00200	0.277	<0.000150	0.00666	<0.00200	<0.00200	0.21	0.24	0.45
BAC-6	4.44	128	594	0.763	7.6	1040	2500	<0.00200	0.0237	0.0269	<0.00200	<0.000500	0.00205	<0.00400	<0.00200	0.28	<0.000150	0.0873	0.0045	<0.00200	0.12	-0.21	-0.09
BAC-7	3.31	151	591	0.936	7.43	1140	3120	<0.00200	0.0237	0.0253	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.327	<0.000150	0.0702	0.007	<0.00200	0.21	0.7	0.91

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.08	8.22	55	783	1.8	6.02	0.501
BA-U-2	17.77	11.71	-250	2120	1.9	7.87	1.36
BAC-1	16.44	7.24	-131	9640	11.2	2.14	6.07
BAC-2	15.89	6.86	-53	10400	0.1	0.6	6.44
BAC-3	15.61	7.1	-44	18000	3.4	0.5	11.2
BAC-4	14.42	7.58	-165	2400	0	2.76	1.53
BAC-5	15.18	7.53	-155	2550	0.1	0.57	1.63
BAC-6	16.07	7.42	-115	4030	0	0.32	2.58
BAC-7	16.54	7.34	-124	4780	1.5	0.38	3.06

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	131	785	0.458	7.54	247	1760	<0.00200	0.00941	0.08	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.25	<0.000150	0.00227	<0.00200	<0.00200	0.33	0.24	0.33
WW-U-1	1.15	336	1880	0.2	7.26	1180	4890	<0.00200	0.00593	0.0568	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.477	<0.000150	0.00558	0.00583	<0.00200	0.53	0.89	1.42
WW-U-2	0.6	317	1860	0.438	7.38	734	4300	<0.00200	0.00355	0.095	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.479	<0.000150	0.021	0.00749	<0.00200	0.51	1.6	2.11
WWC-1	11.2	479	4510	<0.100	6.98	2940	12200	<0.00200	0.0213	0.0288	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.932	0.000328	0.00995	0.0149	<0.00200	0.26	1.1	1.36
WWC-2	< 0.500	52	318	0.405	7.79	125	856	<0.00200	0.0149	0.0361	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.122	<0.000150	0.00357	<0.00200	<0.00200	0.17	0.61	0.78
WWC-3	< 0.500	25.7	195	0.852	8.13	76	680	<0.00200	0.0227	0.0302	<0.00200	<0.000500	0.00309	<0.00400	<0.00200	0.137	<0.000150	0.00537	<0.00200	<0.00200	0.24	-0.21	0.03
WWC-4	1.3	233	1250	0.319	7.38	819	3230	<0.00200	0.0135	0.061	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.382	<0.000150	<0.00200	0.00239	<0.00200	0.18	-0.2	-0.02
WWC-5	1.72	318	1520	0.292	7.13	1190	4560	<0.00200	0.01	0.0501	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.555	<0.000150	0.00523	0.00399	<0.00200	0.23	0.95	1.18

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.03	7.37	-45	3340	1.1	8.42	2.14
WW-U-1	18.15	6.96	-57	7980	11.5	1.02	5.02
WW-U-2	17.03	7.29	-15	7470	2.3	1.36	4.71
WWC-1	15.08	6.74	-32	19700	0.3	1.8	12.2
WWC-2	15.4	7.75	-134	1650	1	0.44	1.06
WWC-3	15.31	8.09	207	1230	1.2	0.22	0.784
WWC-4	15.85	7.18	-70	5390	0.5	3.15	3.39
WWC-5	16.2	6.84	-61	7180	0	0.62	4.52

Date: 3/23/2017

Round 7 Detection Monitoring - June 5-21, 2017

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	53	480	0.996	7.74	132	1010	<0.00200	0.0344	0.0826	<0.00200	0.00065	<0.00200	<0.00400	<0.00200	0.202	<0.000150	0.00402	<0.00200	<0.00200	0.36	0.95	1.31
CL-U-2	< 0.500	55.1	444	1	7.8	134	952	<0.00200	0.0247	0.0938	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.19	<0.000150	0.00408	<0.00200	<0.00200	2.7	1	3.7
CLW-1	< 0.500	36.4	322	1.06	7.85	68.2	772	<0.00200	0.0289	0.0615	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.173	<0.000150	0.00389	<0.00200	<0.00200	0.2	0.14	0.34
CLW-2	< 0.500	44.7	436	1.19	7.83	102	964	<0.00200	0.0246	0.0754	<0.00200	<0.000500	0.00411	<0.00400	<0.00200	0.211	<0.000150	0.00461	<0.00200	<0.00200	0.24	1	1.24
CLW-3	< 0.500	37.3	380	1.23	7.85	106	856	<0.00200	0.0378	0.0951	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.197	<0.000150	0.00498	<0.00200	<0.00200	0.27	0.29	0.56
CLW-4	< 0.500	30.6	345	1.44	7.89	86.3	816	<0.00200	0.0352	0.0885	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.189	<0.000150	0.00481	<0.00200	<0.00200	0.29	0.3	0.59
CLW-5	< 0.500	32.4	358	1.82	7.86	91.6	860	<0.00200	0.0203	0.0732	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.188	<0.000150	0.00572	<0.00200	<0.00200	1.4	1.2	2.6
CLW-6	< 0.500	31	336	1.61	7.9	77.5	768	<0.00200	0.02	0.0893	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	<0.100	0.183	<0.00200	0.0068	<0.00200	0.01	0.5	0.51
CLW-7	< 0.500	41.5	352	1.01	7.88	70.4	832	<0.00200	0.0241	0.0514	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.169	<0.000150	0.0033	<0.00200	<0.00200	0.14	0.75	0.89
CLW-8	< 0.500	38.4	339	1.02	7.81	73.1	812	<0.00200	0.0239	0.0681	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.176	<0.000150	0.00391	<0.00200	<0.00200	0.18	0.81	0.99

Round 7

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.35	7.59	-206	1920	0	1.51	1.23
CL-U-2	15.98	7.5	-177	1860	0	1.62	1.19
CLW-1	18.47	7.79	-160	768	0	0.9	0.491
CLW-2	16.77	7.73	-210	945	0	1.52	0.605
CLW-3	17.35	7.78	-246	879	0	213	0.562
CLW-4	17.86	7.75	-252	1580	0	4.35	1.01
CLW-5	18.97	7.66	-232	1680	0	2.65	1.08
CLW-6	16.95	7.75	-258	1590	0	5.1	1.02
CLW-7	18.07	7.7	-131	805	0	2.21	0.516
CLW-8	17.59	7.74	-130	776	0	1.58	0.497

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	26.3	317	1.75	8.32	52.9	776	<0.00200	0.0323	0.0901	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.191	<0.000150	0.0109	<0.00200	<0.00200	0.15	0.73	0.88
BA-U-2	< 0.500	3.58	366	0.821	11.8	39.6	748	<0.00200	<0.00200	0.0899	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.215	<0.000150	0.0086	<0.00200	<0.00200	0.09	0.98	1.07
BAC-1	1.91	88.7	914	0.266	8.92	702	2920	<0.00200	0.0145	0.0563	<0.00200	<0.000500	0.00666	<0.00400	<0.00200	0.305	<0.000150	0.0317	0.00643	<0.00200	0.2	0.99	1.19
BAC-2	10.6	216	1730	<0.100	7.21	3260	7720	<0.00200	0.042	0.0211	<0.00200	<0.000500	0.00799	<0.00400	<0.00200	0.586	<0.000150	0.177	0.0138	<0.00200	0.14	0.64	0.78
BAC-3	7.76	401	3510	<0.100	7.29	4900	13200	<0.00200	0.0251	0.0316	<0.00200	<0.000500	0.00858	<0.00400	<0.00200	1.17	<0.000150	0.0292	0.0212	<0.00200	0.3	0.76	1.06
BAC-4	< 0.500	56.1	612	1.13	7.84	212	1220	<0.00200	0.0329	0.0666	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.228	<0.000150	0.0113	<0.00200	<0.00200	0.37	0.47	0.84
BAC-5	< 0.500	58.3	654	1.1	7.76	217	1180	<0.00200	0.0297	0.0881	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.259	<0.000150	0.00728	<0.00200	<0.00200	0.31	0.28	0.59
BAC-6	4.25	135	697	0.779	7.63	1110	2810	<0.00200	0.0229	0.0256	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.257	<0.000150	0.0921	0.00414	<0.00200	0.24	0.76	1
BAC-7	3.4	146	632	0.864	7.78	1290	3170	<0.00200	0.0154	0.0288	<0.00200	<0.000500	0.00398	<0.00400	<0.00200	0.36	<0.000150	0.0888	0.00457	<0.00200	2.5	0.88	3.38

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.46	8.13	-138	1500	0	2.32	0.963
BA-U-2	19.9	11.43	-301	1870	0	0.58	1.2
BAC-1	22.57	9.92	-118	5180	15.6	2.32	3.27
BAC-2	19.02	7.09	-80	10900	2.2	0.84	6.76
BAC-3	18.87	7.1	-69	17800	3.2	1.02	11
BAC-4	17.01	7.62	-158	2380	0	1.61	1.52
BAC-5	17.31	7.69	-131	2560	0	2.62	1.64
BAC-6	19.46	7.59	-128	3900	35.2	0.85	2.5
BAC-7	17.97	7.5	-147	4610	2.9	1.16	2.95

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	116	763	0.522	7.56	427	1800	<0.00200	0.0101	0.0599	<0.00200	0.00128	0.00274	<0.00400	<0.00200	0.235	<0.000150	0.00233	<0.00200	<0.00200	0.2	1.3	1.5
WW-U-1	1.18	312	2340	0.181	7.41	1450	4540	<0.00200	0.00568	0.0521	<0.00200	<0.000500	0.00212	<0.00400	<0.00200	0.441	<0.000150	0.00556	0.00625	<0.00200	1.2	1.5	2.7
WW-U-2	0.741	338	2590	0.287	7.36	1040	12500	<0.00200	0.00325	0.0803	<0.00200	<0.000500	0.067	<0.00400	<0.00200	0.512	<0.000150	0.0226	0.00846	<0.00200	0.52	1.6	2.12
WWC-1	9.88	413	4410	<0.100	7.14	2770	11000	<0.00200	0.0173	0.0326	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.11	0.000175	0.0147	0.0147	<0.00200	0.39	1.5	1.89
WWC-2	< 0.500	49.5	326	0.447	7.85	134	832	<0.00200	0.0141	0.0339	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.138	<0.000150	0.00405	<0.00200	<0.00200	0.24	0.24	0.48
WWC-3	< 0.500	25.9	220	0.974	8.12	84.3	696	<0.00200	0.0214	0.0281	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.146	<0.000150	0.00504	<0.00200	<0.00200	0.1	0.45	0.55
WWC-4	1.33	229	1330	0.466	7.22	912	3060	<0.00200	0.013	0.0545	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.421	<0.000150	<0.00200	0.00241	<0.00200	0.22	0.74	0.96
WWC-5	2.25	287	1790	<0.100	7.49	1420	4810	<0.00200	0.00753	0.0379	<0.00200	<0.000500	0.00202	<0.00400	<0.00200	0.567	<0.000150	0.00531	0.00336	<0.00200	0.2	1.5	1.7

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.96	7.27	-138	3170	0	0.57	2.03
WW-U-1	18.63	6.87	-32	8050	0	1	5.07
WW-U-2	18.21	7.22	-161	7610	0	0.91	4.79
WWC-1	16.96	6.95	-34	15200	0.1	0.67	9.48
WWC-2	16.11	7.72	-169	1500	1.3	0.94	0.96
WWC-3	16.94	7.99	-194	1210	0.7	0.63	0.773
WWC-4	16.15	7.16	-73	5.48	0.5	0.6	3.46
WWC-5	16.54	7.01	-42	7225	0.9	0.76	4.57

Round 8 Detection Monitoring - September 25-October 4, 2017

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	52.1	422	1.07	7.73	116	1130	<0.00200	0.0291	0.088	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.228	<0.000150	0.00398	<0.00200	<0.00200	0.25	1.6	1.85
CL-U-2	< 0.500	53.8	390	1.1	7.67	120	1060	<0.00200	0.0262	0.0941	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.212	<0.000150	0.00415	<0.00200	<0.00200	0.17	1.4	1.57
CLW-1	< 0.500	35.7	310	1.15	7.85	71.7	808	<0.00200	0.0308	0.0614	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.192	<0.000150	0.00407	<0.00200	<0.00200	0.21	1.7	1.91
CLW-2	< 0.500	43.5	407	1.23	7.76	97.3	1040	<0.00200	0.0257	0.0793	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.229	<0.000150	0.00467	<0.00200	<0.00200	0.12	3	3.12
CLW-3	< 0.500	36.2	347	1.34	7.8	100	884	<0.00200	0.0408	0.102	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.223	<0.000150	0.00474	<0.00200	<0.00200	0.16	1.1	1.26
CLW-4	< 0.500	30.5	313	1.6	7.81	85.1	856	<0.00200	0.0333	0.09	<0.00200	<0.000500	0.0516	<0.00400	<0.00200	0.199	<0.000150	0.0115	<0.00200	<0.00200	0.24	1.8	2.04
CLW-5	< 0.500	33.2	344	1.82	7.8	88.5	824	<0.00200	0.023	0.0727	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.211	<0.000150	0.0052	<0.00200	<0.00200	0.2	2.2	2.4
CLW-6	< 0.500	30.5	317	1.73	7.82	74.5	828	<0.00200	0.0143	0.0961	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.199	<0.000150	0.00721	<0.00200	<0.00200	0.29	1.7	1.99
CLW-7	< 0.500	45.5	319	1.11	7.7	64.5	868	<0.00200	0.0244	0.0539	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.189	<0.000150	0.00389	<0.00200	<0.00200	0.45	0.95	1.4
CLW-8	< 0.500	37.9	319	1.13	7.77	70.6	788	<0.00200	0.0252	0.0689	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.192	<0.000150	0.00431	<0.00200	<0.00200	0.25	1.6	1.85

Round 8

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	16.07	7.45	-199	1930	0.4	0.56	1.24
CL-U-2	15.67	7.43	-176	1880	0.8	0.58	1.2
CLW-1	20.49	7.68	-172	1.48	0	0.41	0.949
CLW-2	16.63	7.63	-199	1880	0.7	0.64	1.2
CLW-3	16.82	7.59	-251	1750	1.5	2.9	1.12
CLW-4	17.63	7.56	-269	1620	1.6	1.56	1.03
CLW-5	17.21	7.71	-244	1690	3.7	1.12	1.09
CLW-6	15.97	7.75	-259	1.6	2.3	3.3	1.02
CLW-7	16.72	7.59	-147	1640	0	0.86	1.05
CLW-8	18.26	7.65	-145	1.53	1.1	1.89	0.975

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	169	1040	1.02	7.53	343	2310	<0.00200	0.0215	0.0745	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.368	<0.000150	0.00296	0.00375	<0.00200	0.07	1.3	1.37
BA-U-2	< 0.500	46.3	479	0.993	8.04	53.7	1140	<0.00200	0.0249	0.156	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.241	<0.000150	0.00294	<0.00200	<0.00200	0.24	1.5	1.74
BAC-1	4.86	229	2620	0.854	7.4	2150	8400	<0.00200	0.0148	0.702	<0.00200	<0.000500	0.114	0.00461	<0.00200	0.52	<0.000150	0.0467	0.0174	<0.00200	0.39	1.6	1.99
BAC-2	10.1	221	1690	1.33	7.62	2970	7940	<0.00200	0.0469	0.0202	<0.00200	<0.000500	0.00547	<0.00400	<0.00200	0.431	<0.000150	0.154	0.0149	<0.00200	0.11	0.14	0.25
BAC-3	8.76	353	3370	2.51	7.43	5340	12700	<0.00200	0.054	0.0306	<0.00200	<0.000500	0.0114	<0.00400	<0.00200	0.897	<0.000150	0.0525	0.0287	<0.00200	0.23	1.3	1.53
BAC-4	< 0.500	62.4	482	1.26	7.76	231	1280	<0.00200	0.0359	0.0703	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.262	<0.000150	0.0139	<0.00200	<0.00200	0.1	2.5	2.6
BAC-5	< 0.500	67.5	593	1.17	7.74	269	1450	<0.00200	0.0325	0.0877	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.294	<0.000150	0.00838	<0.00200	<0.00200	0.26	2.7	2.96
BAC-6	0.978	77.2	516	1.01	7.97	301	1510	<0.00200	0.0156	0.0833	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.265	<0.000150	0.0213	<0.00200	<0.00200	0.27	3.8	4.07
BAC-7	3.41	144	633	1.15	7.65	1220	2990	<0.00200	0.0191	0.0223	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.285	<0.000150	0.074	0.00446	<0.00200	0.15	0.84	0.99

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.04	7.21	-166	4300	1.7	0.78	2.75
BA-U-2	16.58	8.07	-272	2030	0	1.63	1.3
BAC-1	15.36	6.93	-28	7170	1	0.54	4.52
BAC-2	16.95	6.92	-20	11500	2	0.9	7.11
BAC-3	16.87	7.07	-102	18.7	43.3	0.94	11.6
BAC-4	16.67	7.68	-148	2470	1.1	0.62	1.58
BAC-5	16.66	7.71	-140	2740	0.8	1.12	1.75
BAC-6	17.02	7.83	-47	2610	0.9	2.54	1.67
BAC-7	15.97	7.45	-121	4500	3.3	2.56	2.88

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	110	820	0.618	7.55	263	1810	0.002	0.00969	0.0783	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.257	<0.000150	0.00251	<0.00200	<0.00200	0.44	0.56	1
WW-U-1	1.2	311	2130	0.539	7.23	1280	5260	<0.00200	0.0055	0.0545	<0.00200	<0.000500	0.003309	<0.00400	<0.00200	0.459	<0.000150	0.00792	0.00697	<0.00200	0.34	1.2	1.54
WW-U-2	1.66	314	2280	0.721	7.31	1220	5510	<0.00200	0.0104	0.0659	<0.00200	<0.000500	0.00415	<0.00400	<0.00200	0.485	<0.000150	0.00647	0.0122	<0.00200	0.24	1.3	1.54
WWC-1	9.55	492	4430	0.507	7.37	2990	11500	<0.00200	0.0177	0.0272	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.755	0.000262	0.0068	0.014	<0.00200	0.26	1.2	1.46
WWC-2	< 0.500	53.6	347	0.452	7.78	137	936	<0.00200	0.0142	0.0361	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.112	<0.000150	0.00341	<0.00200	<0.00200	0.04	1.2	1.24
WWC-3	< 0.500	25.3	207	1.13	8.14	84	704	<0.00200	0.0207	0.0242	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.127	<0.000150	0.00477	<0.00200	<0.00200	0.08	2	2.08
WWC-4	1.11	201	1100	0.57	7.38	744	3280	<0.00200	0.0135	0.0529	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.313	<0.000150	<0.00200	0.00214	<0.00200	0.38	0.4	0.78
WWC-5	1.48	327	1620	0.544	7.16	1240	4590	<0.00200	0.0104	0.0438	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.496	<0.000150	0.00395	0.00407	<0.00200	0.41	0.65	1.06

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.02	7.36	-123	3490	0	1.25	2.24
WW-U-1	16.41	6.96	-135	8820	0.7	1.56	5.56
WW-U-2	16.68	7.09	-34	9.23	0.6	3.75	5.82
WWC-1	16.21	6.78	48	18900	0.8	1.92	11.7
WWC-2	16.38	7.64	-110	1740	1	2.87	1.12
WWC-3	15.49	8.16	-207	1220	1.3	0.45	0.781
WWC-4	16.11	7.17	-77	4980	1.2	0.46	3.19
WWC-5	15.42	6.94	-31	7180	1.3	0.53	4.52

Round 9 Assessment Monitoring - March 26-30, 2018

Landfill Wells	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	62.6	402	0.971	7.66	94.9	1090	<0.00200	0.0283	0.0758	<0.00200	<0.000500	0.000529	<0.00400	<0.00200	0.209	<0.000150	0.00359	<0.00200	<0.00200	0.18	0.81	0.99
CL-U-2	< 0.500	64.1	352	0.895	7.65	92.7	980	<0.00200	0.0236	0.0873	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.194	<0.000150	0.00376	<0.00200	<0.00200	0.34	0.16	0.5
CLW-1	< 0.500	37.8	318	1.02	7.67	59.5	720	<0.00200	0.0265	0.053	<0.00200	<0.000500	0.0271	<0.00400	<0.00200	0.179	<0.000150	0.0068	<0.00200	<0.00200	0.09	0.53	0.62
CLW-2	< 0.500	51.4	421	1.13	7.8	79.4	1020	<0.00200	0.0258	0.0711	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.212	<0.000150	0.00439	<0.00200	<0.00200	0.24	0.94	1.18
CLW-3	< 0.500	42.8	334	1.23	7.86	82.3	956	<0.00200	0.0364	0.089	<0.00200	<0.000500	0.000505	<0.00400	<0.00200	0.2	<0.000150	0.00464	<0.00200	<0.00200	0.37	0.94	1.31
CLW-4	< 0.500	35.8	301	1.35	7.77	70.4	864	<0.00200	0.0352	0.0788	<0.00200	<0.000500	0.000762	<0.00400	<0.00200	0.189	<0.000150	0.00477	<0.00200	<0.00200	0.46	0.59	1.05
CLW-5	< 0.500	37.4	354	1.71	7.66	79.9	876	<0.00200	0.021	0.0671	<0.00200	<0.000500	0.000712	<0.00400	<0.00200	0.194	<0.000150	0.0054	<0.00200	<0.00200	0.15	0.96	1.11
CLW-6	< 0.500	34.2	292	1.62	7.74	60.4	916	<0.00200	0.0104	0.0885	<0.00200	<0.000500	0.000612	<0.00400	<0.00200	0.182	<0.000150	0.00729	<0.00200	<0.00200	0.56	0.48	1.04
CLW-7	< 0.500	47	316	0.972	7.59	51.3	792	<0.00200	0.0215	0.0475	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.183	<0.000150	0.00341	<0.00200	<0.00200	0.28	0.22	0.5
CLW-8	< 0.500	44.1	303	0.981	7.63	54.2	792	<0.00200	0.0231	0.0609	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.188	<0.000150	0.00376	<0.00200	<0.00200	0.25	0.8	1.05

Round 9

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	14.91	7.28	-193	1940	0.6	0.54	1.24
CL-U-2	14.84	7.24	-174	1890	0.2	0.67	1.21
CLW-1	16.76	7.7	-186	1530	0.2	0.7	0.98
CLW-2	15.47	7.6	-204	1880	0.4	0.96	1.22
CLW-3	16.64	7.49	-236	1720	0	1.61	1.1
CLW-4	16.15	7.51	-259	1610	0	2.2	1.03
CLW-5	16.46	7.43	-239	1720	3	1	1.1
CLW-6	15.56	7.47	-250	1600	0.1	3.61	1.03
CLW-7	18.88	7.52	-123	1570	0	1.89	1
CLW-8	18.47	7.58	-129	1520	0	0.45	0.973

Bottom Ash	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	33.5	296	1.64	8.05	50.7	872	<0.00200	0.0276	0.0837	<0.00200	<0.000500	0.00126	<0.00400	<0.00200	0.199	<0.000150	0.00914	0.0022	<0.00200	0.07	0.31	0.38
BA-U-2	< 0.500	46.2	399	0.943	8.2	46.9	1080	<0.00200	0.0227	0.125	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.209	<0.000150	0.00311	0.000691	<0.00200	0.12	0.34	0.46
BAC-1	3.88	192	1890	0.507	7.63	1470	6120	0.00138	0.0127	0.0501	<0.00200	<0.000500	0.00451	<0.00400	<0.00200	0.581	<0.000150	0.028	0.00924	<0.00200	0.31	0.48	0.79
BAC-2	9.89	283	1940	1.32	7.72	3070	8590	<0.00200	0.0508	0.0238	<0.00200	<0.000500	0.00777	<0.00400	<0.00200	0.524	<0.000150	0.142	0.0173	<0.00200	0.29	0.89	1.18
BAC-3	7.91	417	3480	1.62	7.84	4460	13000	<0.00200	0.0441	0.0331	<0.00200	<0.000500	0.00468	<0.00400	<0.00200	1.05	<0.000150	0.0396	0.0228	<0.00200	0.28	1.25	1.53
BAC-4	< 0.500	67.4	489	1.14	7.74	221	1300	<0.00200	0.0316	0.0605	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.249	<0.000150	0.0143	<0.00200	<0.00200	0.1	0.81	0.91
BAC-5	< 0.500	74.8	524	1.07	7.68	234	1480	<0.00200	0.0275	0.0706	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.284	<0.000150	0.00915	<0.00200	<0.00200	0.24	0.5	0.74
BAC-6	4.58	145	595	1.15	7.48	1100	2600	<0.00200	0.0214	0.0227	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.28	<0.000150	0.0898	0.00249	<0.00200	0.08	0.72	0.8
BAC-7	4.51	137	1980	0.388	7.57	1100	2730	<0.00200	0.0235	0.0195	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.288	<0.000150	0.0752	0.0048	<0.00200	0.14	0.71	0.85

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	15.13	7.78	-33	1600	0.6	3.82	1.02
BA-U-2	16.14	8.65	-281	1750	0.2	0.25	1.12
BAC-1	16.99	7.23	-189	9190	8.1	0.52	5.79
BAC-2	15.94	6.82	-77	12000	1.2	0.51	7.44
BAC-3	15.37	7.03	-82	18900	5	3.65	11.7
BAC-4	15.79	7.47	-150	2500	0.5	0.7	1.6
BAC-5	18.41	7.47	-149	2570	0.5	3.97	1.63
BAC-6	19.15	7.32	-92	3810	0.5	0.55	2440
BAC-7	19.26	7.4	-101	4190	3	3.14	2.68

Waste Water	Results																					
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	129	739	0.506	7.5	201	1840	<0.00200	0.00929	0.0741	<0.00200	<0.000500	0.00137	<0.00400	<0.00200	0.241	<0.000150	0.00227	<0.00200	<0.00200	0.04	0.73	0.77
WW-U-1	1.34	339	1900	0.406	7.05	1050	5280	<0.00200	0.005	0.0486	<0.00200	<0.000500	0.00193	<0.00400	<0.00200	0.436	<0.000150	0.00702	0.00653	<0.00200	0.45	0.91	1.36
WW-U-2	1.47	370	2010	0.532	7.16	925	5260	<0.00200	0.00642	0.0499	<0.00200	<0.000500	0.00144	<0.00400	<0.00200	0.475	<0.000150	0.00467	0.0115	<0.00200	0.34	0.94	1.28
WWC-1	11.9	638	4100	0.236	6.89	2640	12700	<0.00200	0.02	0.0209	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.805	0.000205	0.00596	0.015	<0.00200	0.25	1.21	1.46
WWC-2	< 0.500	57.2	308	0.41	7.62	111	784	<0.00200	0.014	0.031	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.104	<0.000150	0.00356	<0.00200	<0.00200	0.1	0.55	0.65
WWC-3	< 0.500	28.9	200	0.985	7.96	67.8	628	<0.00200	0.0214	0.0245	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.131	<0.000150	0.00464	<0.00200	<0.00200	0.07	0.27	0.34
WWC-4	1.19	200	1010	0.365	7.3	593	2790	<0.00200	0.0128	0.0463	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.355	<0.000150	<0.00200	<0.00200	<0.00200	0.22	0.58	0.8
WWC-5	2.86	321	1600	0.384	6.92	1450	5030	<0.00200	0.0096	0.0302	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.511	<0.000150	0.00301	0.00415	<0.00200	0.2	1.64	1.84

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.11	7.56	-31	3240	0	0.71	2.07
WW-U-1	16.35	7.11	-75	8010	0.7	0.4	5.03
WW-U-2	16.11	7.27	-10	8450	0.2	0.47	5.32
WWC-1	16.03	6.65	-17	19900	0	2.51	12.4
WWC-2	15.75	7.52	-124	1650	0.4	0.55	1.05
WWC-3	14.89	7.81	-190	1250	1.1	0.79	0.8
WWC-4	16.17	7.26	-64	4600	2.3	0.37	2.92
WWC-5	17.27	7.02	-36	7300	0	0.34	4.6

Round 10 Assessment Monitoring - June 4-13, 2018

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	< 0.500	54.7	372	0.853	7.7	98	984	<0.00200	0.0272	0.0799	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.208	<0.000150	0.00361	<0.00200	<0.00200	0.18	0.67	0.85
CL-U-2	< 0.500	56.4	365	0.862	7.64	108	952	<0.00200	0.0242	0.09	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.195	<0.000150	0.0038	<0.00200	<0.00200	-0.02	0.67	0.65
CLW-1	< 0.500	35.2	298	1.02	7.93	57.8	748	<0.00200	0.0285	0.0568	<0.00200	<0.000500	0.00102	<0.00400	<0.00200	0.184	<0.000150	0.00388	0.000928	<0.00200	0.29	1.01	1.3
CLW-2	< 0.500	44.6	399	1.14	7.79	86.8	980	<0.00200	0.0247	0.072	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.222	<0.000150	0.00433	<0.00200	<0.00200	0.25	0.96	1.21
CLW-3	< 0.500	37.5	323	1.16	7.91	94.2	876	<0.00200	0.0382	0.0948	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.214	<0.000150	0.00483	<0.00200	<0.00200	0.18	0.55	0.73
CLW-4	< 0.500	31.8	289	1.35	7.91	76.4	836	<0.00200	0.0358	0.0801	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.204	<0.000150	0.00459	<0.00200	<0.00200	0.13	0.85	0.85
CLW-5	< 0.500	33.1	318	1.59	7.79	75.3	804	<0.00200	0.0215	0.0689	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.21	<0.000150	0.00519	<0.00200	<0.00200	0.11	0.76	0.87
CLW-6	< 0.500	29.9	292	1.45	7.88	66.3	796	<0.00200	0.0109	0.0902	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.199	<0.000150	0.00711	<0.00200	<0.00200	0.27	0.85	1.12
CLW-7	< 0.500	40.6	321	0.945	7.68	58.6	900	<0.00200	0.0234	0.0514	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.186	<0.000150	0.00329	<0.00200	<0.00200	0.16	0.97	0.97
CLW-8	< 0.500	38.8	314	0.933	7.73	63.5	768	<0.00200	0.0244	0.0632	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.188	<0.000150	0.00359	<0.00200	<0.00200	0.18	1.26	1.26

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	< 0.500	140	799	0.818	7.54	254	1970	<0.00200	0.0199	0.0636	<0.00200	<0.000500	0.000506	<0.00400	<0.00200	0.337	<0.000150	0.00279	0.00324	<0.00200	0.39	1.94	2.33
BA-U-2	< 0.500	70.1	578	0.73	7.68	63.5	1330	<0.00200	0.0208	0.145	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.279	<0.000150	0.00215	0.00201	<0.00200	0.16	1.13	1.13
BAC-1	2.16	113	1190	0.315	7.92	971	3120	0.00158	0.0141	0.0393	<0.00200	<0.000500	0.00714	<0.00400	<0.00200	0.314	<0.000150	0.0288	0.00694	<0.00200	0.24	1.06	1.3
BAC-2	8.44	263	2210	0.684	7.1	3430	7720	<0.00200	0.0445	0.021	<0.00200	<0.000500	0.00483	<0.00400	<0.00200	0.463	<0.000150	0.143	0.0154	<0.00200	0.12	1.03	1.03
BAC-3	7.26	347	3870	1.52	7.42	5080	12700	<0.00200	0.0588	0.0327	<0.00200	<0.000500	0.00511	<0.00400	<0.00200	0.944	<0.000150	0.0467	0.0229	<0.00200	0.27	1.44	1.71
BAC-4	< 0.500	62.8	510	1.01	7.95	221	1290	<0.00200	0.0322	0.0672	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.247	<0.000150	0.0165	<0.00200	<0.00200	0.06	0.92	0.98
BAC-5	< 0.500	73.5	591	0.916	7.82	302	1180	<0.00200	0.0292	0.0763	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.288	<0.000150	0.0128	<0.00200	<0.00200	0.19	1.56	1.75
BAC-6	4.12	134	694	0.582	7.65	1120	2980	<0.00200	0.0217	0.0235	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.25	<0.000150	0.0938	0.00229	<0.00200	0.14	1.02	1.02
BAC-7	4.36	130	709	1.09	7.74	1280	2760	<0.00200	0.0275	0.0204	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.269	<0.000150	0.0757	0.00541	<0.00200	0.06	0.87	0.93

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	< 0.500	123	873	0.499	7.62	209	2040	<0.00200	0.00839	0.0653	<0.00200	<0.000500	0.000602	<0.00400	<0.00200	0.254	<0.000150	0.00182	<0.00200	<0.00200	0.32	1.34	1.66
WW-U-1	1.19	289	1940	0.265	7.17	1140	5450	<0.00200	0.00477	0.0479	<0.00200	<0.000500	0.00124	<0.00400	<0.00200	0.443	<0.000150	0.00591	0.00663	<0.00200	0.23	1.49	1.72
WW-U-2	1.23	337	2130	1.01	7.3	985	5120	<0.00200	0.0102	0.0459	<0.00200	<0.000500	0.00137	<0.00400	<0.00200	0.508	<0.000150	0.00277	0.0112	<0.00200	0.05	0.93	0.93
WWC-1	8.22	504	4710	0.114	7.2	2730	11100	<0.00200	0.0173	0.0268	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.831	0.000168	0.00896	0.0139	<0.00200	0.25	1.16	1.16
WWC-2	< 0.500	50	340	0.358	7.91	119	852	<0.00200	0.0143	0.0338	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.11	<0.000150	0.00372	<0.00200	<0.00200	0.08	0.27	0.35
WWC-3	< 0.500	27.3	230	0.897	8.05	88.4	644	<0.00200	0.0226	0.0278	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.125	<0.000150	0.00527	<0.00200	<0.00200	-0.03	0.15	0.12
WWC-4	0.998	184	1080	0.435	7.43	620	2640	<0.00200	0.0129	0.0495	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.309	<0.000150	0.00215	0.00201	<0.00200	0.28	0.35	0.63
WWC-5	2.64	314	1820	0.219	7.26	1660	5200	<0.00200	0.0104	0.0327	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.472	<0.000150	0.00324	0.00395	<0.00200	0.1	1.58	1.58

Round 10

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
CL-U-1	17.54	7.56	-196	1888	1.7	0.39	1.2
CL-U-2	17.81	7.55	-171	1830	0.7	2.53	1.17
CLW-1	19.97	7.67	-159	1480	2.1	4.08	9.45
CLW-2	17.54	7.63	-220	1830	4.5	0.63	1.18
CLW-3	17.95	7.73	-260	1680	5.5	1.57	1.07
CLW-4	17.85	7.73	-278	1570	2.8	1.64	1
CLW-5	17.16	7.72	-276	1660	8.2	1.29	1.07
CLW-6	17.86	7.83	-280	1570	8	2.56	1.01
CLW-7	17.32	7.6	-150	1610	15.7	3.84	1.03
CLW-8	17.1	7.61	-194	1550	2	0.73	0.985

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	19.26	7.41	-163	3640	1	0.46	2.33
BA-U-2	18.16	7.63	-187	2370	2.1	1.31	1.51
BAC-1	17.87	8.86	-418	6480	53.2	2.95	4.04
BAC-2	16.94	6.98	-63	12400	2.3	4.29	7.68
BAC-3	17.19	7.16	-356	18300	15.2	0.87	11.4
BAC-4	17.11	7.64	-149	2500	1.5	0.75	1.6
BAC-5	17.63	7.61	-126	2850	1.2	0.65	1.83
BAC-6	17.58	7.51	-112	4210	0	0.51	2.63
BAC-7	17.32	7.6	-127	4440	0	0.56	2.84

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	18.38	7.39	-108	3510	1.7	0.79	2.25
WW-U-1	21.81	6.92	-77	8180	0.1	0.51	5.14
WW-U-2	18.76	7.09	-16	8130	7.6	1.06	5.12
WWC-1	16.92	6.94	-84	15600	1.5	4.48	9.65
WWC-2	17.4	7.75	-163	1570	1.2	0.4	1
WWC-3	17.01	7.89	-191	1220	2.6	0.42	0.782
WWC-4	18.39	7.27	-106	4320	2.4	1.17	2.77
WWC-5	15.81	6.98	-84	7740	0.8	0.58	4.88

Round 11 (all results ppm) Assessment Monitoring - October 8-18, 2018

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	61.9	415	0.981	7.79	122	1060	<0.00200	0.029	0.0796	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.229	<0.000150	0.00383	<0.00200	<0.00200	0.09	0.32	0.41
CL-U-2	< 0.500	67.5	414	0.995	7.73	128	1010	<0.00200	0.0255	0.0919	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.212	<0.000150	0.00408	<0.00200	<0.00200	0.12	0.94	0.94
CLW-1	< 0.500	39.6	288	1.06	7.76	61.9	784	<0.00200	0.0298	0.0582	<0.00200	<0.000500	0.0157	<0.00400	<0.00200	0.194	<0.000150	0.00589	<0.00200	<0.00200	0.11	1.2	1.2
CLW-2	< 0.500	49.7	475	1.19	7.72	88.1	904	<0.00200	0.0244	0.0716	<0.00200	<0.000500	0.014	<0.00400	<0.00200	0.227	<0.000150	0.00593	<0.00200	<0.00200	0.17	0.39	0.56
CLW-3	< 0.500	42	325	1.27	7.79	95	888	<0.00200	0.0384	0.0941	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.217	<0.000150	0.0052	<0.00200	<0.00200	0.33	0.68	1.01
CLW-4	< 0.500	35.2	297	1.45	7.85	80.7	792	<0.00200	0.0375	0.0786	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.211	<0.000150	0.00525	<0.00200	<0.00200	1.89	0.65	1.89
CLW-5	< 0.500	36.9	320	1.7	7.72	85.3	852	<0.00200	0.0229	0.0714	<0.00200	<0.000500	0.00999	<0.00400	<0.00200	0.213	<0.000150	0.00679	<0.00200	<0.00200	1.87	0.17	1.87
CLW-6	< 0.500	33.8	292	1.6	7.82	73.3	804	<0.00200	0.0152	0.0873	<0.00200	<0.000500	0.0116	<0.00400	<0.00200	0.204	<0.000150	0.00746	<0.00200	<0.00200	0.18	0.41	0.59
CLW-7	< 0.500	46.5	399	1.02	7.65	73.2	780	<0.00200	0.0232	0.0491	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.19	<0.000150	0.00416	<0.00200	<0.00200	0.05	0.07	0.12
CLW-8	< 0.500	43	300	1.04	7.71	66.5	796	<0.00200	0.0254	0.0643	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.192	<0.000150	0.00503	<0.00200	<0.00200	0.19	1.2	1.2

Round 11

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	17.4	7.85	-132	1800	40.9	0.61	1.15
CL-U-2	18.15	7.83	-97	1770	0	3.95	1.13
CLW-1	17.83	7.93	-114	1490	0	1.48	0.951
CLW-2	16.04	7.84	-184	1850	0.6	2.72	1.18
CLW-3	17.52	7.98	-178	1660	3.6	3.1	1.06
CLW-4	18.53	8.02	-192	1530	7.2	1.63	0.983
CLW-5	21	7.94	-175	1640	0	1.29	1.05
CLW-6	16.49	8.02	-210	1560	0	2.23	1
CLW-7	17.12	7.83	-81	1560	2.4	2.97	1
CLW-8	17.05	7.91	-130	1510	0	1.37	0.963

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	73.9	561	0.881	7.97	62.2	1050	<0.00200	0.0216	0.149	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.276	<0.000150	0.00237	<0.00200	<0.00200	0.44	0.74	1.18
BA-U-2	< 0.500	143	885	0.977	7.58	298	1750	<0.00200	0.0209	0.0728	<0.00200	<0.000500	0.0125	<0.00400	<0.00200	0.321	<0.000150	0.00574	<0.00200	<0.00200	0.22	0.62	0.84
BAC-1	4.87	225	1840	0.582	7.57	1760	6420	<0.00200	0.0129	0.0391	<0.00200	<0.000500	0.0184	<0.00400	<0.00200	0.629	<0.000150	0.0232	0.00818	<0.00200	0.45	0.88	1.33
BAC-2	9.98	255	1660	1.1	7.35	2730	7800	<0.00200	0.0565	0.0204	<0.00200	<0.000500	0.0111	<0.00400	<0.00200	0.472	<0.000150	0.156	0.0157	<0.00200	0.08	0.96	0.96
BAC-3	8.33	469	3280	1.63	7.31	4450	12300	<0.00200	0.0496	0.0317	<0.00200	<0.000500	0.00968	<0.00400	<0.00200	1.06	<0.000150	0.038	0.022	<0.00200	0.39	1.06	1.45
BAC-4	0.523	68.1	501	1.15	7.96	273	1300	<0.00200	0.00882	0.0171	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.267	<0.000150	0.017	<0.00200	<0.00200	-0.16	0.48	0.32
BAC-5	< 0.500	82.2	557	1.04	7.86	353	1460	<0.00200	0.0325	0.0714	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.323	<0.000150	0.0134	<0.00200	<0.00200	0.26	0.81	1.07
BAC-6	4.57	138	624	0.847	7.75	1080	2340	<0.00200	0.0248	0.0245	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.276	<0.000150	0.0842	<0.00200	<0.00200	0.17	1.02	1.19
BAC-7	4.24	143	649	1.51	7.75	1210	2830	<0.00200	0.0434	0.0214	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.303	<0.000150	0.075	0.00579	<0.00200	0.19	0.71	0.9

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.4	7.71	-41	3010	0	0.7	1.94
BA-U-2	18.72	8.31	-138	2010	0	0.56	1.28
BAC-1	16.12	7.43	-228	9840	77.8	0.85	6.2
BAC-2	16.79	7.15	-22	11200	2.5	1.3	6.93
BAC-3	16.79	7.31	42	18300	7	5.15	11.3
BAC-4	15.08	7.77	-69	2500	0.2	0.61	1.6
BAC-5	16.95	7.88	-43	2860	0	0.52	1.83
BAC-6	17.13	7.74	-35	3970	0	0.49	2.54
BAC-7	17	7.76	-71	4420	1.9	0.48	2.84

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	139	805	0.533	7.63	394	1760	<0.00200	0.0103	0.0575	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.265	<0.000150	0.00241	<0.00200	<0.00200	0.07	0.85	0.85
WW-U-1	1.36	357	2150	0.41	7.28	1360	5090	<0.00200	<0.00200	0.0449	<0.00200	<0.000500	0.0258	<0.00400	<0.00200	0.456	<0.000150	0.0101	0.00682	<0.00200	0.43	1.2	1.63
WW-U-2	1.23	380	2160	0.604	7.31	1090	4570	<0.00200	0.0109	0.0446	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.519	<0.000150	0.00338	0.0105	<0.00200	0.14	0.83	0.83
WWC-1	12	607	4430	0.331	7.25	3210	13000	<0.00200	0.0243	0.0223	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.964	0.000312	0.00835	0.0145	<0.00200	0.15	1.2	1.35
WWC-2	< 0.500	59.5	344	0.448	7.85	139	832	<0.00200	0.0152	0.0344	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.124	<0.000150	0.00304	<0.00200	<0.00200	0.17	0.03	0.2
WWC-3	< 0.500	29.7	209	1.06	7.92	84.2	436	<0.00200	0.0247	0.0289	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.139	<0.000150	0.00482	<0.00200	<0.00200	0	0.76	0.76
WWC-4	1.34	219	1030	0.481	7.46	692	2880	<0.00200	0.0145	0.0507	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.36	<0.000150	<0.00200	<0.00200	<0.00200	0.03	0.8	0.83
WWC-5	3.07	364	1720	0.431	7.38	1620	5000	<0.00200	0.0131	0.034	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.523	<0.000150	0.0031	0.00478	<0.00200	0.2	-0.56	-0.36

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	17.1	7.65	-6	3290	0	0.58	2.11
WW-U-1	16.29	7.25	-7	8350	0.6	0.87	5.27
WW-U-2	16.41	7.44	55	7730	0	1.5	4.87
WWC-1	16.6	7.11	40	19600	0	4.49	12.1
WWC-2	17.73	7.91	-84	1600	2.1	0.62	1.03
WWC-3	16.97	8.12	-179	1190	0.2	0.56	0.759
WWC-4	16.27	7.4	-32	4780	0.7	0.54	3.06
WWC-5	15.76	7.16	-11	7580	1	3.51	4.77

Round 12 (all results ppm) Assessment Monitoring - April 4 - May 15, 2019

Landfill Wells – Results

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	61.1	388	0.989	7.74	112	932	<0.00200	0.0279	0.0841	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.231	<0.000150	0.0036	<0.00200	<0.00200	0.13	0.4	0.53
CL-U-2	< 0.500	68.4	378	1.02	7.74	97.6	920	<0.00200	0.0254	0.0943	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.214	<0.000150	0.00405	<0.00200	<0.00200	0.31	0.94	1.25
CLW-1	< 0.500	39.4	303	1.12	7.88	64.5	692	<0.00200	0.002	0.0589	<0.00200	<0.000500	0.00742	<0.00400	<0.00200	0.203	<0.000150	0.00481	<0.00200	<0.00200	0	0.41	0.41
CLW-2	< 0.500	55.1	416	1.25	7.8	96.4	976	<0.00200	0.0259	0.0743	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.253	<0.000150	0.00423	<0.00200	<0.00200	0.21	0.75	0.96
CLW-3	< 0.500	44.5	351	1.34	7.83	98.4	884	<0.00200	0.0382	0.0970	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.243	<0.000150	0.00488	<0.00200	<0.00200	0.16	0.49	0.65
CLW-4	< 0.500	38.8	321	1.45	7.90	85.5	968	<0.00200	0.0376	0.0819	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.232	<0.000150	0.00425	<0.00200	<0.00200	0.47	0.54	1.01
CLW-5	< 0.500	38.5	340	1.85	7.93	85.6	936	<0.00200	0.0236	0.0707	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.226	<0.000150	0.00515	<0.00200	<0.00200	0.14	0.28	0.42
CLW-6	< 0.500	38.4	270	1.55	7.89	72.8	828	<0.00200	0.0271	0.0896	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.214	<0.000150	0.00478	<0.00200	<0.00200	0.2	0.78	0.98
CLW-7	< 0.500	51.3	336	1.07	7.76	68.9	792	<0.00200	0.0228	0.0511	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.205	<0.000150	0.00323	<0.00200	<0.00200	-0.09	0.54	0.45
CLW-8	< 0.500	44.3	317	1.11	7.81	67.2	776	<0.00200	0.0257	0.0621	<0.00200	<0.000500	0.00200	<0.00400	<0.00200	0.212	<0.000150	0.00358	<0.00200	<0.00200	0.27	0.22	0.49
CLW-9	< 0.500	26.2	298	2.02	7.91	86.4	760	<0.00200	0.0368	0.0462	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.168	<0.000150	0.00518	<0.00200	<0.00200	0.21	0.21	0.42
CL-U-3	< 0.500	59.6	390	0.872	7.83	114	984	<0.00200	0.0183	0.0495	<0.00200	<0.000500	0.00565	<0.00400	<0.00200	0.212	<0.000150	0.00372	<0.00200	<0.00200	0	0.48	0.48

Round 12 – Landfill Wells – Field Results

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	15.92	7.84	-138	1880	1.6	0.42	1.2
CL-U-2	15.68	7.81	-119	1820	4.7	0.6	1.17
CLW-1	15.59	7.68	-68	1540	0.9	2.06	0.984
CLW-2	15.77	7.86	-187	1870	1.7	1.5	1.2
CLW-3	15.45	7.93	-201	1720	2.1	1.37	1.1
CLW-4	15.51	7.97	-203	1610	12.7	1.55	1.03
CLW-5	15.07	7.94	-214	1.69	3.8	3.03	1.08
CLW-6	16.62	8.04	-225	1570	1.1	1.54	1
CLW-7	16.75	7.76	-79	1630	0.5	0.91	1.05
CLW-8	16.41	7.82	-99	1570	0.07	1.7	1.01
CLW-9	15.39	7.98	-184	1550	3.6	0.83	0.993
CL-U-3	15.07	7.55	-197	1830	0.3	2.51	1.17

Bottom Ash – Results

Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	174	934	0.919	7.61	271	2050	<0.00200	0.002	0.0776	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.354	<0.000150	0.00312	0.00458	<0.00200	0	0.4	0.4
BA-U-2	< 0.500	91.8	718	0.844	7.68	102	1350	<0.00200	0.0211	0.1670	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.300	<0.000150	0.0022	0.00234	<0.00200	0.18	0.62	0.8
BAC-1	1.31	72.4	431	0.197	8.42	404	1830	<0.00200	0.0121	0.0567	<0.00200	<0.000500	0.00359	<0.00400	<0.00200	0.172	<0.000150	0.142	0.00278	<0.00200	0.28	0.09	0.37
BAC-2	10.3	233	1700	1.11	7.2	2590	8310	<0.00200	0.0519	0.0180	<0.00200	<0.000500	0.00556	<0.00400	<0.00200	0.491	<0.000150	0.163	0.0145	<0.00200	0.17	0.48	0.65
BAC-3	8.64	417	3400	1.3	7.24	4090	12900	<0.00200	0.0472	0.0272	<0.00200	<0.000500	0.00593	<0.00400	<0.00200	1.030	0.000105	0.0388	0.0206	<0.00200	0.17	0.77	0.94
BAC-4	0.553	72.4	488	1.22	7.76	269	1270	<0.00200	0.0319	0.0641	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.281	<0.000150	0.0196	<0.00200	<0.00200	0.16	0.58	0.74
BAC-5	< 0.500	91.8	585	1.07	7.73	393	1540	<0.00200	0.0294	0.0594	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.334	<0.000150	0.0168	<0.00200	<0.00200	-0.1	0.27	0.17
BAC-6	4.4	137	536	0.866	7.84	963	2260	<0.00200	0.0248	0.0206	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.283	<0.000150	0.0923	<0.00200	<0.00200	-0.09	-0.38	-0.47
BAC-7	5.17	142	529	1.34	7.72	985	2760	<0.00200	0.0298	0.0184	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.284	<0.000150	0.0908	0.00388	<0.00200	0.09	0.34	0.43
BAC-8	< 0.500	27.8	266	1.61	7.92	81.1	708	<0.00200	0.0519	0.0732	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.165	<0.000150	0.0055	<0.00200	<0.00200	0.31	0.41	0.72
BAC-9	< 0.500	28.4	283	1.7	7.91	82.6	736	<0.00200	0.583	0.051	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.167	<0.000150	0.00451	<0.00200	<0.00200	0.06	0.53	0.59
BAC-10	< 0.500	31.1	273	1.66	7.91	85	788	<0.00200	0.0527	0.0612	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.171	<0.000150	0.00567	<0.00200	<0.00200	0.15	0.5	0.65

Bottom Ash – Field Results

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	18.39	7.67	-60	3720	1.1	0.31	2.38
BA-U-2	16.57	7.81	-97	2710	2	0.38	1.74
BAC-1	19.56	8.75	-282	1340	22.8	1.17	0.852
BAC-2	18.83	7.25	-39	5370	2.2	1.1	3.38
BAC-3	17.57	7.34	-11	8.95	1.1	1.61	5.64
BAC-4	15.14	7.6	-57	2600	0	1.94	1.66
BAC-5	15.26	7.68	-62	2960	0	2.03	1.9
BAC-6	15.21	7.63	-44	3880	0	1.48	2.48
BAC-7	15.95	7.74	-71	4210	0	1.37	2.7
BAC-8	17.34	7.98	-91	1490	3.9	1.21	0.954
BAC-9	16.49	8.02	-69	1460	1.6	0.96	0.937
BAC-10	17.35	8	-80	1500	2.9	0.94	0.963

Waste Water – Results

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	147	744	0.519	7.59	263	1840	<0.00200	0.00927	0.0634	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.271	<0.000150	0.00206	<0.00200	<0.00200	0.27	0.59	0.86
WW-U-1	1.39	323	1820	0.416	7.27	1140	5120	<0.00200	0.00592	0.0442	<0.00200	<0.000500	0.00432	<0.00400	<0.00200	0.431	<0.000150	0.00702	0.00748	<0.00200	0.38	0.89	1.27
WW-U-2	1.16	347	1170	0.633	7.45	872	4270	<0.00200	0.0114	0.0473	<0.00200	<0.000500	0.00237	<0.00400	<0.00200	0.484	<0.000150	0.00411	0.0113	<0.00200	0.19	0.54	0.73
WWC-1	12.9	584	4600	0.245	7.1	3190	13800	<0.00200	0.0215	0.0183	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.000	0.00018	0.00794	0.0146	<0.00200	0.13	0.82	0.95
WWC-2	< 0.500	54.2	316	0.534	7.75	128	824	<0.00200	0.0161	0.0296	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.128	<0.000150	0.00348	<0.00200	<0.00200	-0.06	0.5	0.44
WWC-3	< 0.500	35.3	244	1.14	7.79	86	764	<0.00200	0.0226	0.0306	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.151	<0.000150	0.00471	<0.00200	<0.00200	0.06	0.38	0.44
WWC-4	1.34	240	1030	0.449	7.97	673	2780	<0.00200	0.0133	0.0412	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.388	<0.000150	<0.00200	<0.00200	<0.00200	-0.03	0.56	0.53

Waste Water – Field Results

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.23	7.68	-37	3470	1.9	0.36	2.22
WW-U-1	16.64	7.24	-17	8020	0	0.41	5.05
WW-U-2	17.11	7.41	-8	7650	1.1	0.51	4.82
WWC-1	16.68	7.13	2	9830	0	1.37	6.19
WWC-2	15.94	8.03	-95	1550	2.9	1.56	0.989
WWC-3	16.07	8.01	-144	1310	0	2.09	0.841
WWC-4	15.29	7.38	-19	4910	0	1.4	3.14

Round 13 (all results ppm) Assessment Monitoring - September 23 - October 15, 2019

Landfill Wells	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
CL-U-1	< 0.500	58.9	432	0.753	7.94	109	976	<0.00200	0.0289	0.0799	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.239	<0.000150	0.0035	<0.00200	<0.00200	0.03	0.75	0.75
CL-U-2	< 0.500	60.6	424	0.792	7.87	112	968	<0.00200	0.0251	0.0935	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.229	<0.000150	0.00412	<0.00200	<0.00200	0.03	0.57	0.6
CLW-1	< 0.500	36	328	1.11	8.03	69.1	852	<0.00200	0.0295	0.0612	<0.00200	<0.000500	0.00742	<0.00400	<0.00200	0.187	<0.000150	0.00357	<0.00200	<0.00200	0.29	0.38	0.67
CLW-2	< 0.500	50.8	438	1.13	8.15	88.1	924	<0.00200	0.0283	0.1510	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.253	<0.000150	0.0102	<0.00200	<0.00200	0.08	0.56	0.64
CLW-3	< 0.500	47	363	1.24	7.99	90.8	828	<0.00200	0.039	0.0976	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.242	<0.000150	0.00504	<0.00200	<0.00200	0.6	0.43	1.03
CLW-4	< 0.500	34.6	332	1.55	7.97	75.6	768	<0.00200	0.0387	0.0797	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.235	<0.000150	0.00441	<0.00200	<0.00200	0.22	1.06	1.06
CLW-5	< 0.500	37.5	351	1.89	8	76.9	1060	<0.00200	0.0231	0.0685	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.237	<0.000150	0.00479	<0.00200	<0.00200	0.25	0.44	0.69
CLW-6	< 0.500	34.5	330	1.7	7.98	74.4	1110	<0.00200	0.0145	0.0936	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.239	<0.000150	0.00607	<0.00200	<0.00200	0.42	1.05	1.47
CLW-7	< 0.500	43.7	362	1	7.89	71.4	796	<0.00200	0.0238	0.0523	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.192	<0.000150	0.00402	<0.00200	<0.00200	0.12	-0.03	0.09
CLW-8	< 0.500	39.9	337	1.04	7.98	70.7	836	<0.00200	0.0266	0.0521	<0.00200	<0.000500	0.00000	<0.00400	<0.00200	0.196	<0.000150	0.00449	<0.00200	<0.00200	-0.05	0.32	0.27
CLW-9	< 0.500	26.9	288	1.94	8.12	88.7	792	<0.00200	0.0398	0.0469	<0.00200	<0.000500	0.00287	<0.00400	<0.00200	0.181	<0.000150	0.00573	<0.00200	<0.00200	0.36	0.02	0.38
CL-U-3	< 0.500	64.6	304	0.429	8.85	168	596	<0.00200	<0.00200	0.0342	<0.00200	<0.000500	0.0738	<0.00400	<0.00200	0.152	<0.000150	0.00964	<0.00200	<0.00200	2.13	0.21	2.13

Round 13

Landfill Wells	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
CL-U-1	15.85	7.75	-159	777	0	1.62	0.497
CL-U-2	15.96	7.7	-158	743	0	1.01	0.476
CLW-1	15.83	7.73	-48	1480	1.3	2.01	0.948
CLW-2	16.6	7.79	-191	760	0	2	0.488
CLW-3	17.14	7.84	-215	1730	0.5	1.43	1.11
CLW-4	16.47	7.88	-233	1600	2.7	1.61	1.03
CLW-5	17.05	7.83	-220	1700	1.9	1.84	1.09
CLW-6	16.65	7.7	-229	1590	1.6	2.69	1.02
CLW-7	17.74	7.76	-57	1580	0.6	1.24	1.01
CLW-8	16.37	7.81	-36	1520	1	1.51	0.969
CLW-9	16.03	7.72	-299	1610	0.2	7.56	1.03
CL-U-3	16.1	9.08	-76	503	0	1.84	0.322

Bottom Ash	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
BA-U-1	< 0.500	173	1140	0.587	7.71	314	2290	<0.00200	0.0223	0.0770	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.385	<0.000150	0.00302	0.00502	<0.00200	0.16	0.73	0.73
BA-U-2	< 0.500	47.1	400	0.893	8.18	56.6	972	<0.00200	0.0283	0.1270	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.247	<0.000150	0.00332	<0.00200	<0.00200	0.26	0.7	0.96
BAC-1	1.43	93.7	801	0.307	8.16	701	2730	<0.00200	0.0126	0.0460	<0.00200	<0.000500	0.00163	<0.00400	<0.00200	0.259	<0.000150	0.128	0.00436	<0.00200	0	0.14	0.14
BAC-2	9.49	208	1730	1.07	7.45	2760	7240	<0.00200	0.0647	0.0192	<0.00200	<0.000500	0.0058	<0.00400	<0.00200	0.466	0.00028	0.19	0.0145	<0.00200	0.12	0.39	0.51
BAC-3	7.32	441	3500	0.675	7.49	4310	13900	0.0027	0.0356	0.0321	<0.00200	<0.000500	0.00449	<0.00400	<0.00200	0.957	<0.000150	0.0255	0.0236	<0.00200	0	0.45	0.45
BAC-4	0.606	66.7	573	1.13	7.95	330	1820	<0.00200	0.0322	0.0637	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.279	<0.000150	0.0218	<0.00200	<0.00200	0.15	0.16	0.31
BAC-5	< 0.500	66.2	568	1.11	8.07	250	1410	<0.00200	0.0321	0.0814	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.289	<0.000150	0.00941	<0.00200	<0.00200	0.25	0.36	0.61
BAC-6	2.66	119	625	0.796	7.86	646	1870	<0.00200	0.0223	0.0338	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.288	<0.000150	0.0651	0.00273	<0.00200	0.31	0.83	1.14
BAC-7	5.06	107	566	1.31	7.96	1170	2320	<0.00200	0.0314	0.0174	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.248	<0.000150	0.0887	0.00276	<0.00200	0.04	0.22	0.26
BAC-8	< 0.500	23.2	280	1.53	8.05	95.5	784	<0.00200	0.0639	0.0389	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.156	<0.000150	0.00545	<0.00200	<0.00200	0.03	1.21	1.21
BAC-9	< 0.500	27.1	299	1.45	8.06	87.6	788	<0.00200	0.0593	0.0388	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.16	<0.000150	0.00483	<0.00200	<0.00200	0.09	0	0.53
BAC-10	< 0.500	25.7	280	1.51	8.09	87.4	808	<0.00200	0.0595	0.045	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.16	<0.000150	0.00584	<0.00200	<0.00200	0.8	1	1.8

Bottom Ash	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
BA-U-1	16.68	7.47	-58	1610	0	1.29	1.03
BA-U-2	16.37	8.94	-255	1550	1.4	0.8	0.99
BAC-1	17.09	7.98	-50	3950	1.32	3.4	2.53
BAC-2	16.92	7.19	28	10600	3.3	2.45	6.59
BAC-3	17.34	7.1	20	16700	2	0.61	10.4
BAC-4	16.73	7.81	-57	2570	0.6	1.18	1.64
BAC-5	17.52	7.84	-50	2540	0.4	1.33	1.63
BAC-6	16.78	7.74	-52	2670	0.7	0.87	1.71
BAC-7	17.16	7.83	-156	4000	3.1	0.86	2.56
BAC-8	15.03	7.65	-41	1540	0.2	5.45	0.989
BAC-9	15.03	7.68	-23	1560	0.3	1.2	0.993
BAC-10	14.98	7.65	-31	1560	0.1	1.15	0.999

Waste Water	Results																						
	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
SI-U-1	< 0.500	136	824	0.38	7.71	281	1850	<0.00200	0.00981	0.0599	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.277	<0.000150	<0.00200	<0.00200	<0.00200	0.19	1.61	1.61
WW-U-1	1.41	311	1010	<0.100	7.37	588	5720	<0.00200	0.00594	0.0419	<0.00200	<0.000500	0.00166	<0.00400	<0.00200	0.485	<0.000150	0.00689	0.0077	<0.00200	-0.08	1.42	1.42
WW-U-2	1.02	346	2020	<0.100	7.3	855	4400	<0.00200	0.00735	0.0499	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.54	<0.000150	0.00317	0.011	<0.00200	-0.2	1.36	1.36
WWC-1	13.2	473	4940	0.292	7.42	3570	14900	<0.00200	0.0264	0.0205	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.974	0.000278	0.0113	0.016	<0.00200	0.23	0.9	0.9
WWC-2	< 0.500	57.6	349	0.427	7.99	141	876	<0.00200	0.0166	0.0336	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.126	<0.000150	0.00327	<0.00200	<0.00200	-0.15	0.81	0.81
WWC-3	< 0.500	33.3	262	0.986	8.13	95.3	776	<0.00200	0.0236	0.0331	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.151	<0.000150	0.00477	<0.00200	<0.00200	3.1	0.58	3.1
WWC-4	1.06	176	968	0.453	7.61	594	3080	<0.00200	0.0154	0.0456	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.329	<0.000150	<0.00200	0.00177	<0.00200	0.72	0.57	1.29

Waste Water	Field Results						
	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
SI-U-1	16.51	7.63	-12	3290	0.1	0.78	2.11
WW-U-1	16.11	7.19	14	8000	2.8	1.93	5.04
WW-U-2	16.06	7.38	22	7390	0.6	1.32	4.66
WWC-1	15.13	6.79	36	1910	0	3.67	11.8
WWC-2	14.82	7.31	-29	1720	0.3	0.47	1.1
WWC-3	15.96	7.72	-244	1420	0	0.2	0.909
WWC-4	14.38	7.21	-34	4460	0	2.35	2.86

Round 14 (all results ppm) Assessment Monitoring - March 25 - April 9, 2020

Landfill Wells	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
CL-U-1	< 0.500	57.6	429	0.979	7.70	122	916	<0.00200	0.0310	0.0800	<0.00200	<0.000500	0.00551	<0.00400	<0.00200	0.241	<0.000150	0.00505	<0.00200	<0.00200	0.36	0.93	1.29
CL-U-2	< 0.500	60.0	408	1.01	7.68	118	964	<0.00200	0.0266	0.0901	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.221	<0.000150	0.00404	<0.00200	<0.00200	0.09	1.23	1.23
CLW-1	< 0.500	36.6	304	0.979	7.91	61.0	856	<0.00200	0.0300	0.0612	<0.00200	<0.000500	0.00551	<0.00400	<0.00200	0.172	<0.000150	0.00527	<0.00200	<0.00200	0.25	0.12	0
CLW-2	< 0.500	47.0	418	1.23	7.84	86.0	992	<0.00200	0.0258	0.0770	<0.00200	<0.000500	0.00337	<0.00400	<0.00200	0.212	0.000278	0.00556	<0.00200	<0.00200	0.03	0.54	0
CLW-3	< 0.500	39.4	361	1.27	7.88	101	488	<0.00200	0.0387	0.0991	<0.00200	<0.000500	0.00251	<0.00400	<0.00200	0.206	<0.000150	0.00560	<0.00200	<0.00200	0.20	-0.04	0
CLW-4	< 0.500	33.6	323	1.34	7.88	85.5	960	<0.00200	0.0381	0.0822	<0.00200	<0.000500	0.00245	<0.00400	<0.00200	0.204	<0.000150	0.00508	<0.00200	<0.00200	-0.03	0.47	0
CLW-5	< 0.500	34.5	340	1.58	7.86	83.9	800	<0.00200	0.0227	0.0737	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.198	<0.000150	0.00585	<0.00200	<0.00200	0.15	0.62	0
CLW-6	< 0.500	33.0	312	1.48	7.94	81.2	544	<0.00200	0.0225	0.0878	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.203	<0.000150	0.00540	<0.00200	<0.00200	0.43	-0.06	0
CLW-7	< 0.500	44.3	329	1.03	7.79	60.5	1020	<0.00200	0.0242	0.0526	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.180	<0.000150	0.00392	<0.00200	<0.00200	0.20	-0.08	0
CLW-8	< 0.500	40.8	316	1.03	7.86	63.7	880	<0.00200	0.0267	0.0634	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.182	<0.000150	0.00400	<0.00200	<0.00200	0.12	0.12	0
CLW-9	< 0.500	25.2	296	1.90	7.96	83.5	932	<0.00200	0.0402	0.0499	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.170	<0.000150	0.00597	<0.00200	<0.00200	0.15	0.32	0
CL-U-3	< 0.500	57.7	386	0.889	7.75	116	1090	<0.00200	0.0206	0.0478	<0.00200	<0.000500	0.00553	<0.00400	<0.00200	0.205	<0.000150	0.00467	<0.00200	<0.00200	-0.06	0.95	0.95

Round 14

Landfill Wells	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
Round 13	14.31	7.53	-172	1970	1.0	0.46	1.26
CL-U-2	14.47	7.47	-132	1890	1.1	4.72	1.21
CLW-1	15.51	7.45	-110	1500	0.3	0.40	0.96
CLW-2	15.46	7.59	-189	1950	1.0	0.14	1.25
CLW-3	15.26	7.66	-230	1760	1.0	0.16	1.13
CLW-4	15.25	7.67	-237	1650	3.3	0.17	1.06
CLW-5	15.20	7.57	-234	1730	7.5	0.40	1.11
CLW-6	14.63	7.57	-236	1650	0.9	0.26	1.06
CLW-7	16.02	7.45	-97	1610	0.2	0.24	1.03
CLW-8	16.24	7.47	-106	1540	6.0	0.37	0.98
CLW-9	13.95	7.72	-276	1590	1.9	6.57	1.02
CL-U-3	14.31	7.51	-210	1870	1.7	5.53	1.20

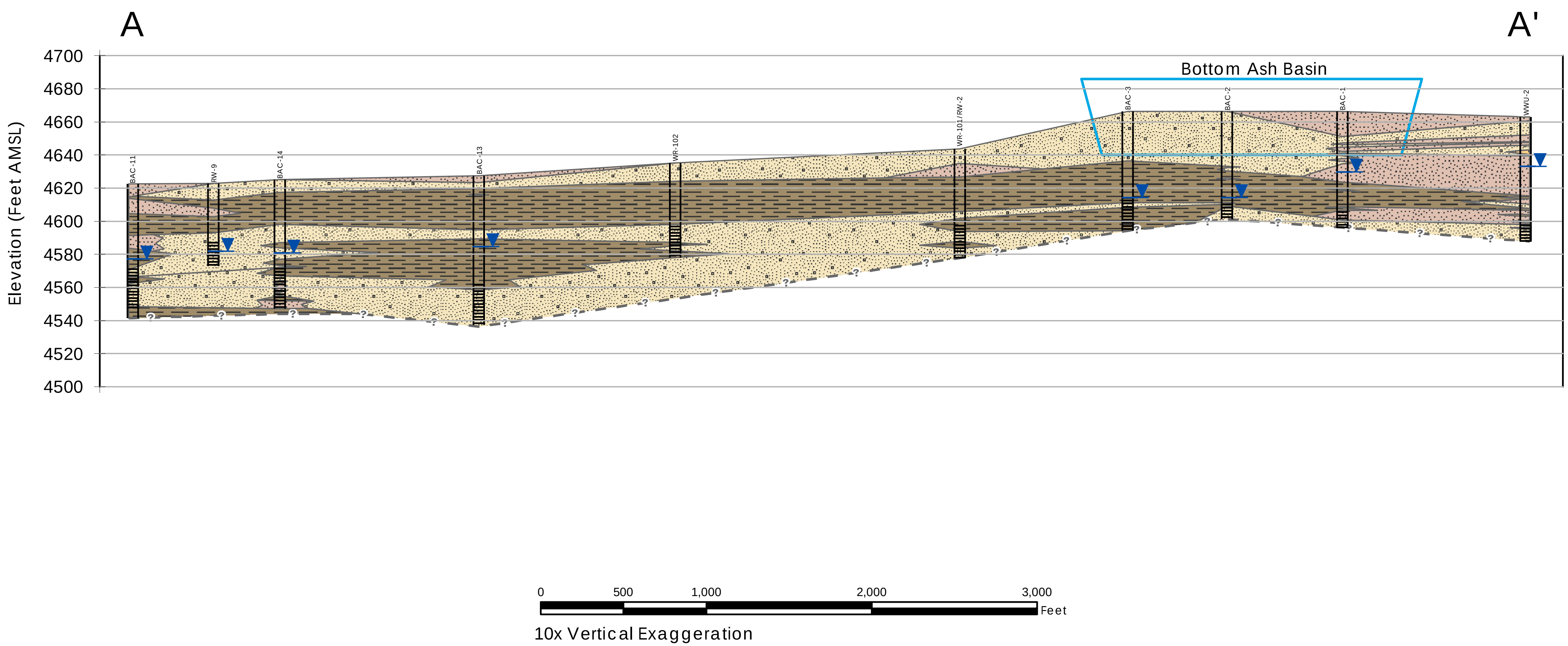
Bottom Ash	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
BA-U-1	< 0.500	188	1090	0.817	7.50	367	3050	<0.00200	0.0226	0.0774	<0.00200	<0.000500	0.0711	<0.00400	<0.00200	0.375	<0.000150	0.0152	0.00519	<0.00200	0.28	1.20	1.2
BA-U-2	< 0.500	2.47	395	0.912	10.70	42.7	872	<0.00200	0.00683	0.0804	<0.00200	<0.000500	0.00611	<0.00400	<0.00200	0.327	<0.000150	0.00629	<0.00200	<0.00200	-0.03	0.70	0
BAC-1	3.00	239	1890	0.645	7.39	1300	5270	<0.00200	0.0154	0.0340	<0.00200	<0.000500	0.00219	<0.00400	<0.00200	0.547	<0.000150	0.0170	0.00791	<0.00200	0.09	0.83	0.83
BAC-2	8.38	210	1710	1.16	7.27	2440	6380	<0.00200	0.0609	0.0206	<0.00200	<0.000500	0.00986	<0.00400	<0.00200	0.431	0.000192	0.172	0.0128	<0.00200	0.33	1.21	1.21
BAC-3	7.47	447	3620	1.26	7.21	4380	12500	<0.00200	0.0321	0.0284	<0.00200	<0.000500	0.0150	<0.00400	<0.00200	0.913	<0.000150	0.0251	0.0204	<0.00200	0.16	0.51	0
BAC-4	0.613	70.5	541	1.09	7.89	295	1540	<0.00200	0.0330	0.0649	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.272	<0.000150	0.0211	<0.00200	<0.00200	-0.06	0.17	0
BAC-5	0.547	83.5	552	0.991	7.79	416	1760	<0.00200	0.0297	0.0560	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.306	<0.000150	0.0242	<0.00200	<0.00200	0.03	0.22	0
BAC-6	4.02	115	560	0.847	7.74	1020	2340	<0.00200	0.0255	0.0215	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.242	0.000278	0.0805	<0.00200	<0.00200	0.14	0.52	0
BAC-7	5.48	92.6	532	1.48	7.91	1090	2400	<0.00200	0.0350	0.0168	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.218	<0.000150	0.0805	0.00202	<0.00200	0.21	0.25	0
BAC-8	< 0.500	25.4	264	1.61	7.97	84.4	784	<0.00200	0.0596	0.0370	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.183	<0.000150	0.00581	<0.00200	<0.00200	0	0.16	0
BAC-9	< 0.500	31.4	305	1.47	7.94	77.5	824	<0.00200	0.0488	0.0400	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.185	<0.000150	0.00487	<0.00200	<0.00200	0.09	0.29	0
BAC-10	0.571	26.1	278	1.62	7.95	84.0	804	<0.00200	0.0531	0.0381	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.171	<0.000150	0.00617	<0.00200	<0.00200	0.22	0.19	0
BAC-11	< 0.500	84.4	676	0.984	7.71	147	1100	<0.00200	0.0312	0.1160	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.244	<0.000150	0.00345	<0.00200	<0.00200	0.36	0.09	0
BAC-12	< 0.500	25.9	210	1.24	7.99	71.7	360	<0.00200	0.0423	0.0938	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.132	<0.000150	0.00479	<0.00200	<0.00200	0.23	0.18	0
BAC-13	0.604	115	929	0.957	7.50	276	46400	<0.00200	0.0329	0.0773	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.285	<0.000150	0.00250	<0.00200	<0.00200	0.35	0.55	0
BAC-14	0.565	158	940	0.972	7.53	432	1180	<0.00200	0.0359	0.0542	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.321	<0.000150	0.00222	<0.00200	<0.00200	0.03	0.08	0
BAC-15	< 0.500	26.2	263	1.75	8.01	78.9	600	<0.00200	0.0539	0.0395	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.172	<0.000150	0.00827	<0.00200	<0.00200	0.08	0.18	0
BAC-16	< 0.500	24.2	304	1.89	8.15	77.8	900	<0.00200	0.0783	0.0346	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.183	<0.000150	0.00732	<0.00200	<0.00200	0.20	0.22	0

Bottom Ash	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
BA-U-1	15.43	7.22	-203	4340	5.7	0.20	2.78
BA-U-2	15.98	10.31	-330	469	0.0	0.35	0.305
BAC-1	17.25	7.20	-60	8060	2.4	0.32	5.09
BAC-2	16.70	7.16	-30	10100	8.1	5.44	6.26
BAC-3	16.05	7.18	-5	16500	3.7	0.50	10.2
BAC-4	15.70	7.53	-107	2600	0.0	0.18	1.67
BAC-5	15.76	7.51	-74	2900	0.2	0.16	1.86
BAC-6	16.17	7.49	-63	3540	0.9	0.33	2.26
BAC-7	15.35	7.66	-115	3840	1.9	2.47	2.46
BAC-8	14.78	7.54	68	1510	0.8	0.89	0.969
BAC-9	15.30	7.55	-28	1590	2.4	1.12	1.02
BAC-10	15.23	7.60	-50	1540	3.2	0.92	0.991
BAC-11	15.03	7.41	12	2980	7.1	7.33	1.91
BAC-12	14.93	7.75	-152	1280	1.4	6.36	0.821
BAC-13	14.46	7.28	-47	3850	1.1	6.99	2.47
BAC-14	14.81	7.20	4230	22	2.0	4.84	2.7
BAC-15	14.67	7.72	-45	1550	1.5	7.69	0.99
BAC-16	14.41	7.71	-64	1710	0.5	7.76	1.1

Waste Water	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium	Radium 226	Radium 228	Radium 226 and 228 combined
	Results																						
SI-U-1	< 0.500	113	699	0.511	7.70	279	1230	<0.00200	0.00865	0.0609	<0.00200	<0.000500	0.00305	<0.00400	<0.00200	0.239	<0.000150	0.00280	<0.00200	<0.00200	0.20	1.04	1.04
WW-U-1	1.42	286	1940	0.324	7.24	1270	4740	<0.00200	0.00653	0.0391	<0.00200	<0.000500	0.00544	<0.00400	<0.00200	0.412	<0.000150	0.00811	0.00724	<0.00200	0.21	1.38	1.38
WW-U-2	1.23	337	2020	0.473	7.42	981	4020	<0.00200	0.0108	0.0502	<0.00200	<0.000500	0.00696	<0.00400	<0.00200	0.498	<0.000150	0.00309	0.0112	<0.00200	0	1.08	1.08
WWC-1	13.4	464	4800	<0.100	7.29	3440	13000	<0.00200	0.0256	0.0207	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.936	0.000238	0.0136	0.0133	<0.00200	0.32	0.36	0
WWC-2	< 0.500	51.7	322	0.452	7.88	124	644	<0.00200	0.0159	0.0357	<0.00200	<0.000500	0.00332	<0.00400	<0.00200	0.119	<0.000150	0.00455	<0.00200	<0.00200	0.24	-0.15	0
WWC-3	< 0.500	31.8	254	1.06	7.96	85.8	712	<0.00200	0.0219	0.0304	<0.00200	<0.000500	0.00240	<0.00400	<0.00200	0.142	<0.000150	0.00536	<0.00200	<0.00200	-0.08	0.19	0
WWC-4	1.20	182	935	0.426	7.44	638	2730	<0.00200	0.0140	0.0437	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.314	<0.000150	0.00207	0.00228	<0.00200	0.47	0.27	0

Waste Water	Temp	pH	REDOX	Conductance	Turbidity (NTUs)	DO	TDS
	Field Results						
SI-U-1	16.33	7.30	3	789	0.0	3.90	0.505
WW-U-1	15.39	7.01	-38	3910	1.2	0.17	2.5
WW-U-2	13.24	7.19	-19	3800	0.7	1.02	2.43
WWC-1	14.71	6.90	-20	19400	2.8	0.31	12.0
WWC-2	13.47	7.59	-97	1690	12.8	0.54	1.08
WWC-3	14.65	7.67	-154	1430	1.1	0.17	0.916
WWC-4	14.61	7.13	-12	4750	1.4	0.40	3.04

ATTACHMENT 11. GEOLOGIC CROSS-SECTIONAL FIGURES



Stantec

Legend

Groundwater Elevation (March 2020)

Uncertain

Inferred

Well Construction

Casing

Screen

Lithology

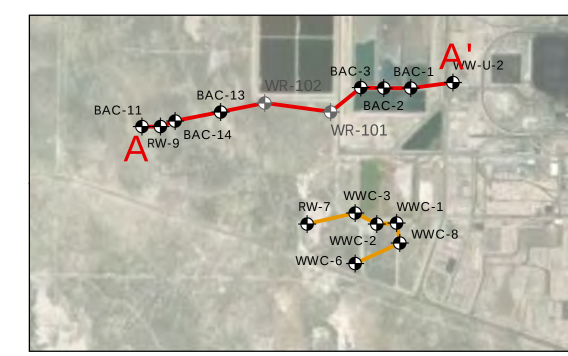
Clay

Sand and Fines

Sand

Gravel and Sand-Gravel

Notes
1. Coordinate System: NAD 1983 State Plane Louisiana North FIPS 1701 Feet
2. AMSL = Above Mean Sea Level
3. Fines: Clay and Silt



Project Location 213470011

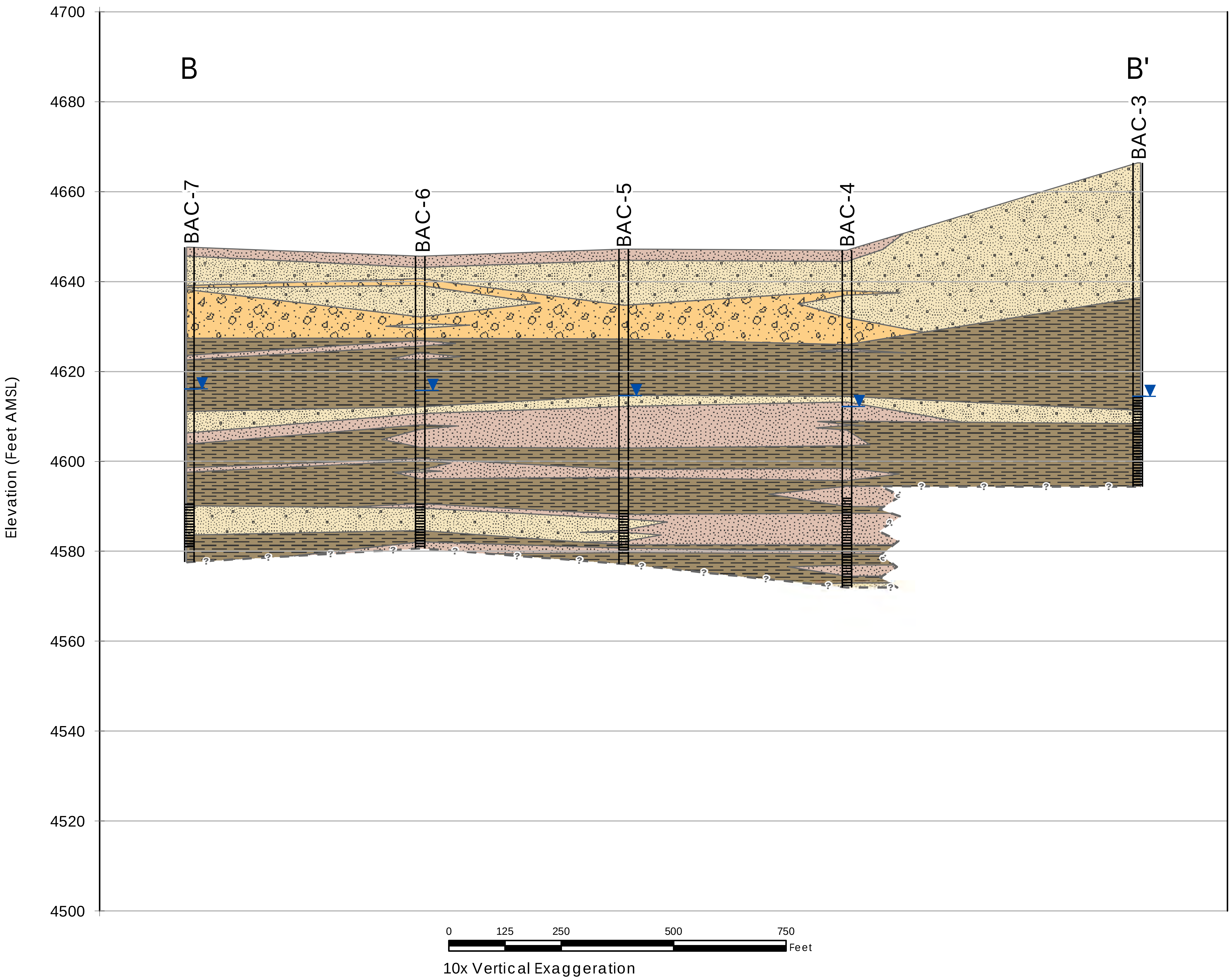
Alexandria, Louisiana

Prepared by CK on 2020-10-23
Technical Review by xx on 2020-XX-XX
Independent Review by xx on 2020-XX-XX

Client/Project
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

Figure No.
3

Title
Cross Section A-A'



Stantec

Legend

Groundwater Elevation (March 2020)

Uncertain

Inferred

Well Construction

Casing

Screen

Lithology

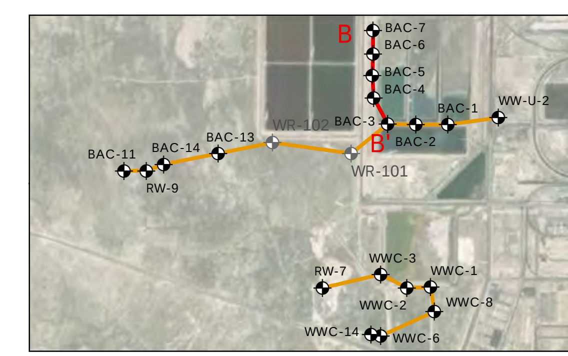
Clay

Sand and Fines

Sand

Gravel and Sand-Gravel

Notes
1. Coordinate System: NAD 1983 State Plane Louisiana North FIPS 1701 Feet
2. AMSL = Above Mean Sea Level
3. Fines: Clay and Silt



Project Location 213470011

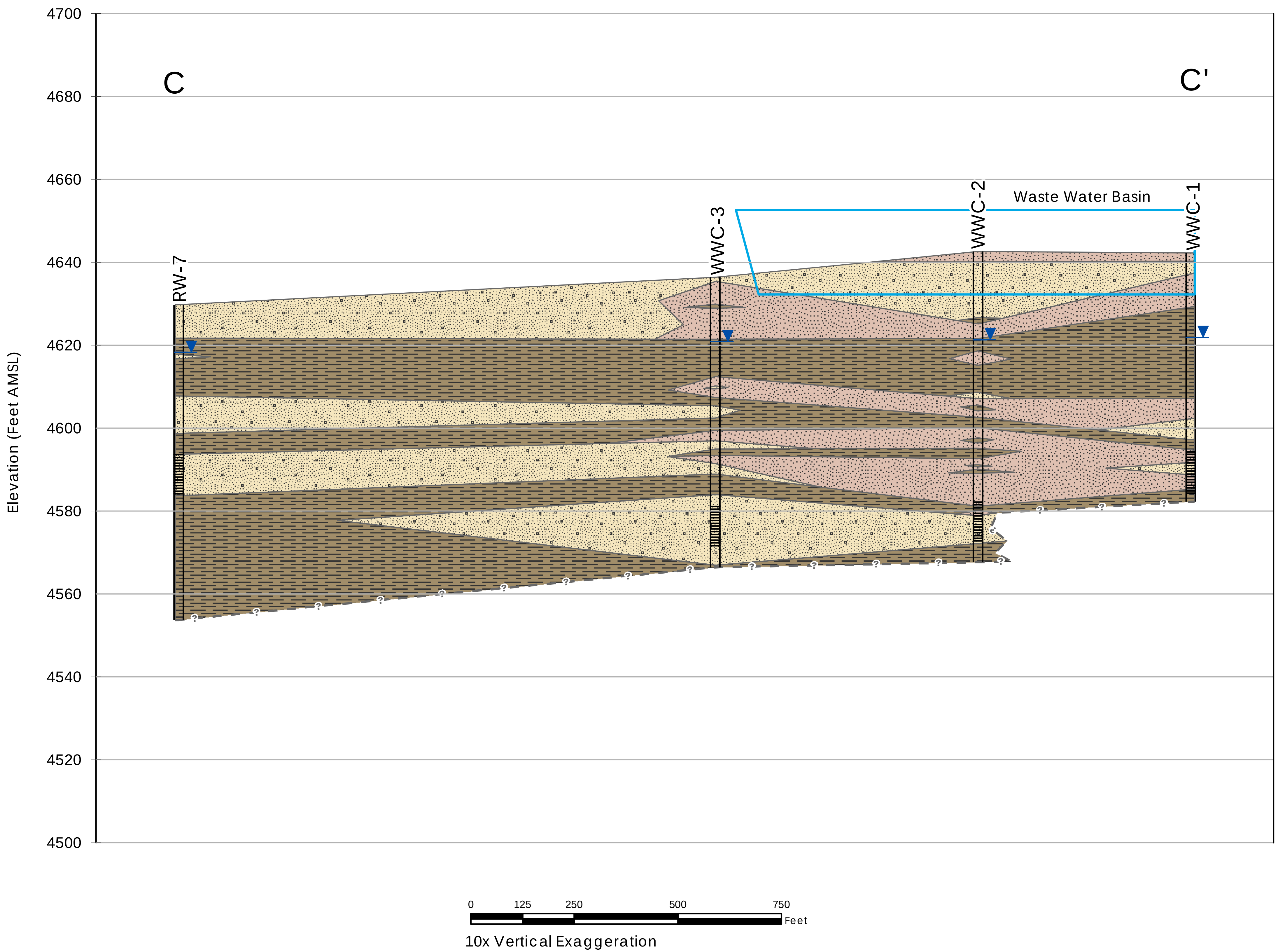
Alexandria, Louisiana

Prepared by CK on 2020-10-23
Technical Review by xx on 2020-XX-XX
Independent Review by xx on 2020-XX-XX

Client/Project
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

Figure No.
4

Title
Cross Section B-B'



Stantec

Legend

Groundwater Elevation (March 2020)

Uncertain

Inferred

Well Construction

Casing

Screen

Lithology

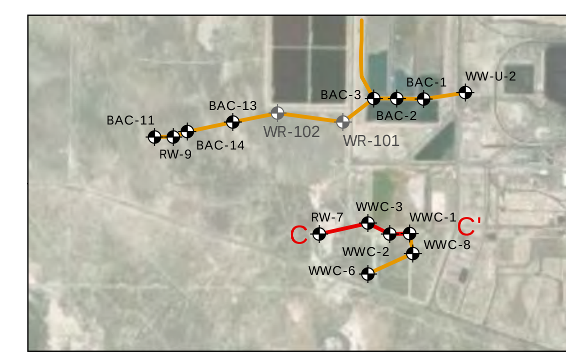
Clay

Sand and Fines

Sand

Gravel and Sand-Gravel

Notes
1. Coordinate System: NAD 1983 State Plane Louisiana North FIPS 1701 Feet
2. AMSL = Above Mean Sea Level
3. Fines: Clay and Silt



Project Location

213470011

Alexandria, Louisiana

Prepared by CK on 2020-10-23
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Independent Review by xx on 2020-XX-XX

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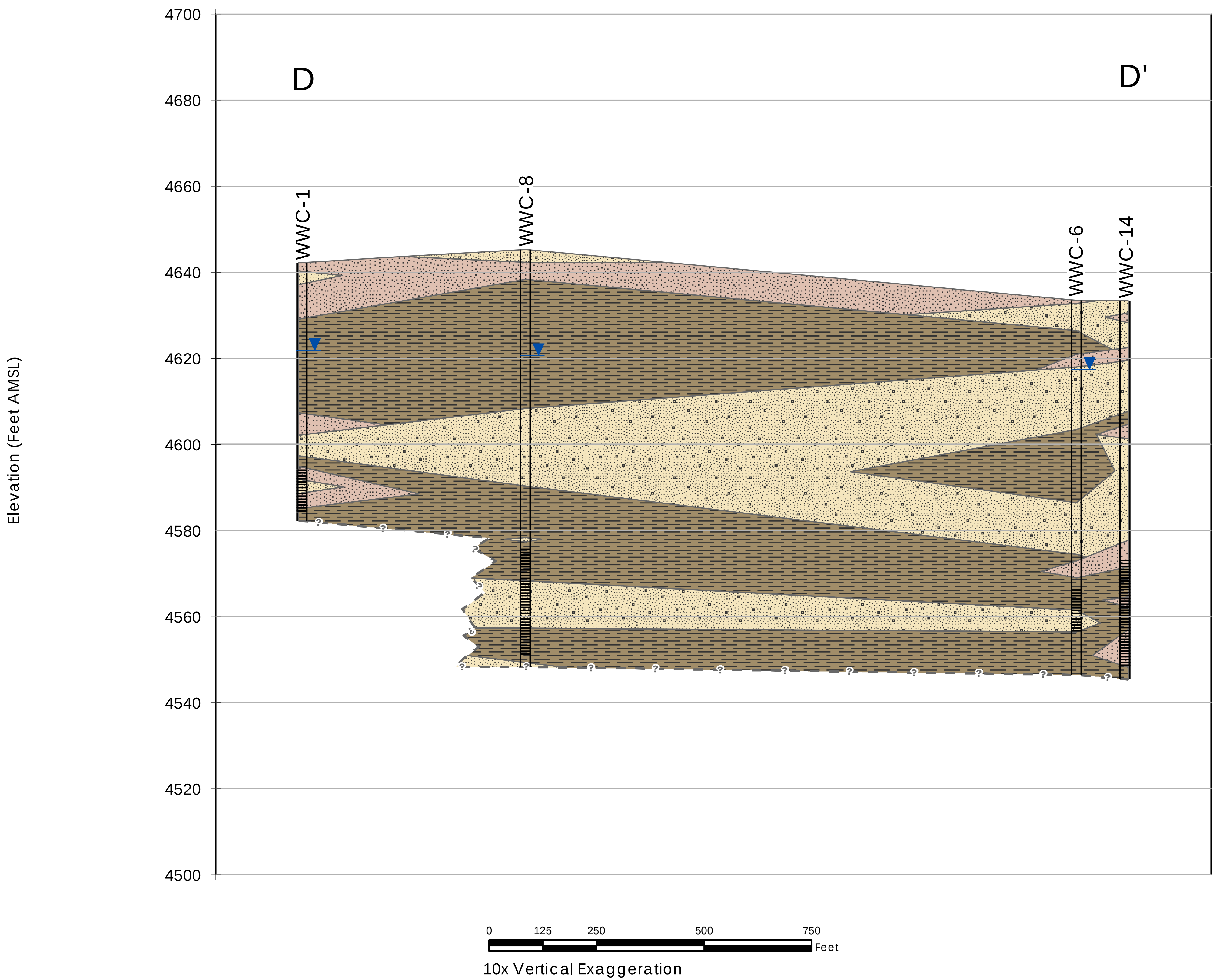
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

Figure No.

5

Title

Cross Section C-C'



Stantec

Legend

Groundwater Elevation (March 2020)

Uncertain

Inferred

Well Construction

Casing

Screen

Lithology

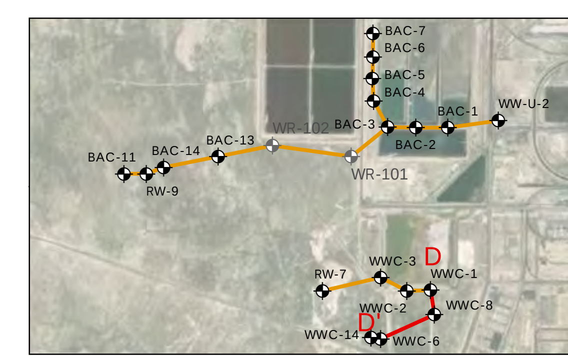
Clay

Sand and Fines

Sand

Gravel and Sand-Gravel

Notes
1. Coordinate System: NAD 1983 State Plane Louisiana North FIPS 1701 Feet
2. AMSL = Above Mean Sea Level
3. Fines: Clay and Silt



Project Location | 213470011

Alexandria, Louisiana

Prepared by CK on 2020-10-23
Technical Review by xx on 2020-XX-XX
Independent Review by xx on 2020-XX-XX

Client/Project
INTERMOUNTAIN POWER SERVICE CORP.
INTERMOUNTAIN GENERATION FACILITY
DELTA, UTAH

Figure No.
6

Title
Cross Section D-D'

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ATTACHMENT 12. COPIES OF IPSC'S CCR SURFACE IMPOUNDMENT CLOSURE PLANS AND CLOSURE SCHEDULES

Bottom Ash Basin Closure Plan

Intermountain Generating Facility

November 19, 2020

Prepared for:

Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624
Attention: Mike Utley

Prepared by:
Stantec Consulting Services Inc.
2890 East Cottonwood Parkway, Suite 300
Salt Lake City, Utah 84121

Stantec Project Number 233001396

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Prepared by ______________________________
(signature)

Peter Bernhard

Reviewed by ______________________________
(signature)

Mike Davis

Approved by ______________________________
(signature)

Chad Tomlinson

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Abbreviations

amsl	Above Mean Sea Level
ASTM	American Society for Testing and Materials
the Basin	Bottom Ash Basin
bgs	Below Ground Surface
CCR	Coal Combustion Residual
CY	Cubic Yards
ft	Feet
HDPE	High-Density Polyethylene
IPA	Intermountain Power Agency
IPP	Intermountain Power Project
IPSC	Intermountain Power Services Corporation
L.L.	Liquid Limit
N.P.	Non-Plastic
Plan	Closure Plan
P.I.	Plasticity Index
P.L.	Plastic Limit
TDS	Total Dissolved Solids
UAC	Utah Administrative Code Rule
UDEQ	Utah Department of Environmental Quality

1.0 INTRODUCTION

This Closure Plan (Plan) has been prepared to describe the activities to be performed to obtain final closure of Intermountain Power Services Corporation's (IPSC) Intermountain Power Project (IPP) Bottom Ash Basin (the Basin). The site is located approximately ten miles north of Delta, Utah. The major waste sources contained within the Basin are bottom ash and boiler slag.

This Plan has been prepared for IPSC by Stantec for review and approval by the Utah State Department of Environmental Quality (UDEQ). Division of Waste Management and Radiation Control.

1.1 PURPOSE AND SCOPE

The bottom ash waste currently disposed of in the Basin could pose both a long-term source of fugitive dust emissions from the surface and a potential threat to groundwater. Therefore, the purpose of this document is to present the plan to eliminate fugitive dust emissions and potential groundwater impacts from the bottom ash waste associated with the Basins in compliance with applicable regulatory requirements.

This document provides a detailed description of the activities to be performed as part of the proposed Plan, to close and cover the Basins with the bottom ash waste in place. These activities include:

- Dewatering.
- Backfill with general fill to pre-consolidate the Basin solids, assist in dewatering and to construct a sloping crown for the final cover system.
- Construction of a high-density polyethylene (HDPE) liner.
- Construction of an 18-inch general fill for liner protection.
- Construction of a 6-inch vegetated layer of Topsoil.
- Vegetation of the cover surfaces.

The cover system presented in this Plan will utilize HDPE liner, overlain by an 18-inch liner protection layer and a 6-inch topsoil layer. The final cover system is designed to achieve the following:

- Provides a cover system that has a permeability less than or equal permeability rate of the bottom liner system of the basin.
- Minimize infiltration into the underlying bottom ash waste material.

- Provides an erosion protection layer consisting of a topsoil and vegetation.

This cover system has been designed to meet the Utah Administrative Code Rule (UAC) R315-319-102(d)(3) regulations for Closure and Post-Closure Care – Criteria for Conducting the Closure or Retrofit of CCR Units as discussed in Section 2.1.2.

In addition, a post closure monitoring plan has been designed to monitor the performance of the proposed closure.

2.0 PROJECT BACKGROUND

The IPP is a 1,900-megawatt coal-fired, steam electric generation station located on an approximately 4,600-acre site in the Sevier Desert approximately 10-miles North of Delta, Utah. The IPP is owned by the Intermountain Power Agency (IPA) and operated by IPSC. The IPP began generating power in 1986 and has operated continuously since that time. The IPP delivers power to users located in Utah and Sothern California. In May 2017, IPSC announced plans to cease power generation using coal and to develop new, natural gas fueled generation at the project site by 2025. As a result of this transition, there are several CCR units at the plant that must be closed.

An Initial written closure plan was developed in 2016 (Stantec, 2016) to comply with Utah Administrative Code Rule (UAC) R315-319-102(b) that requires IPSC to submit a written closure plan to the Division of Waste Management and Radiation Control. The basis of the initial written closure plan was the closure of the CCR units by leaving CCR material in place.

2.1 APPLICABLE REGULATORY REQUIREMENTS

2.1.1 UDEQ Requirements

A review of current UDEQ regulations/guidelines was conducted to determine if there is a presumptive requirement for closure of the Basin following cessation of its operation. The review identified the UAC R315-319-102 titled “Closure and Post-Closure Care – Criteria for Conducting the Closure or Retrofit of CCR Units” and is in effect as of September 1, 2016 (UDEQ, 2016) which outlines the closure and post-closure process, minimum reporting. Specifically, the UDEQ rule includes the following requirements, in **Table 2.1**, for the closure of an inactive CCR surface impoundment:

Table 2.1 Closure performance standard when leaving CCR in place (R315-319.102(d))

Section R315-319.102(d)	Description of Requirement	Bottom Ash Basin Closure Design
(1)(i)	Control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere	The HDPE liner will act to prevent infiltration of liquids into the Basin and prevent runoff from contacting the CCR.
(1)(ii)	Preclude the probability of future impoundment of water, sediment, or slurry	The cover and surrounding area will be graded to shed stormwater away from the cover. Diversion channels will be maintained upstream of the Basin to prevent run-on from precipitation.

(1)(iii)	Include measures to provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure period	The Basin is comprised of coarse and angular particles, and the material is inherently stable even when saturated. Therefore, the Basin will exhibit minimal settlement when dewatered.
(1)(iv)	Minimize the need for further maintenance of the CCR unit	The cover will be vegetated with a native seed mix. Once established, the cover will require little or no long-term maintenance.
(1)(v)	Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.	A schedule has been created to expedite the closure post final delivery of waste.
(2)(i)	Eliminate free liquids by removal or solidifying remaining wastes and waste residues	The Basin cells will be dewatered from the southern portion of each cell to remove the free water. General fill with a 1.5% gradient will be placed to partially stabilize and account for any nominal amount of settlement.
(2)(ii)	Stabilize remaining wastes to sufficiently support final cover system	
(3)(i)(A)	The permeability of the final cover system shall be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less.	The Basin cover system incorporating a HDPE geomembrane is necessary as the basin has a bottom HDPE liner.
(3)(i)(B)	The infiltration of liquids through the closed CCR unit shall be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.	The low permeability layer consists of a HDPE liner overlain by an 18-inches thick layer of general fill to provide liner protection.
(3)(i)(C)	The erosion of the final cover system shall be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.	The design of the soil cover includes a 6-inch thick erosion protection layer. The erosion protection layer will be fertilized and seeded with a native seed mix to establish vegetation.
(3)(i)(D)	The disruption of the integrity of the final cover system shall be minimized through a design that accommodates settling and subsidence	The Basin includes dewatering, preloading general fill and 1.5% gradient crown to accommodate nominal amounts of settlement.

Source: Utah Administrative Code Rule R315-319 (UDEQ, 2020)

2.1.2 Performance Standards for Surface Impoundment Covers

The UDEQ final rule for disposal of coal combustion residuals (UDEQ, 2016) requires that the permeability of the cover surface for the Basin be less than or equal to the permeability of the bottom liner, or 1×10^{-5} centimeters per second (cm/sec), whichever is less. The Basin is comprised of three separate cells. The existing liner system beneath Basins is an 80-mil thickness high density polyethylene (HDPE) geomembrane on top of a prepared subsoil bedding surface. The liner system was initially constructed in 1986. The Basin is anticipated to contain approximately 5,000,000 cubic yards (CY) of waste covering an area of approximately 101 acres at closure (Stantec, 2016).

As the existing liner system beneath the Basin is an HDPE liner, it is necessary that the cover system incorporates a liner system of similar permeability as HDPE liner. An HDPE geomembrane is incorporated in the cover system due to inherently stable waste even when saturated. The HDPE liner meets the UDEQ requirement and is appropriate for use in the cover system.

3.0 SITE CONDITIONS

This section presents a summary of the Basin's characteristics as well as a description of the geological and hydrogeological conditions at the site. The majority of this information has been obtained from the Coal Combustion Residual Units Initial Closure Plan (Stantec, 2016), Specific Site Assessment for Coal Combustion Waste Impoundments at Intermountain Generating Station (GEI, 2011), and IPP Coal Combustion Waste Ponds – Geotechnical Stability Analysis Report (Gerhart Cole, 2013).

3.1 BOTTOM ASH BASIN DESCRIPTION

The Basin was commissioned in 1986 and provides decant water to the Ash Water Recycle Basin for reuse in the ash water system and the sulfur dioxide removal system. The major waste sources contained within the Basin are bottom ash and boiler slag.

Figure 3-1 shows the current layout of the Basin. The Basin contains approximately 5,000,000 CY of waste covering an approximate area of 101 acres at closure (Stantec, 2016). The Basin consist of three adjacent cells-oriented north to south, each about 2,200 feet (ft) long by 650 ft wide. The cells are bounded by dikes constructed of local borrow materials, rising 30 to 36 ft above the surrounding topography. The bottom elevation of each cell is 4,639 ft above mean sea level (amsl), and the top of each berm is at 4,685 ft amsl (the total basin depth is 46 ft). Each cell is underlain by an 80 mil HDPE liner (GEI, 2011). Refer to **Figure 3-2** for a typical cross-section of the existing Basin. The upstream and downstream berm side slopes are 3H:1V. The existing operating procedures requires that a minimum freeboard of three (3) ft be maintained to provide adequate storage for the 50-year, 24-hr storm event (Stantec, 2016).

Figure 3-1 – Bottom Ash Basin Current Conditions

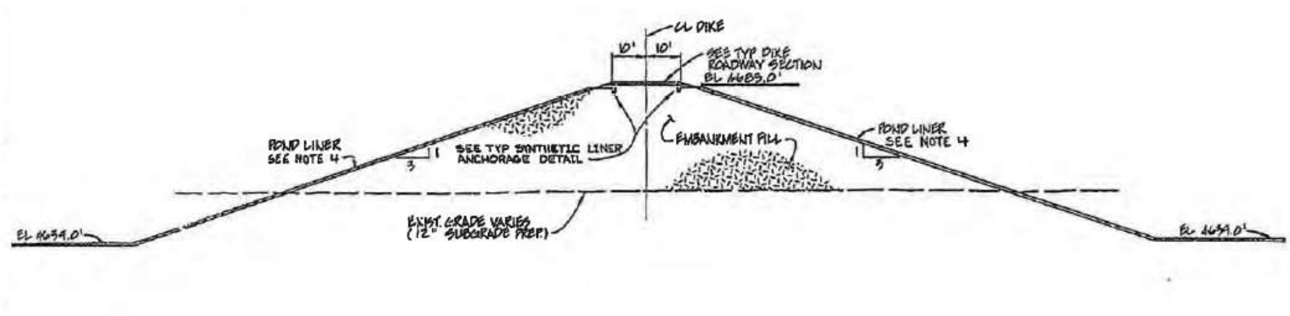

Figure 3-2 – Existing Typical Bottom Ash Basin Detail (GEI 2011)

Based on the current design, the Basin will be closed post final delivery of waste. The CCR material in the Basin is comprised of course and angular particles, and the material is inherently stable even when saturated. The CCR material in the Basin are vitrified, free-draining and differential settlement in the basin is expected to be negligible when dewatered. It is anticipated that the CCR material within the cells will be stable.

3.2 SITE GEOLOGY

The Basin is located near the center of the northern Sevier Desert in the Basin and Range Physiographic Province as shown in **Figure 3-3**. The area encompassing the Basin is in the Sevier Lake drainage system and is located on a broad alluvial fan. The ground surface within this area is relatively flat, sloping only slightly to the west. No major drainages cross the area.

The upper unit consists primarily of interbedded lenses of sand and silty sand. This unit is about 15 to 20 ft thick. The top few feet of this deposit are comprised of eolian sand, fluvial sand, and fine gravel. The underlying unit consists of fine-grained silts and clays of lacustrine origin. This unit is thickly bedded and extends to a depth of at least one hundred ft below ground surface (bgs). Both of the two major subsurface units dip slightly toward the west, paralleling the existing topographic slope.

Figure 3-3– IPP Physiographical Location

3.3 GROUNDWATER

Groundwater levels underlying the Basin indicate a relatively flat groundwater surface roughly paralleling the ground surface. The average groundwater surface gradient is about 0.5 percent to the west-southwest. The depths of the groundwater surface in the area range between 20 to 30 feet below ground surface (bgs).

Groundwater levels are measured and recorded semi-annually from 37 wells at the site as part of the Plant groundwater monitoring program (Stantec, 2020). The results of the groundwater monitoring program are documented in annual groundwater monitoring reports which are submitted to UDEQ. In order to provide a brief description of groundwater conditions in the vicinity of the Wastewater Basin, the *June 2020 Semi-Annual Progress Report* (Stantec, 2020), is summarized throughout the remainder of this section.

Based on measurements collected in March 2020, groundwater elevations in the vicinity of the Basin range between 4633.1 ft amsl (up-gradient of the Basin) and 4612.3 ft amsl (down-gradient of the pond). The groundwater flow direction at the site is predominantly from northeast to southwest (Stantec, 2020).

The monitoring wells and associated groundwater elevations in the vicinity of the Basin that were sampled as part of the June 2020 Semi-Annual Progress Report (Stantec, 2020) are presented in **Table 3.1**.

Table 3.1 Representative Wells for Bottom Ash Basin

Well I.D.	Location	Groundwater Elevation (ft amsl) March 2020	Depth to Groundwater (ft bgs) March 2020
BA-U-1	Northeast of Bottom Ash Basin	4624.97	40.76
BA-U-2	East of Bottom Ash Basin	4626.52	34.81
WW-U-2	East of Bottom Ash Basin	4633.15	22.31
BAC-1	Southeast of Bottom Ash Basin	4626.81	41.89
BAC-2	South of Bottom Ash Basin	4614.84	53.88
BAC-3	Southeast of Bottom Ash Basin	4614.42	54.42
BAC-4	East of Bottom Ash Basin	4612.24	37.21
BAC-5	East of Bottom Ash Basin	4614.62	35.05
BAC-6	East of Bottom Ash Basin	4615.80	32.35
BAC-7	Northeast of Bottom Ash Basin	4616.14	33.95

Groundwater data for the Basin indicates that most wells show little seasonal water level variation.

Water quality is monitored semi-annually at the Plant. During each sampling event, groundwater samples are collected from the representative wells listed in **Table 3.1**. All groundwater samples are analyzed for representative water quality parameters.

As reported to the UDEQ in the past, and as is the current status based upon existing information: the plume of ground water containing total dissolved solid (TDS) concentrations in excess of background concentrations is located within the uppermost aquifer beneath the IPSC-owned lands. The TDS plume is positioned well within the physical confines of IPSC-owned property and as such poses minimal risk to potential off-site receptors. The plume monitoring and corrective actions being taken by IPSC are addressed in the Updated Corrective Action Plan (Stantec, 2016).

4.0 CLOSURE DESIGN

The following sections contain an overview of the anticipated closure activities for the Basin. Design drawings are presented in **Appendix A** and construction specification are provided in **Appendix B**. The regulations described in Section 2.1 were used as guidance for this closure design. The recommended closure alternative has been chosen to achieve the following performance objectives:

- Provides a cover system that has a permeability less than or equal permeability of the bottom liner system of the Basin.
- Minimize infiltration into the underlying bottom ash waste material.
- Provides an erosion protection layer consisting of a topsoil and vegetation.

4.1 CLOSURE STEPS

The closure of the Basin will be completed in steps as described in the following sections. The purpose of implementing the closure of the Basin in steps is to achieve the following:

- Allow for decanting of standing water
- Allow for placement of general fill over the Basin solids to provide a subgrade for installation of the final cover system.
- Final Cover Construction

Closure activities to achieve the performance objectives include dewatering of the Basin material, placement of material with general fill to serve as the subgrade for the cover system, construction of a HDPE liner cover over the Basin, construction of an 18-inch soil protective layer over liner, 6-inch topsoil / erosion layer, establishing vegetation on the soil cover. In addition, site monitoring will be continued to track the performance of the implemented closure. The closure design is presented in **Appendix B** and the major Closure Plan activities are described in the following subsections and construction specific are provided in **Appendix B**.

4.1.1 Dewatering of Bottom Ash

Prior to initiating fill placement, the standing water in the Basin's Cells will be pumped to the existing evaporation ponds. Once the standing water has been removed, the cells will be backfilled with general fill. Dewatering of the Basin's cells will first be accomplished using the recycling water inlet structure. Once the level of water is reached where the existing recycling water inlet structure can no longer be used, a system of portable pipes and pumps will be used to remove the remaining free liquid to the extent possible.

4.1.2 Initial Fill Placement

Following dewatering of the cells, initial fill placement in the Basin will be initiated. The initial fill placement design has been developed to facilitate achieving the required lines and grades for the subgrade of the final cover system.

The fill placement shall generally be advanced from the north towards the south, where the dewatering pumping area is located. Advancement of fill in this manner will force the water in the basin towards the dewatering area. Water collected in the dewatering area will be pumped, as needed, to the existing evaporation ponds.

The Berms surrounding each cell shall be cut to reduce the amount of initial fill to be placed. To achieve this the existing HDPE liner anchor trench will be relocated to the final design elevation. The cut material from the surrounding berms shall be placed in the cells as initial fill and in accordance with **Appendix B**.

At the end of the initial fill placement, the fill/subgrade will primarily match the required lines and grades required for installation of the final cover; however, the area encompassing the dewatering area will remain open to accommodate continued dewatering.

Soil from the onsite Borrow Areas 1 and 3 will be used to construct the subgrade of the soil cover. Although constructed of the same material as the cover soil layer, the soil placed as part of the cover dome (general fill) will be compacted at a higher density to reduce the potential of settlement within the soil cover itself. The soil cover dome will be constructed to the design grades as shown in the design drawings presented in **Appendix A**. Placement specifications for the general fill are presented in **Appendix B**.

4.1.3 Final Subgrade Grading

The dewatering areas shall remain open to support dewatering until instructed by the Engineer. Once the dewatering areas are no longer required, these areas shall be backfilled with general fill to the designed grades shown in the design drawings presented in **Appendix A**.

The final fill/subgrade surface to receive the HDPE liner will be smooth and free of all rocks, stones, sticks, roots, sharp objects, or debris of any kind. The surface will be a firm, unyielding foundation for the membrane with no sudden, sharp, or abrupt changes or break in grade. Placement specifications for the general fill and prepared liner subgrade are presented in **Appendix B**.

4.1.4 Final Cover Construction

The cover system has been designed to minimize infiltration of precipitation control runoff, sustain native vegetation, minimize erosion, and require minimal maintenance. The cover system will consist of a HDPE liner barrier overlain by cover soil and a vegetated erosion control layer. Each of the 3 cells of the Basin will receive an isolated cover system as described below and as shown in the design drawings presented in **Appendix A**.

4.1.4.1 High Density Polyethylene (HDPE) Liner Installation

An HDPE liner has been selected due to the minimal amount of differential settlement expected within the coarse-grained bottom ash. The HDPE liner will be supplied by an approved manufacturer and installed in accordance with manufacturer's installation instructions and the project specifications which are provided in **Appendix B**.

4.1.4.2 Liner Protection Layer

An 18-inch thick liner protection layer will be installed over the liner. Soil used for this protective layer will be derived from the upper silty sand material within the designated borrow areas. Design drawings for the cover system are provided in **Appendix A**.

4.1.4.3 Erosion Layer

Section R315-319-1023(i)(C) of the UDEQ CCR Regulations states that "erosion of the final cover system shall be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material capable of sustaining native plant growth." To provide an earthen material that promotes soil moisture storage and reduce the potential for soil erosion of the cover, this material will be a blend of clay and silty sand material obtained from Borrow Areas 1 and 3.

4.1.4.4 Seedbed Preparation

Seedbed preparation and seeding will take place in the fall or early spring after grading and topsoil placement is complete. Following placement of the final lift of soil, it will be tilled to a depth of 6-inches by ripping, discing, or other approved method to loosen compacted soil and leave a roughened, friable surface. Slopes shall be tilled on the contour leaving furrows perpendicular to the slope where practicable to reduce erosion and improve water capture and retention. Soil furrows and roughness are planned to shelter the seeds from wind and reduce development of erosion features, as well as collect water needed for the seeds to germinate.

4.1.4.5 Seeding

Following tilling the seed mix will be applied evenly over the entire area. Seeding will be applied in late Fall (mid-October or later) or in early Spring (before the first of May). Reclamation seed mixtures shall be similar to the native plant species of the site. Seed mixture should provide forage and cover species, which mimic pre-disturbance conditions. In addition, the established community will be adapted to the environmental conditions of the site to protect the area from wind and water erosion.

Immediately following seeding, the site will be mulched with weed-free straw or hay at a rate of 2 tons/acre. The straw or hay will be crimped into the soil to secure the mulch and to reduce movement by wind. Hydromulching with a wood fiber mulch may be used as an alternative to straw or hay and applied at a rate of 1.5 tons/acre along with a tackifier to bind the mulch to the soil.

Specifications for seeding and mulching of the soil cover are presented in **Appendix B**. If an alternative seeding method is utilized, IPSC will notify UDEQ and provide a modified seeding plan for the alternative method prior to commencing seeding operations. Reclaimed borrow areas will also be re-vegetated to control runoff, reduce erosion, and blend into the surrounding topography.

4.1.4.6 Seed Mix Design

Seed mix selection will be based on a combination of plant species, characteristics, and conditions at the site, Seed Species selection criteria will be based on soil texture and chemistry, precipitation, temperature and growing season, seed availability and ease of species establishment. The following recommendations should be used in determining the proposed seed mixture:

- Native Plants are better adapted to the harsh desert climate of central Utah.
- Seed mixture should reflect the type of plants that grew prior to disturbance.
- Seed should come from a similar elevation and latitude to the site.
- Seed should be applied at a seeding rate between 14 to 28 pure live seed (PLS) pounds per acre for drill seeding (rates may be higher for broadcast seeding).

The seed mix should be comprised of a variety of native shrubs, grasses and forbs to provide habitat diversity and maximize transpiration at the site.

4.1.5 Stormwater Controls

There is currently no inflow into the Basin from any upstream catchments. Stormwater controls, to prevent surface water from entering the Basin, will not be required.

4.2 BORROW SOURCE INVESTIGATOIN

The borrow source planned for the general fill, liner protection layer and erosion layer will be obtained from an area directly north of the basin and labeled as Borrow 1 and 3 on Sheet G-003 of **Appendix A**. Borrow material characterization consisted of excavation test pits sample collection and laboratory testing. Five-gallon bucket composite samples were collected for each material encountered in each of the 6 test pits. The associated test pit logs and laboratory testing are provided in **Appendix C** and **Appendix D**.

4.2.1 Borrow Source Sampling

Following the collection of the composite samples from the test pits, the samples were sent to Intermountain GeoEnvironmental Services, Inc. (IGES) in Salt Lake City, Utah for geotechnical and hydrological testing. The testing program is summarized in **Table 4.1** and **Table 4.2**.

Table 4.1 Borrow Area 1 Geotechnical and Hydrological Testing

Test	ASTM Method	Number of Samples	Comments
Organic Content	D2974	3	1 per test pit
Atterberg Limits	D4318 a	7	7 per borrow source
USCS Classification	D2487	8	1 per composite sample
Particle-Size Distribution	D6913	8	1 per composite sample
Hydrometer Analysis	D7928	8	1 per composite sample
Crumb Test	D6572	4	4 per borrow source
Standard Proctor	D698 b	2	2 per borrow source
Hydraulic Conductivity	D5084	2	2 per borrow source
Soil Water Characteristic Curve	D6836	2	2 per borrow source

Source: IGES Laboratory Testing Results (IGES, 2020)

Table 4.2 Borrow Area 3 Geotechnical and Hydrological Testing

Test	ASTM Method	Number of Samples	Comments
Organic Content	D2974	1	1 per borrow source
Atterberg Limits	D4318 a	6	2 per test pit sample
USCS Classification	D2487	6	2 per test pit sample
Particle-Size Distribution	D6913	6	2 per test pit sample
Hydrometer Analysis	D7928	6	2 per test pit sample
Crumb Test	D6572	2	2 per borrow source
Standard Proctor	D698 b	1	1 per borrow source
Hydraulic Conductivity	D5084	1	1 per borrow source

Source: IGES Laboratory Testing Results (IGES, 2020)

The test results are summarized in **Table 4.3** and **Table 4.4**. Complete laboratory reports for the testing are presented in Appendix D.

Table 4.3 Borrow Area 1Geotechnical and Hydrological Testing on Composite Samples

Soil Test	B1TP 1	B1TP1	B1TP2	B1TP2	B1TP2	B1TP3	B1TP3	B1TP3	Comb. B1 TP1-3	Comb. B1 TP2-3
Composite Sample Depth	10-15'	15-25'	0-10'	10-20'	20-25'	0-10'	10-20'	20-30'	0-20'	10-30'
USCS Classification	SM	CL	SM	SM	CL	ML	CL	CL	SM	CL
Standard Proctor Compaction Test (MDD lbs/ft^3)	-	-	-	-	-	-	-	-	117.9	105.3
Optimum Moisture Content (OMC%)	-	-	-	-	-	-	-	-	14	19
Particle Size Distribution %Gravel %Sand %Fines	13.6 48.3 38.1	8.8 31.8 59.4	0 58.9 41.1	0 75 25	0 36 64	0.2 41.3 58.6	0 4.4 95.6	0 6.3 93.7	-	-
Atterberg Limits LL[a/] (%) PL[b/] (%) PI [c/] (%)	N.P.	25 14 11	NP	NP	23 15 8	NP	47 19 28	39 18 21	-	-
Organic Matter (%)	1.5	-	-	0.8	-	0.8	-	-	-	-
Crumb Test[e]	Grade 1	-	-	Grade 3	-	Grade 2	-	Grade 1	-	-
Average Hydraulic Conductivity K (cm/sec)	3.6E-04	-	-	2.1E-04	-	-	-	-	-	-

Notes:

[a]/ LL: Liquid Limit

[b]/ PL Plastic Limit

[c]/ PI: Plasticity Index

[d/] N.P.: Non-Plastic

[e]/ Crumb Test Results: Grade 1 – Nondispersive, Grade 2 – Intermediate, Grade 3 – Dispersive,

Table 4.4 Borrow Area 3 Geotechnical and Hydrological Testing on Composite Samples

Soil Test	B3TP1	B3TP1	B3TP2	B3TP2	B3TP3	B3TP3	Comb. B3 TP1-3
Composite Sample Depth	0-10'	10-20'	0-15'	15-25'	0-15'	15-30'	10-30'
USCS Classification	SC	CL	CL	CL	SM	CL	CL
Standard Proctor Compaction Test (MDD lbs/ft^3)	-	-	-	-	-	-	105.4
Optimum Moisture Content (OMC%)	-	-	-	-	-	-	20.8
Particle Size Distribution %Gravel %Sand %Fines	3.3 69.3 27.4	0.9 23.6 75.5	0.8 32.7 66.5	1.3 30.1 68.6	2.1 73.6 24.3	0.8 20.6 78.6	-
Atterberg Limits LL[a/] (%) PL[b/] (%) PI [c/] (%)	29 17 12	34 15 19	31 14 17	30 15 15	N.P.[d/]	29 15 14	
Organic Matter (%)		3.2					
Crumb Test[e]				Grade 1	Grade 1		
Average Hydraulic Conductivity K (cm/sec)							1.5E-05

Notes:

[a/] LL: Liquid Limit

[b/] PL Plastic Limit

[c/] PI: Plasticity Index

[d/] N.P.: Non-Plastic

[e/] Crumb Test Results: Grade 1 – Nondispersive

5.0 POST CLOSURE OPERATION AND MAINTENANCE PLAN

This section describes activities that will be conducted as part of the post-closure process. Utah Administrative Code Rule R315-319-104 titled Closure and Post-Closure Care – Post-Closure Care Requirements (UDEQ, 2016) require that a post-closure plan be developed and implemented for a period of 30 years once closure and reclamation activities have been completed. Post-closure is the process which is used to allow a facility to stabilize to the point where it no longer presents a threat to human health or the environment. During this period, the facility will be routinely monitored to ensure that the integrity of the soil cover is not compromised by erosion and settlement and ensure that the soil cover's performance is acceptable. Therefore, this post-closure plan will provide the following:

- A plan for inspection and maintenance of the soil cover
- A description of the proposed use of the property during the post-closure care period.

IPSC may petition for the UDEQ to terminate the post-closure period earlier if they can demonstrate that the soil cover has stabilized and is protective of groundwater.

5.1 COVER INTEGRITY MONITORING AND MAINTENANCE

Following construction of the soil cover, routine monitoring will be performed to identify the need for maintenance of the soil covers. The monitoring will include both visual inspection and surveying of the soil cover to ensure that their integrity is not being compromised. The monitoring plan, including the individual monitoring tasks, inspection locations, schedule, monitoring criteria, and possible maintenance is summarized in **Table 5.1**.

Table 5.1 Post-Closure Monitoring Summary

Monitoring Activity	Purpose	Monitoring Frequency	Monitoring Locations	Monitoring Method	Comments	Actions Items
Visual Cover Inspection	Visually inspect soil cover surface for ponding, sags, drainage interruptions, surface erosion, and vertical cracking.	Semi-Annually and Following major storm events of 1-inch or more of rainfall in 24-hrs.	Throughout entire cover.	Visual	The locations of ponding, sags, drainage interruptions, surface erosion, and vertical cracking shall be noted on the inspection form.	Ponding, sags, and drainage interruptions will be repaired and re-vegetated.
Vegetation Inspection	Inspect soil cover for vegetation establishment.	Semi-Annually	Throughout entire cover.	Visual	Any areas showing vegetation distress such as bare areas or significantly lower vegetative establishment compared to rest of the soil cover will be noted on the inspection form.	Bare areas will be repaired during the next seeding season.
Groundwater Monitoring	Detect potential migration of spent liquor from the Pond.	Semi-Annually	In accordance with the approved groundwater monitoring well list for the Plant as well as monitoring of the extraction trench	In accordance with the approved groundwater monitoring parameter list for the Plant	None	Record significant deviations in groundwater quality to UDEQ.

5.1.1 Visual Cover Inspection

Visual inspections of the soil cover will be performed to identify damage to or degradation of the soil cover including; the formation of rills, loss of vegetation over significant portions of the soil cover, and formation of visible animal burrows or trails over the soil cover. The visual inspections will be performed across the entire soil cover. Visual inspections of the soil cover will be performed semi-annually and following major storm events. The results of the visual inspections will be documented in site inspection reports and retained on-site for UDEQ review upon request.

5.1.2 Vegetation Monitoring

During the semi-annual soil cover monitoring, the cover vegetation will be inspected for burned areas, overall establishment, disease or pests, and noxious weed infestations. The inspections will be performed during the semi-annually visual inspection of the soil cover. Any areas showing vegetation distress such as bare areas or significantly lower vegetative establishment compared to rest of the soil cover will be clearly noted on the inspection form.

5.2 SOIL COVER MAINTENANCE

The purpose of the final cover maintenance procedures is to maintain the integrity of the soil cover over the long-term and to provide maintenance, scheduling, and documentation so that materials and maintenance practices are consistent with the final cover design and specifications. Semi-annual visual inspections and settlement monitoring will provide identification of erosion and settlement. A site representative, designated by IPSC, will be responsible for documenting the location and extent of repairs.

All final cover repairs and/or reconstruction shall be conducted in a manner directed to maintain the integrity of the as-built final cover system. Repair of fill materials will be performed in six to eighteen-inch layers consistent with the cover design, procedures, and specifications utilized during the final cover construction. The methods of repair will be performed for the following principal modes of final cover distress:

- Settlement related sags and drainage interruptions, which interfere with controlled flow and discharge of surface waters from the soil cover surface
- Surface erosion as a result of drainage channel “overflow” associated with intense rains
- Local surficial slumping on slopes resulting from intense rains
- Vertical or near vertical cracking of cover soils as a result of settlement.

5.2.1 Depressions, Ponding, Drainage Interruptions and Surface Erosion

Any repairs of depressions in the final soil cover will be completed on an annual basis. If significant sags or ponding is identified during other times of the year, the IPSC representative will accurately locate the limits of the depressions. The IPSC representative will be responsible for directing fill placement in the sag area to facilitate drainage. The permanent repair of sags and ponding, when necessary, will be performed by adding sufficient cover soil material necessary to maintain the design slope. Cover soil will be placed in accordance with the design specifications. An IPSC representative shall inspect and certify any fill placed in the final cover layers. Repaired areas shall also be re-seeded in accordance with the design specifications.

5.3 POST-CLOSURE INSPECTION AND MAINTENANCE REPORTING

All copies of the operator's inspection and maintenance reports will be retained on-site for UDEQ review upon request to demonstrate that the site has been inspected on a routine basis to evaluate the integrity and stability of the soil cover and stormwater diversion systems. Any repairs or maintenance performed will be discussed in detail in maintenance reports.

5.4 GROUNDWATER MONITORING

The current groundwater monitoring and corrective actions being taken by IPSC are addressed in the Updated Corrective Action Plan (Stantec, 2016) and will continue following closure of the Basin until conditions warrant revisions to the groundwater monitoring plan.

6.0 CLOSURE SCHEDULE

Per the requirements of UAC R315-319-102(b)(1)(vi), a preliminary closure schedule has been developed for the Basin. The schedule showing key dates s presented in **Appendix E**. The schedule was developed based on the closure approach discussed in Section 3 and was based on the following assumptions:

- The first season of closure activities would consist of dewatering, redistribution of bottom ash within each cell, and cutting down of the crest and repositioning the existing bottom liner in a new anchor trench. These closure activities would commence following conversion to gas and cessation of flows, which is anticipated to be July 1, 2025.
- The second season of closure would consist of placement of general fill in the Basin cells.
- The third season of closure would consist of final placement of general fill in the Basin cells to meet the required lines and grades for the subgrade of the final closure cover.
- The third season of closure would consist of liner placement, liner cover placement, erosion layer placement, and seeding of the cover.

Based on the schedule developed, closure activities for the Basin are anticipated to be completed by September 15, 2028.

7.0 REFERENCES

GEI, 2011. Specific Site Assessment for Coal Combustion Waste Impoundments at Intermountain Generating Station. Delta, Utah. April 2011.

Gerhart Cole, 2013. IPP Coal Combustion Waste Ponds. Geotechnical Stability Analysis Report. April 2013.

IGES, 2014. Geotechnical Laboratory Testing Results – IPSC CCR Unit Closures, Delta, UT.

Stantec, 2016. Coal Combustion Residual (CCR) Units Initial Closure Plan. Intermountain Generating Facility. Delta, Utah. October 13, 2016.

Stantec, 2020. June 2020 Semi-Annual Progress Report. Intermountain Generating Facility. Delta, Utah. June 25, 2020.

UDEQ, 2016. R315. Environmental Quality, Waste Management and Radiation Control, Waste Management. R315-319. Coal Combustion Residual Requirements., Issued September 2016.

Appendix A

IPSC CCR Bottom Ash Basin Closure Design

PRELIMINARY DESIGN PHASE - 10/16/2020

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This document is an interim document and not suitable for construction. As an interim document, it may contain data that is potentially inaccurate or incomplete and is not to be relied upon without the express written consent of the preparer.

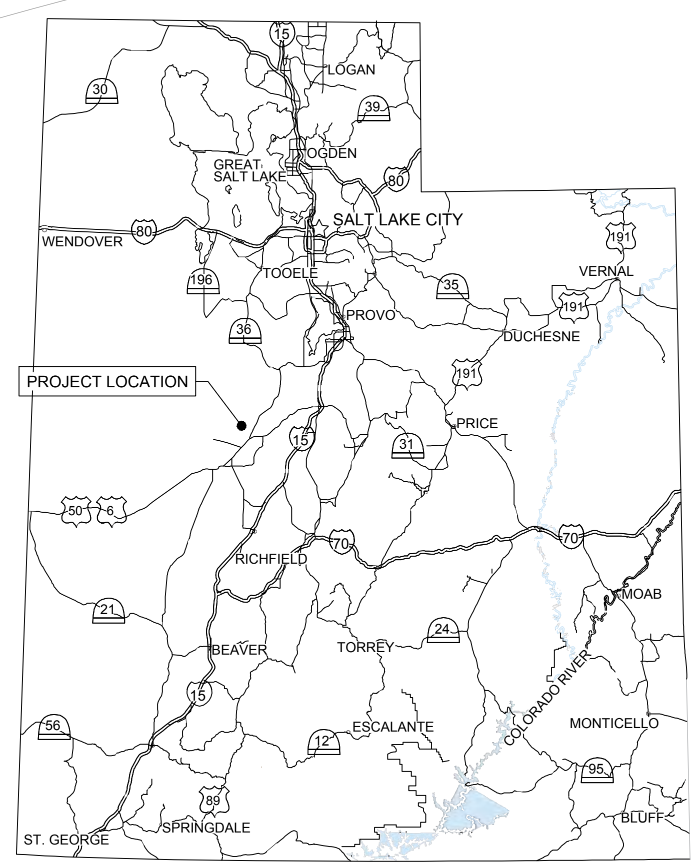
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN

CLOSURE DESIGN SUBMITTAL - OCTOBER 2020

INTERMOUNTAIN POWER SERVICE CORP

Stantec



AREA MAP
NTS

INDEX OF DRAWINGS

DRAWING NO	DRAWING NAME
G-001	COVER SHEET AND DRAWING INDEX
G-002	GENERAL NOTES
G-003	EXISTING SITE LAYOUT
C-300	BOTTOM ASH BASIN CLOSURE - EXISTING CONDITIONS
C-310	BOTTOM ASH BASIN CLOSURE - SUBGRADE PLACEMENT
C-311	BOTTOM ASH BASIN CLOSURE - EMBANKMENT CUT LONGITUDINAL SECTIONS
C-320	BOTTOM ASH BASIN CLOSURE - FINAL COVER DESIGN
C-330	BOTTOM ASH BASIN CLOSURE - SECTIONS
C-340	BOTTOM ASH BASIN CLOSURE - CONTROL POINTS
C-341	BOTTOM ASH BASIN CLOSURE - CONTROL POINTS TABLE
C-350	BOTTOM ASH BASIN CLOSURE - BORROW 1 - SITE PLAN
C-351	BOTTOM ASH BASIN CLOSURE - BORROW 1 - SECTIONS
C-360	BOTTOM ASH BASIN CLOSURE - DETAILS

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CIVIL GENERAL NOTES

GENERAL

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.

THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL DEBRIS FROM DEMOLITION AT CONTRACTORS EXPENSE.

CONTRACTOR SHALL RESTORE ALL SURVEY MONUMENTS THAT ARE DAMAGED OR DESTROYED DURING CONSTRUCTION.

UTILITIES

PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES IN AND AROUND THE AREAS OF NEW CONSTRUCTION.

THE CONTRACTOR SHALL PROTECT ALL REMAINING EXISTING UTILITIES.

LOCATIONS OF UNDERGROUND AND ABOVE GROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS AND ELEVATIONS AND SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT UTILITY LINES WHETHER SHOWN OR NOT SHOWN.

PRIOR TO ANY EXCAVATION IN THE VICINITY OF ANY EXISTING UNDERGROUND FACILITIES, INCLUDING ALL WATER, SEWER, STORM DRAIN, GAS, PETROLIUM PRODUCTS, OR OTHER PIPELINES; ALL BURIED ELECTRIC POWER, COMMUNICATIONS, OR TELEVISION CABLES; ALL TRAFFIC SIGNAL AND STREET LIGHTING FACILITIES; AND ALL ROADWAY, STATE HIGHWAY, AND RAILROAD RIGHTS-OF-WAY, THE CONTRACTOR SHALL NOTIFY THE RESPECTIVE AUTHORITIES REPRESENTING THE OWNERS OR AGENCIES RESPONSIBLE FOR SUCH FACILITIES NOT LESS THAN 3 DAYS NOR MORE THAN 7 DAYS PRIOR TO EXCAVATION SO THAT A REPRESENTATIVE OF SAID OWNERS OR AGENCIES CAN BE PRESENT DURING SUCH WORK IF THEY SO DESIRE. IN THE CASE OF THE UNDERGROUND UTILITY SERVICE ALERT CENTER, THIS NOTICE WILL GIVE THEM TIME TO MARK THE LOCATION OF THE UTILITIES. THE CONTRACTOR SHALL ALSO NOTIFY THE REGIONAL OR LOCAL UNDERGROUND SERVICE ALERT COMPANY AT LEAST 3 DAYS, BUT NO MORE THAN 7 DAYS, PRIOR TO SUCH EXCAVATION.

EROSION CONTROL

THE CONTRACTOR SHALL SUBMIT AN EROSION CONTROL PLAN FOR WORK DURING THE CONSTRUCTION, SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER PRIOR TO THE START OF CONSTRUCTION.

ALL SLOPES SHALL BE PROTECTED FROM EROSION DURING ROUGH GRADING OPERATIONS AND THEREAFTER, UNTIL INSTALLATION OF FINAL GROUNDCOVER.

ALL SLOPE PROTECTION SWALES SHALL BE CONSTRUCTED AT THE SAME TIME AS BANKS ARE GRADED.

THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF EROSION CONTROL MEASURES CONTAINED WITHIN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL ALSO PROVIDE ANY ADDITIONAL EROSION CONTROL MEASURES (E.G. HYDROSEEDING, MULCHING OF STRAW, SAND BAGGING, DIVERSION DITCHES, ETC.) DICTATED BY FIELD CONDITIONS TO PREVENT EROSION OR THE INTRODUCTION OF DIRT, MUD, OR DEBRIS INTO EXISTING WATERWAYS, OR ONTO ADJACENT PROPERTIES DURING ANY PHASE OF CONSTRUCTION OPERATIONS.

CIVIL GENERAL NOTES - CONTINUED

SURVEY AND CONTROL

1. TOPOGRAPHY AND AERIAL IMAGERY BASED ON A NOVEMBER 2019 OLYMPUS AERIAL SURVEYS INC. SURVEY.
2. SURVEY IN LOCAL PLANT COORDINATE SYSTEM AND LOCAL DATUM IN INTERNATIONAL FEET.

PERMITTING

OWNER WILL BE RESPONSIBLE FOR OBTAINING PERMITS FROM THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY.

GENERAL CIVIL SYMBOLS

4600	MAJOR CONTOURS
	MINOR CONTOURS
4600	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
P/L	PROPERTY LINE
R/W	RIGHT-OF-WAY LINE
	EASEMENT LINE
TEMP ESMT	TEMPORARY EASEMENT LINE
	TRAIL OR DIRT ROAD
	FLOW LINE
	RAILROAD
	GUARDRAIL (PERMANENT)
	GUARDRAIL (REMOVABLE)
	VEGETATION
	WELL
	NEW
	EXISTING
	CENTERLINE
3:1	BERM SLOPE (HORZ TO VERT)

CONTROL SYMBOLS

BM-XX	BENCH MARK
###	SITE COORDINATE NUMBER
N XXXXXXX E XXXXXXX	SITE COORDINATES
EL XXXX.XX	MONUMENT
	HORZ AND VERT CONTROL POINT
XXX.XX	FINISHED ELEVATION
(XXX.XX)	EXISTING ELEVATION

GEOTECHNICAL SYMBOLS

B-X	SOIL BORING LOCATION
	TEST PIT LOCATION
XX	OBSERVATION HOLE
MW	MONITORING WELL

STRUCTURES

	SITE OR RETAINING WALL
x	FENCE (CHAINLINK)
	FENCE (WOOD)
	STRUCTURE
	STRUCTURE (BELOW GRADE)
	CONVEYOR SYSTEM

REV 050215

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: NTS

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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Stantec

INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN
GENERAL
GENERAL NOTES
SYMBOLS

SHEET G-002

Job# 233001396

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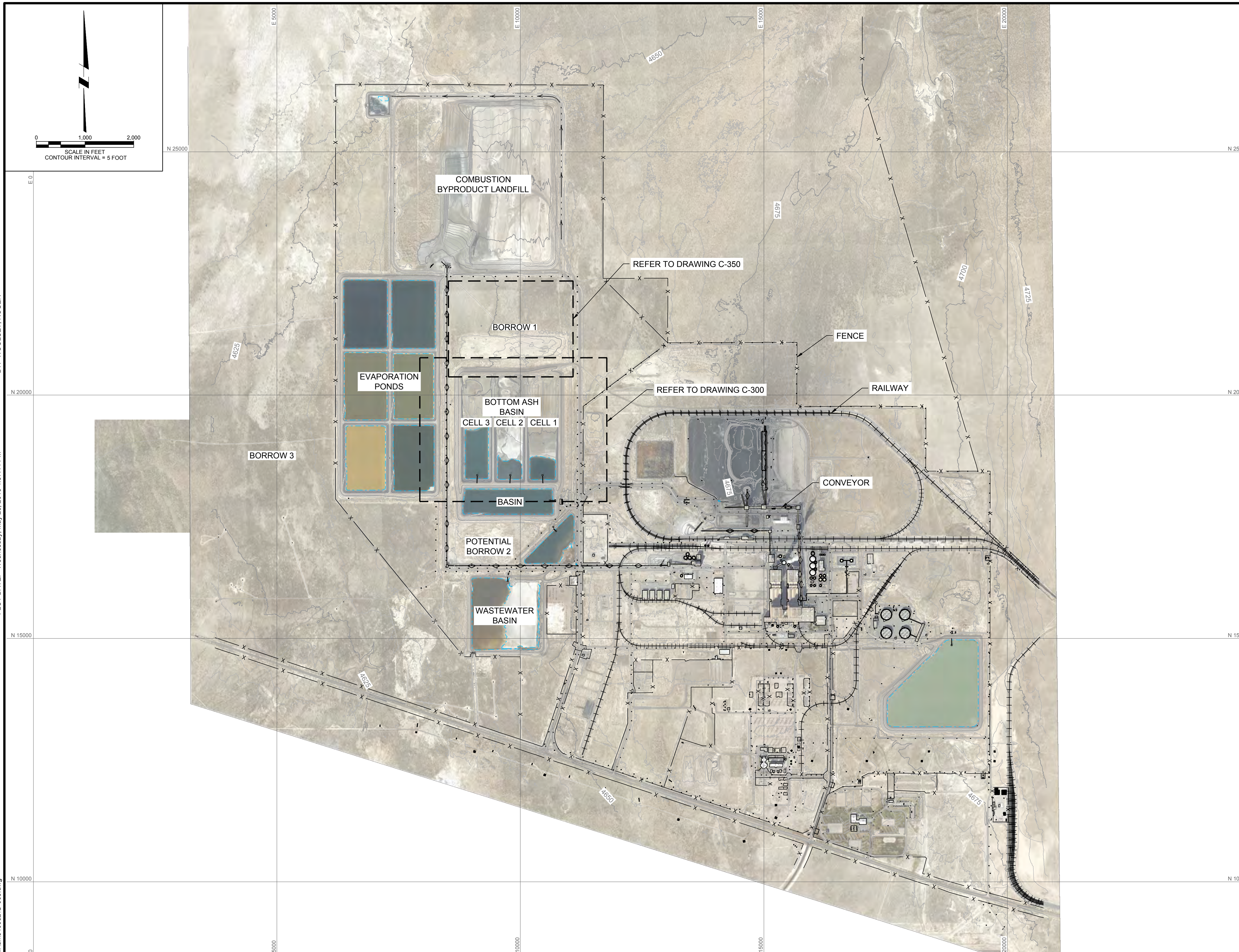

KEY PLAN

LEGEND

- EXISTING CONTOURS
- EXISTING RAILWAY
- CONVEYOR SYSTEM
- FENCE
- POWER POLE
- EXISTING WATER LEVEL

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

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REV	DATE	BY	DESCRIPTION
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A	10/16/2020	CF	ISSUED FOR CLIENT REVIEW

SCALE: 1"=1000'

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN C. FOWLER
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 11/18/2020

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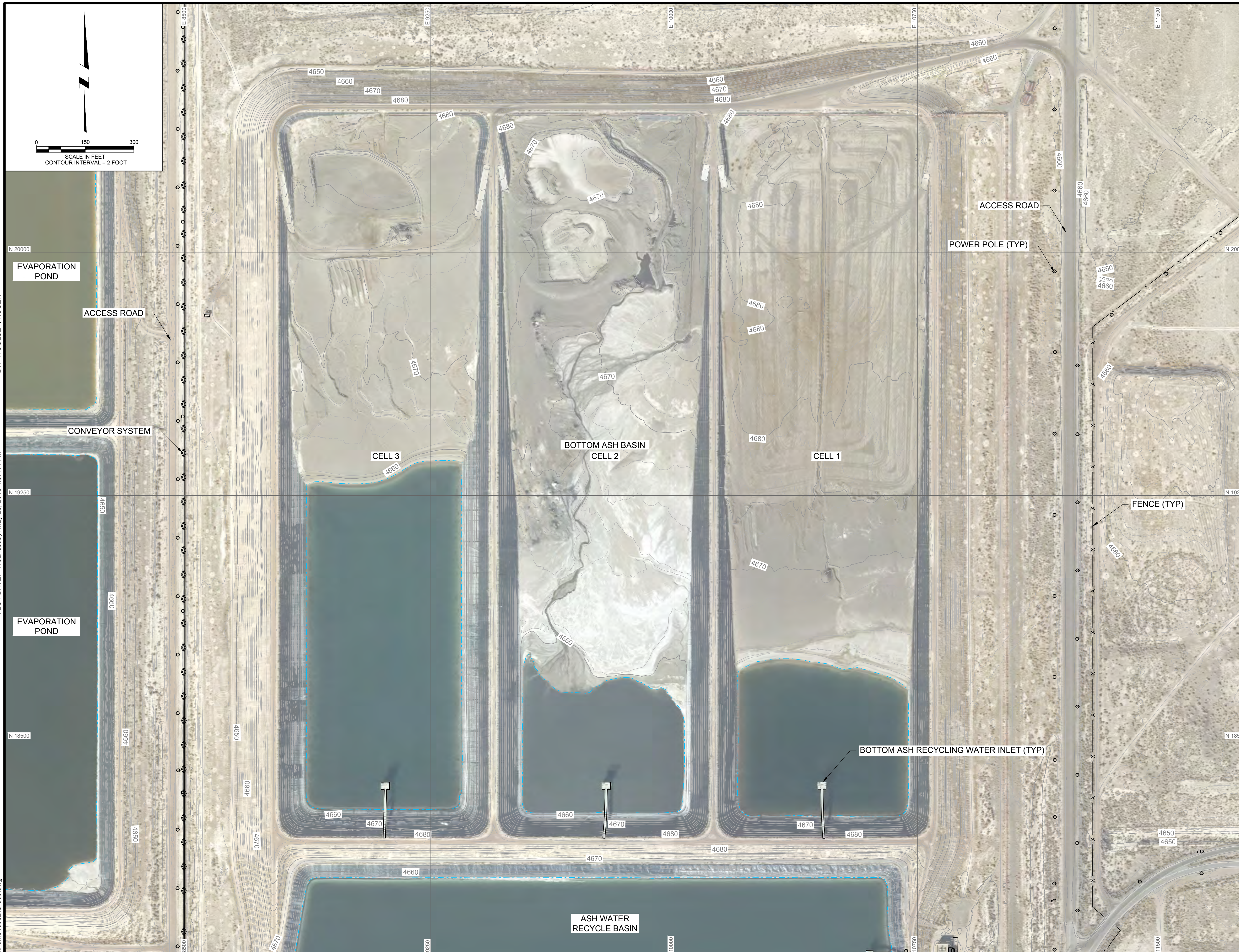
INTERMOUNTAIN POWER SERVICE CORP

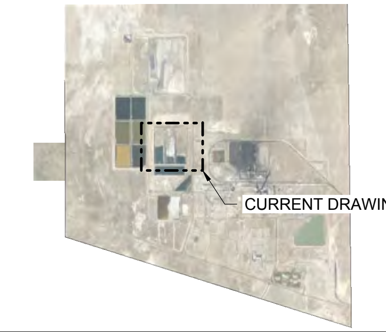
IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
EXISTING SITE LAYOUT

SHEET G-003

Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
	CONVEYOR SYSTEM
x	FENCE
○	POWER POLE
	EXISTING WATER LEVEL

GENERAL SHEET NOTES

1. EXTENT OF BOTTOM ASH BASED ON SURVEY COMPLETED ON NOVEMBER 2019. ACTUAL BOTTOM ASH ELEVATIONS MAY VARY AT TIME OF CLOSURE.

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40952\C-300.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	CF	ISSUED FOR CLIENT REVIEW

SCALE 1" = 150'

WARNING 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN C. FOWLER
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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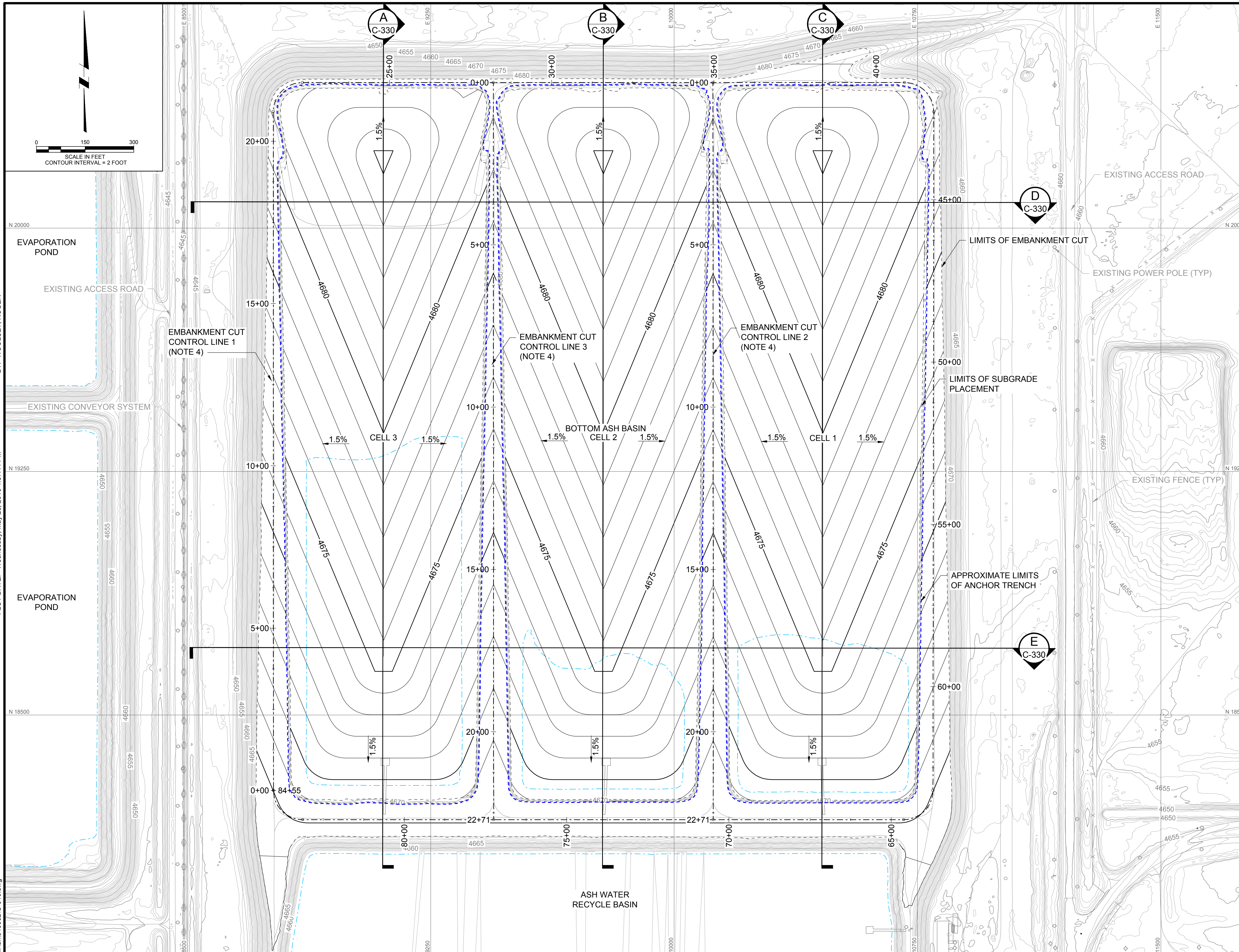
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
EXISTING CONDITIONS

SHEET C-300
Job# 233001396

BY: WOOLSEY, ROGER PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM



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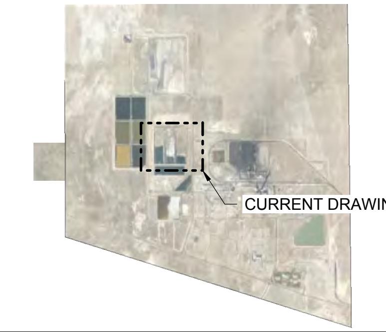

LEGEND

- 4600 — EXISTING CONTOURS
- 4600 — DESIGN CONTOURS
- LIMITS OF DISTURBANCE
- APPROXIMATE EXTENTS OF ANCHOR TRENCH
- EXISTING CONVEYOR SYSTEM
- EXISTING FENCE
- EXISTING POWER POLE
- EXISTING WATER LEVEL

GENERAL SHEET NOTES

1. REFER TO C-340 FOR LINER SUBGRADE CROSS SECTIONS.
2. CONTRACTORS SHALL INCORPORATE SOIL FROM EXCAVATION OF BERMS AND BOTTOM ASH IN CUT AREAS AS GENERAL FILL FOR LINER SUBGRADE GENERAL FILL.
3. VOLUMES MAY VARY DEPENDING ON FINAL BOTTOM ASH ELEVATIONS.
4. REFER TO DRAWING C-311 FOR LONGITUDINAL SECTIONS.
5. TRANSITION FROM DOUBLE ANCHOR TRENCH TO SINGLE ANCHOR TRENCH SHALL BE FIELD FIT.

QUANTITY TABLE (SUBGRADE AND LINER)

DESCRIPTION	GENERAL FILL** (CY)	WASTE CUT (CY)	EMBANKMENT CUT (CY)	LINER (SF)	ANCHOR TRENCH (FT)
CELL 1	101,205	16,545	71,235	1,316,900	5,579
CELL 2	418,123	352	49,870	1,316,600	5,561
CELL 3	527,980	0	70,955	1,316,300	5,560

**ASSUMES TOP OF WASTE ELEVATION IS AS SURVEYED IN NOVEMBER 2019

DWG FILE: C:\pwwrkdir\dms40952\C-310.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	CF	ISSUED FOR CLIENT REVIEW

SCALE 1" = 150'

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DESIGNED P. BERNHARD
DRAWN B. ROBERTSON
CHECKED C. TOMLINSON

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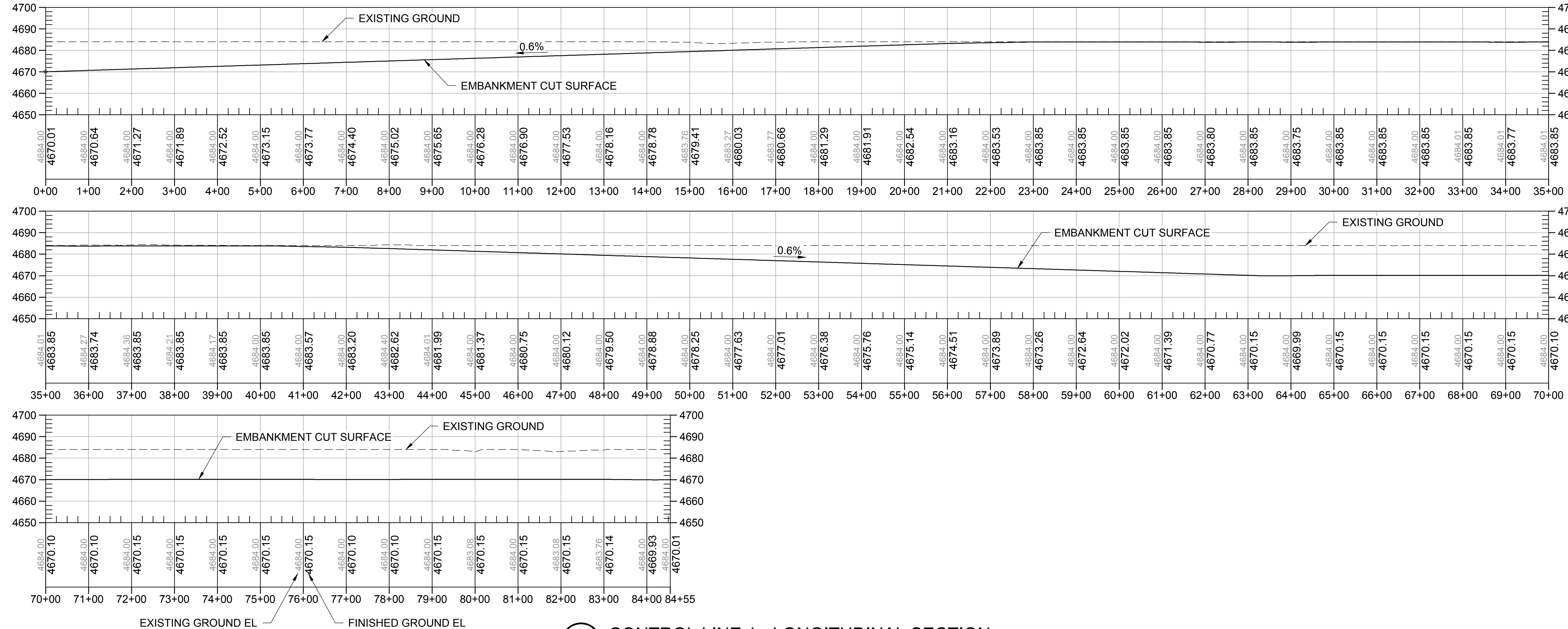
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
SUBGRADE PLACEMENT

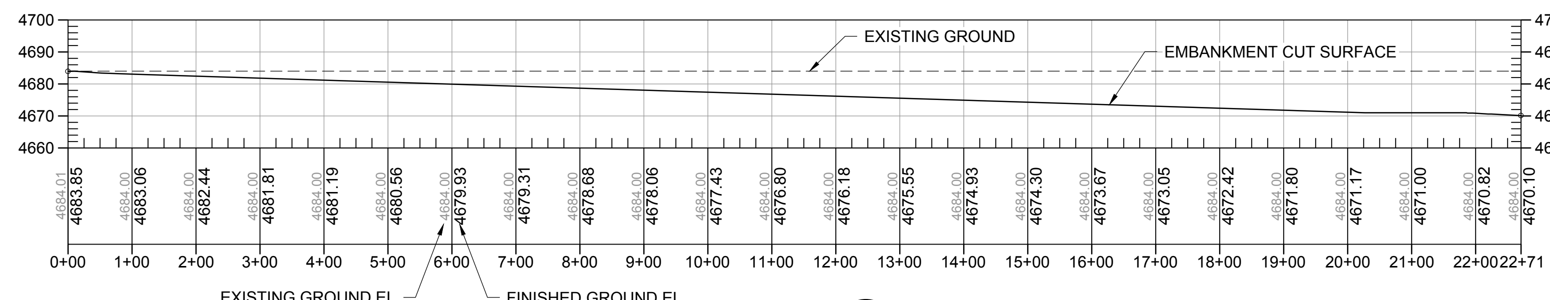
SHEET C-310

Job# 233001396



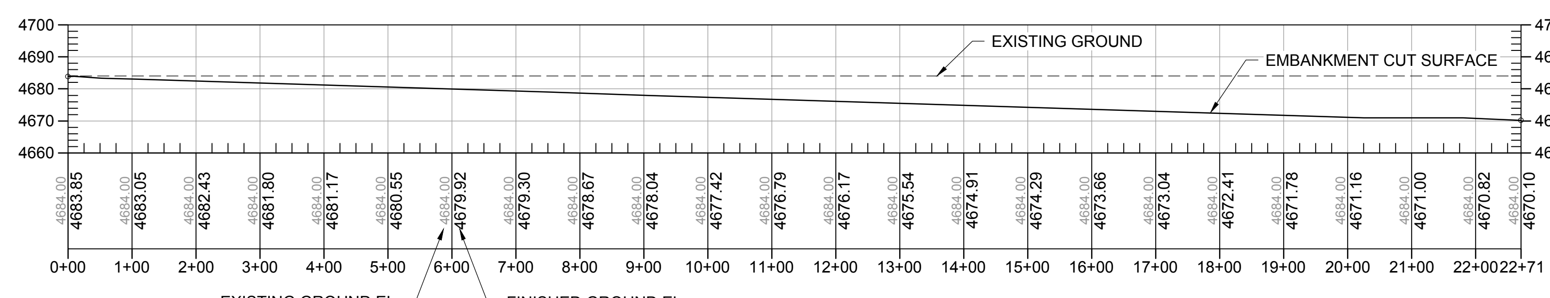
CONTROL LINE 1 - LONGITUDINAL SECTION

C-310



CONTROL LINE 2 - LONGITUDINAL SECTION

C-310



CONTROL LINE 3 - LONGITUDINAL SECTION

C-310

GENERAL SHEET NOTES

1. WASTE SHALL BE REMOVED AROUND EXISTING EMBANKMENT (BY OTHERS) TO FACILITATE COVER SYSTEM CONSTRUCTION.
2. TEMPORARY SUCTION PUMP AND DISCHARGE LINES SHALL BE PROVIDED BY CONTRACTOR.
3. PUMPED WATER SHALL BE ROUTED TO THE EVAPORATION POND.
4. FILL QUANTITIES ARE BASED ON THE APPROXIMATE TOP OF WASTEWATER BASIN SOLIDS OF 4645 FT AMSL AND REPRESENT IN PLACE QUANTITIES.
5. DEWATERING AREA TO REMAIN OPEN TO SUPPORT DEWATERING UNTIL INSTRUCTED BY ENGINEER.

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40952\C-311.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: 1" = 150'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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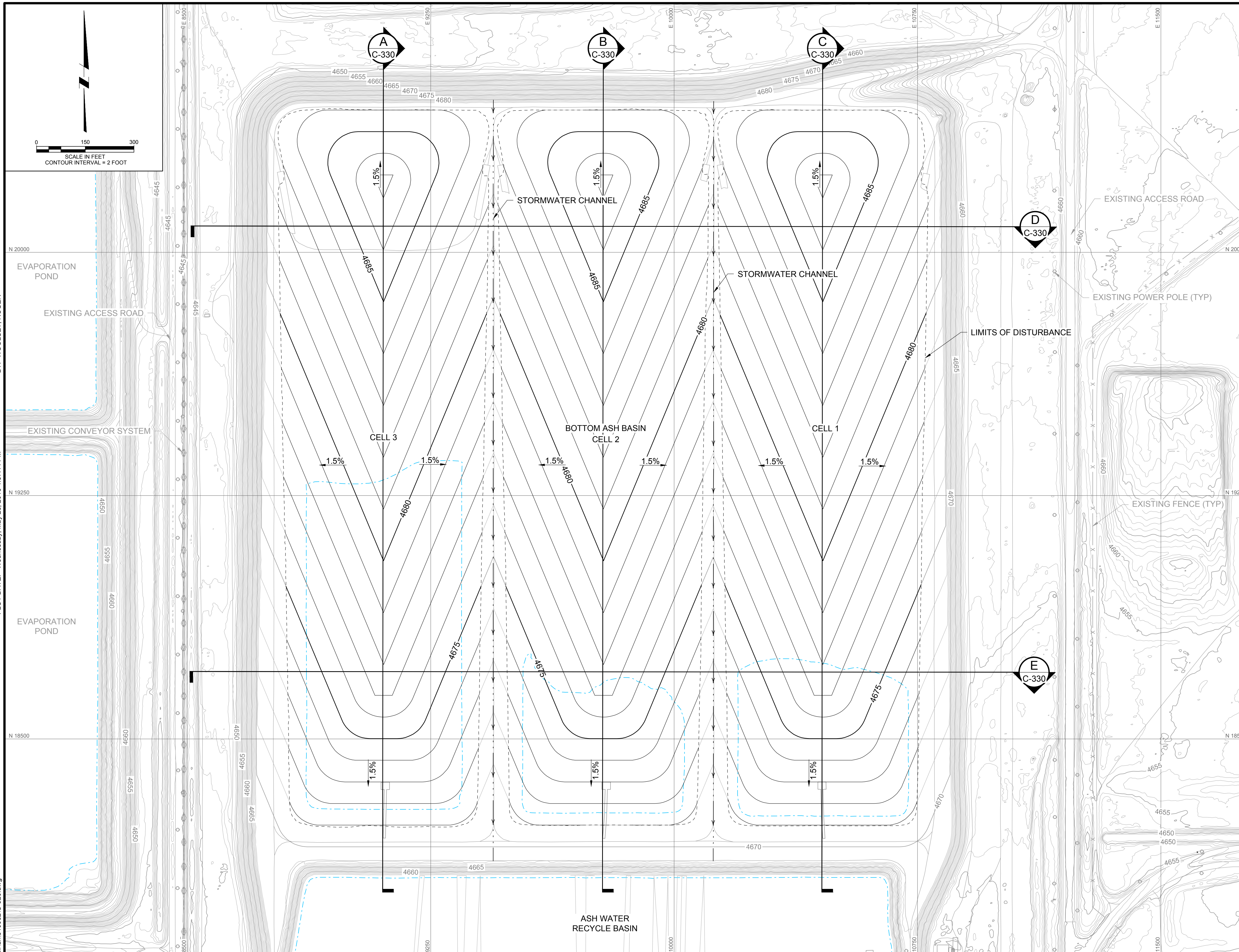
INTERMOUNTAIN POWER SERVICE CORP

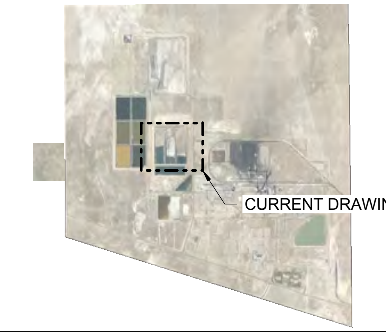
IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
EMBANKMENT CUT LONGITUDINAL SECTIONS

SHEET C-311

Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
	LIMITS OF DISTURBANCE
	STORMWATER DRAINAGE
	EXISTING CONVEYOR SYSTEM
x	EXISTING FENCE
	EXISTING POWER POLE
	EXISTING WATER LEVEL

GENERAL SHEET NOTES

1. SOIL USED IN CLOSURE OF BOTTOM ASH BASINS TO BE OBTAINED FROM BORROW SOURCE 1 AND BORROW SOURCE 3.

QUANTITY TABLE

DESCRIPTION	18" GENERAL FILL (CY)	6" TOPSOIL (CY)
CELL 1	73,136	24,888
CELL 2	73,135	24,876
CELL 3	73,126	24,886

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40952\C-320.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE 1" = 150'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN C. FOWLER
CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

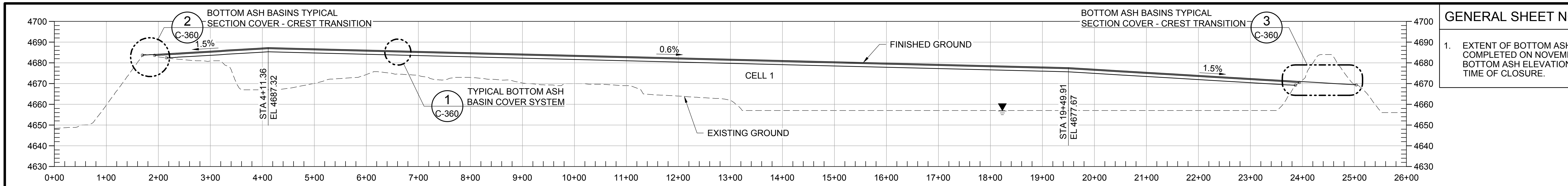
IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
FINAL COVER DESIGN

SHEET C-320

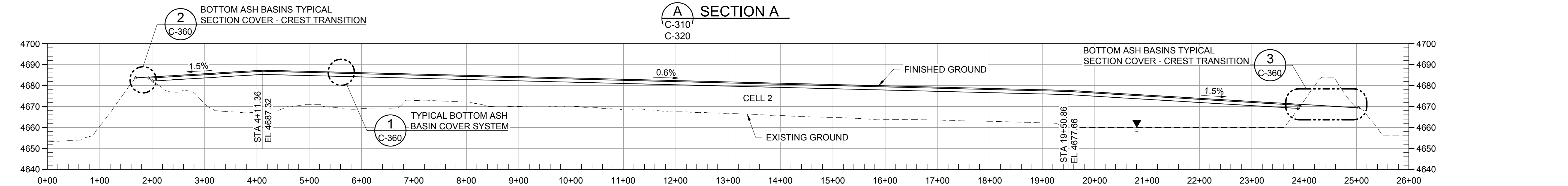
Job# 233001396

GENERAL SHEET NOTES

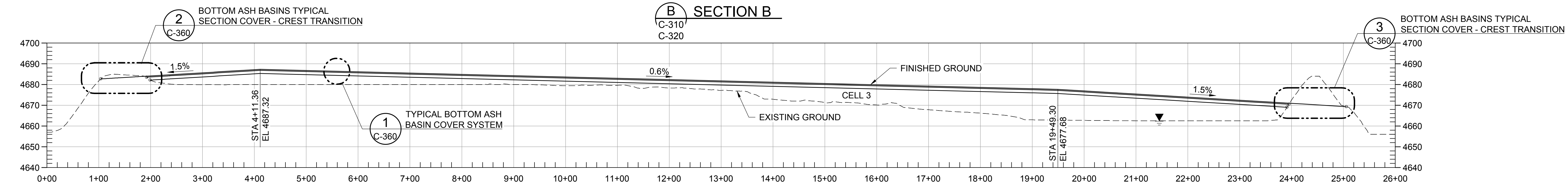
1. EXTENT OF BOTTOM ASH BASED ON SURVEY COMPLETED ON NOVEMEBER 2019. ACTUAL BOTTOM ASH ELEVATIONS MAY VARY AT TIME OF CLOSURE.



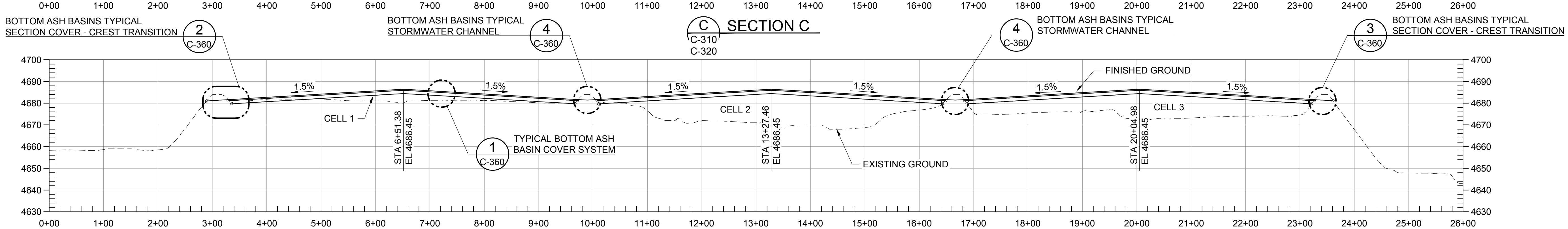
A SECTION A
C-310
C-320



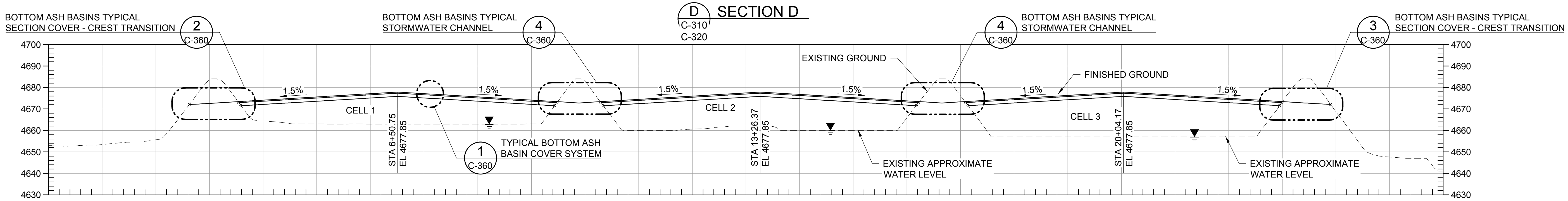
B SECTION B
C-310
C-320



C SECTION C
C-310
C-320



D SECTION D
C-310
C-320



E SECTION E
C-310
C-320

HORZ 0 100 200
VERT 0 25 50
SCALE IN FEET

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrkdir\dms40952\C-330.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	CF	ISSUED FOR CLIENT REVIEW

SCALE: AS SHOWN

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN C. FOWLER
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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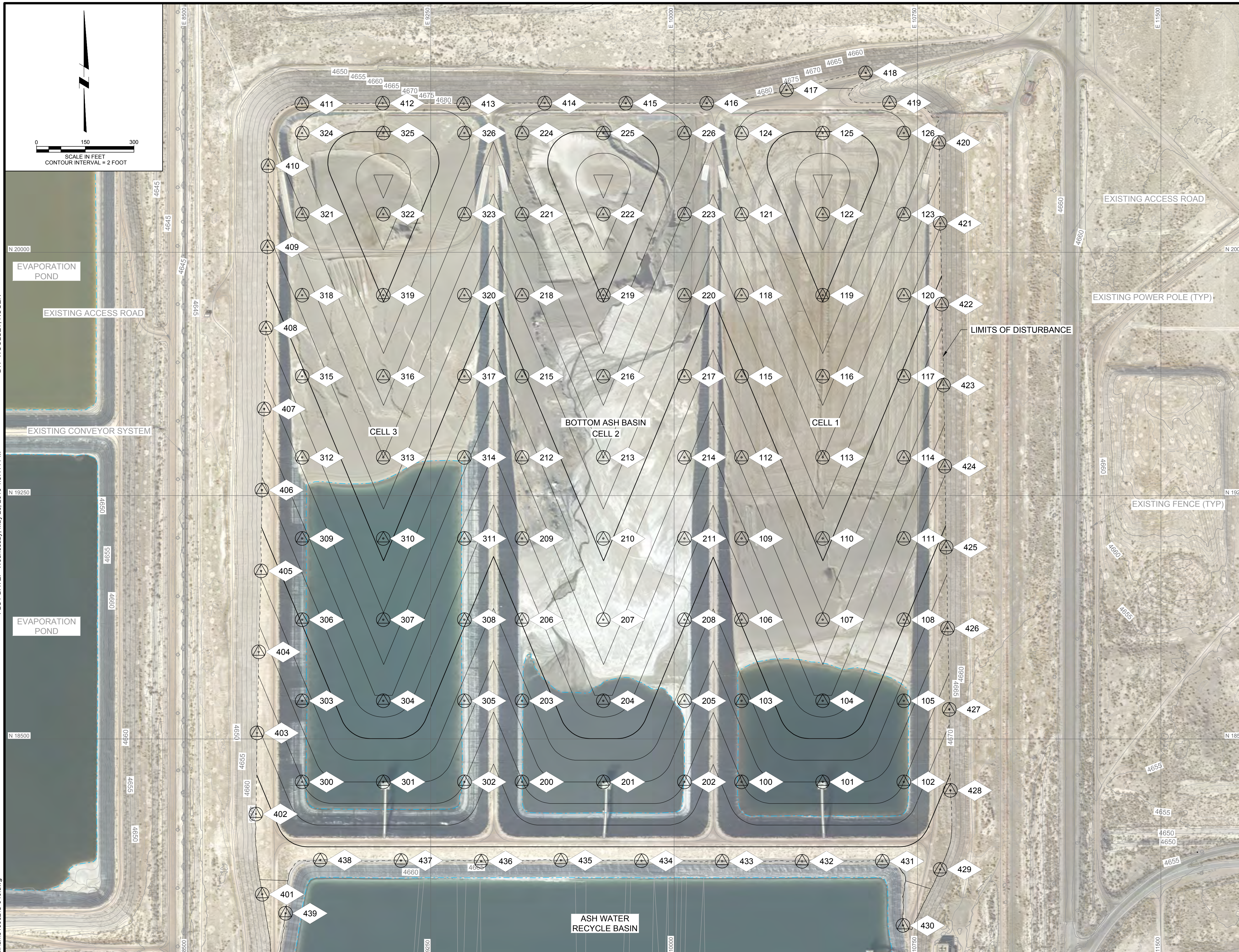
INTERMOUNTAIN POWER SERVICE CORP

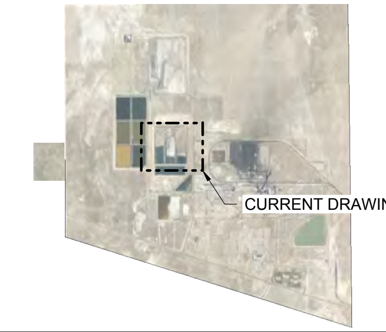
IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
SECTIONS

SHEET C-330

Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
	LIMITS OF DISTURBANCE
	EXISTING CONVEYOR SYSTEM
x	EXISTING FENCE
	EXISTING POWER POLE
	EXISTING WATER LEVEL

GENERAL SHEET NOTES

1. REFER TO SHEET C-330 FOR CONTROL POINT TABLES.

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40952\C-340.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: 1" = 150'

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CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
CONTROL POINTS

SHEET C-340

Job# 233001396

GENERAL SHEET NOTES

1. REFER TO SHEET C-320 FOR CONTROL POINTS.
2. CONTROL POINTS PROVIDED FOR USE BY THE CONTRACTOR. CONTRACTOR SHALL PROVIDE ADDITIONAL CONTROL POINTS TO EXECUTE WORK.

TOP OF COVER POINT TABLE

POINT	NORTHING	EASTING	ELEVATION (FT)
100	18367.46	10208.02	4671.97
101	18367.46	10458.02	4673.00
102	18367.46	10708.02	4671.99
103	18617.46	10208.02	4673.54
104	18617.46	10458.02	4676.75
105	18617.46	10708.02	4673.56
106	18867.46	10208.02	4675.11
107	18867.46	10458.02	4678.85
108	18867.46	10708.02	4675.12
109	19117.46	10208.02	4676.67
110	19117.46	10458.02	4680.42
111	19117.46	10708.02	4676.68
112	19367.46	10208.02	4678.24
113	19367.46	10458.02	4681.99
114	19367.46	10708.02	4678.25
115	19617.46	10208.02	4679.81
116	19617.46	10458.02	4683.55
117	19617.46	10708.02	4679.81
118	19867.46	10208.02	4681.37
119	19867.46	10458.02	4685.12
120	19867.46	10708.02	4681.37
121	20117.46	10208.02	4682.94
122	20117.46	10458.02	4686.69
123	20117.46	10708.02	4682.94
124	20367.46	10208.02	4684.11
125	20367.46	10458.02	4685.07

TOP OF COVER POINT TABLE

POINT	NORTHING	EASTING	ELEVATION (FT)
126	20367.46	10708.02	4684.11
200	18367.46	9531.93	4671.97
201	18367.46	9781.93	4673.00
202	18367.46	10031.93	4671.99
203	18617.46	9531.93	4673.54
204	18617.46	9781.93	4676.75
205	18617.46	10031.93	4673.56
206	18867.46	9531.93	4675.11
207	18867.46	9781.93	4678.85
208	18867.46	10031.93	4675.12
209	19117.46	9531.93	4676.67
210	19117.46	9781.93	4680.42
211	19117.46	10031.93	4676.68
212	19367.46	9531.93	4678.24
213	19367.46	9781.93	4681.99
214	19367.46	10031.93	4678.25
215	19617.46	9531.93	4679.81
216	19617.46	9781.93	4683.55
217	19617.46	10031.93	4679.81
218	19867.46	9531.93	4681.37
219	19867.46	9781.93	4685.12
220	19867.46	10031.93	4681.37
221	20117.46	9531.93	4682.94
222	20117.46	9781.93	4686.69
223	20117.46	10031.93	4682.94
224	20367.46	9531.93	4684.11

TOP OF COVER POINT TABLE

POINT	NORTHING	EASTING	ELEVATION (FT)
225	20367.46	9781.93	4685.07
226	20367.46	10031.93	4684.11
300	18367.46	8854.42	4671.97
301	18367.46	9104.42	4673.00
302	18367.46	9354.42	4671.99
303	18617.46	8854.42	4673.54
304	18617.46	9104.42	4676.75
305	18617.46	9354.42	4673.56
306	18867.46	8854.42	4675.11
307	18867.46	9104.42	4678.85
308	18867.46	9354.42	4675.12
309	19117.46	8854.42	4676.67
310	19117.46	9104.42	4680.42
311	19117.46	9354.42	4676.68
312	19367.46	8854.42	4678.24
313	19367.46	9104.42	4681.99
314	19367.46	9354.42	4678.25
315	19617.46	8854.42	4679.81
316	19617.46	9104.42	4683.55
317	19617.46	9354.42	4679.81
318	19867.46	8854.42	4681.37
319	19867.46	9104.42	4685.12
320	19867.46	9354.42	4681.37
321	20117.46	8854.42	4682.94
322	20117.46	9104.42	4686.69
323	20117.46	9354.42	4682.94

TOP OF COVER POINT TABLE

POINT	NORTHING	EASTING	ELEVATION (FT)
324	20367.46	8854.42	4684.11
325	20367.46	9104.42	4685.07
326	20367.46	9354.42	4684.11
400	17773.65	8762.48	4669.00
401	18020.79	8731.08	4669.00
402	18268.49	8711.84	4669.21
403	18518.38	8715.19	4670.83
404	18768.10	8720.42	4672.47
405	19017.69	8727.94	4674.15
406	19267.32	8730.37	4675.75
407	19516.96	8737.41	4677.42
408	19766.79	8742.69	4679.07
409	20016.59	8747.63	4680.71
410	20266.48	8749.23	4682.30
411	20457.37	8853.49	4683.53
412	20459.31	9102.29	4683.69
413	20458.08	9352.05	4683.71
414	20460.02	9601.54	4683.68
415	20459.29	9851.47	4683.69
416	20459.64	10101.34	4683.69
417	20500.64	10346.82	4683.07
418	20553.21	10590.41	4682.28
419	20461.07	10664.02	4683.66
420	20338.57	10815.94	4682.70
421	20089.44	10819.86	4681.09
422	19839.88	10824.42	4679.46

TOP OF COVER POINT TABLE

POINT	NORTHING	EASTING	ELEVATION (FT)
423	19590.08	10830.17	4677.81
424	19340.39	10834.03	4676.19
425	19090.50	10838.29	4674.56
426	18840.72	10843.20	4672.93
427	18590.88	10848.25	4671.29
428	18341.11	10851.59	4669.68
429	18097.56	10819.84	4669.00
430	17924.75	10705.59	4669.00
431	18122.67	10642.17	4669.33
432	18122.52	10394.77	4669.33
433	18123.01	10147.94	4669.33
434	18124.24	9899.54	4669.35
435	18125.80	9651.12	4669.37
436	18122.95	9405.54	4669.33
437	18125.10	9158.82	4669.36
438	18126.26	8910.15	4669.38
439	17962.21	8803.48	4669.00

DWG FILE: C:\pwwrk\dms40952\C-341.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: NTS

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DESIGNED P. BERNHARD
DRAWN B. ROBERTSON
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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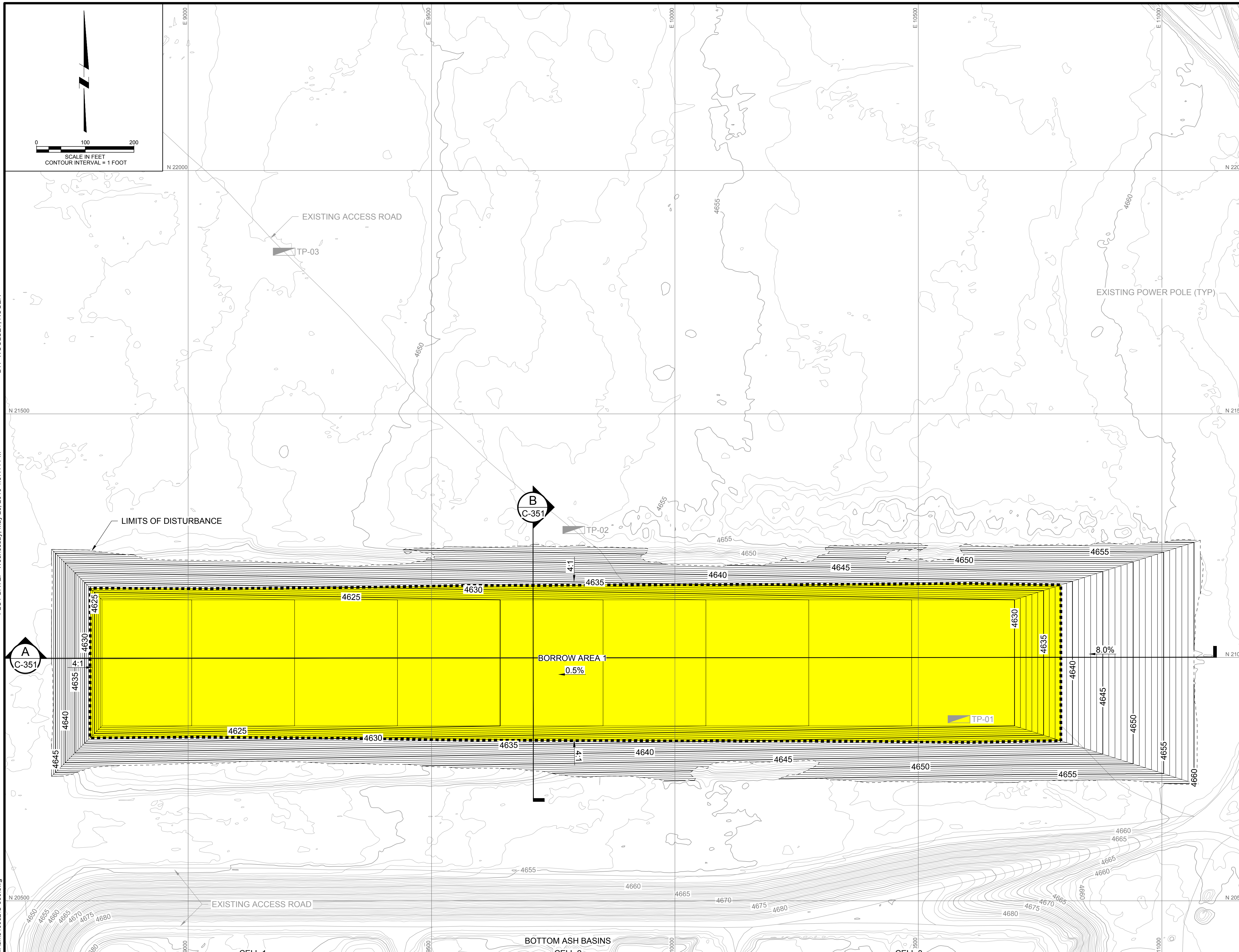
INTERMOUNTAIN POWER SERVICE CORP

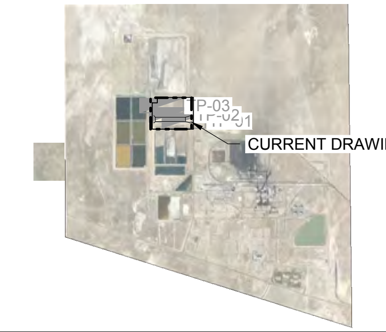
IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
CONTROL POINTS TABLE

SHEET C-341

Job# 233001396



KEY PLAN



LEGEND

- EXISTING CONTOURS
- DESIGN CONTOURS
- LIMITS OF DISTURBANCE
- EXISTING FENCE
- EXSTING TEST PIT
- CLAY EXCAVATION

GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.

QUANTITY TABLE		
DESCRIPTION	GEN FILL (CY)	CLAY (CY)
EXCAVATION	344,950	149,855

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40952\C-350.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	CF	ISSUED FOR CLIENT REVIEW

SCALE 1" = 100'

WARNING: IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN C FOWLER
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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Stantec

INTERMOUNTAIN POWER SERVICE CORP

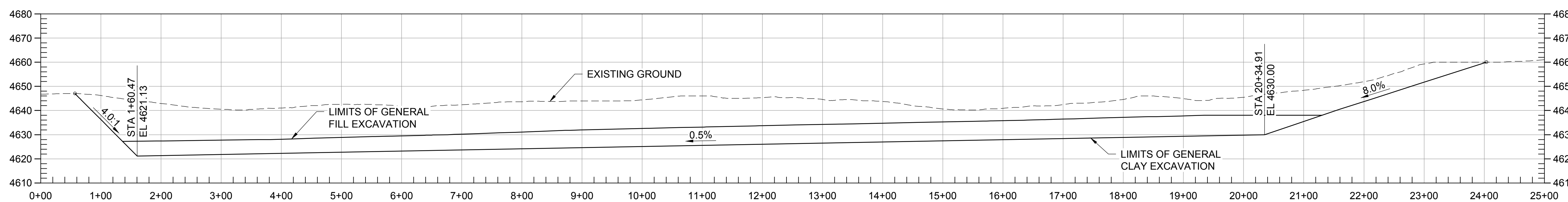
IPSC CCR BOTTOM ASH BASIN
CIVIL
BORROW AREA 1
EXCAVATION PLAN

SHEET C-350

Job# 233001396

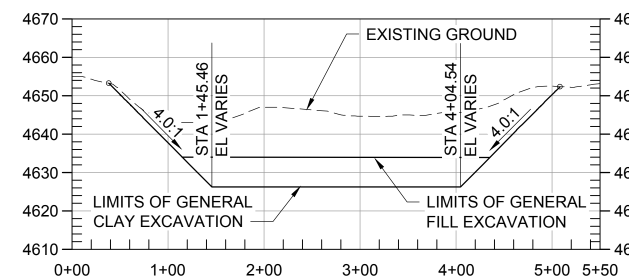
GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.



SECTION A (A / C-350)

HORZ 0 100 200 / VERT 0 25 50 SCALE IN FEET



SECTION B (B / C-350)

HORZ 0 100 200 / VERT 0 25 50 SCALE IN FEET

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40952\C-351.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: AS SHOWN

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN C FOWLER
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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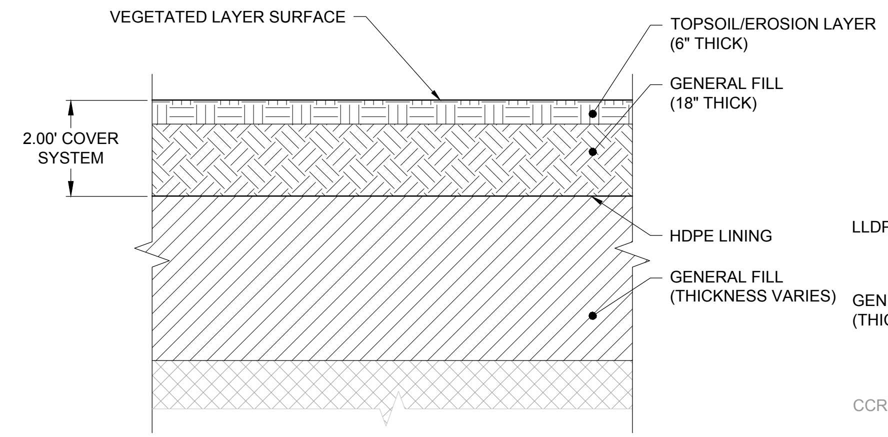
Stantec

INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN
CIVIL
BORROW AREA 1
EXCAVATION SECTIONS

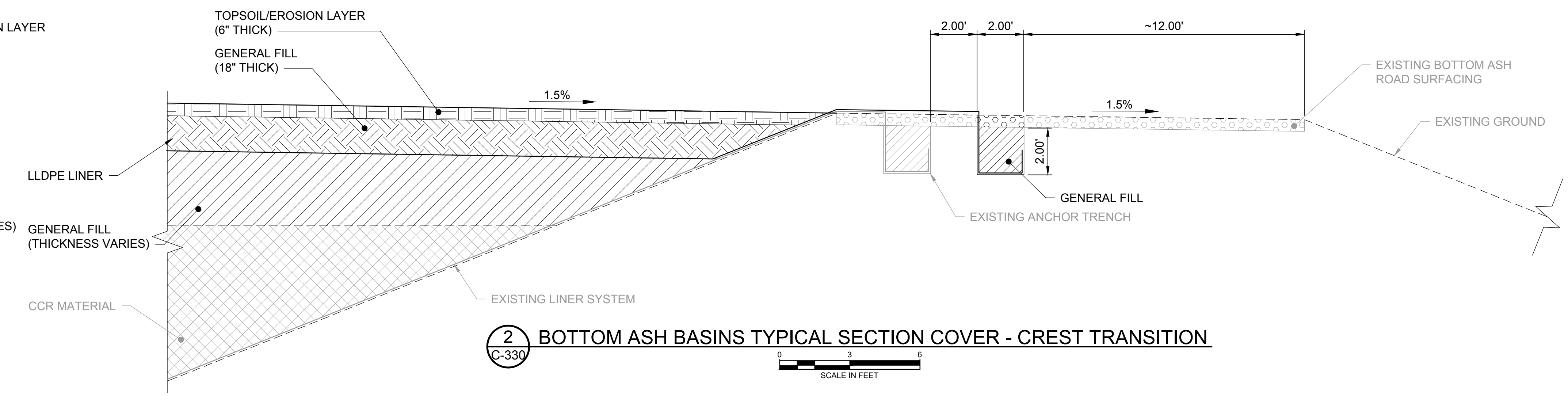
SHEET C-351

Job# 233001396



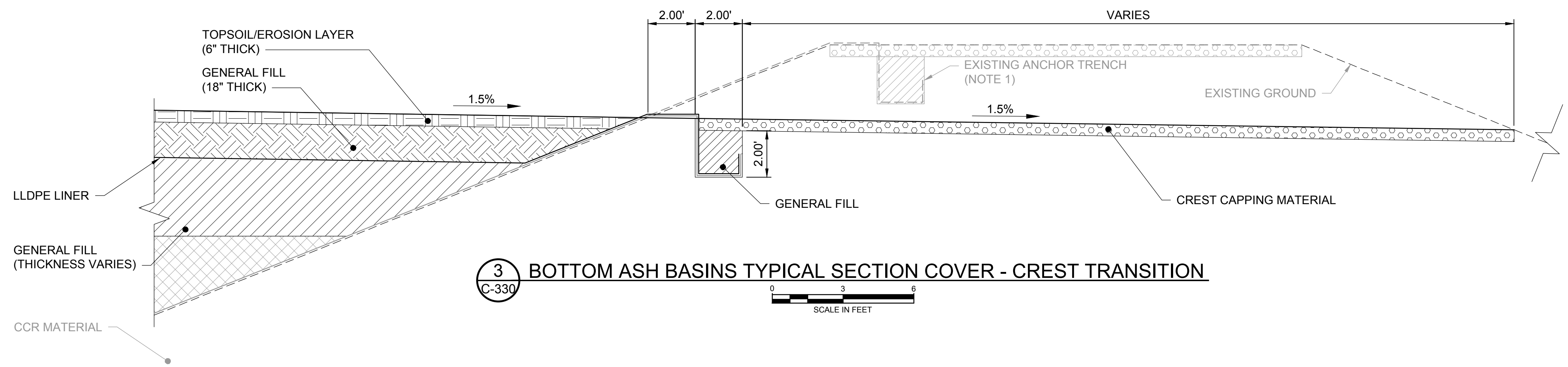
1 C-330 TYPICAL BOTTOM ASH BASIN COVER SYSTEM

SCALE IN FEET 0 2 4



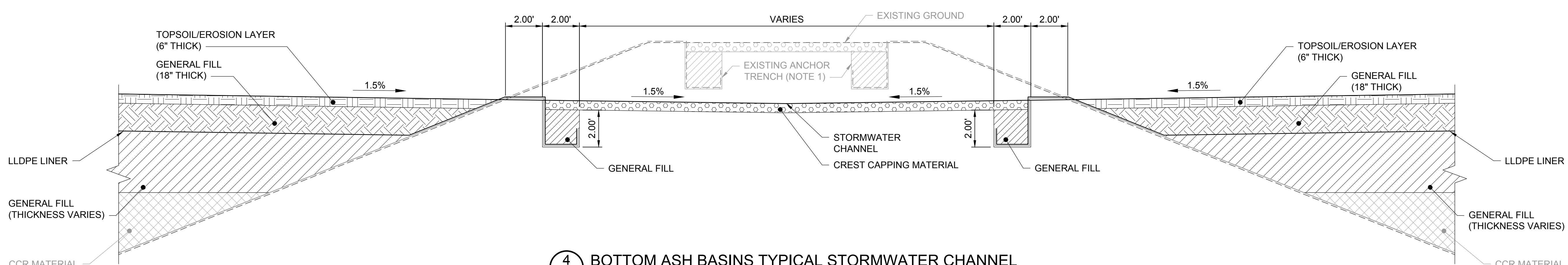
2 C-330 BOTTOM ASH BASINS TYPICAL SECTION COVER - CREST TRANSITION

SCALE IN FEET 0 3 6



3 C-330 BOTTOM ASH BASINS TYPICAL SECTION COVER - CREST TRANSITION

SCALE IN FEET 0 3 6



4 C-330 BOTTOM ASH BASINS TYPICAL STORMWATER CHANNEL

SCALE IN FEET 0 3 6

GENERAL SHEET NOTES

1. EXISTING LINER SHALL BE TRIMMED AND INSTALLED IN NEW ANCHOR TRENCH.

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: AS SHOWN

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN C. FOWLER
CHECKED C. TOMLINSON

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Stantec

INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN
CIVIL
BOTTOM ASH BASIN CLOSURE
DETAILS

SHEET C-360

Job# 233001396

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40952\C-360.dwg

Appendix B

Construction Specifications

IPP CCR CLOSURE TECHNICAL SPECIFICATIONS

DIVISION 02 - SITEWORK

SECTION 02222 – EARTHWORK AND GRADING

PART 1 -- GENERAL

1.1 SUMMARY

A. The Contractor shall be responsible for all activities required to ensure that the designated areas are free from objectionable materials, in accordance with the Contract Documents.

B. Contractor shall be responsible for the excavation and grading of the site to configuration in accordance with the details and to the lines and grades indicated by the project drawings.

C. Contractor shall be responsible for construction of the soil covers to the grades and specifications presented herein.

D. The Contractor shall be responsible for development of borrow areas.

1.2 RELATED SPECIFICATION

A. The following specifications contain requirements that relate to this specification:

- 02272 – Geomembranes

1.3 DEFINITIONS

A. Company: Intermountain Power Service Corp.

B. Engineer: Stantec

C. Contractor: The party to whom the Contract for the work described herein has been awarded and any of its authorized representatives.

1.4 CONTRACTOR SUBMITTALS

A. The Contractor shall submit the following documents for Engineer approval and acceptance prior to mobilization:

1. Samples:

    a. The Contractor shall submit samples of materials proposed for the Work.

    b. Sample sizes shall be determined by the testing laboratory.

PART 2 -- EQUIPMENT AND MATERIALS

2.1 EQUIPMENT

A. Conventional earth-moving equipment shall be used for the material acquisition. All equipment shall be decontaminated prior to arrival at the site, in good working condition, and suitable for its intended use.

2.2 MATERIALS

A. The following materials shall be furnished by the Contractor from designated soil borrow areas or supplied by the Company as specified below.

1. General Fill: General fill material shall be obtained from the identified borrow areas located on the drawings and shall conform to the gradation limits given in Table 1 below, when tested in accordance with ASTM D 422:

Table 1: General Fill Gradation Requirements

U.S. Standard Sieve Size	% Passing	
	Coarse Range	**Fine Range**
1.5-inch	100	100
¾-inch	90	100
No.4	65	100
No. 40	30	80
No. 200	10	50

2. Compacted Clay Layer, Clay Trench, and Clay Dividing Berm: Compacted Clay Layer, Clay Trench and Clay Dividing Berm material shall be obtained from the identified borrow areas located on the drawings and shall conform to the gradation limits given in Table 2 below, when tested in accordance with ASTM D 422:

Table 2: Compacted Clay Layer, Clay Trench and Clay Dividing Berm Gradation Requirements

U.S. Standard Sieve Size	% Passing	
	Coarse Range	**Fine Range**
1-inch	100	100
¾-inch	95	100
No.4	90	100
No. 40	80	100
No. 200	60	100

Note that clay clay material can be used for gernal fill if necessary.

3. Topsoil / Erosion Layer: Topsoil / Erosion Layer material shall be 1.5-inch minus material, shall be a blend of 50% clay material and 50% slty sand to promote soil moisture storage and reduce the potential for soil erosion. The Topsoil / Erosion Layer shall conform to the gradation limits given in Table 3 below, when tested in accordance with ASTM D 422.

Table 3: Topsoil / Erosion Layer Material Gradation Requirements

`	% Passing	
	Coarse Range	**Fine Range**
1.5-inch	100	100
¾-inch	90	100
No. 4	65	100
No. 40	50	95
No. 200	30	75

PART 3 -- EXECUTION

3.1 EXCAVATION

A. General

1. Excavation is unclassified and includes excavation to required grade, or subgrade elevations, regardless of the character of materials or obstruction encountered.

2. Tolerances for all excavated surfaces shall be within ±0.1 foot of the elevation as specified in the design drawings.

3. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable state safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

4. The Contractor shall provide quantity surveys where so required to verify quantities for Unit Price Contracts.

5. Survey shall be performed prior to beginning Work and upon completion by a surveyor licensed in the State of Utah.

6. If stockpiles will be used, the material shall be transported and stockpiled in an approved stockpiling area.

B. Disposal Of Excess Excavated Material

1. The Contractor shall be responsible for the removal and stockpiling of any excess excavated material according to Section 01552 – Staging and Stockpile Areas.

2. Material shall be disposed of at an approved on-Site disposal area.

3.2 FILL PLACEMENT AND COMPACTION

A. Material Placement

1. Material shall be placed and spread evenly in approximately horizontal layers.

2. Lift thicknesses are specified by material types in the following sections.

3. Unless otherwise approved by the Engineer, loose lift thickness shall not exceed 6 inches, prior to compaction by hand operated compactors.

B. General Fill:

1. General Fill shall be spread in 18-inch loose lifts using equipment meeting the ground pressure requirements described in Section 02272 – Geomembrane to prevent damage to the geomembrane. The equipment shall have GPS elevation grade control capability.

2. Following placement and grading of each lift, the surface shall be compacted with a number of passes by equipment that is capale of achieving the required degree of compaction stated in Table 4.

3. Following placement and grading of the general fill for the liner protection layer, the surface shall be compacted with a number of passes (tracked) by the low-groud-pressure (LGP) dozer. The Contractor shall determine the appropriate number of passes to achieve the required degree of compaction stated in Table 4.

4. Moisture contents of the general fill during placement shall comply with Table 4.

C. Compacted Clay Layer, Clay Trench and Clay Divider Berm:

1. Compacted Clay Layer shall be spread in 8-inch loose lifts. The equipment used to spread lifts shall have GPS elevation grade control capability.

2. Clay Trench and Clay Divider Berm shall be spread in 12-inch loose lifts. The equipment used to spread lifts shall have GPS elevation grade control capability.

3. Following placement and grading of each lift, the surface shall be compacted with a number of passes by equipment that is capale of achieving the required degree of compaction stated in Table 4. The Contractor shall determine the appropriate number of passes.

4. Moisture contents of the Compacted Clay Layer, Clay Trench and Clay Divider Berm during placement shall comply with Table 4.

5. Where clay is to be used as General Fill the contractor shall place, spread, and compact the layer in accordance with Section 3.2.B

D. Topsoil / Erosion Layer:

1. Topsoil Layer shall be spread in one loose lift using equipment meeting the ground pressure requirements described in Section 02272 – Geomembrane to prevent damage to the geomembrane, graded to achieve final design grades, and compacted to meet the requirements of Table 4, by tracking to achieve the final thickness.

2. The surface of the layer shall be tracked into place to maintain the surface of the material, in the event of heavy rain, prior to vegetation.

E. Compaction Requirements:

1. Compaction equipment shall be of the appropriate type and weight for the fill materials being placed in order to achieve the compaction requirements of this Specification and meet the ground pressure requirements described in Section 02272 – Geomembrane where applicable.

2. The Contractor shall submit compaction procedures to the Engineer as part of the Construction Plan submitted. Procedures shall include details of the equipment proposed for use and the number of passes required. The Contractor shall state in the procedures, the steps that will be taken to control moisture content of the fill materials. Approval of the compaction procedures shall be given by the Engineer prior to Contractor undertaking any compaction work.

3. Coverages of Compaction Equipment: Coverages of the compaction equipment shall be carried out so that the compactive effort is uniformly distributed in a systematic manner over the entire lift. Compaction of individual lanes of a lift shall be completed before beginning compaction of adjacent portions of the lift. Individual lanes shall be overlapped by at least 1 ft.

4. In locations where compaction by normal mechanical equipment is not possible and compaction can only be completed by hand tamping, fill shall be moistened, placed and compacted with the aid of pneumatic or hand tampers. Pneumatic and hand tampers shall provide a minimum of 9 psi compactive force.

5. Compaction shall meet the requirements given in Table 4 below in accordance with:

   ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (400 ft-lbf/ft^3) where the material is graded such that 10 percent or more passes a No. 4 sieve.

Table 4: Compaction Requirements for Fill Materials

Location or Use of Fill or Backfill	Percentage of Maximum Dry Density	Percentage of Optimum Moisture
General Fill	90% (±3% of MDD)	±2%
General Fill (Liner Protective Layer)	90% (±3% of MDD)	±2%
Compacted Clay Layer (CB Landfill)	95% (minimum)	±2%
Clay Trench (Wastewater Basin)	90% (±3% of MDD)	NA
Clay Divider Berm (Wastewater Basin)	90% (minimum)	±2%
Erosion Protection Layer (topsoil)	85% (+5%)	±2%

F. Moisture Content

1. For General Fill, Compacted Clay Layer, Clay Divider Berm and Topsoil, the moisture contents of materials to be placed and compacted or scarified and compacted shall be within +2.0 and -2.0 percent of the Optimum Moisture Content (OMC) as

determined by ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3).

2. The moisture content of materials shall be uniform throughout each layer of material placed prior to and during compaction.

3. Perform wetting and drying operations as necessary in order to achieve the required moisture contents prior to compaction.

4. Materials too dry for compaction shall be pre-wetted in the borrow areas. Supplemental water, if required, shall be added to the material at the placement area prior to compaction; by uniform sprinkling, followed by uniform mixing, prior to compaction.

5. Materials too wet for compaction shall be dried to the proper moisture content before compaction. Mixing of wet materials with drier materials may also be performed to achieve the appropriate moisture content, as approved by the Engineer.

6. If the moisture content of fill material placed into the work falls outside the required limits, the Contractor shall condition the material to bring it to within the required limits. If the material cannot be brought readily to the specified moisture content, the Contractor shall remove the material from the work.

3.3 MATERIALS TESTING

A. Samples:

1. Soils testing of samples submitted by the Contractor will be performed by a testing laboratory of the Contractor's choice and at the Contractor’s expense.

2. The Engineer may direct the Contractor to supply samples for testing of any material used in the Work.

3. Particle-size analyses of soils and aggregates will be performed using ASTM D 422 - Standard Test Method for Particle-size Analysis of Soils.

4. References in this Section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D 2487.

5. The Contractor shall be bound by applicable provisions of ASTM D 2487 in the interpretation of soil classifications.

B. Field and Laboratory Testing:

1. Field soils testing will be performed by a testing laboratory of the Contractor's choice at the Contractor's expense at the frequency given in Table 5 below.

Table 5: Minimum Required QC Field and Laboratory Testing Methods and Frequencies

Material	Test Name	Testing Method	Minimum QC Testing Frequency
General Fill / Liner Protective Layer	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 10,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 20,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Compacted Clay Layer (CB Landfill)	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 5,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per10,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Clay Ternch / Clay Dividing Berm	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 5,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 10,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Topsoil/Erosion Layer	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 2,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 5,000CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test

Notes:
1. The Engineer may revise the listed frequencies and test methods during the work.
2. Standard Proctor testing shall be performed at the frequencies listed in the table and as needed to obtain Proctor values representative of the placed material.

C. Contractor's Responsibilities:

1. Re-working to Attain Specified Limits: When the test results indicate that compaction, water content, or relative compaction is not in conformance with specified limits, the Contractor shall make immediate adjustments in procedures as necessary to conform to the specified limits. Re-working to attain the specified limits may include removal, rehandling reconditioning, re-rolling, or combinations of these procedures. The Contractor shall perform all re-work required to achieve the specified compaction water content and relative compaction at no cost to the Company.

2. Confirmation of In-Situ Material Properties: The Contractor shall independently confirm the geotechnical properties of the proposed Cover Soil material and determine the appropriate moisture conditioning and compaction methods to ensure that cover material meets the project specifications and are constructed to the design lines and grades as provided in the design drawings. Claims arising from material shrinkage and/or swelling will not be entertained.

- END OF SECTION -

SECTION 02272 –GEOMEMBRANES

PART 1 -- GENERAL

1.1 SUMMARY

A. The CONTRACTOR shall supply all labor, equipment, materials, and appurtenances for the complete installation of geomembranes as per contract documents.

B. Sufficient geomembrane material shall be furnished to cover all lined areas, including seam overlaps and anchor trenches. One percent shall be added to the length of each panel to allow for shrink and wrinkles. The geomembrane shall be installed in a relaxed condition and shall be free of tension or stress upon completion of the installation.

1.2 SUBMITTALS

A. Prior to installation of geomembrane material, the CONTRACTOR shall submit the following for the ENGINEER's approval:

1. Resin Data, including a certification stating that the resin meets the specification requirements (see Paragraph 2.3.C).

2. Statement certifying that geomembrane materials have been tested and inspected in accordance with Paragraph 1.5.

3. Statement certifying no recycled polymer and no more than 10% rework of the same type of material is added to the resin (product run may be recycled).

4. Specification sheet stating that the geomembrane meets the specification requirements (see Paragraph 2.3.E)

5. Installation layout drawings showing the proposed panel layout to cover the lined area shown, with proposed size, number, position, and sequence of placing all sheets and indicating the location and direction of all field joints and penetrations. Installation layout drawings shall also show complete details and/or methods for anchoring, field joints, seals at existing structures, etc.

6. Four 8-inch x 10-inch samples of the material proposed for the lining

7. A Statement of Qualifications for the geomembrane manufacturer and installation contractor with sufficient detail to satisfy the experience requirements of Paragraph 1.3.

8. Installation Contractor's Quality Control Plan.

B. Placement of geomembrane material shall not commence until the submittals required in Paragraph 1.2 A have been approved by the ENGINEER.

C. Upon completion of geomembrane installation, the CONTRACTOR shall submit the following:

1. Certificate stating the geomembrane has been installed in accordance with the Contract Documents.

2. Material and installation warranties

3. As-built drawings showing actual geomembrane placement and seams including complete details.

1.3 QUALIFICATIONS

A. **Qualifications of Manufacturer:** The manufacturer shall have at least five years continuous experience in manufacturing polyethylene geomembrane and/or experience totaling not less than 5 million square feet of manufactured polyethylene geomembrane.

1. The following manufacturers are approved by the COMPANY:

   a. Agru America

   b. Solmax

B. **Qualifications of Installation Contractor:** The installation contractor shall be the manufacturer, or shall be trained to install the manufacturer's material, and shall have experience of not less than 3 projects and not less than 1,000,000 square feet of successfully installed polyethylene geomembrane.

1. Field Installation Supervisor: Installation shall be performed under the constant direction of a Field Installation Supervisor who shall remain on site and be responsible, throughout the geomembrane installation, for layout, seaming, testing, repairs, and all other activities by the Installer. The Field Installation Supervisor shall have installed or supervised the installation of not less than 1,000,000 square feet of polyethylene geomembrane.

2. Master Seamer: Seaming shall be performed under the direction of a Master Seamer (who may also be the Field Installation Supervisor) who has seamed not less than 1,000,000 square feet of polyethylene geomembrane, using the same type of seaming apparatus specified for this project. The Field Installation Supervisor and/or Master Seamer shall be present whenever seaming is performed.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

ASTM D792	Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1004	Test Method for Initial Tear Resistance of Plastic Film and Sheeting
ASTM D1238	Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1505	Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1603	Test Method for Carbon Black in Olefin Plastics
ASTM D3895	Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D4218	Standard Test Method for Determination of Carbon Black in Polyethylene Compounds
ASTM D4833	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

ASTM D5199	Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
ASTM D5397	Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D5994	Standard Test Method for Measuring Core Thickness of Textured Geomembranes
ASTM D6392	Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
ASTM D6693	Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
ASTM D7240	Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique (Conductive Geomembrane Spark Test)
GRI GM 13	Test Methods, Test Properties, and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
GRI GM 14	Standard Guide for Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes
GRI GM 17	Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

1.5 QUALITY CONTROL

A. All WORK shall be constructed, monitored and tested in accordance with the requirements of the Installation Contractor's Quality Control Plan (CQP), which shall be submitted in accordance with Paragraph 1.2 A.

B. The CONTRACTOR shall be aware of all activities outlines in the CQP, and the CONTRACTOR shall account for these activities in the construction schedule. No additional costs to the COMPANY shall be allowed by the CONTRACTOR as a result of the performance of the CQP activities.

1.6 QUALITY ASSURANCE

A. The COMPANY shall conduct quality assurance monitoring and testing of the geomembrane installation under the direction of the ENGINEER. This testing is defined in Part 3 of the Specification and include, but are not limited to, trial welds (Section 3.2.F.5) and seam testing (Section 3.3).

1.7 WARRANTY

A. The CONTRACTOR shall procure and provide copies of the manufacturer's warranty for the geomembrane system and all appurtenances. The warranty shall cover materials for a period of 5 years prorated and workmanship for a period of 1 year from the date of the COMPANY's acceptance of the project. The warranty shall not be prorated for workmanship, but shall be a full replacement value warranty. Should defects or premature loss of use within the scope of the above warranty occur, repair and/or replacement of damaged material shall be performed by the CONTRACTOR at no cost to the COMPANY.

PART 2 -- PRODUCTS

2.1 SCHEDULE OF GEOMEMBRANES

TABLE 1 – SCHEDULE OF GEOMEMBRANES

Application	Geomembrane
Bottom Ash Basin Cover Geomembrane	60-mil HDPE, Textured (Single Side)
Wastewater Basin Cover Geomembrane	60-mil LLDPE, Textured (Single Side)

2.2 APPROVED GEOMEMBRANE PRODUCTS

A. 60-mil HDPE, Textured (Single Side)

1. Solmax HDPE Single Textured

2. Agru America HDPE MicroSpike Single Sided

B. 60-mil LLDPE, Textured (Single Side)

1. Solmax LLDPE Single Textured

2. Agru America LLDPE MicroSpike Single Sided

2.3 "OR EQUAL" PRODUCTS

A. CONTRACTOR shall provide the COMPANY approved geomembrane products listed in Paragraph 2.2, or provide "or equal" products that meet the requirement indicated below.

B. **Materials:** The material shall be black, coextruded high-density polyethylene (HDPE) geomembrane or black, coextruded linear low-density polyethylene (LLDPE) geomembrane as listed below and as shown on the Contract Drawings.

C. The geomembrane shall be manufactured from new, first quality resin produced in the United States and shall be compounded and manufactured specifically for producing geomembrane. Natural resin (without carbon black) shall meet requirements listed in Table 2:

TABLE 2 – RESIN PROPERTIES

Property	Test Method	HDPE Value	LLDPE Value
Density (g/cm3)	ASTM D 792 / ASTM D 1505	≥0.932	≤0.926
Melt Flow Index (g/10 min)	ASTM D 1238 (190/2.16)	≤1.0	≤1.0

Reprocessed materials shall not be acceptable. No post-consumer resin of any type shall be added to the formulation.

D. **Fabrication:** The geomembrane shall have a minimum 20-foot seamless width. The geomembrane shall be supplied in rolls with labels identifying the thickness of material, the length and width of the roll, the lot and roll numbers, and the name of the manufacturer.

E. Properties:

1. The geomembrane shall not exceed a combined maximum total of 1 percent by weight of additives other than carbon black.

2. The geomembrane shall be free of holes, pinholes, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

3. The finished product shall be uniform in color, thickness, and surface texture and shall meet the **minimum** average specifications listed in Table 3 and as stipulated in GRI Test Method GM13 and GM17 for HDPE and LLDPE liners, respectively.

F. Manufacturer Quality Control

1. All resins and additives used in the fabrication of the geomembrane shall be sampled, tested, and approved by the MANUFACTURER before being eligible for use. Sampling and testing of the resins and additives shall be performed in accordance with the Manufacturer's Quality Control program.

2. All roll goods shall be inspected for defects and impurities. Geomembrane thickness shall be measured for each roll.

3. All geomembrane sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements listed in Paragraph 2.3.E and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be corrected during installation.

4. The geomembrane shall be tested by the MANUFACTURER for the listed properties provided in the tables in Part 2. A log shall be maintained showing the testing date, time and results. Any rolls not meeting the visual inspection or requirements of the specification shall be rejected.

5. Certification that the material has been inspected, tested, and meets all requirements shall be submitted to the ENGINEER. Test results shall be made available to the ENGINEER upon request.

TABLE 3 – GEOMEMBRANE PROPERTIES

Tested Property	Test Method	Frequency	Textured HDPE	Textured LLDPE
Thickness, (minimum average) mil; Lowest individual reading (-10%);	ASTM D 5199 (Sm.) / ASTM D 5994 (Tx.)	every roll	60 54	60 54
Density, g/cm^3	ASTM D 792 / ASTM D 1505	200,000 lb	0.94	0.94
Tensile Properties (each direction) Strength at Yield, lb/in-width Strength at Break, lb/in-width Elongation at Yield, % Elongation at Break, %	ASTM D 6693, Type IV Dumbell, 2 ipm G.L. 1.3 in (33 mm) G.L. 2.0 in (51 mm)	20,000 lb	126 90 12 100	N/A 120 N/A 250
Tear Resistance, lb	ASTM D 1004	45,000 lb	42	33
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	90	66
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lb	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note(1)	Note(1)
Asperity Height, mil	ASTM D 7466	second roll	18	18
Notched Constant Tensile Load(2), hr	ASTM D 5397, Appendix	200,000 lb	300	N/A
Oxidative Induction Time, min	ASTM D 3895, 200° C; O_2, 1 atm	200,000 lb	≥100	≥100

NOTES:
(1)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3. *Modified

PART 3 -- EXECUTION

3.1 STORAGE

A. After delivery, all roll goods shall be stored so as to be protected from puncture, dirt, grease, moisture and excessive heat which may result in damage or degradation of the material. Damaged material shall be stored separately for repair or replacement. The rolls shall be stored on a prepared smooth surface and should not be stacked more than two rolls high.

3.2 INSTALLATION

A. **General:** The geomembrane shall be installed in accordance with the following specifications and approved procedures submitted with the shop drawings.

B. Subgrade Preparation and Inspection:

1. Surfaces to be lined shall be smooth and free of all rocks, stones, sticks, roots, sharp objects, or debris of any kind. The surface shall provide a firm, unyielding foundation for the membrane with no sudden, sharp, or abrupt changes or break in grade.

2. The CONTRACTOR shall, on a daily basis, approve the surface on which the geomembrane shall be installed. The surface shall be smooth, clean and free of foreign material, sharp objects, frost, standing water or excessive moisture. Installation shall proceed only if the surface conditions are found satisfactory.

C. Equipment:

1. Welding equipment and accessories shall meet the following requirements:

a. Gauges showing temperatures in apparatus such as extrusion welder or fusion welder shall be present.

b. An adequate number of welding apparati shall be available to avoid delaying work.

c. Power source must be capable of providing constant voltage under combined line load.

D. Deployment:

1. Each panel shall be assigned a simple and logical identifying code.

2. The coding system shall be subject to approval by the ENGINEER and shall be determined at the job site.

3. The CONTRACTOR shall visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.

4. Deployment of geomembrane panels shall be performed in a manner that shall comply with the following guidelines:

a. Geomembranes shall be installed according to site-specific specifications and MANUFACTURER recommendations.

b. The geomembrane shall be placed in such a manner as to assure minimum handling.

c. Only those sheets of material which can be anchored and sealed together that same day shall be unpackaged and placed in position.

d. Deployment of the geomembrane shall proceed with ambient temperatures greater than 32° F. Placement can proceed below 32° F only after it has been verified by the ENGINEER that the material can be seamed in accordance with GRI GM9 (Cold weather seaming of geomembranes).. Placement shall not be done during any precipitation, in the presence of excessive moisture (fog, rain, dew) that deposits a residue on the liner that is detectable for sight or touch and could adversely impact the performance of the seam welding process.

e. Placement shall not be done in the presence of excessive winds which could adversely impact the ability to complete the seam welding process. In areas where wind is prevalent, installation should be started at the upwind side of the project and proceed downwind. The leading edge of the geomembrane shall be secured at all times with sandbags or other means sufficient to hold it down during high winds.

f. Geomembrane shall be unrolled using methods that shall not damage geomembrane and shall protect underlying surface from damage (spreader bar, protected equipment bucket).

g. Ballast (commonly sandbags) which shall not damage geomembrane shall be placed on geomembrane to prevent wind uplift.

h. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage it. Smoking shall not be permitted on the geomembrane.

i. No vehicle traffic shall travel on the geomembrane other than an approved low ground pressure vehicle.

j. Geomembrane shall be protected in areas of heavy traffic by placing protective cover over the geomembrane. Protective cover is material as approved by the ENGINEER that is placed over the geomembrane to reduce the ground pressure of heavy traffic to less than 8 psi on the liner.

5. Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

E. Lining sheets shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Lining to concrete seals shall be made with a mechanical anchor or as approved by the ENGINEER. All piping, structures, and other projections through the lining shall be sealed with approved sealing methods.

F. Field Seams:

1. Seams shall meet the following requirements:

   a. To the maximum extent possible, seams shall be oriented parallel to line of slope, i.e., down and not across slope.

   b. The number of field seams in corners, odd-shaped geometric locations and outside corners shall be minimized.

   c. Slope seams (panels) shall extend a minimum of five-feet beyond the grade break into the flat area.

   d. Be designated using a sequential seam numbering system compatible with panel numbering system, and that is agreeable to the ENGINEER.

   e. Seam overlaps shall be aligned to be consistent with the requirements of the welding equipment being used.

2. During welding operations provide at least one Master Seamer who shall provide direct supervision over other welders as necessary.

3. Extrusion Welding

   a. Hot-air tack adjacent pieces together using procedures that do not damage the geomembrane.

   b. Clean geomembrane surfaces by disc grinder or equivalent.

   c. Purge welding apparatus of heat-degraded extrudate before welding.

4. Hot Wedge Welding

   a. Welding apparatus shall be a self-propelled device equipped with an electronic controller which displays applicable temperatures.

   b. Clean seam area of dust, mud, moisture and debris immediately ahead of hot wedge welder.

   c. Protect against moisture build-up between sheets.

5. Trial Welds

   a. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.

   b. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.

   c. Minimum of two trial welds per day, per welding apparatus, one made prior to the start of work and one completed at mid shift.

   d. Cut four, one-inch wide by six-inch long test strips from the trial weld.

   e. Quantitatively test specimens for peel adhesion, and then for shear strength.

f. Trial weld specimens shall pass when the results shown in the Table 4 are achieved in both peel and shear test:

TABLE 4 – SEAM PROPERTIES

Property	Test Method	Minimum Values	
		60-mil HDPE	**60-mil LLDPE**
Peel Strength (fusion) ppi (1), (2)	ASTM D6392	91	75
Peel Strength (extrusion) ppi (1), (2)	ASTM D6392	78	66
Shear Strength (fusion and ext.) ppi	ASTM D6392	120	90

Notes:
1) The break, when peel testing, occurs in the geomembrane material itself, not through peel separation (FTB).
2) The break is ductile.

g. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.

h. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed trial weld.

i. Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the geomembrane installation. CONTRACTOR shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds.

j. Defects and Repairs

1) Examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.

2) Repair and non-destructively test each suspect location in both seam and non-seam areas. Do not cover geomembrane at locations that have been repaired until test results with passing values are available.

G. **Anchor Trench:** The geomembrane shall be placed and secured in an earth anchor trench as indicated in the Contract Drawings. The installer shall coordinate with the earthwork contractor regarding excavation and backfilling of the anchor trench. Care shall be taken when backfilling the trenches to prevent any damage to the geomembrane. If damage occurs, it shall be repaired prior to backfilling.

3.3 SEAM TESTING

A. Field Destructive Testing

1. Destructive seam tests shall be performed to evaluate bonded seam strength. The frequency of sample removal shall be one sample per 500 linear feet of seam. Location of the destructive samples shall be selected by the ENGINEER. Field testing shall take place as soon as possible after completion of the seam.

   a. At the sole discretion of the ENGINEER, destructive seam tests may be reduced in frequency by following the procedures of Geosynthetic Research Institute (GRI) Standard Guide GM 14.

2. Sample labeling shall be the responsibility of the ENGINEER and shall include test number, seam number, seaming machine number, job number, date welded, and welding tech number.

3. The samples shall be approximately 12 inches x 25 inches. The samples shall then be cut into two samples approximately 12 inches x 12 inches: one for field testing and one for archiving or independent testing.

4. The sample for field testing shall have ten coupons cut and be tested with a tensiometer adjusted to a pull rate as shown below. The strength of four out of five specimens shall meet or exceed the values below, and the fifth value must meet or exceed 80% of the value below.

   a. Seam must exhibit film tear bond (FTB). Welds shall have less than 25% incursion into the weld.

   b. Peel and shear values shall meet or exceed the values in Table 4 (at 2 inches/minute)

5. All destructive weld test data shall be logged by the ENGINEER.

6. If a test fails, additional samples shall be cut, approximately ten feet on each side of the failed test, and retested. This procedure shall be repeated until a sample passes. Then the area of the failed seam between the two tests that pass shall be capped or reconstructed.

B. Non-Destructive Testing

1. The CONTRACTOR shall non-destructively test all seams their full length for continuity using an air pressure or vacuum test.

2. Air Pressure Testing

   a. Air pressure testing shall be performed on all seams welded with a double seam fusion welder.

   b. The equipment used for air pressure testing shall consist of an air tank or pump capable of producing a minimum of 35 psi and a sharp needle with a pressure gauge attached to insert into the air chamber.

   c. Both ends of the seam to be tested shall be heated and squeezed together.

d. The needle with gauge shall be inserted into the air channel and the channel shall be pressurized to 30 psig.

e. If the pressure in the air channel drops by more than 4 psig over a period of five minutes, then the seam has failed.

f. If the seam fails the air pressure test, the leak shall be located and the area cut away. Air pressure testing shall be performed on the remaining portions of the seam until all portions of the seam pass the test.

g. The area cut away shall be repaired with a patch. The patch shall be tested according to the procedures outlined below for vacuum testing.

3. Vacuum Testing

a. Vacuum testing shall be performed on all seams welded with an extrusion welder.

b. The equipment used for vacuum testing shall consist of a vacuum pumping device, a vacuum box, and a foaming agent in solution.

c. The section of seam to be tested shall be wetted with a foaming agent and the vacuum box shall be placed over the wetted area. Air shall be evacuated from the vacuum box until a seal between the box and the geomembrane has been formed.

d. The minimum vacuum shall be equivalent to 5 psig (10 inches of mercury).

e. If fusion welded seams are being tested, the overlap flap must be cut off prior to testing.

f. The seam shall be observed through the viewing window for bubbles emitting from the seam.

g. If no bubbles are observed, the box shall be moved on to the next area for testing. If bubbles are observed, the area of the leak shall be marked for repair.

h. After completion of repairs, the repair seam shall be retested according to the requirements of paragraph 3.3B.

3.4 INSPECTION AND REPAIR

A. **Field Inspection:** All seals to penetrations as well as all seams and non-seam areas of the geomembrane shall be inspected for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection. Each suspect location shall be non-destructively tested as appropriate and repaired accordingly.

B. Repair Procedures:

1. Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.

2. Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.

3. CONTRACTOR shall be responsible for repair of defective areas.

4. Agreement upon the appropriate repair method shall be decided between ENGINEER and CONTRACTOR by using one of the following repair methods:

   a. Patching- Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.

   b. Abrading and Re-welding- Used to repair short section of a seam.

   c. Spot Welding- Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.

   d. Capping- Used to repair long lengths of failed seams.

   e. Flap Welding- Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.

   f. Remove the unacceptable seam and replace with new material.

5. The following procedures shall be observed when a repair method is used:

   a. All geomembrane surfaces shall be clean and dry at the time of repair.

   b. Surfaces of the polyethylene which are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.

   c. Extend patches or caps at least 6 inches for extrusion welds and 4 inches for wedge welds beyond the edge of the defect, and around all corners of patch material.

6. Repair Verification

   a. Number and log each patch repair (performed by ENGINEER).

   b. Non-destructively test each repair using methods specified in this Specification.

7. The CONTRACTOR shall also keep detailed record drawings showing the location, size, type, and frequency of all repairs made during the installation of the geomembrane. These record drawings shall be updated by the CONTRACTOR on a daily basis and submitted to the COMPANY upon completion of the project. Inspection of these record drawings shall be made available to the ENGINEER or the COMPANY for verification and review at any time during the construction period.

3.5 ACCEPTANCE

A. The CONTRACTOR shall retain all ownership and responsibility for the geomembrane system until acceptance by the ENGINEER. Final acceptance shall occur when the following conditions are met:

   1. Installation is finished.

2. Verification of the adequacy of all field seams and repairs is complete.

3. Submittals required in Paragraph 1.2 D have been accepted by the ENGINEER.

- END OF SECTION –

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SECTION 02930 - SEEDING

PART 1 -- GENERAL

1.1 SUMMARY

A. The Contractor shall apply reclamation seed mix to the completed cover, complete and in place, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Federal Specifications:

FS O-F-241D	Fertilizer, Mixed, Commercial.

B. Commercial Standards:

ANSI/ASTM D 422	Method for Particle-size Analysis of Soils.

1.3 CONTRACTOR SUBMITTALS

A. Furnish submittals for approval.

B. Materials List: A list of all materials to be used in the seeding operations together with the source of those materials. The list shall include mulches, soil amendments, seed mixtures, and erosion control blanketing. Manufacturer's literature showing physical characteristics, applications, and installation instrumentation shall be included.

C. Schedules: The following work plans, before work is started.

1. Delivery schedule at least 10 days prior to the intended date of the first delivery.

2. Seeding Operation: A list of seeding and mulching equipment to be used.

D. Reports

1. Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

2. Reports for the following materials shall be included.

   a. Fertilizer: For chemical analysis and composition percent.

   b. Seed: For mixture, percent pure live seed, minimum percent germination and hard seed, maximum percent weed content, date tested and state certification.

E. Certificates: Certificates of compliance that materials meet the indicated requirements prior to the delivery of materials.

F. Records:

1. Plant Establishment Period

2. Maintenance Report

3. Maintenance Instructions

1.4 CLEANUP

A. Upon completion of all seeding operations, the portion of the Site used for a work or storage area by the Contractor shall be cleaned of all debris, superfluous materials, equipment, and garbage.

1.5 MAINTENANCE OF LANDSCAPING PLANTING PRIOR TO ACCEPTANCE OF PROJECT

A. General: The Contractor shall be responsible for protecting seeded areas until final acceptance of the Work.

B. Upon completion of seeding, the entire planted area shall be soaked to saturation by a fine spray. Care shall be taken to avoid excessive washing, or puddling on the surface, and any such damage caused thereby shall be repaired by the Contractor.

C. Protection: The Contractor shall provide adequate protection to all newly seeded areas including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until the end of the one-year warranty period.

1.6 FINAL INSPECTION AND GUARANTEE

A. Inspection of seeded areas will be made at final acceptance

B. Written notice requesting inspection shall be submitted to the Engineer at least 10 days prior to the anticipated inspection date.

C. Any delay in completing the Work of this Section beyond a single season will be cause for extending the correction of defects period an equal time.

D. The Contractor shall, without additional expense to the Company, replace seeding which develops defects or dies during the correction period.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Cover soil shall be obtained from onsite borrow sources.

2.2 TOPSOIL

A. General fill and clay to be blended to generate the topsoil shall be obtained from the pre-established borrow source at a location directed by the Company and placed in accordance with Section 02222 – Earthwork and Grading.

2.3 FERTILIZER AND ADDITIVES

A. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.

B. Fertilizers shall be uniform in composition, dry, and free flowing.

C. Chemical fertilizers shall be a mixed uncommercial fertilizer with nitrogen (N), phosphorous (P), and potassium (K) at the following application rates. Nitrogen shall be applied at 70 lbs /acre in the form of ammonium nitrate (33-0-0). This is an equivalent of 23 lbs of total N/acre (70 x 33%). Phosphorous shall be applied at 150 lbs/acre in the form of triple super phosphate (0-44-0). This form of phosphorous contains 20% total P, so the application of total P will be 30 lbs/acre. Potassium shall be applied at 60 lbs/acre in the form of potassium chloride (0-0-60). This form of potassium contains 50% total K, so the application of total K will be 30 lbs/acre. Fertilizer recommendations may be modified as to the forms or blends of fertilizer used as formulations vary by region. The total nutrient application rate for each of the nutrients shall be matched within ±10% of what is recommended. Fertilizers shall be uniform in composition, dry, and free flowing.

2.4 MULCH

A. Wood Cellulose Fiber: shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to aid visual monitoring during application. Composition will include at least 70 percent specially prepared virgin cellulose fiber and shall contain the following properties: recycled cellulose fiber (30 percent minimum), ash content (0.8 to 1.1 percent maximum), water holding capacity (10 to 1 ratio of water to fiber), and pH range from 4.5 to 5.5.

B. Weed free straw mulch, or native hay, for a soil/seed stabilizer shall be clean hay or straw applied at a rate of 2 tons per acre. Mulch shall be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6-inches minimum and 9-inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3 inches.

2.5 SEED MIXTURES

A. All seed shall conform to applicable County, State of Utah, and Federal regulations. Seed shall be mixed by the seed supplier. The Contractor shall furnish the seed supplier's guaranteed germination of each variety listed in the seed mixture. Grass seed shall not be delivered to the Site until samples have been approved by the Engineer. Approval of samples, however, shall not affect the right of the Engineer to reject seed upon or after delivery. Seed which has become wet, moldy, or otherwise damaged prior to use will not be accepted.

B. Seed shall be delivered in strong, clearly marked bags not exceeding 50 pounds each.

C. Seed shall be fresh, clean, and new-crop seed composed of the following varieties mixed in the proportions by weight as indicated. Seed shall be tested for compliance with the minimum percentage of purity and germination requirements. All rates specified shall be pure live seed (PLS).

D. The seed mixture shall not contain more than 5 percent weeds or other species that are not required.

E. Any deviation of the indicated seed mixture composition shall be approved by the Engineer prior to delivery.

SEED MIXTURE	
Common Names	**Drill Seeding Rate (lbs pf Pure Live Seed/Acre)**
Tall Wheatgrass	2.0
Hercules Tall Wheatgrass	2.0
AC Saltlander Green Wheatgrass	4.0
Garrison Creeping Foxtail	2.5
Intermediate Wheatgrass	2.5
FSG423ST Salt Tolerant Alfalfa	1.5
Strawberry Clover	1.5
Total	16.0

PART 3 -- EXECUTION

3.1 GENERAL

A. Delivery of seed and fertilizer may begin only after samples and tests have been approved by the Engineer. Seed and fertilizer furnished shall not be different from the approved sample.

B. Seeding shall not be performed at any time when it may be impaired by climatic conditions.

3.2 SOIL PREPARATION

A. The seeding shall not begin until the Contractor has repaired all areas of settlement, erosion, rutting, etc. and the soils have been placed, compacted, and contoured to finish grade. The Engineer shall be notified of areas that prevent the planting work from being executed.

B. After removal of waste materials in the planting areas, such as weeds, roots, rocks 6 inches and larger, construction materials, etc., the seeding subgrade shall be tilled to a depth of 6 inches and all surface irregularities removed.

C. Areas requiring grading by the Contractor including adjacent transition areas shall be uniformly level or sloping between finish elevations to within 0.10-ft above or below required finish elevations.

D. Any unusual subsoil condition that will require special treatment shall be reported to the Engineer.

E. Topsoil: Topsoil shall be placed in accordance with Section 02222 – Earthworks and Grading. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, excessively compacted or in a condition detrimental to the proposed planting or grading.

F. Fertilizer: Fertilizer shall be applied at the following rates:

1. Nitrogen shall be applied at 70 lbs /acre in the form of ammonium nitrate (33-0-0). This is an equivalent of 23 lbs of total N/acre (70 x 33%).

2. Phosphorous shall be applied at 150 lbs/acre in the form of triple super phosphate (0-44-0). This form of phosphorous contains 20% total P, so the application of total P will be 30 lbs/acre.

3. Potassium shall be applied at 60 lbs/acre in the form of potassium chloride (0-0-60). This form of potassium contains 50% total K, so the application of total K will be 30 lbs/acre.

G. Fertilizer shall be incorporated into the soil to a minimum depth of 6 inches and may be incorporated as part of the tillage operation.

H. Tillage

1. Preparation. Seed areas shall be filled as needed or have surplus soil removed to attain the finished grade. Drainage patterns shall be maintained as indicated on drawings. Seed areas compacted by construction operations shall be completely pulverized by tillage.

2. Protection. Finished graded areas shall be protected from damage by vehicular or pedestrian traffic and erosion.

3. Finish Grading. Finished grade shall be 1-inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing. Make minor adjustments of finish grades as directed by the Engineer.

I. No seeding shall be done when wind velocity exceeds 4 mph, within 4 hours after rain, or if the surface has been compacted without first loosening the ground.

3.3 HYDROSEEDING

A. **Equipment:** Mixing shall be performed in a tank. The tank shall have a built-in continuous agitation and circulation system, of sufficient operating capacity to produce a homogenous slurry of mulch, stabilizer, seed, fertilizer and water in the designated unit proportions for a minimum coverage of one-half acre. The tank shall have a discharge system which will permit attachment of at least 500-feet of hose extensions, a change of elevation of 150-feet in height from tank to discharge nozzle, and still retain enough pressure to apply the slurry to the areas at a continuous and uniform rate.

B. **Proportions:** Proportions of mulch, seed, stabilizer and water per acre shall be as indicated in the approved Revegetation Plan, or as otherwise approved by the ENGINEER.

C. Application

1. With agitation system operating at part speed, water shall be added to the tank and good recirculation shall be established. Materials shall be added in such a manner that they are uniformly blended into the mixture.

2. Slurry distribution shall begin immediately. Application of slurry shall be done only when rain is not anticipated for at least three days after slurry application.

3. The entire tank of each batch of slurry shall be emptied and the slurry evenly applied to areas to be hydroseeded within a 2 hour period following the mixing of each slurry batch. Slurry batches not applied during this time will be rejected.

3.4 DRILL SEEDING

A. **Equipment:** Seeding drill shall be a mechanical grass drill with depth bands and have multiple seed boxes to appropriate to the size and weight of the specified seeds.

B. All seed shall be drilled to one-quarter (1/4) inch to one half (1/2) inch into the soil at the specified seed rate.

C. CONTRACTOR shall drill on-half (1/2) of the required seed in one direction, and then drill the remaining half of the required seed in a direction 90° to the first half.

3.5 SEEDING COMPLETION

A. Mulching: Immediately after seeding, the entire area shall be mulched with one of the two following methods:

1. Weed free straw or native hay at a rate of 2 tons per acre. Weed free straw mulch or native hay for a soil/seed stabilizer shall be clean hay or straw. Mulch shall be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6-inches minimum and 9-inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3-inches.

2. Hydromulching with wood fiber mulch can be used as an alternative to straw or hay and applied at a rate of 1.5 tons/acre along with a tackifier to bind the mulch to the soil.

3.4 INSPECTION

A. At the completion of the work, the Contractor shall request a preliminary inspection by the Engineer to determine the condition of seeding.

B. A final inspection shall be requested 48 hours following seed germination. The Contractor and Engineer will be present for the inspection. Seeded areas considered for final inspection shall show uniform smooth ground surface without eroded ruts or gullies and evidence of uniform seed germination.

3.5 ACCEPTANCE

A. If the installation is found satisfactory, the Company will approve the work in writing.

B. If the installation is found unsatisfactory, the Engineer will submit a punch list of conditions to correct at the Contractor's expense. The Contractor shall be responsible for requesting additional inspections after the conditions of the punch list have been corrected.

C. The final acceptance criteria for seeding will be an average of one seedling (from seeded species) per square foot after the first growing season. Therefore, for seeding performed in late fall, the evaluation of final acceptance will be determined in the fall of next year.

D. Any areas not achieving the acceptance criteria presented above will be re-seeded at the expense of the Contractor.

3.6 REPAIRS

A. Seed shall be re-applied in any area, including washout gullies and/or slopes, where growth has not initiated during the first rainy season, November through April, following initial application. Washout gullies will require the placement of additional topsoil to fill washouts in accordance with Section 02222 – Earthwork and Grading, prior to re-seeding.

- END OF SECTION -

Appendix C

Borrow Area 1 and 3 Test Pit Logs

TRENCH TEST PIT LOG FORM

Project IPSC CCR Closures **Project Number** 233001396

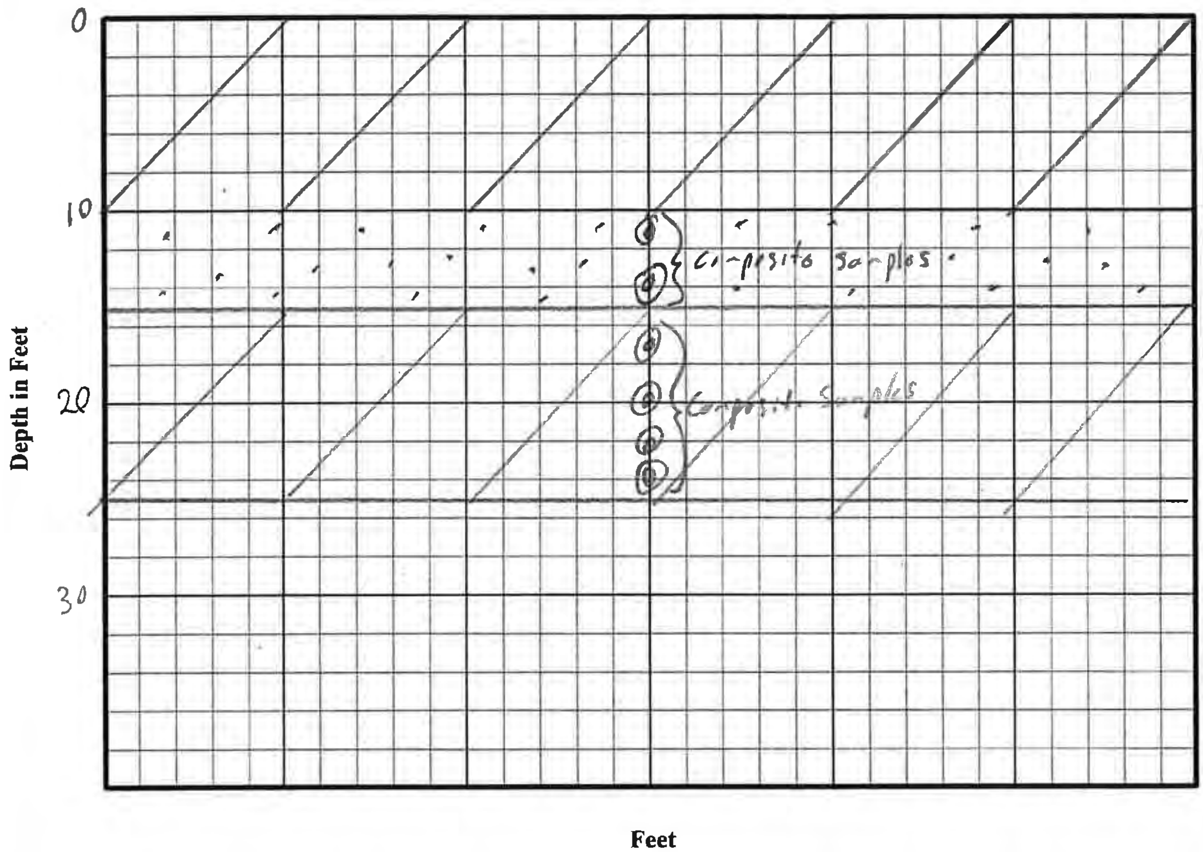
Sample Location Borrow Area 1 **Trench Number** B1TP-1 **Date** 10/29/20

Coordinates: Inside Stake ______ **Outside Stake** ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' – Sand and gravel. No samples collected
10-15' – Light brown, silty sand, no plasticity
15-25' – Light brown, transitions to sandy clay, moderate plasticity

Begin Trench 12:45 **Finish Trench** 1200 **Trenching Contractor** IPSC

Total Depth 20' **Total Length** 10'

TRENCH TEST PIT LOG FORM

Project IPSC CCR Closures **Project Number** 233001396

Sample Location Borrow Area 1 **Trench Number** B1TP-2 **Date** 10/29/20

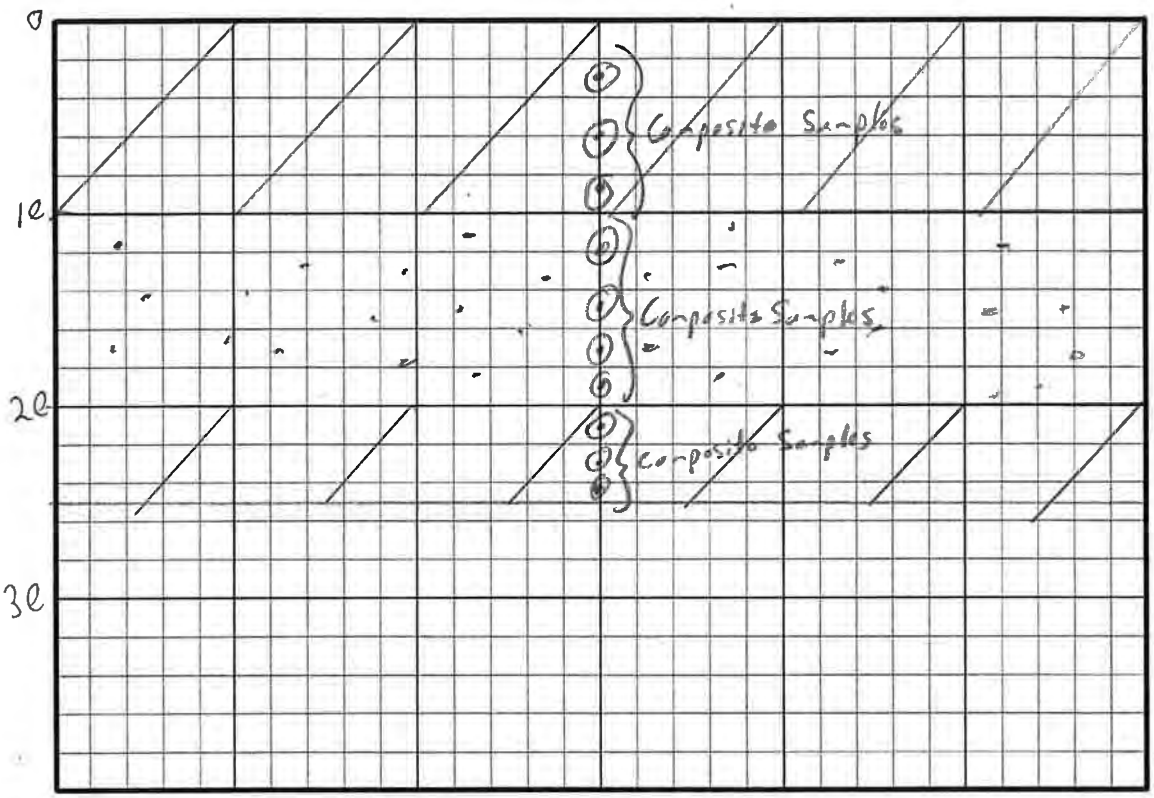
Coordinates: Inside Stake See map **Outside Stake**

Native/Fill Stake

Logged By Chad Tomlinson

TRENCH PROFILE

Depth in Feet



Feet

Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' - Light brown, silty sand (SM), no plasticity

10-20' - Same as above transitioning to sandy clay

20-25' - Light brown, sandy clay (CL), moderate plasticity

Begin Trench 1:10 **Finish Trench** 1:25 **Trenching Contractor** IPSC

Total Depth 25 **Total Length** 10

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures

Project Number 233001396

Sample Location Borrow Area 1

Trench Number B1 TP-3

Date 10/29/20

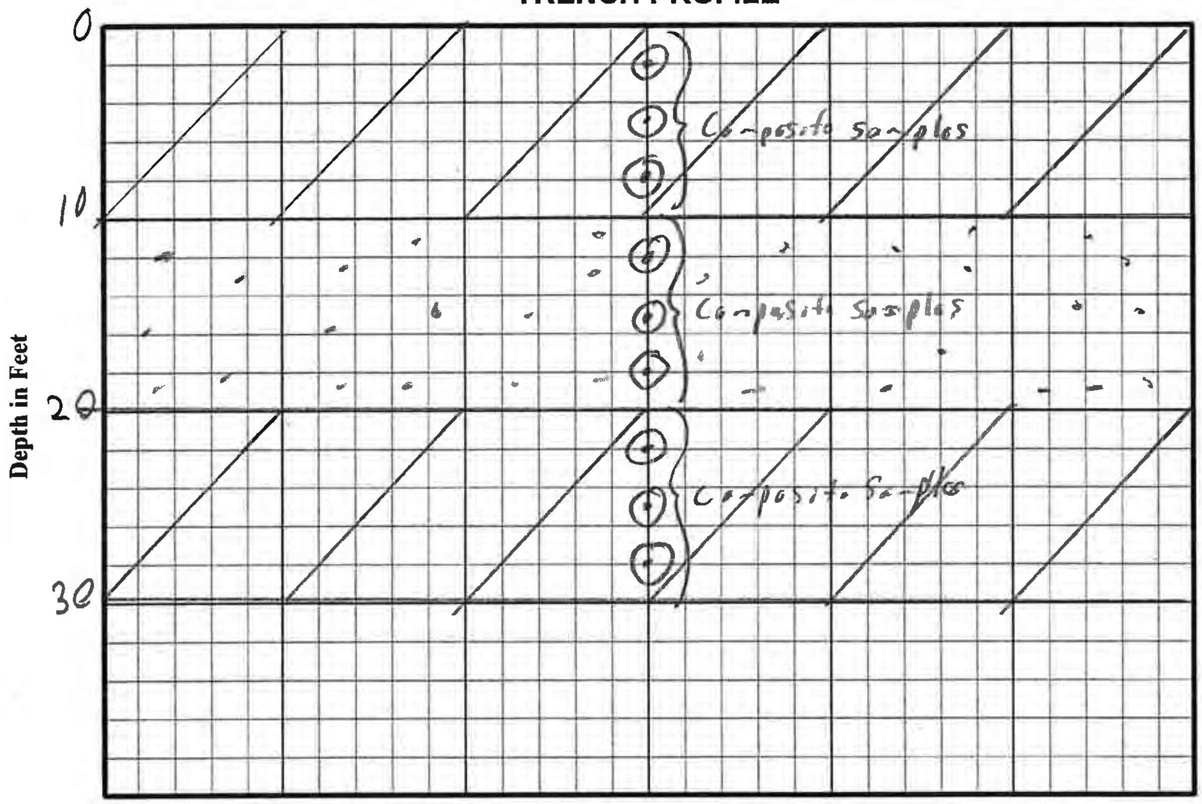
Coordinates: Inside Stake See map

Outside Stake

Native/Fill Stake

Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications

(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' - Light brown, sandy silt (ML), low to no plasticity beginning to transition to clay at bottom of composite interval.

10'-20' - Light brown, clay moderately dense, high plasticity

20'-30' - Same as above

Begin Trench 1:35

Finish Trench 1:50

Trenching Contractor IPSC

Total Depth 30

Total Length 10

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures
Project Number 233001396

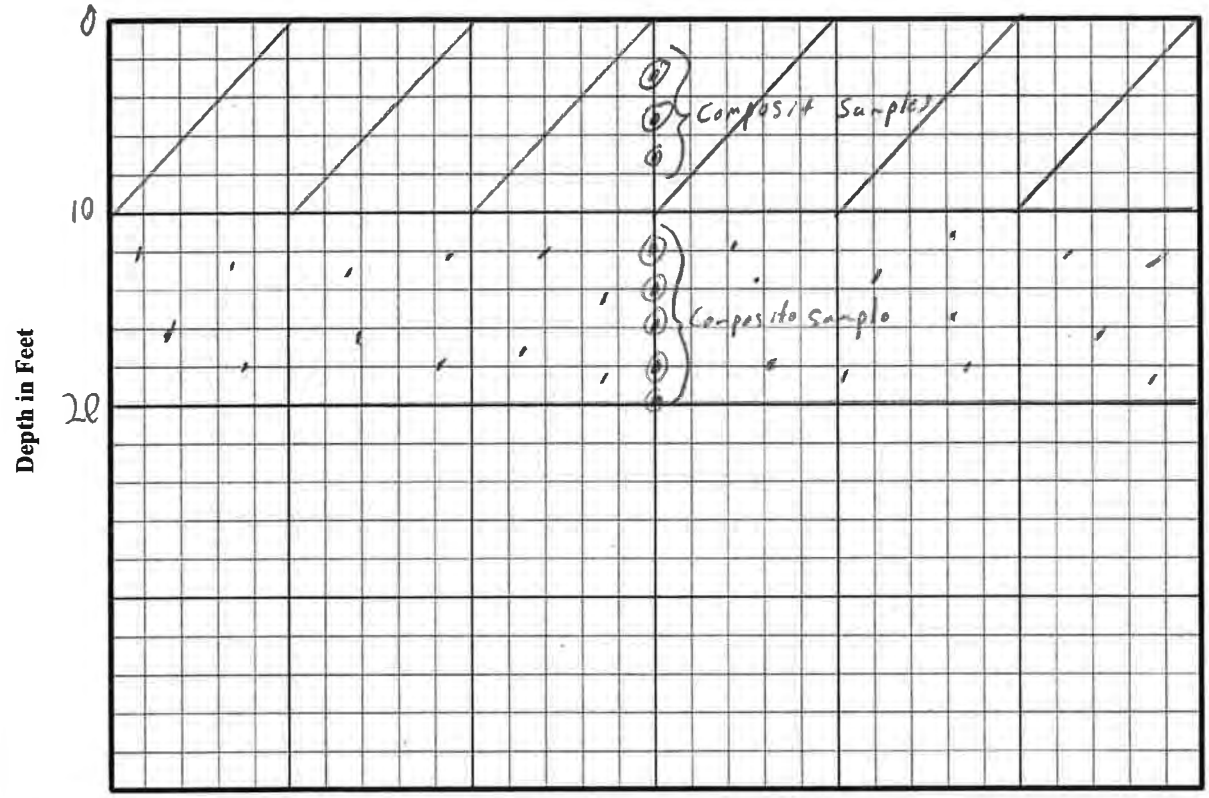
Sample Location Borrow Area 3
Trench Number B3TP-1
Date 10/29/20

Coordinates: Inside Stake ______ Outside Stake ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE



Feet

Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' - Light brown in color, clayey sand (SC), low plasticity

10-20' - Light brown in color, transitioning to clay with sand (CL), moderate plasticity

Begin Trench 10:20
Finish Trench 10:35
Trenching Contractor IPSC

Total Depth 20'
Total Length 10'

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project: IPSC CCR Closure

Project Number: 23300/396

Sample Location: Borrow Area 3

Trench Number: B3TP-2

Date: 10/29/19

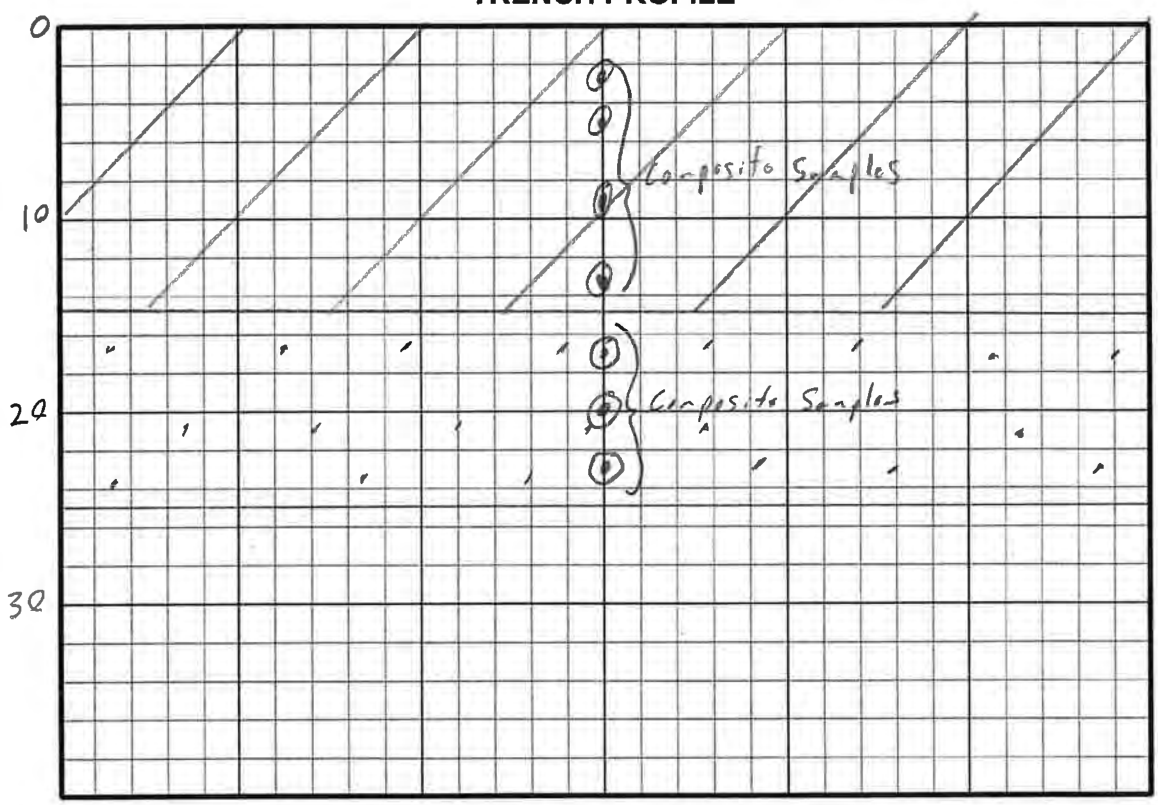
Coordinates: Inside Stake ______ Outside Stake ______

Native/Fill Stake ______

Logged By: Chad Tomlinson

TRENCH PROFILE

Depth in Feet



Feet

Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-15' - Light brown, sandy Clay, moderate plasticity

15-25' - Same as above.

Begin Trench: 10:40

Finish Trench: 10:50

Trenching Contractor: IPSC

Total Depth: 25'

Total Length: 10'

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures **Project Number** 233001396

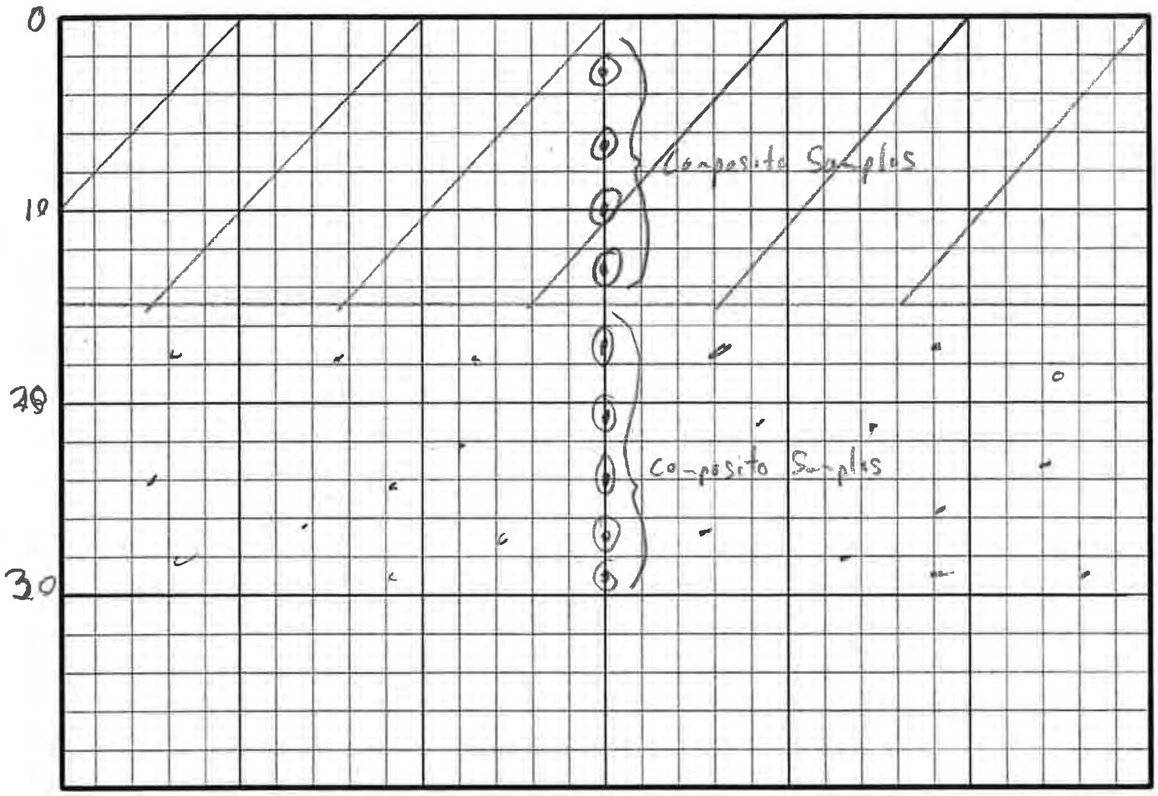
Sample Location Borrow Area 3 **Trench Number** B3TP-3 **Date** 10/29/20

Coordinates: Inside Stake ______ **Outside Stake** ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE



Feet

Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-15' - Light brown, silty sand, low to no plasticity

15-30' - Light brown, transition from silty sand to clay with sand, moderate plasticity

Begin Trench 10:55 **Finish Trench** 11:15 **Trenching Contractor** IPSC

Total Depth 30' **Total Length** 10'

Appendix D

Laboratory Test Results

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/2/2020
By: LJ

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Description: SILT, light brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 1"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

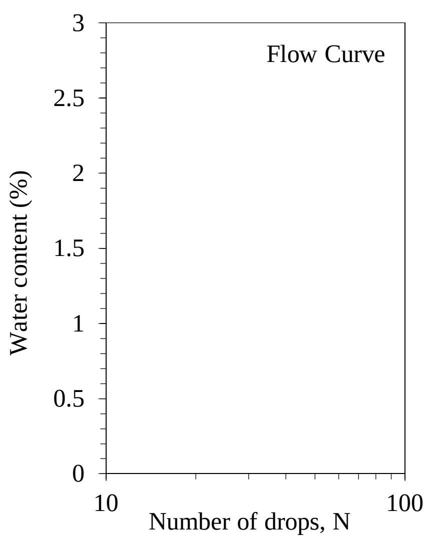
Plastic Limit

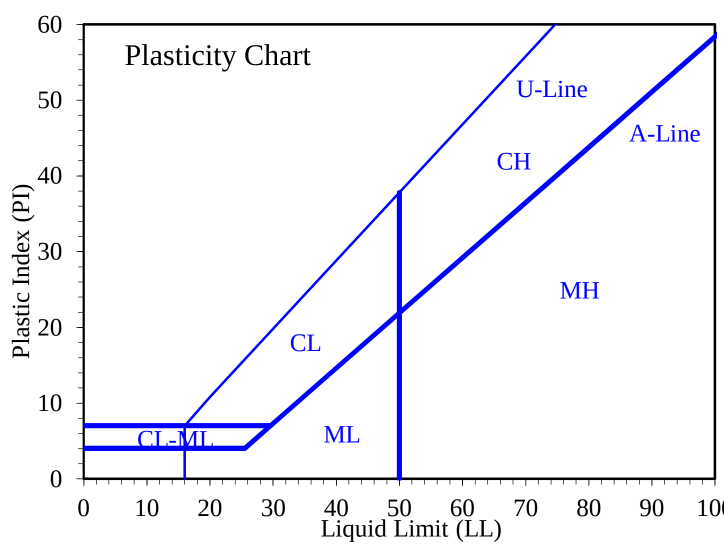
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Reviewed:___________

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: LJ

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/4"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

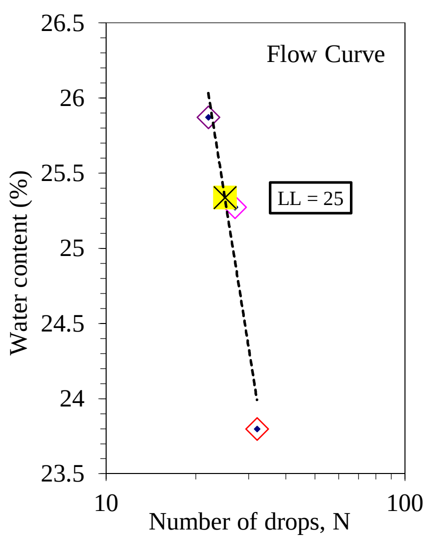
Plastic Limit

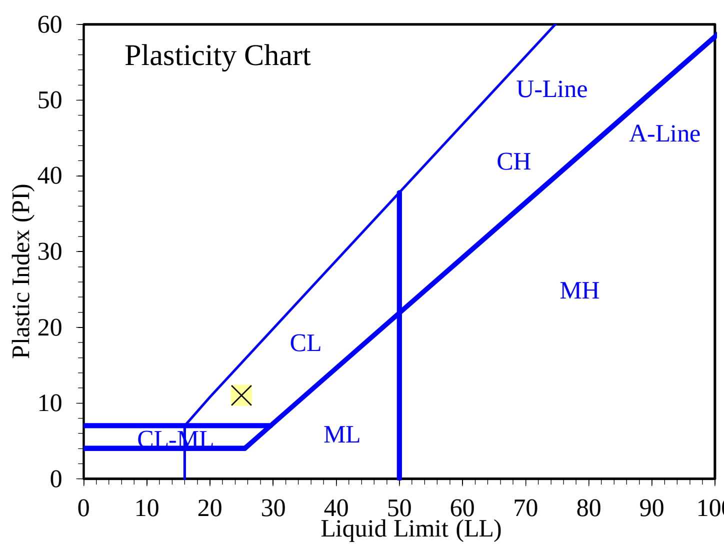
Determination No	1	2				
Wet Soil + Tare (g)	18.55	15.58				
Dry Soil + Tare (g)	17.17	14.58				
Water Loss (g)	1.38	1.00				
Tare (g)	7.55	7.54				
Dry Soil (g)	9.62	7.04				
Water Content, w (%)	14.35	14.20				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	32	27	22			
Wet Soil + Tare (g)	16.29	16.29	17.49			
Dry Soil + Tare (g)	14.56	14.43	15.41			
Water Loss (g)	1.73	1.86	2.08			
Tare (g)	7.29	7.07	7.37			
Dry Soil (g)	7.27	7.36	8.04			
Water Content, w (%)	23.80	25.27	25.87			
One-Point LL (%)		26	25			

Liquid Limit, LL (%)	**25**
Plastic Limit, PL (%)	**14**
Plasticity Index, PI (%)	**11**





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Reviewed:___________

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/2/2020
By: LJ

Boring No.:
Sample: B1TP-2
Depth: 0-10'
Description: SILT, light brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

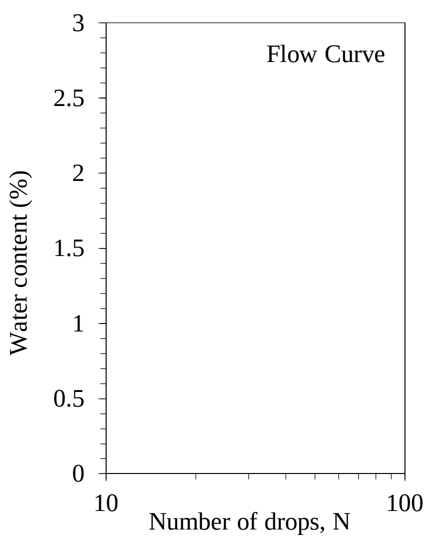
Plastic Limit

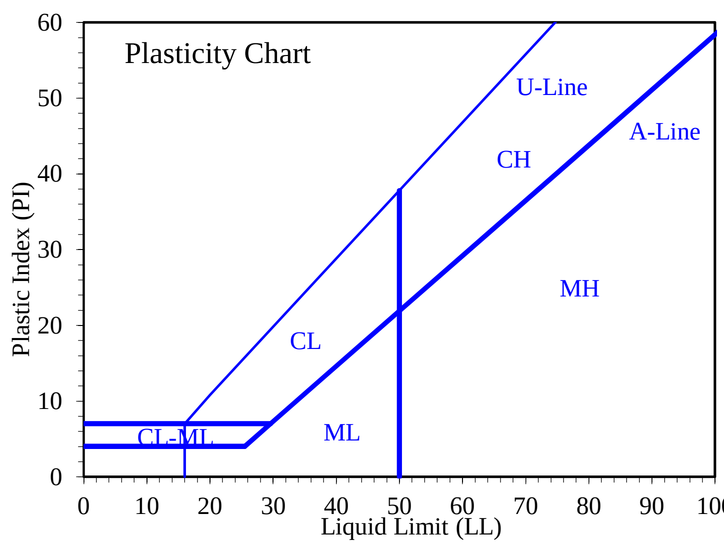
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/6/2020
By: LJ

Boring No.:
Sample: B1TP-2
Depth: 10-20'
Description: SILT, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

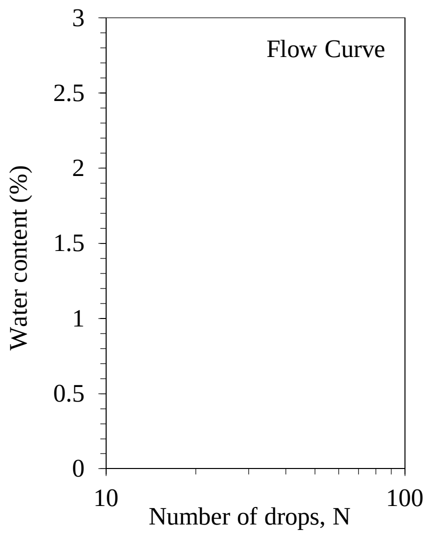
Plastic Limit

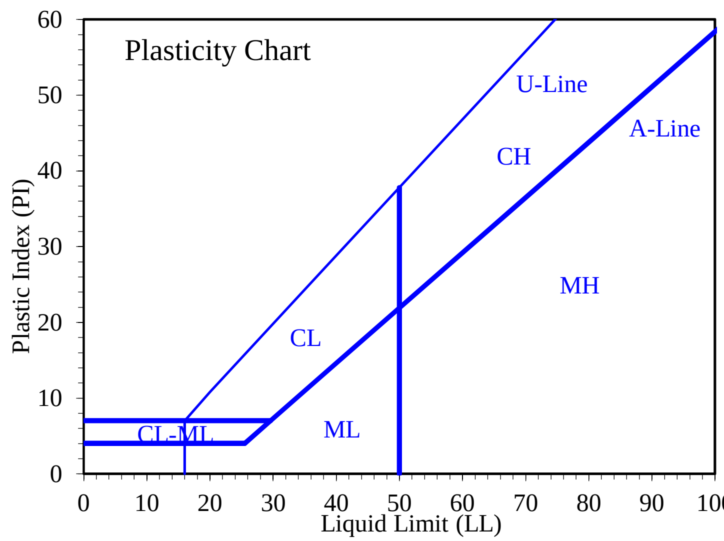
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/7/2020
By: LJ

Boring No.:
Sample: B1TP-2
Depth: 20-25'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

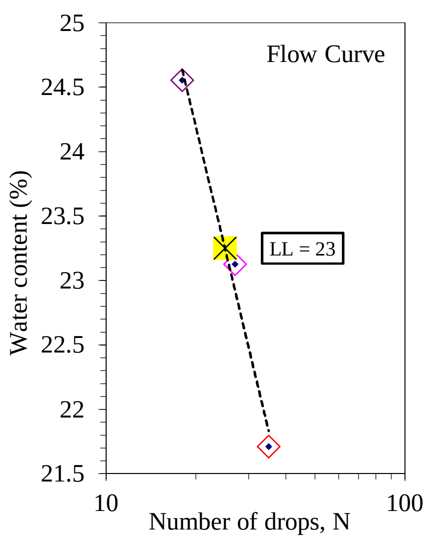
Plastic Limit

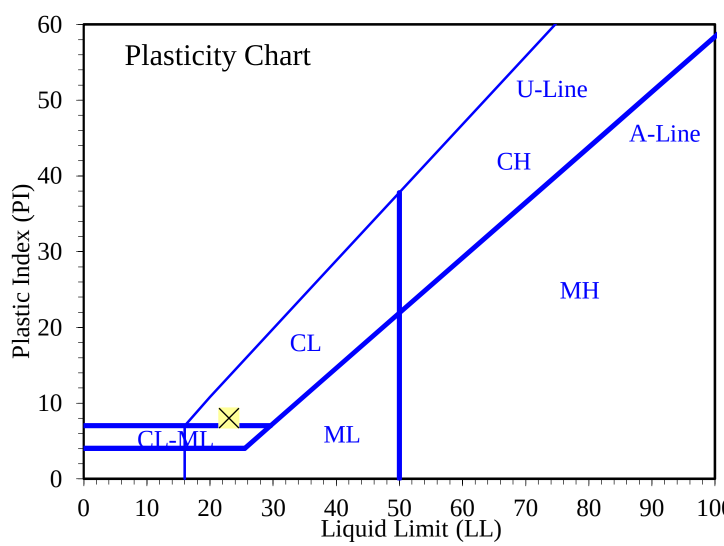
Determination No	1	2				
Wet Soil + Tare (g)	16.24	15.62				
Dry Soil + Tare (g)	15.04	14.50				
Water Loss (g)	1.20	1.12				
Tare (g)	7.34	7.08				
Dry Soil (g)	7.70	7.42				
Water Content, w (%)	15.58	15.09				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	27	18			
Wet Soil + Tare (g)	17.85	16.80	16.48			
Dry Soil + Tare (g)	15.92	14.98	14.69			
Water Loss (g)	1.93	1.82	1.79			
Tare (g)	7.03	7.11	7.40			
Dry Soil (g)	8.89	7.87	7.29			
Water Content, w (%)	21.71	23.13	24.55			
One-Point LL (%)		23				

Liquid Limit, LL (%)	**23**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**8**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/6/2020
By: LJ

Boring No.:
Sample: B1TP-3
Depth: 0-10'
Description: SILT, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.4
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

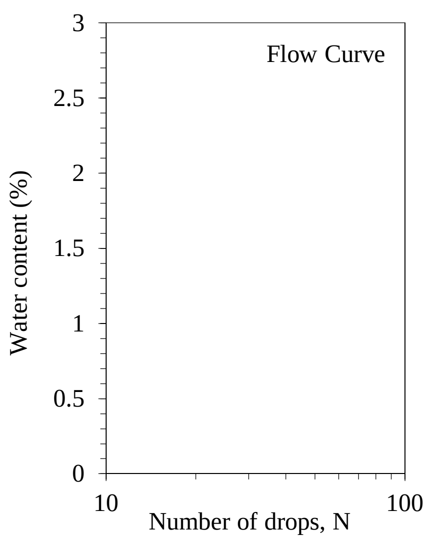
Plastic Limit

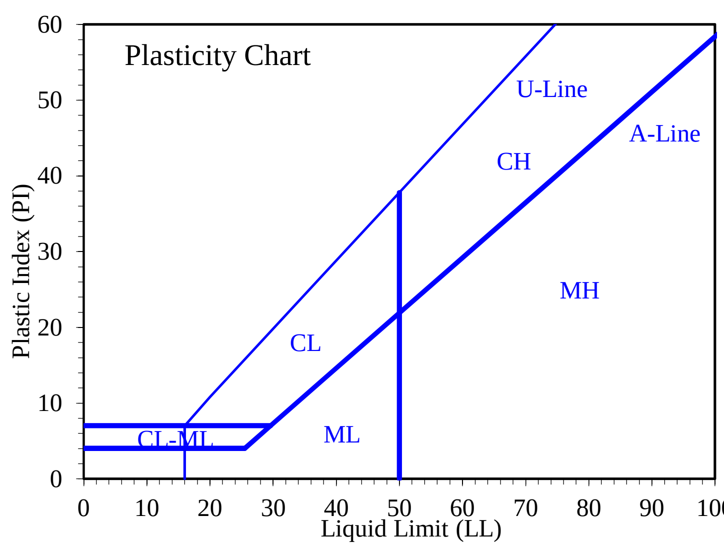
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/6/2020
By: LJ

Boring No.:
Sample: B1TP-3
Depth: 10-20'
Description: Lean CLAY, grey

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

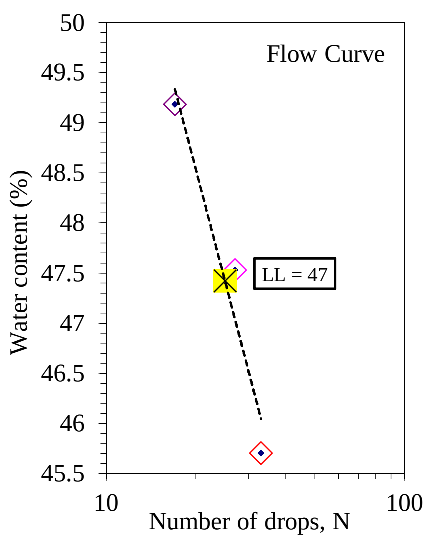
Plastic Limit

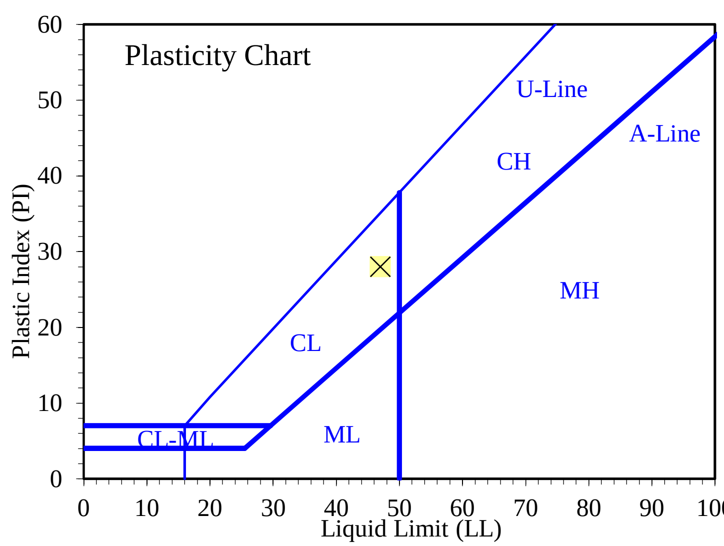
Determination No	1	2				
Wet Soil + Tare (g)	15.19	15.69				
Dry Soil + Tare (g)	13.87	14.39				
Water Loss (g)	1.32	1.30				
Tare (g)	7.05	7.55				
Dry Soil (g)	6.82	6.84				
Water Content, w (%)	19.35	19.01				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	33	27	17			
Wet Soil + Tare (g)	15.78	14.57	14.66			
Dry Soil + Tare (g)	13.28	12.26	12.25			
Water Loss (g)	2.50	2.31	2.41			
Tare (g)	7.81	7.40	7.35			
Dry Soil (g)	5.47	4.86	4.90			
Water Content, w (%)	45.70	47.53	49.18			
One-Point LL (%)		48				

Liquid Limit, LL (%)	**47**
Plastic Limit, PL (%)	**19**
Plasticity Index, PI (%)	**28**





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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9633.7	8765.6
+3/8" Coarse fraction (g):	566.59	556.78
-3/8" Split fraction (g):	206.76	187.19
Hydrometer fraction (g):	64.70	58.97
First Split fraction:	0.936	

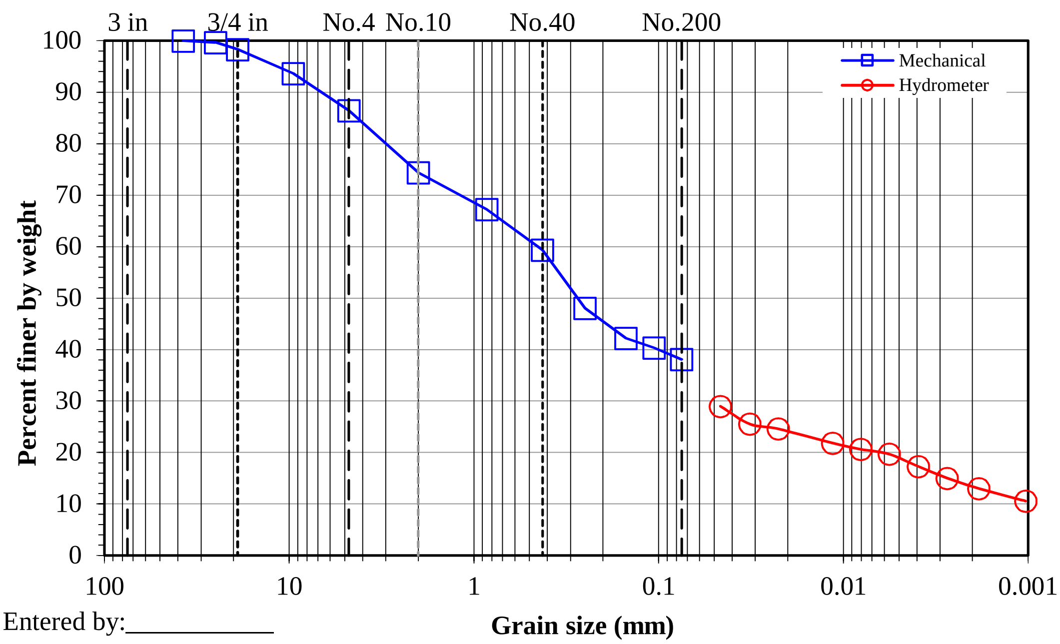
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	695.22	329.16	26.95
Dry soil + tare (g):	685.34	309.59	25.23
Tare (g):	124.76	122.40	7.54
Water content (%):	1.76	10.45	9.72

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	74.37
Cylinder ID:	T6	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer		Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
6"		150	-		1	21.4	28.25	0.0463	28.96
4"		100	-		2	21.4	25.5	0.0321	25.53
3"		75	-		4	21.4	24.75	0.0226	24.60
1.5"		37.5	100.0		15	21.5	22.5	0.0115	21.84
1"	32.12	25	99.6		30	21.6	21.5	0.0080	20.63
3/4"	148.62	19	98.3		60	21.6	20.75	0.0057	19.70
3/8"	556.78	9.5	93.6	<=1st Split	120	21.8	18.75	0.0039	17.29
No.4	14.43	4.75	86.4		240	21.6	17	0.0027	15.02
No.10	38.53	2	74.4	<=Split hyd.	511	22	15.25	0.0019	13.02
No.20	52.79	0.85	67.2		1590	22.1	13.25	0.0010	10.57
No.40	68.53	0.425	59.4						
No.60	91.12	0.25	48.1						
No.100	102.86	0.15	42.2						
No.140	106.57	0.106	40.3						
No.200	111.05	0.075	38.1						

Note: in the original, the "<=1st Split" label is printed level with the 3/8" sieve row and the "<=Split hyd." label level with the No.10 row; the hydrometer readings start at the top of the table and are unrelated to the sieve rows.

Gravel (%): 13.6
Sand (%): 48.3
Fines (%): 38.1



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Reviewed:___________

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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JP/EH

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9630.7	8851.1
+3/8" Coarse fraction (g):	294.56	288.18
-3/8" Split fraction (g):	298.58	273.85
Hydrometer fraction (g):	64.69	59.43
First Split fraction:	0.967	

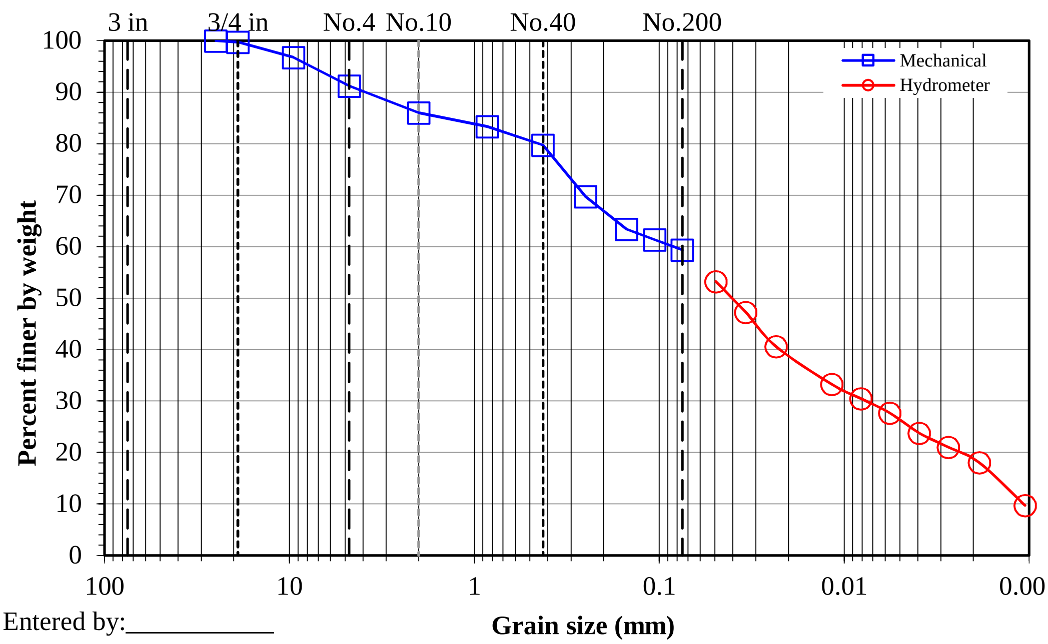
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	485.54	478.29	18.00
Dry soil + tare (g):	478.75	453.56	17.11
Tare (g):	172.19	179.71	7.06
Water content (%):	2.21	9.03	8.86

Hydrometer data
Hyd. split: No.10
Gs: 2.8 Assumed
Bulb No.: 6
Hyd. fraction: 85.98
Cylinder ID: T3
Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	100.0	
3/4"	25.41	19	99.7	
3/8"	288.18	9.5	96.7	<=1st Split
No.4	15.72	4.75	91.2	
No.10	30.47	2	86.0	<=Split hyd.
No.20	37.93	0.85	83.3	
No.40	48.24	0.425	79.7	
No.60	76.41	0.25	69.8	
No.100	94.41	0.15	63.4	
No.140	100.31	0.106	61.3	
No.200	105.83	0.075	59.4	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.4	43	0.0494	53.21
2	21.4	38.75	0.0341	47.25
4	21.4	34	0.0234	40.60
15	21.4	28.75	0.0117	33.24
30	21.5	26.75	0.0081	30.49
60	21.5	24.75	0.0057	27.69
120	21.4	22	0.0039	23.78
240	21.5	20	0.0027	21.03
500	21.8	17.75	0.0019	18.03
1414	21.3	12	0.0011	9.72

Gravel (%): 8.8
Sand (%): 31.8
Fines (%): 59.4



Entered by:___________
Reviewed:___________

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-2
Depth: 0-10'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928		
Split:	No		
Second split:	No		
	Moist	Dry	
Total sample wt. (g):	221.32	209.67	
Hydrometer fraction (g):	59.42	56.44	

Water content data		S.F.	Hyd.(-No.10)
Moist soil + tare (g):	-	372.46	17.86
Dry soil + tare (g):	-	360.81	17.32
Tare (g):	-	151.14	7.10
Water content (%):		5.56	5.28

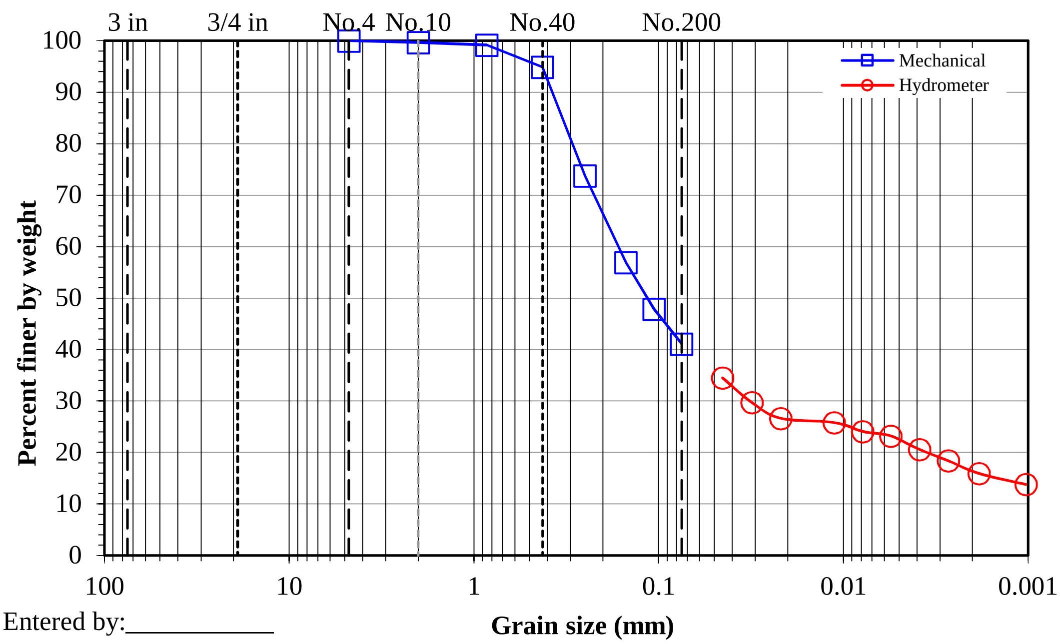
Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	99.64
Cylinder ID:	N30	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	-
No.4		4.75	100.0
No.10	0.76	2	99.6
No.20	1.80	0.85	99.1
No.40	10.74	0.425	94.9
No.60	55.07	0.25	73.7
No.100	90.26	0.15	57.0
No.140	109.33	0.106	47.9
No.200	123.47	0.075	41.1

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.5	24.75	0.0451	34.49
2	21.5	22	0.0312	29.69
4	21.5	20.25	0.0218	26.64
15	21.6	19.75	0.0112	25.83
30	21.6	18.75	0.0079	24.08
60	21.6	18.25	0.0055	23.21
120	21.6	16.75	0.0039	20.59
240	21.6	15.5	0.0027	18.41
506	21.8	14	0.0018	15.91
1590	21.9	12.75	0.0010	13.79

Gravel (%): 0.0
Sand (%): 58.9
Fines (%): 41.1



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Reviewed:___________

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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-2
Depth: 10-20'
Description: Silty SAND, brown

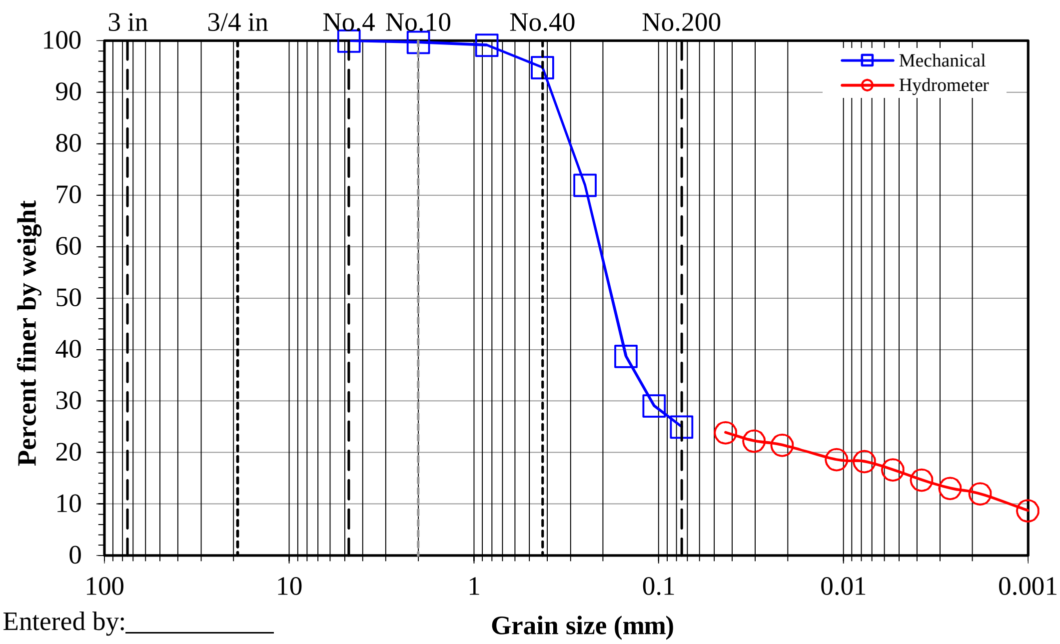
ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	No.10	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	221.70	214.45
No.10 Coarse fraction (g):	0.57	0.56
-No.10 Split fraction (g):	62.94	60.88
Hydrometer fraction (g):	62.94	60.88
First Split fraction:	0.997	

Water content data	C.F.1(+No.10)	S.F.1(-No.10)	Hyd.(-No.10)
Moist soil + tare (g):	344.36	19.84	19.84
Dry soil + tare (g):	339.29	19.42	19.42
Tare (g):	122.66	7.01	7.01
Water content (%):	2.34	3.38	3.38

Hydrometer data
Hyd. split: No.10
Gs: 2.7 Assumed
Bulb No.: 6 Hyd. fraction: 99.74
Cylinder ID: T5 Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	-
No.4		4.75	100.0
No.10	0.56	2	99.7 <=1st Split
No.20	0.35	0.85	99.2
No.40	3.00	0.425	94.8
No.60	16.95	0.25	72.0
No.100	37.23	0.15	38.7
No.140	43.12	0.106	29.1
No.200	45.61	0.075	25.0

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.5	19.75	0.0434	23.91
2	21.5	18.75	0.0305	22.29
4	21.5	18.25	0.0215	21.48
15	21.5	16.5	0.0109	18.64
30	21.6	16.25	0.0077	18.30
60	21.6	15.25	0.0054	16.68
120	21.7	14	0.0038	14.71
240	21.7	13	0.0026	13.09
501	21.9	12.25	0.0018	11.99
1590	21.9	10.25	0.0010	8.75



Gravel (%): 0.0
Sand (%): 75.0
Fines (%): 25.0

Entered by:___________
Reviewed:___________

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BSS/EH

Boring No.:
Sample: B1TP-2
Depth: 20-25'
Description: Sandy lean CLAY, brown

ASTM Standard(s): ASTM D6913 and ASTM D7928
Split: No
Second split: No

	Moist	Dry
Total sample wt. (g):	305.97	279.27
Hydrometer fraction (g):	64.95	59.57

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	459.30	17.55
Dry soil + tare (g):	432.60	16.68
Tare (g):	153.33	7.05
Water content (%):	9.56	9.03

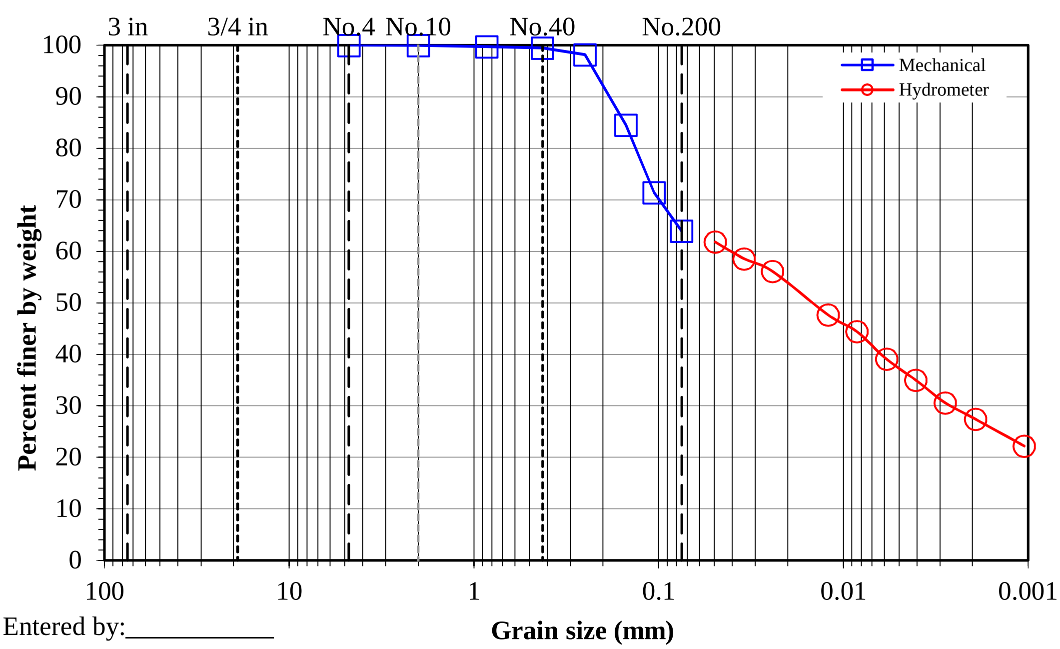
Hydrometer data
Hyd. split: No.10
Gs: 2.8 Assumed
Bulb No.: 6
Hyd. fraction: 99.95
Cylinder ID: 11
Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	-
No.4		4.75	100.0
No.10	0.14	2	99.9
No.20	0.73	0.85	99.7
No.40	1.41	0.425	99.5
No.60	5.06	0.25	98.2
No.100	43.21	0.15	84.5
No.140	79.89	0.106	71.4
No.200	100.67	0.075	64.0

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.6	43	0.0494	61.82
2	21.6	41	0.0346	58.57
4	21.6	39.5	0.0242	56.13
15	21.7	34.25	0.0121	47.66
30	21.7	32.25	0.0084	44.41
60	21.6	29	0.0058	39.07
120	21.6	26.5	0.0041	35.01
240	21.7	23.75	0.0028	30.60
498	21.8	21.75	0.0019	27.41
1587	21.9	18.5	0.0010	22.18

Gravel (%): 0.0
Sand (%): 36.0
Fines (%): 64.0



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Reviewed:___________

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-3
Depth: 0-10'
Description: Sandy SILT, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928		
Split:	No		
Second split:	No		
	Moist	Dry	
Total sample wt. (g):	184.65	166.57	
Hydrometer fraction (g):	66.04	59.92	

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	306.54	20.61
Dry soil + tare (g):	288.46	19.35
Tare (g):	121.89	7.02
Water content (%):	10.85	10.22

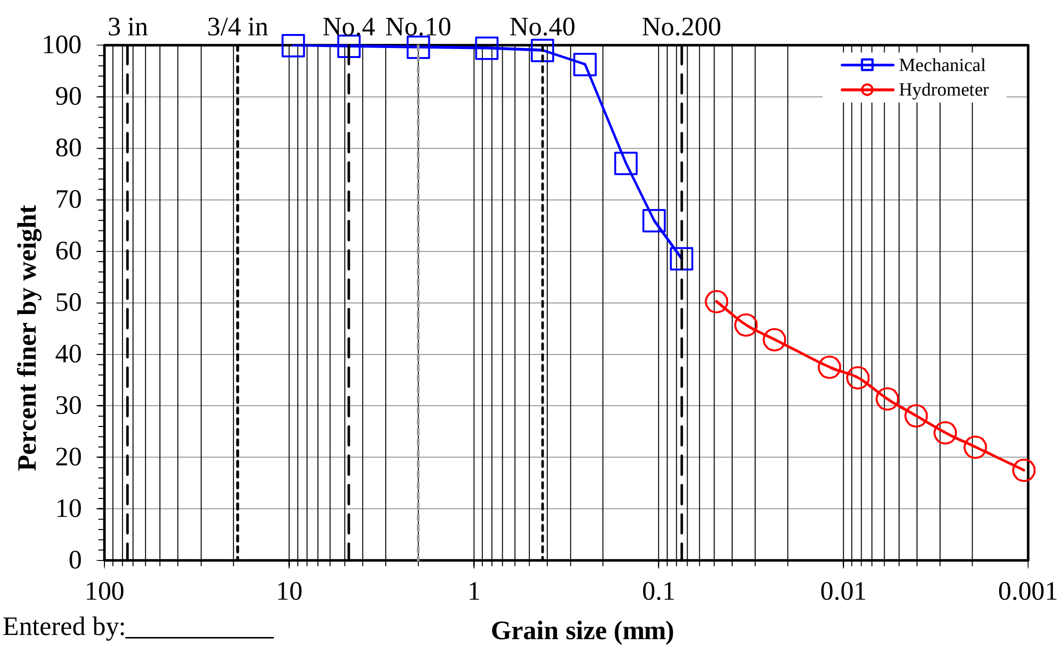
Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	99.63
Cylinder ID:	N18	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	100.0
No.4	0.27	4.75	99.8
No.10	0.61	2	99.6
No.20	0.87	0.85	99.5
No.40	1.61	0.425	99.0
No.60	6.18	0.25	96.3
No.100	38.13	0.15	77.1
No.140	56.65	0.106	66.0
No.200	69.00	0.075	58.6

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.7	35.5	0.0486	50.28
2	21.7	32.75	0.0338	45.76
4	21.7	31	0.0236	42.88
15	21.7	27.75	0.0119	37.54
30	21.7	26.5	0.0083	35.48
60	21.7	24	0.0058	31.37
120	21.7	22	0.0040	28.08
240	21.7	20	0.0028	24.80
493	21.9	18.25	0.0019	22.04
1583	21.9	15.5	0.0011	17.51

Gravel (%): 0.2
Sand (%): 41.3
Fines (%): 58.6



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BSS/EH

Boring No.:
Sample: B1TP-3
Depth: 10-20'
Description: Lean CLAY, brownish grey

ASTM Standard(s): ASTM D6913 and ASTM D7928
Split: No
Second split: No

	Moist	Dry
Total sample wt. (g):	379.51	350.56
Hydrometer fraction (g):	63.43	58.92

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	501.99	25.48
Dry soil + tare (g):	473.04	24.20
Tare (g):	122.48	7.46
Water content (%):	8.26	7.65

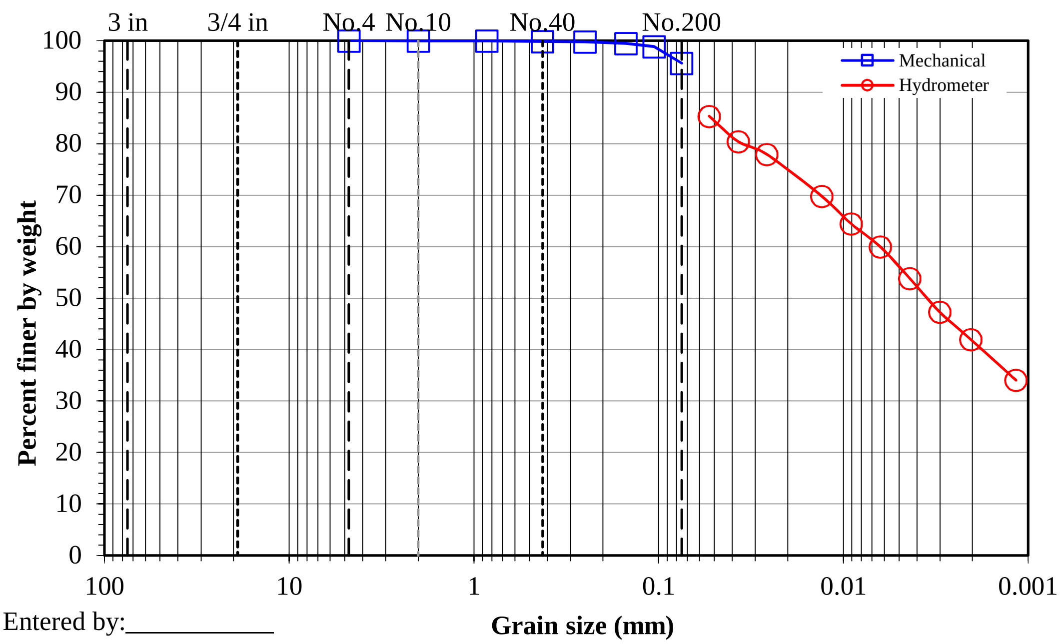
Hydrometer data
Hyd. split: No.10
Gs: 2.8 Assumed
Bulb No. 6
Hyd. fraction: 99.97
Cylinder ID: N33
Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	-
No.4		4.75	100.0
No.10	0.09	2	100.0
No.20	0.16	0.85	100.0
No.40	0.42	0.425	99.9
No.60	0.84	0.25	99.8
No.100	1.87	0.15	99.5
No.140	4.01	0.106	98.9
No.200	15.34	0.075	95.6

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.3	57	0.0533	85.34
2	21.3	54	0.0371	80.41
4	21.3	52.5	0.0260	77.95
15	21.4	47.5	0.0131	69.79
30	21.4	44.25	0.0091	64.45
60	21.5	41.5	0.0063	59.99
120	21.5	37.75	0.0044	53.83
240	21.6	33.75	0.0030	47.31
500	21.6	30.5	0.0020	41.97
1440	21.4	25.75	0.0012	34.05

Gravel (%): 0.0
Sand (%): 4.4
Fines (%): 95.6



Entered by:___________
Reviewed:___________

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BSS/EH

Boring No.:
Sample: B1TP-3
Depth: 20-30'
Description: Lean CLAY, brownish grey

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	No	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	454.10	418.96
Hydrometer fraction (g):	62.92	58.55

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	593.85	23.73
Dry soil + tare (g):	558.71	22.59
Tare (g):	139.75	7.31
Water content (%):	8.39	7.46

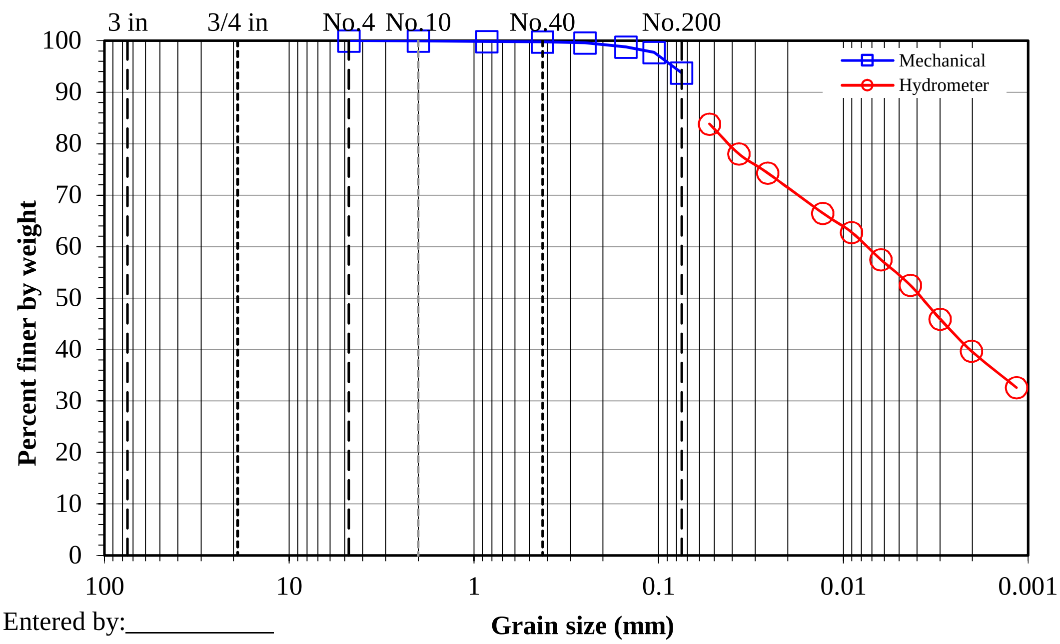
Hydrometer data			
Hyd. split:	No.10		
Gs:	2.8	Assumed	
Bulb No.	6	Hyd. fraction:	99.98
Cylinder ID:	N10	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"	-	37.5	-
1"	-	25	-
3/4"	-	19	-
3/8"	-	9.5	-
No.4	-	4.75	100.0
No.10	0.09	2	100.0
No.20	0.52	0.85	99.9
No.40	0.87	0.425	99.8
No.60	1.67	0.25	99.6
No.100	4.93	0.15	98.8
No.140	9.44	0.106	97.7
No.200	26.20	0.075	93.7

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.3	55.75	0.0530	83.82
2	21.3	52.25	0.0368	78.04
4	21.3	50	0.0257	74.31
15	21.4	45.25	0.0129	66.52
30	21.4	43	0.0090	62.80
60	21.5	39.75	0.0063	57.48
120	21.5	36.75	0.0043	52.52
240	21.6	32.75	0.0030	45.96
500	21.5	29	0.0020	39.70
1442	21.4	24.75	0.0012	32.62

Gravel (%): 0.0
Sand (%): 6.3
Fines (%): 93.7



Entered by:___________
Reviewed:___________

Classification of Soils for Engineering Purposes

(*ASTM D2487*)

IGES

Project: **Stantec**
No: **M00287-022**
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/7/2020
By: BRR

Sample Info. — Boring No.								
Sample:	B1TP-1	B1TP-1	B1TP-2	B1TP-2	B1TP-2	B1TP-3	B1TP-3	B1TP-3
Depth:	10-15'	15-25'	0-10'	10-20'	20-25'	0-10'	10-20'	20-30'
Liquid Limit (%):	NP	25	NP	NP	23	NP	47	39
Plastic Limit (%):	NP	14	NP	NP	15	NP	19	18
Plastic Index (%):	NP	11	NP	NP	8	NP	28	21
Gravel (%):	13.6	8.8	0	0	0	0.2	0	0
Sand (%):	48.3	31.8	58.9	75	36	41.3	4.4	6.3
Fines (%):	38.1	59.4	41.1	25	64	58.6	95.6	93.7
D_{60} (mm):								
D_{30} (mm):								
D_{10} (mm):								
Cu:								
Cc:								
Group Symbol:	**SM**	**CL**	**SM**	**SM**	**CL**	**ML**	**CL**	**CL**
Group Name:	**Silty SAND**	**Sandy lean CLAY**	**Silty SAND**	**Silty SAND**	**Sandy lean CLAY**	**Sandy SILT**	**Lean CLAY**	**Lean CLAY**

Entered by:___________

Reviewed:___________

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Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

(ASTM D2974)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 12/31/2019
By: BF/BSS/JAB

Sample Info.	Boring No.								
	Sample:	B1TP-1	B1TP-2	B1TP-3	B2TP-1	B2TP-2	B2TP-3	B3TP-1	
	Depth:	10-15'	10-20'	0-10'	20-25'	0-15'	12-15'	10-20'	
	Test Method:	C	C	C	C	C	C	C	
	Furnace temp. (°C)	440	440	440	440	440	440	440	
Moisture	Wet soil + tare (g)	680.76	630.70	611.32	614.17	599.84	552.15	569.66	
	Dry soil + tare (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Tare (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Ash / Organic Info	Mass of crucible and oven-dried sample (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Mass of crucible and ash (g)	648.81	622.08	584.01	572.54	578.24	521.82	530.70	
	Mass of crucible (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Moisture Content, w (%) [a]		**10.2**	**2.6**	**12.1**	**17.7**	**9.4**	**18.0**	**16.7**	
Ash Content (%)		**98.5**	**99.2**	**99.2**	**96.9**	**98.9**	**97.2**	**96.8**	
Organic Matter (%)		**1.5**	**0.8**	**0.8**	**3.1**	**1.1**	**2.8**	**3.2**	

[a] Moisture contents are by proportion of oven-dried mass (geotechnical convention).

Entered by:___________

Reviewed:___________

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DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Sample Description: Silty SAND, brown
Engineering Classification: SM
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	144.85	
Dry soil + tare (g)	144.43	
Tare (g)	128.38	
Water content, w (%)	2.6	

Initial water temperature: 19.0 °C
Date test started: 12/27/2019
Time at beginning of test: 10:05

Specimen Number	2 minutes Grade	2 minutes Temp. (°C)	1 hour Grade	1 hour Temp. (°C)	6 hours Grade	6 hours Temp. (°C)
1	1	19.0	1	18.4	1	18.5
2	1	19.0	1	18.4	1	18.5

Dispersive classification: **Grade 1-Nondispersive**

Entered: ________
Reviewed: ________

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DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

IGES

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-2
Depth: 10-20'
Sample Description: Silty SAND, brown
Engineering Classification: SM
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	162.75	
Dry soil + tare (g)	162.17	
Tare (g)	127.70	
Water content, w (%)	1.7	

Initial water temperature:	19.0	°C
Date test started:	12/27/2019	
Time at beginning of test:	10:07	

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	2	19.0	2	18.4	2	18.0
2	2	18.9	3	18.4	3	18.0

Dispersive classification: **Grade 3-Dispersive**

Entered: ________
Reviewed: ________

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DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-3
Depth: 0-10'
Sample Description: Sandy SILT, brown
Engineering Classification: ML
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	156.54	
Dry soil + tare (g)	155.93	
Tare (g)	123.07	
Water content, w (%)	1.9	

Initial water temperature:	19.0	°C
Date test started:	12/27/2019	
Time at beginning of test:	10:10	

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	2	19.0	2	18.4	2	18.0
2	2	19.0	2	18.4	2	18.0

Dispersive classification: **Grade 2-Intermediate**

Entered: ________
Reviewed: ________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-3
Depth: 20-30'
Sample Description: Lean CLAY, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	593.85	
Dry soil + tare (g)	558.71	
Tare (g)	139.75	
Water content, w (%)	8.4	

Initial water temperature: 18.9 °C
Date test started: 12/27/2019
Time at beginning of test: 10:13

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	18.9	1	18.4	1	18.1
2	1	18.9	1	18.4	1	18.1

Dispersive classification: **Grade 1-Nondispersive**

Entered: ________
Reviewed: ________

Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 12/26/2019
By: BF

Sample: B1TP-1 & B1TP-2 & B1TP-3
Depth: 0-20'
Sample Description: Silty SAND, brown
Engineering Classification: SM
As-received water content (%): Not requested

Method: ASTM D698 B
Mold Id. Inc 3
Mold volume (ft^3): 0.0332

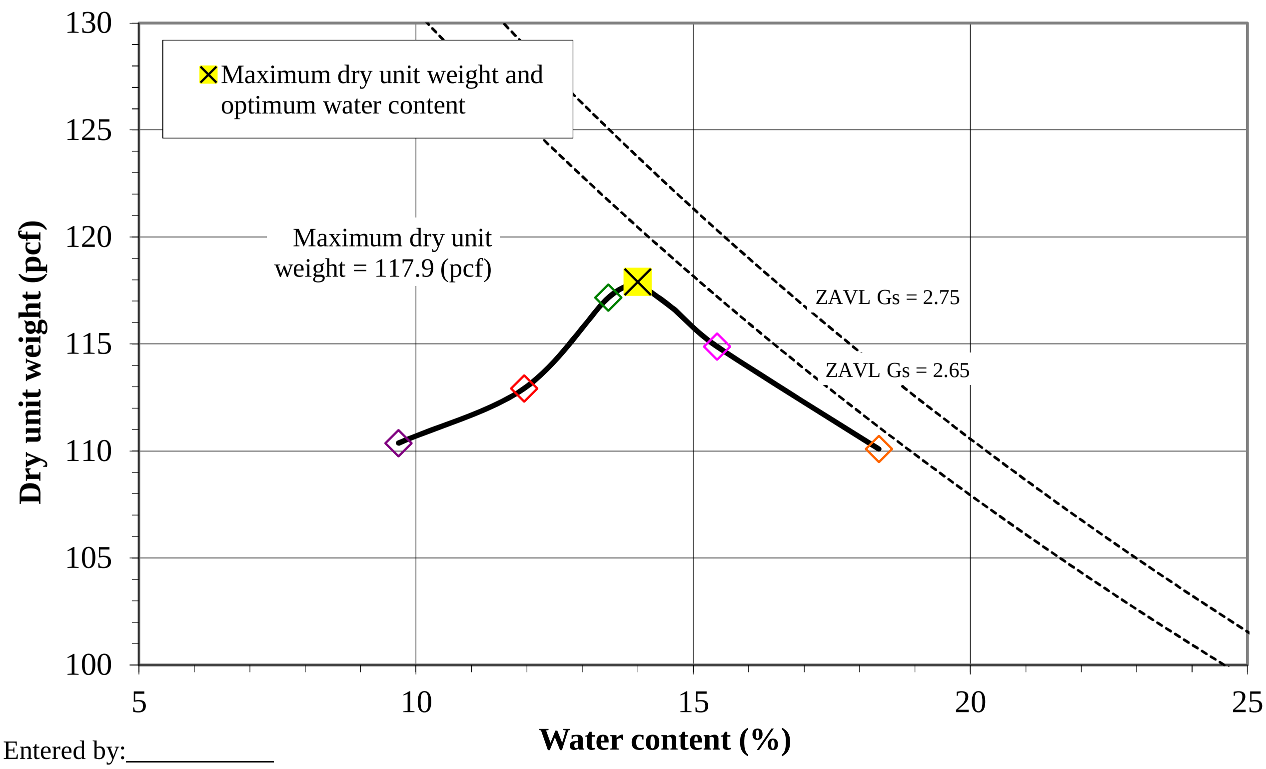
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Optimum water content (%): 14
Maximum dry unit weight (pcf): 117.9

Point Number	+2%	+4%	+6%	+8%	+10%			
Wt. Sample + Mold (g)	6046.3	6127.2	6225.5	6220.5	6185.5			
Wt. of Mold (g)	4220.9	4220.9	4220.9	4220.9	4220.9			
Wet Unit Wt., γ_m (pcf)	121.1	126.4	132.9	132.6	130.3			
Wet Soil + Tare (g)	1271.79	1030.93	1316.46	1342.64	1453.85			
Dry Soil + Tare (g)	1183.63	938.82	1180.06	1185.36	1261.84			
Tare (g)	273.28	168.10	167.11	165.99	215.39			
Water Content, w (%)	**9.7**	**12.0**	**13.5**	**15.4**	**18.3**			
Dry Unit Wt., γ_d (pcf)	**110.4**	**112.9**	**117.2**	**114.9**	**110.1**			

Comments:

Test specimen consisted of material from B1TP-1 @ 10-15', B1TP-2 @ 0-10', B1-TP2 @ 10-20', and B1TP-3 @ 0-10'.



Entered by:___________

Reviewed:___________

Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BSS

Sample: B1TP-2 & B1TP-3
Depth: 10-30'
Sample Description: Lean CLAY, brown
Engineering Classification: CL
As-received water content (%): Not requested

Method: ASTM D698 B
Mold Id. Inc 1
Mold volume (ft^3): 0.0333

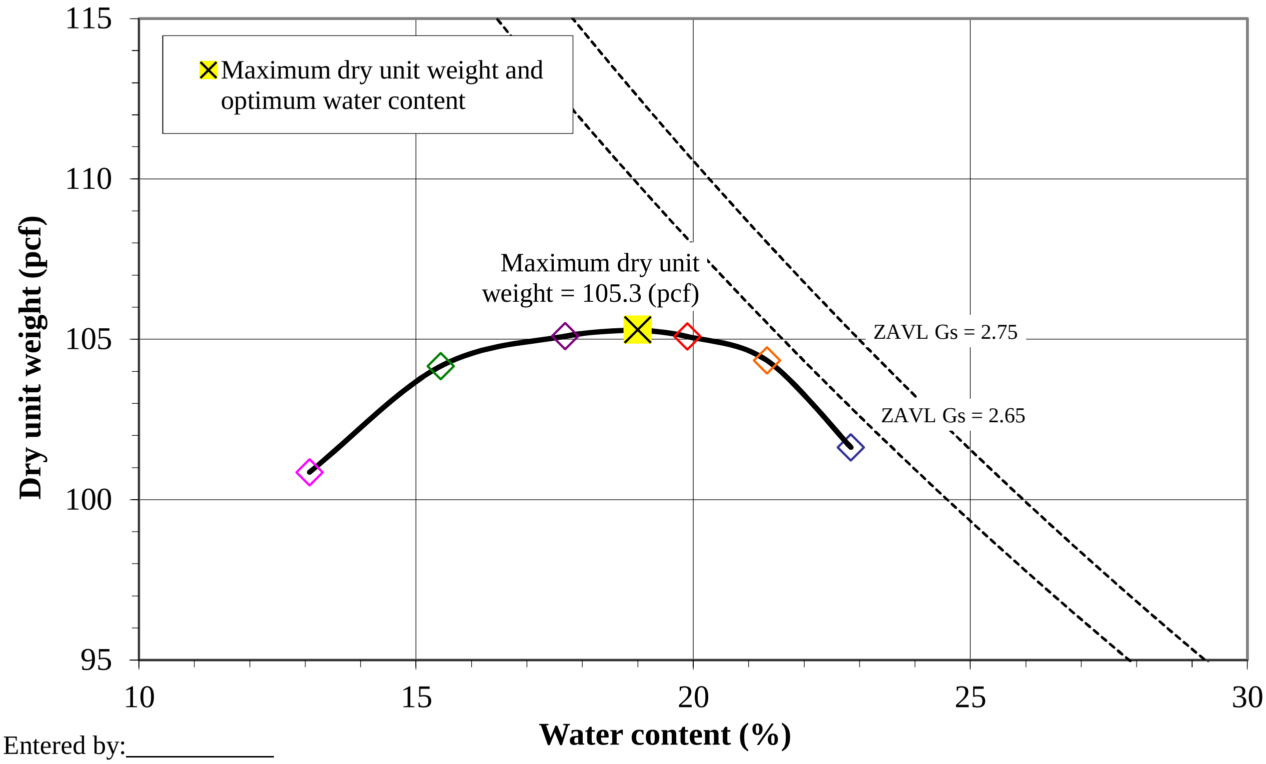
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Optimum water content (%): 19
Maximum dry unit weight (pcf): 105.3

Point Number	+8%	+10%	+6%	+4%	+12%	14%		
Wt. Sample + Mold (g)	6097.0	6131.8	6045.0	5951.4	6140.9	6114.5		
Wt. of Mold (g)	4229.7	4229.7	4229.7	4229.7	4229.7	4229.7		
Wet Unit Wt., γ_m (pcf)	123.7	126.0	120.2	114.0	126.6	124.8		
Wet Soil + Tare (g)	1224.49	1390.14	1141.17	1063.87	1248.59	1113.37		
Dry Soil + Tare (g)	1089.49	1211.00	1032.53	976.63	1083.68	947.60		
Tare (g)	326.42	310.61	328.95	309.51	310.52	221.97		
Water Content, w (%)	**17.7**	**19.9**	**15.4**	**13.1**	**21.3**	**22.8**		
Dry Unit Wt., γ_d (pcf)	**105.1**	**105.1**	**104.2**	**100.9**	**104.3**	**101.6**		

Comments:

Test specimen consisted of material from B1TP-2 @ 20-25', B1TP-3 @ 10-20', and B1TP-3 @ 20-30'. Due to insufficient sample quantity, points +6% and +14% contained previously compacted material.



Entered by:___________

Reviewed:___________

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Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Clousres; Delta, UT
Date: 1/15/2020
By: EH

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Sample Description: Silty SAND, brown
Sample Type: Laboratory Compacted
Compaction Specifications: 90 (%) Dry unit weight
at 14 (%) w

	Initial (o)	Final (f)
Sample Height, H (in)	2.995	2.972
Sample Diameter, D (in)	2.412	2.364
Sample Length, L (cm)	7.607	7.548
Sample Area, A (cm^2)	29.479	28.318
Sample Volume, V (cm^3)	224.26	213.73
Wt. Rings + Wet Soil (g)	435.15	458.15
Wt. Rings (g)	0	0
Wet Unit Wt., γ_m (pcf)	121.1	133.8
Wet Soil + Tare (g)	129.41	572.28
Dry Soil + Tare (g)	118.28	498.07
Tare (g)	37.61	123.49
Weight of solids, Ws (g)	382.39	382.39
Water Content, w (%)	13.80	19.81
Dry Unit Wt, γ_d (pcf)	106.4	111.7
Void ratio, e, for assumed Gs	0.58	0.53
Saturation (%), for assumed Gs	63.8	100 [a]
Average K[b] (cm/sec)	**3.6E-04**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Optimum water content (%)	14	
Maximum dry unit weight (pcf)	117.9	
Gs	2.7	Assumed
Cell No.	2	
Station No.	3	
Permeant liquid used	De-aired tap water	
Total backpressure (psi)	35	
Effective horiz. consolidation stress (psi)	15	
Effective vert. consolidation stress (psi)	15	

	Initial (o)	Final (f)
B value	0.60	0.98
External Burette (cm^3)	8.20	26.60
Cell Pressure (psi)	0.0	50.0

Backpressure bottom (psi)	35.0
Backpressure top (psi)	35.0
System volume coefficient (cm^3/psi)	0.158
System volume change (cm^3)	7.88
Net sample volume change (cm^3)	-10.52
Bottom burette ground length, l_b (cm)	82.25
Top burette ground length, l_t (cm)	81.95
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.076

Start Date and Time: 1/13/20 15:16

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_T	K[b] (cm/sec)
15.0	3.80 4.04	6.16 5.92	12.28	9.84	3.9E-04	23.5 23.5	0.92	3.6E-04
15.0	4.04 4.23	5.92 5.72	9.84	7.86	3.9E-04	23.5 23.5	0.92	3.6E-04
15.0	4.23 4.39	5.72 5.56	7.86	6.24	4.0E-04	23.5 23.5	0.92	3.7E-04
15.0	4.39 4.52	5.56 5.44	6.24	4.97	4.0E-04	23.5 23.5	0.92	3.7E-04
25.0	4.52 4.67	5.44 5.28	4.97	3.40	4.0E-04	23.5 23.5	0.92	3.7E-04

Comments:
Test specimen was remolded (using only material from B1TP-1 at 10-15') to 90% of ASTM D698 B (which inlcuded combined material from B1TP-1 @ 10-15', B1TP-2 @ 0-10', B1-TP2 @ 10-20', and B1TP-3 @ 0-10') at optimum water content.

Entered by:___________
Reviewed:___________

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Clousres; Delta, UT
Date: 1/15/2020
By: EH

Boring No.:
Sample: B1TP-2
Depth: 10-20'
Sample Description: Silty SAND, brown
Sample Type: Laboratory Compacted
Compaction Specifications: 95 (%) Dry unit weight at 14 (%) w

	Initial (o)	Final (f)
Sample Height, H (in)	2.995	2.979
Sample Diameter, D (in)	2.412	2.380
Sample Length, L (cm)	7.607	7.567
Sample Area, A (cm^2)	29.479	28.696
Sample Volume, V (cm^3)	224.26	217.15
Wt. Rings + Wet Soil (g)	459.11	476.24
Wt. Rings (g)	0	0
Wet Unit Wt., γ_m (pcf)	127.8	136.9
Wet Soil + Tare (g)	238.49	601.83
Dry Soil + Tare (g)	223.93	529.21
Tare (g)	118.62	127.39
Weight of solids, Ws (g)	403.34	403.34
Water Content, w (%)	13.83	18.07
Dry Unit Wt, γ_d (pcf)	112.3	116.0
Void ratio, e, for assumed Gs	0.50	0.49
Saturation (%), for assumed Gs	74.5	100 [a]
Average K[b] (cm/sec)	**2.1E-04**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Optimum water content (%)	14	
Maximum dry unit weight (pcf)	117.9	
Gs	2.7	Assumed
Cell No.	1	
Station No.	6	
Permeant liquid used	De-aired tap water	
Total backpressure (psi)	35	
Effective horiz. consolidation stress (psi)	3	
Effective vert. consolidation stress (psi)	3	

	Initial (o)	Final (f)
B value	0.40	0.96
External Burette (cm^3)	12.70	25.50
Cell Pressure (psi)	0.0	38.0

Backpressure bottom (psi)	35.0
Backpressure top (psi)	35.0
System volume coefficient (cm^3/psi)	0.150
System volume change (cm^3)	5.69
Net sample volume change (cm^3)	-7.11
Bottom burette ground length, l_b (cm)	82.05
Top burette ground length, l_t (cm)	82
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.076

Start Date and Time: 1/13/20 11:45

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratic R_T	K[b] (cm/sec)
30.0	3.92 4.19	6.11 5.85	11.17	8.48	2.4E-04	23.5 23.5	0.92	2.2E-04
30.0	4.19 4.39	5.85 5.66	8.48	6.52	2.3E-04	23.5 23.5	0.92	2.1E-04
30.0	4.39 4.54	5.66 5.52	6.52	5.02	2.3E-04	23.5 23.5	0.92	2.1E-04
30.0	4.54 4.66	5.52 5.42	5.02	3.91	2.2E-04	23.5 23.5	0.92	2.0E-04

Comments:
Test specimen was remolded (using only material from B1TP-2 at 10-20') to 95% of ASTM D698 B (which inlcuded combined material from B1TP-1 @ 10-15', B1TP-2 @ 0-10', B1-TP2 @ 10-20', and B1TP-3 @ 0-10') at optimum water content.

Entered by:___________
Reviewed:___________

Determination of the Soil Water Characteristic Curve for Desorption

Using Pressure Extractor

(In general accordance with ASTM D6836)

IGES

Project: Stantec
No: M00287-022
Location: IPSCC CCR Unit Closures; Delta, UT
Date: 3/5/2020
By: DNB/JDF

Specific gravity, Gs: 2.650 Assumed

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Description: Silty SAND, brown
Sample type: Laboratory compacted
Dry unit weight 103.8 pcf
at 16 (%) w
Compaction specifications: 90% of ASTM D698B

		Test No.	1	2	3	4	5	6	7*	8*
		Tension (psi)	0.5	1.0	2.0	6.0	18.0	72.0	2915.26	22991.38
Sample A	Initial Condition	Sample height, H (in)	0.5010	0.5010	0.5010	0.5010	0.5010	0.5010	0.1873	0.1877
		Sample diameter, D (in)	1.880	1.880	1.880	1.880	1.880	1.880	1.4722	1.4715
		Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001	0.0002	0.0002
		Wt. rings/cup + wet soil (g)	64.05	64.05	64.05	64.05	64.05	64.05	34.127	33.817
		Wt. rings/cup (g)	20.69	20.69	20.69	20.69	20.69	20.69	24.594	24.575
		Moist soil, Ws (g)	43.36	43.36	43.36	43.36	43.36	43.36	9.533	9.242
		Dry soil (g)	37.93	37.93	37.93	37.93	37.93	37.93	8.731	8.668
		Moist unit wt., γ_m (pcf)	118.79	118.79	118.79	118.79	118.79	118.79	113.91	110.32
		Wet soil + tare (g)	107.89	107.89	107.89	107.89	107.89	107.89	34.127	33.817
		Dry soil + tare (g)	99.06	99.06	99.06	99.06	99.06	99.06	33.325	33.243
		Tare (g)	37.40	37.40	37.40	37.40	37.40	37.40	24.594	24.575
		Moisture Content, w (%)	14.3	14.3	14.3	14.3	14.3	14.3	9.19	6.62
		Dry Unit Wt., γ_d (pcf)	103.91	103.91	103.91	103.91	103.91	103.91	104.32	103.47
	Final Condition	Wet soil + ring/cup (g)	64.76	64.35	64.07	63.80	63.62	61.14	33.828	33.424
		Dry soil + ring/cup (g)	58.62	58.62	58.62	58.62	58.62	58.62	33.325	33.243
		Ring/cup (g)	20.69	20.69	20.69	20.69	20.69	20.69	24.594	24.575
		Dry soil (g)	37.93	37.93	37.93	37.93	37.93	37.93	8.731	8.668
		Moisture Content, w (%)	16.18	15.10	14.38	13.65	13.19	6.64	5.76	2.09
		Volumetric Water Content, θ	0.269	0.251	0.239	0.227	0.220	0.111	0.096	0.035
Sample B	Initial Condition	Sample height, H (in)	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000		
		Sample diameter, D (in)	1.887	1.887	1.887	1.887	1.887	1.887		
		Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001		
		Wt. rings/cup + wet soil (g)	64.08	64.08	64.08	64.08	64.08	64.08		
		Wt. rings/cup (g)	20.48	20.48	20.48	20.48	20.48	20.48		
		Moist unit wt., γ_m (pcf)	118.80	118.80	118.80	118.80	118.80	118.80		
		Wet soil + tare (g)	107.89	107.89	107.89	107.89	107.89	107.89		
		Dry soil + tare (g)	99.06	99.06	99.06	99.06	99.06	99.06		
		Tare (g)	37.40	37.40	37.40	37.40	37.40	37.40		
		Moisture Content, w (%)	14.3	14.3	14.3	14.3	14.3	14.3		
		Dry Unit Wt., γ_d (pcf)	103.92	103.92	103.92	103.92	103.92	103.92		
	Final Condition	Wet soil + ring/cup (g)	64.82	64.43	64.18	63.90	63.62	63.25		
		Dry soil + ring/cup (g)	58.62	58.62	58.62	58.62	58.62	58.62		
		Ring/cup (g)	20.48	20.48	20.48	20.48	20.48	20.48		
		Dry soil (g)	38.14	38.14	38.14	38.14	38.14	38.14		
		Moisture Content, w (%)	16.26	15.24	14.59	13.85	13.11	12.14		
		Volumetric Water Content, θ	0.271	0.254	0.243	0.231	0.218	0.202		
		Average Volumetric Moisture:	**0.270**	**0.253**	**0.241**	**0.229**	**0.219**	**0.156**	**0.096**	**0.035**

Comments:
*Points 7 and 8 were performed on a Chilled Mirror Hygrometer

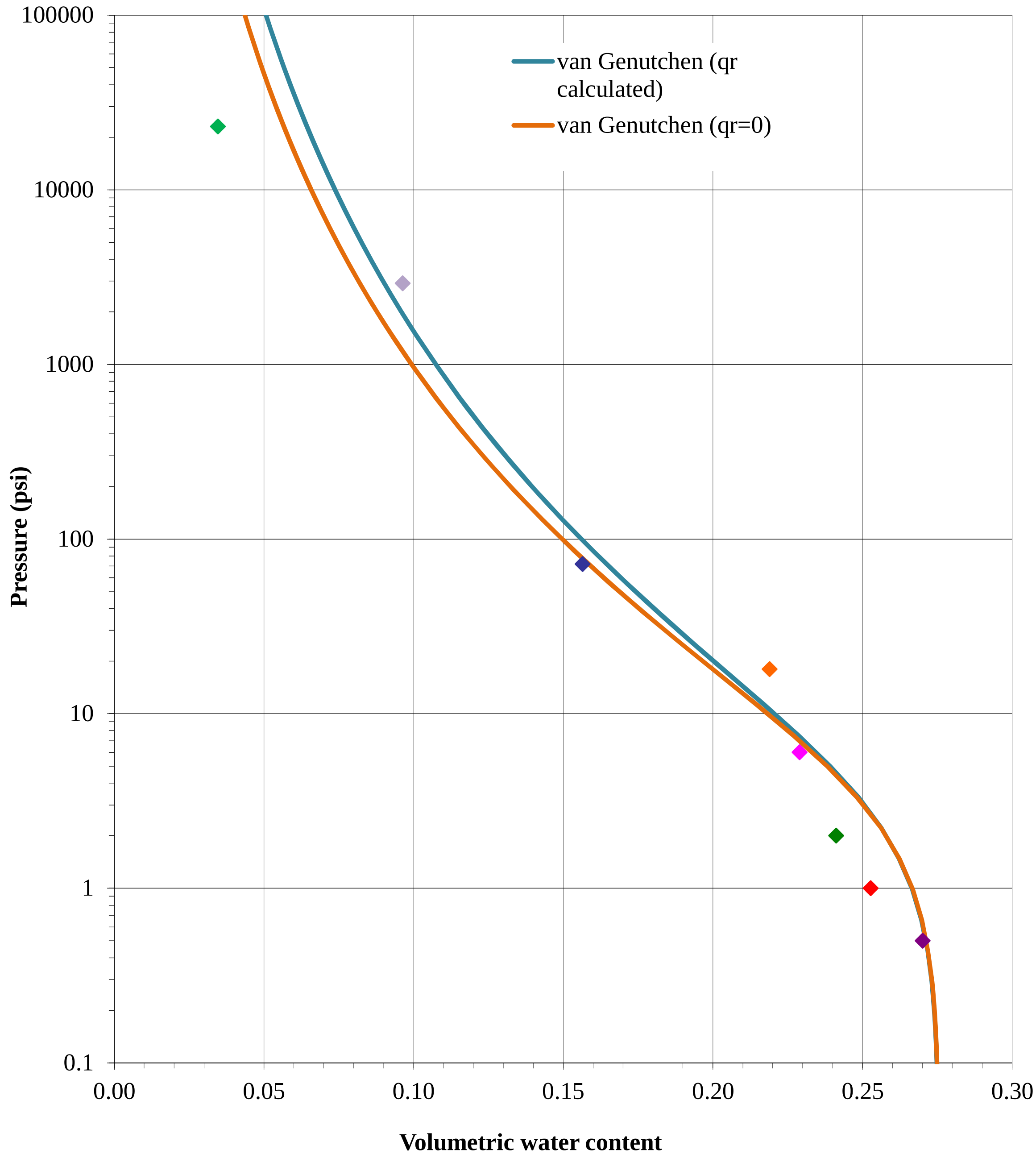
Entered by:___________
Reviewed:___________

Determination of the Soil Water Characteristic Curve for Desorption Using Pressure Extractor

(In general accordance with ASTM D6836)

Project: Stantec
No: M00287-022
Location: IPSCC CCR Unit Closures; Delta, UT
Date: 3/5/2020

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Description: Silty SAND, brown



van Genuchten (1980) fitting parameters (using SWRC fit, Seki, K. (2007)); h in *psi:*

θ_r calculated		Setting θ_r = 0	
θ_s	0.2755	θ_s	0.2755
θ_r	9.938E-06	θ_r	0
α	0.3215	α	0.2987
n	1.1632	n	1.1790
m	0.1403	m	0.1518
R^2	0.9648	R^2	0.9686

$$S_e = \left[\frac{1}{1+(\alpha h)^n}\right]^m$$

$$(m = 1 - 1/n)$$

$$\theta = \theta_r + (\theta_s - \theta_r)S_e$$

Determination of the Soil Water Characteristic Curve for Desorption

Using Pressure Extractor

(In general accordance with ASTM D6836)

Project: Stantec
No: M00287-022
Location: IPSCC CCR Unit Closures; Delta, UT
Date: 3/4/2020
By: DNB/JDF

Specific gravity, Gs: 2.650 Assumed

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Sandy lean CLAY, brown
Sample type: Laboratory compacted
Dry unit weight 93.1 pcf
at 19 (%) w
Compaction specifications: 90% of ASTM D698B

		Test No.	1	2	3	4	5	6	7*	8*
		Tension (psi)	0.5	1.0	2.0	6.0	18.0	72.0	3354.72	22508.41
Sample A	Initial Condition	Sample height, H (in)	0.5010	0.5010	0.5010	0.5010	0.5010	0.5010	0.1890	0.1882
		Sample diameter, D (in)	1.882	1.882	1.882	1.882	1.882	1.882	1.4718	1.4722
		Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001	0.0002	0.0002
		Wt. rings/cup + wet soil (g)	61.18	61.18	61.18	61.18	61.18	61.18	33.709	33.004
		Wt. rings/cup (g)	20.56	20.56	20.56	20.56	20.56	20.56	24.764	24.367
		Moist soil, Ws (g)	40.62	40.62	40.62	40.62	40.62	40.62	8.945	8.637
		Dry soil (g)	34.06	34.06	34.06	34.06	34.06	34.06	7.900	7.842
		Moist unit wt., γ_m (pcf)	111.03	111.03	111.03	111.03	111.03	111.03	105.98	102.71
		Wet soil + tare (g)	146.19	146.19	146.19	146.19	146.19	146.19	33.709	33.004
		Dry soil + tare (g)	128.62	128.62	128.62	128.62	128.62	128.62	32.664	32.209
		Tare (g)	37.42	37.42	37.42	37.42	37.42	37.42	24.764	24.367
		Moisture Content, w (%)	19.3	19.3	19.3	19.3	19.3	19.3	13.23	10.14
		Dry Unit Wt., γ_d (pcf)	93.10	93.10	93.10	93.10	93.10	93.10	93.60	93.25
	Final Condition	Wet soil + ring/cup (g)	63.05	62.69	62.29	61.66	61.13	60.37	33.266	32.394
		Dry soil + ring/cup (g)	54.62	54.62	54.62	54.62	54.62	54.62	32.664	32.209
		Ring/cup (g)	20.56	20.56	20.56	20.56	20.56	20.56	24.764	24.367
		Dry soil (g)	34.06	34.06	34.06	34.06	34.06	34.06	7.900	7.842
		Moisture Content, w (%)	24.74	23.68	22.51	20.66	19.12	16.89	7.62	2.36
		Volumetric Water Content, θ	0.369	0.353	0.336	0.308	0.285	0.252	0.114	0.035
Sample B	Initial Condition	Sample height, H (in)	0.4980	0.4980	0.4980	0.4980	0.4980	0.4980		
		Sample diameter, D (in)	1.881	1.881	1.881	1.881	1.881	1.881		
		Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001		
		Wt. rings/cup + wet soil (g)	61.05	61.05	61.05	61.05	61.05	61.05		
		Wt. rings/cup (g)	20.54	20.54	20.54	20.54	20.54	20.54		
		Moist unit wt., γ_m (pcf)	111.52	111.52	111.52	111.52	111.52	111.52		
		Wet soil + tare (g)	146.19	146.19	146.19	146.19	146.19	146.19		
		Dry soil + tare (g)	128.62	128.62	128.62	128.62	128.62	128.62		
		Tare (g)	37.42	37.42	37.42	37.42	37.42	37.42		
		Moisture Content, w (%)	19.3	19.3	19.3	19.3	19.3	19.3		
		Dry Unit Wt., γ_d (pcf)	93.51	93.51	93.51	93.51	93.51	93.51		
	Final Condition	Wet soil + ring/cup (g)	62.74	62.41	62.02	61.45	61.17	60.44		
		Dry soil + ring/cup (g)	54.51	54.51	54.51	54.51	54.51	54.51		
		Ring/cup (g)	20.54	20.54	20.54	20.54	20.54	20.54		
		Dry soil (g)	33.97	33.97	33.97	33.97	33.97	33.97		
		Moisture Content, w (%)	24.24	23.26	22.11	20.43	19.60	17.47		
		Volumetric Water Content, θ	0.363	0.349	0.331	0.306	0.294	0.262		
		Average Volumetric Moisture:	**0.366**	**0.351**	**0.334**	**0.307**	**0.290**	**0.257**	**0.114**	**0.035**

Comments:
*Points 7 and 8 were performed on a Chilled Mirror Hygrometer

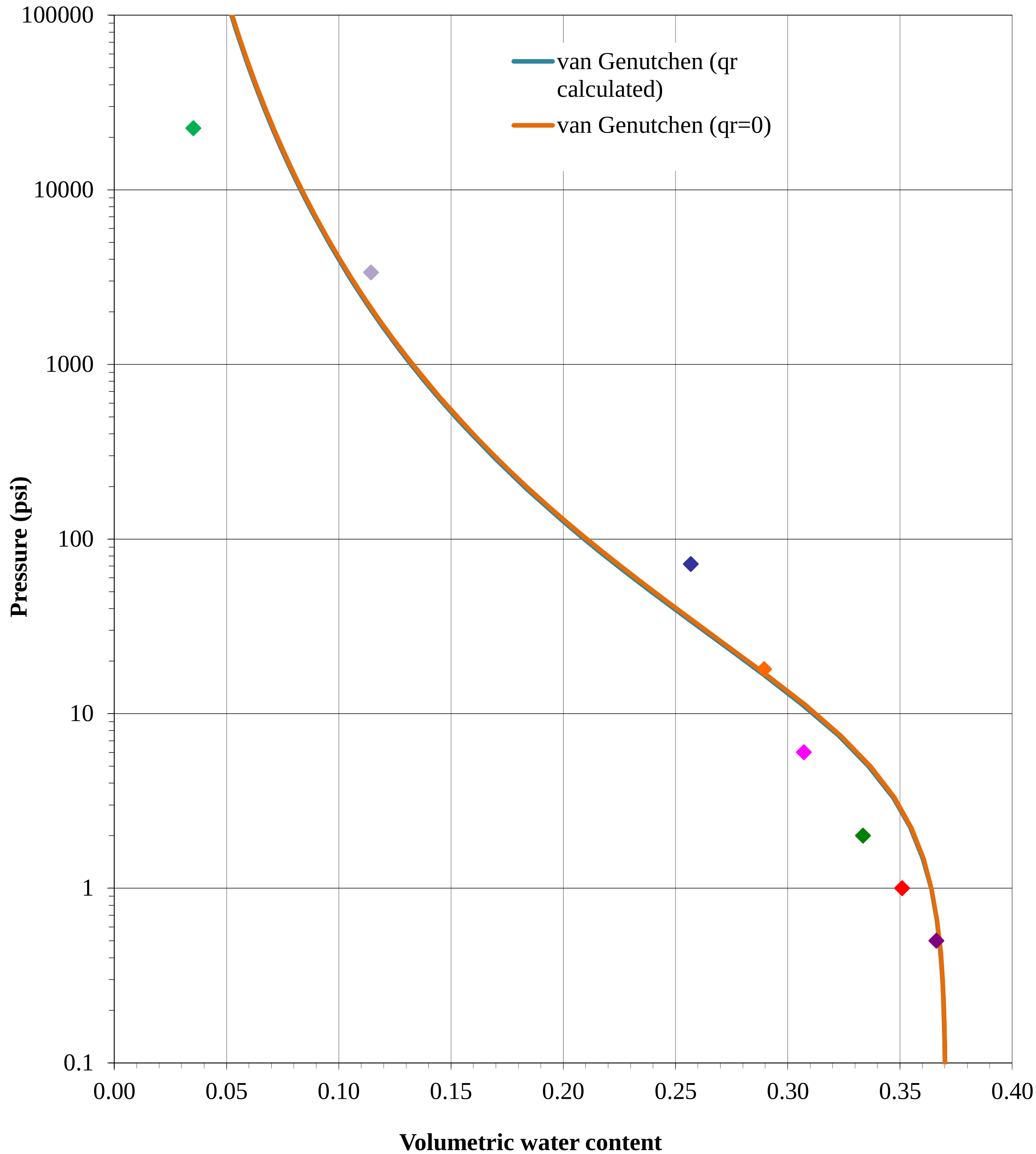
Entered by:___________
Reviewed:___________

Determination of the Soil Water Characteristic Curve for Desorption Using Pressure Extractor

(In general accordance with ASTM D6836)

Project: Stantec
No: M00287-022
Location: IPSCC CCR Unit Closures; Delta, UT
Date: 3/4/2020

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Sandy lean CLAY, brown



van Genuchten (1980) fitting parameters (using SWRC fit, Seki, K. (2007)); *h* in *psi:*

θ_r calculated		Setting θ_r = 0	
θ_s	0.3705	θ_s	0.3705
θ_r	4.115E-06	θ_r	0
α	0.1639	α	0.1598
n	1.2021	n	1.2020
m	0.1681	m	0.1681
R^2	0.9627	R^2	0.9627

$$S_e = \left[\frac{1}{1+(\alpha h)^n}\right]^m$$

$$(m = 1 - 1/n)$$

$$\theta = \theta_r + (\theta_s - \theta_r)S_e$$

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-1
Depth: 0-10'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/4"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

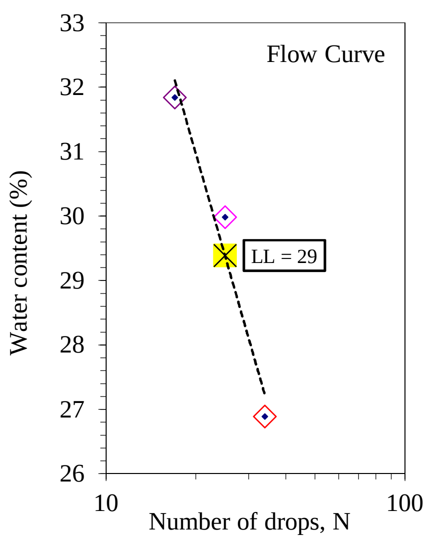
Plastic Limit

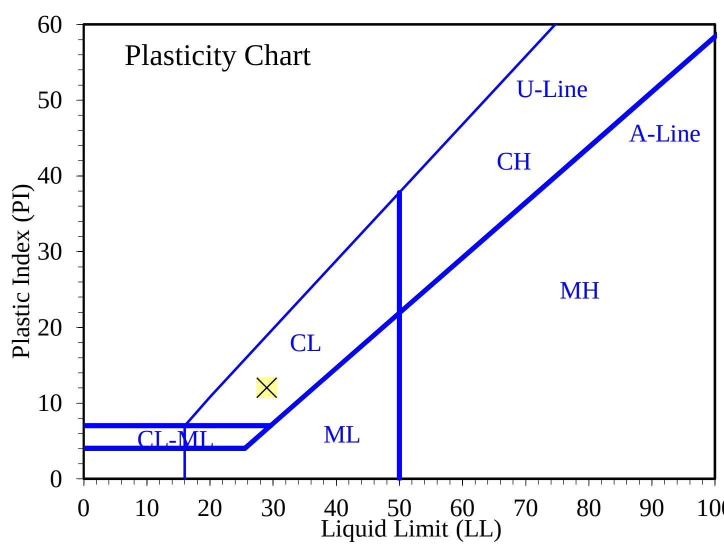
Determination No	1	2				
Wet Soil + Tare (g)	14.37	14.62				
Dry Soil + Tare (g)	13.28	13.51				
Water Loss (g)	1.09	1.11				
Tare (g)	7.08	7.11				
Dry Soil (g)	6.20	6.40				
Water Content, w (%)	17.58	17.34				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	34	25	17			
Wet Soil + Tare (g)	14.56	15.45	16.23			
Dry Soil + Tare (g)	13.03	13.66	14.10			
Water Loss (g)	1.53	1.79	2.13			
Tare (g)	7.34	7.69	7.41			
Dry Soil (g)	5.69	5.97	6.69			
Water Content, w (%)	26.89	29.98	31.84			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**29**
Plastic Limit, PL (%)	**17**
Plasticity Index, PI (%)	**12**





Entered by:____________
Reviewed:____________

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

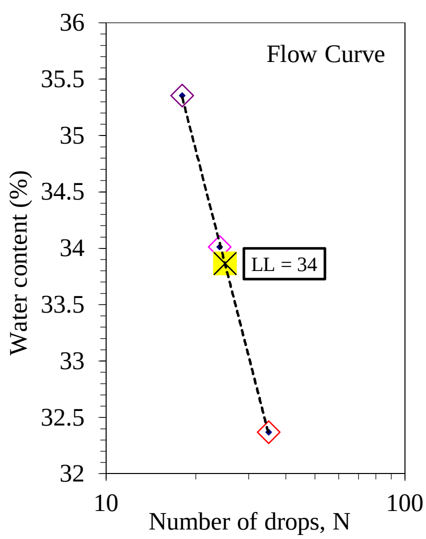
Plastic Limit

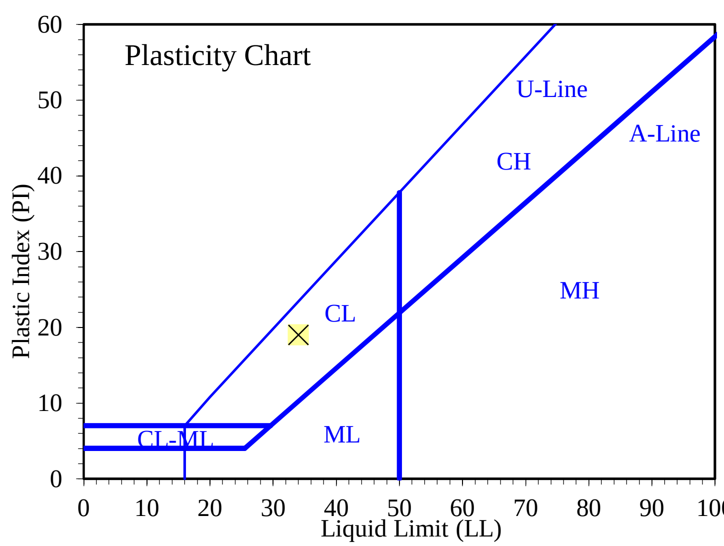
Determination No	1	2				
Wet Soil + Tare (g)	14.56	14.71				
Dry Soil + Tare (g)	13.56	13.73				
Water Loss (g)	1.00	0.98				
Tare (g)	7.03	7.11				
Dry Soil (g)	6.53	6.62				
Water Content, w (%)	15.31	14.80				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	24	18			
Wet Soil + Tare (g)	15.70	16.50	15.24			
Dry Soil + Tare (g)	13.69	14.33	13.20			
Water Loss (g)	2.01	2.17	2.04			
Tare (g)	7.48	7.95	7.43			
Dry Soil (g)	6.21	6.38	5.77			
Water Content, w (%)	32.37	34.01	35.36			
One-Point LL (%)		34				

Liquid Limit, LL (%)	**34**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**19**





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Reviewed:____________

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.:
Sample: B3TP-2
Depth: 0-15'
Description: Lean CLAY, brown
Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

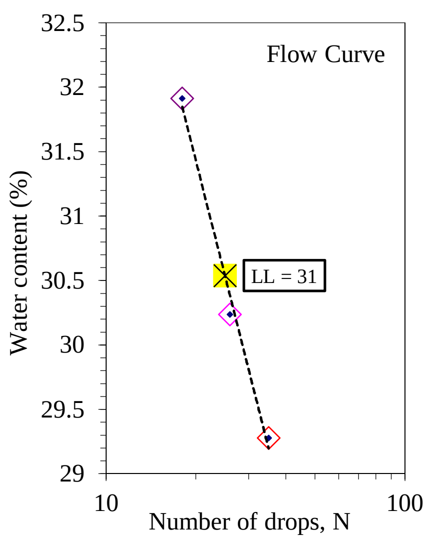
Plastic Limit

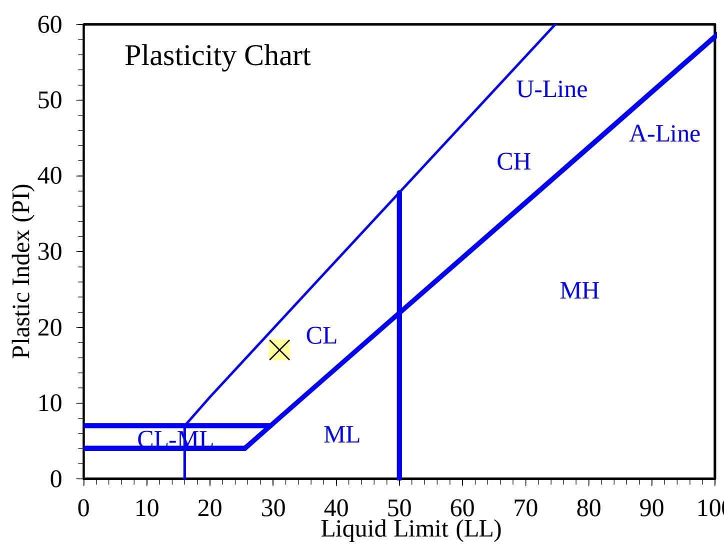
Determination No	1	2				
Wet Soil + Tare (g)	13.77	13.08				
Dry Soil + Tare (g)	12.94	12.34				
Water Loss (g)	0.83	0.74				
Tare (g)	7.05	7.03				
Dry Soil (g)	5.89	5.31				
Water Content, w (%)	14.09	13.94				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	26	18			
Wet Soil + Tare (g)	15.47	14.82	16.03			
Dry Soil + Tare (g)	13.57	13.03	13.86			
Water Loss (g)	1.90	1.79	2.17			
Tare (g)	7.08	7.11	7.06			
Dry Soil (g)	6.49	5.92	6.80			
Water Content, w (%)	29.28	30.24	31.91			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**31**
Plastic Limit, PL (%)	**14**
Plasticity Index, PI (%)	**17**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

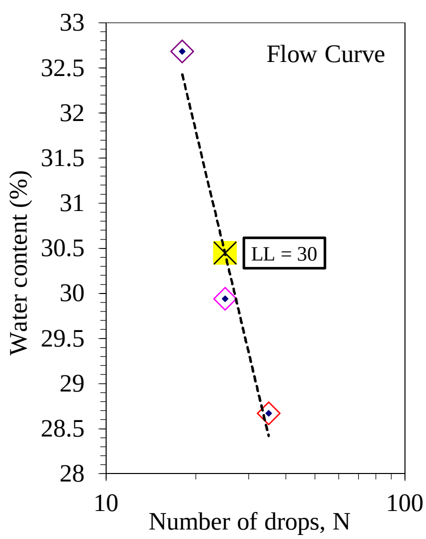
Plastic Limit

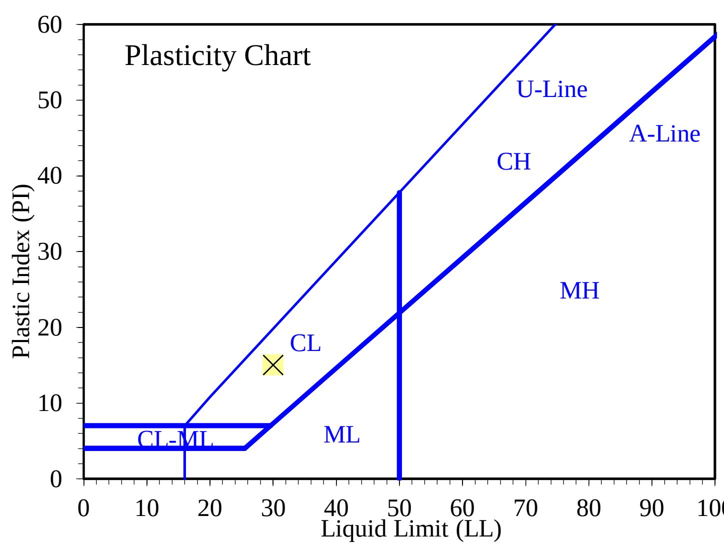
Determination No	1	2				
Wet Soil + Tare (g)	13.81	14.54				
Dry Soil + Tare (g)	12.93	13.56				
Water Loss (g)	0.88	0.98				
Tare (g)	7.03	7.13				
Dry Soil (g)	5.90	6.43				
Water Content, w (%)	14.92	15.24				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	25	18			
Wet Soil + Tare (g)	14.98	16.02	14.94			
Dry Soil + Tare (g)	13.30	14.02	13.10			
Water Loss (g)	1.68	2.00	1.84			
Tare (g)	7.44	7.34	7.47			
Dry Soil (g)	5.86	6.68	5.63			
Water Content, w (%)	28.67	29.94	32.68			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**30**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**15**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.:
Sample: B3TP-3
Depth: 0-15'
Description: SILT, brown
Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

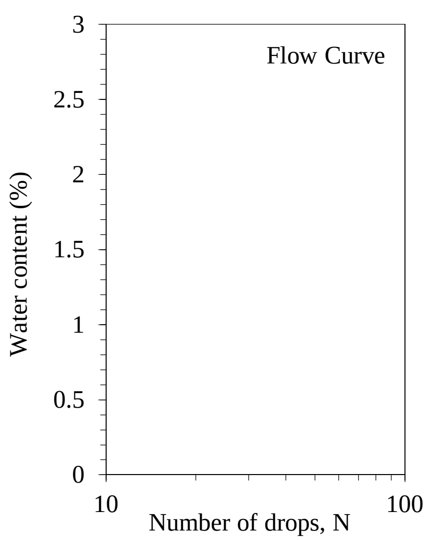
Plastic Limit

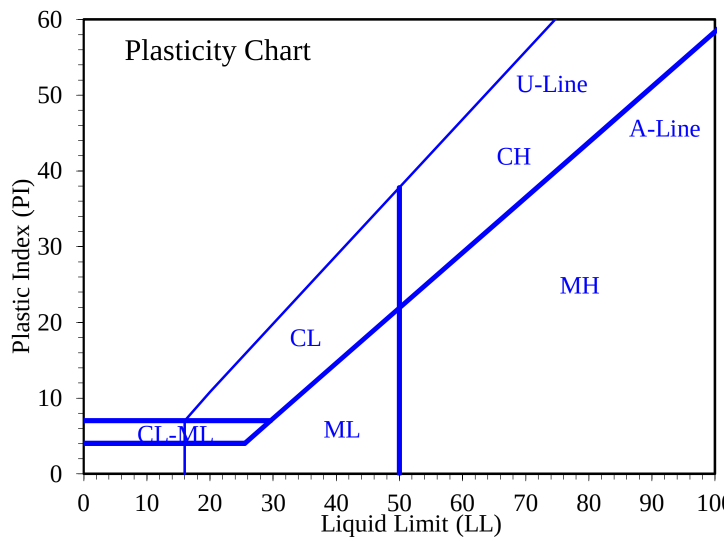
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.:
Sample: B3TP-3
Depth: 15-30'
Description: Lean CLAY, brown
Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.4
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

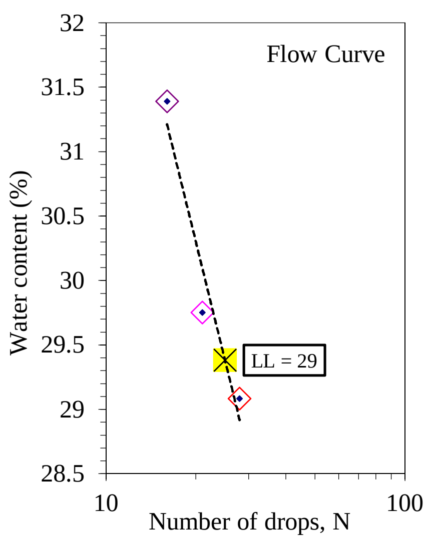
Plastic Limit

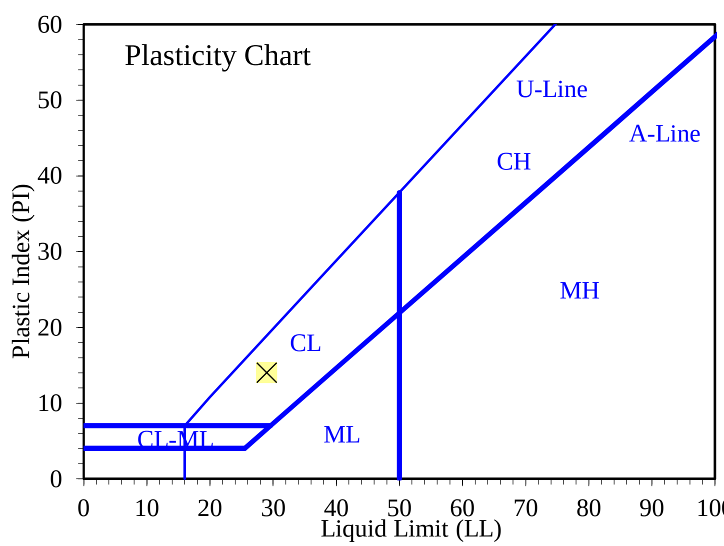
Determination No	1	2				
Wet Soil + Tare (g)	13.22	13.61				
Dry Soil + Tare (g)	12.41	12.75				
Water Loss (g)	0.81	0.86				
Tare (g)	7.12	7.07				
Dry Soil (g)	5.29	5.68				
Water Content, w (%)	15.31	15.14				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	28	21	16			
Wet Soil + Tare (g)	13.54	13.77	17.19			
Dry Soil + Tare (g)	12.08	12.22	14.93			
Water Loss (g)	1.46	1.55	2.26			
Tare (g)	7.06	7.01	7.73			
Dry Soil (g)	5.02	5.21	7.20			
Water Content, w (%)	29.08	29.75	31.39			
One-Point LL (%)	29	29				

Liquid Limit, LL (%)	**29**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**14**





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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-1
Depth: 0-10'
Description: Clayey SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9915.5	9258.2
+3/8" Coarse fraction (g):	139.95	137.45
-3/8" Split fraction (g):	368.30	343.63
Hydrometer fraction (g):	65.30	58.84
First Split fraction:	0.985	

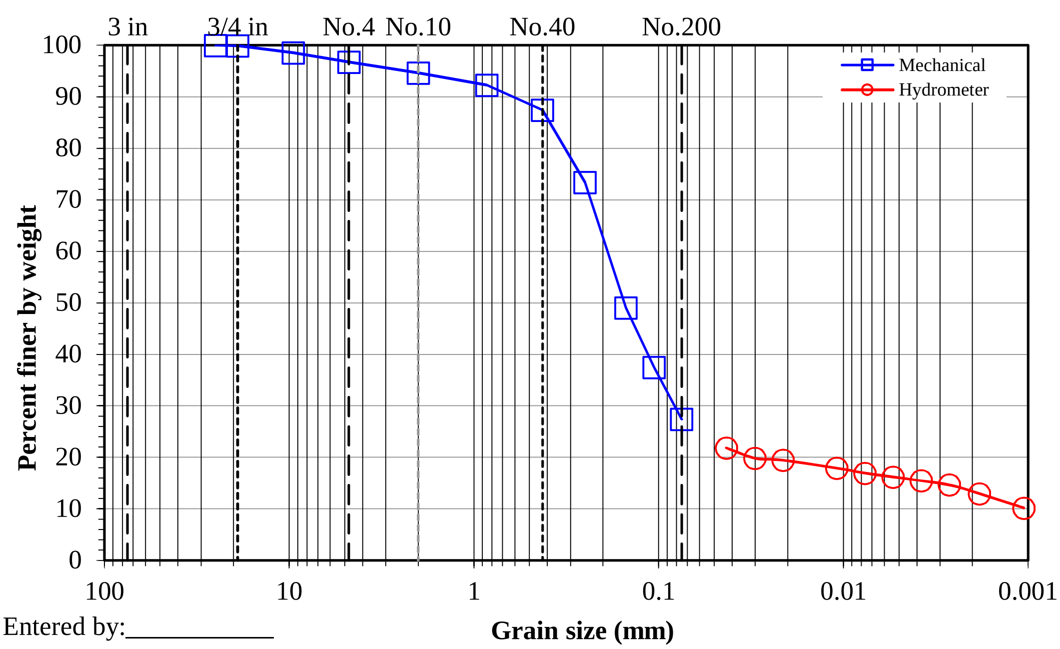
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	264.47	497.11	30.00
Dry soil + tare (g):	261.94	472.44	27.73
Tare (g):	123.06	128.81	7.06
Water content (%):	1.82	7.18	10.98

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	94.65
Cylinder ID:	T5	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	100.0	
3/4"	5.88	19	99.9	
3/8"	137.45	9.5	98.5	<=1st Split
No.4	6.25	4.75	96.7	
No.10	13.50	2	94.6	<=Split hyd.
No.20	21.74	0.85	92.3	
No.40	38.63	0.425	87.4	
No.60	87.59	0.25	73.4	
No.100	172.67	0.15	49.0	
No.140	212.92	0.106	37.5	
No.200	247.98	0.075	27.4	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.1	18.5	0.0430	21.83
2	22.1	17.25	0.0301	19.84
4	22.1	17	0.0212	19.44
15	22.2	16	0.0109	17.91
30	21.9	15.5	0.0077	16.94
60	22	15	0.0054	16.20
120	22.1	14.5	0.0038	15.47
240	22.1	14	0.0027	14.67
500	21.9	13	0.0018	12.97
1465	21.9	11.25	0.0011	10.18

Gravel (%): 3.3
Sand (%): 69.3
Fines (%): 27.4



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Reviewed:___________

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Description: Lean CLAY with sand, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928
Split:	Yes
First Split sieve:	3/8"
Second split:	No

	Moist	Dry
Total sample wt. (g):	9285.1	7989.9
+3/8" Coarse fraction (g):	18.33	17.92
-3/8" Split fraction (g):	308.83	265.68
Hydrometer fraction (g):	65.18	57.28
First Split fraction:	0.998	

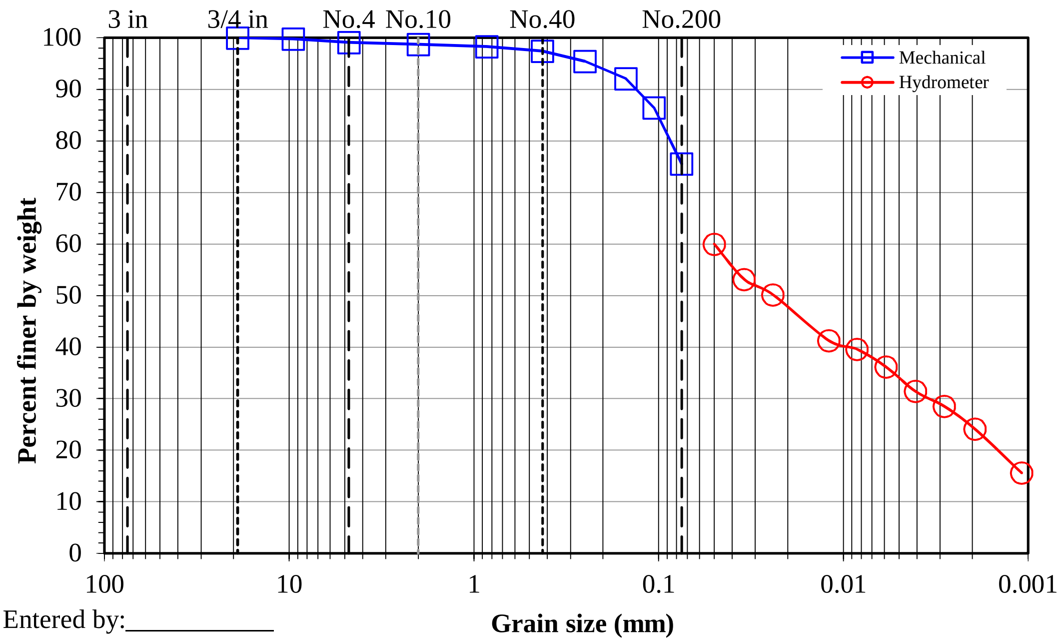
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	147.79	435.66	25.99
Dry soil + tare (g):	147.33	392.51	23.75
Tare (g):	127.04	126.83	7.50
Water content (%):	2.27	16.24	13.78

Hydrometer data
Hyd. split: No.10
Gs: 2.7 Assumed
Bulb No. 6
Hyd. fraction: 98.76
Cylinder ID: N3
Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	17.92	9.5	99.8	<=1st Split
No.4	1.82	4.75	99.1	
No.10	2.71	2	98.8	<=Split hyd.
No.20	3.99	0.85	98.3	
No.40	6.25	0.425	97.4	
No.60	11.55	0.25	95.4	
No.100	20.49	0.15	92.1	
No.140	35.48	0.106	86.5	
No.200	64.53	0.075	75.5	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	40	0.0500	59.99
2	22	36	0.0345	53.17
4	22	34.25	0.0241	50.18
15	22.1	29	0.0120	41.30
30	22.1	28	0.0084	39.59
60	22.1	26	0.0059	36.18
120	22	23.25	0.0041	31.43
240	22.1	21.5	0.0028	28.51
494	21.9	19	0.0019	24.12
1458	21.9	14	0.0011	15.60

Gravel (%): 0.9
Sand (%): 23.6
Fines (%): 75.5



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-2
Depth: 0-15'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	8606.1	7443.4
+3/8" Coarse fraction (g):	4.08	3.99
-3/8" Split fraction (g):	245.05	211.93
Hydrometer fraction (g):	65.51	57.75
First Split fraction:	0.999	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	132.04	373.55	35.45
Dry soil + tare (g):	131.95	340.43	32.09
Tare (g):	127.91	128.50	7.10
Water content (%):	2.23	15.63	13.45

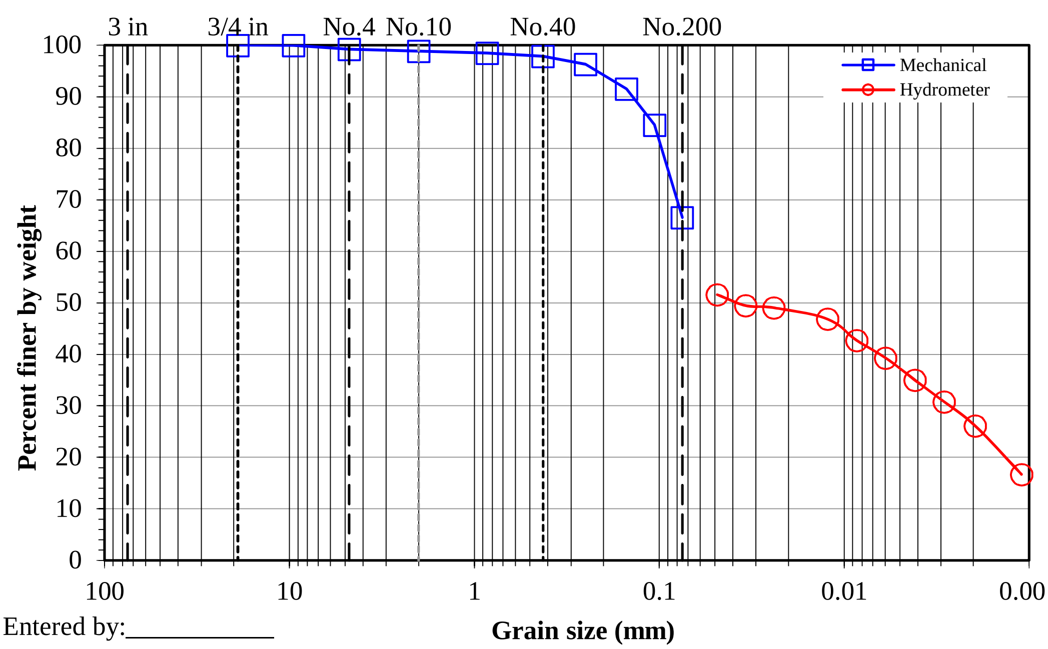
Hydrometer data

Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	98.84
Cylinder ID:	N10	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	3.99	9.5	99.9	<=1st Split
No.4	1.58	4.75	99.2	
No.10	2.34	2	98.8	<=Split hyd.
No.20	3.08	0.85	98.5	
No.40	4.48	0.425	97.8	
No.60	7.69	0.25	96.3	
No.100	17.86	0.15	91.5	
No.140	32.70	0.106	84.5	
No.200	70.82	0.075	66.5	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.1	35.25	0.0486	51.58
2	22.1	34	0.0341	49.46
4	22.1	33.75	0.0240	49.04
15	22	32.5	0.0123	46.86
30	22.1	30	0.0086	42.69
60	22.1	28	0.0060	39.31
120	22	25.5	0.0041	35.02
240	22	23	0.0029	30.78
497	22	20.25	0.0020	26.13
1450	21.1	15	0.0011	16.70

Gravel (%): 0.8
Sand (%): 32.7
Fines (%): 66.5



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	8940.3	7903.2
+3/8" Coarse fraction (g):	56.99	54.10
-3/8" Split fraction (g):	261.81	231.33
Hydrometer fraction (g):	61.80	55.36
First Split fraction:	0.993	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	192.03	389.49	28.99
Dry soil + tare (g):	188.63	359.01	26.74
Tare (g):	125.02	127.68	7.41
Water content (%):	5.35	13.18	11.64

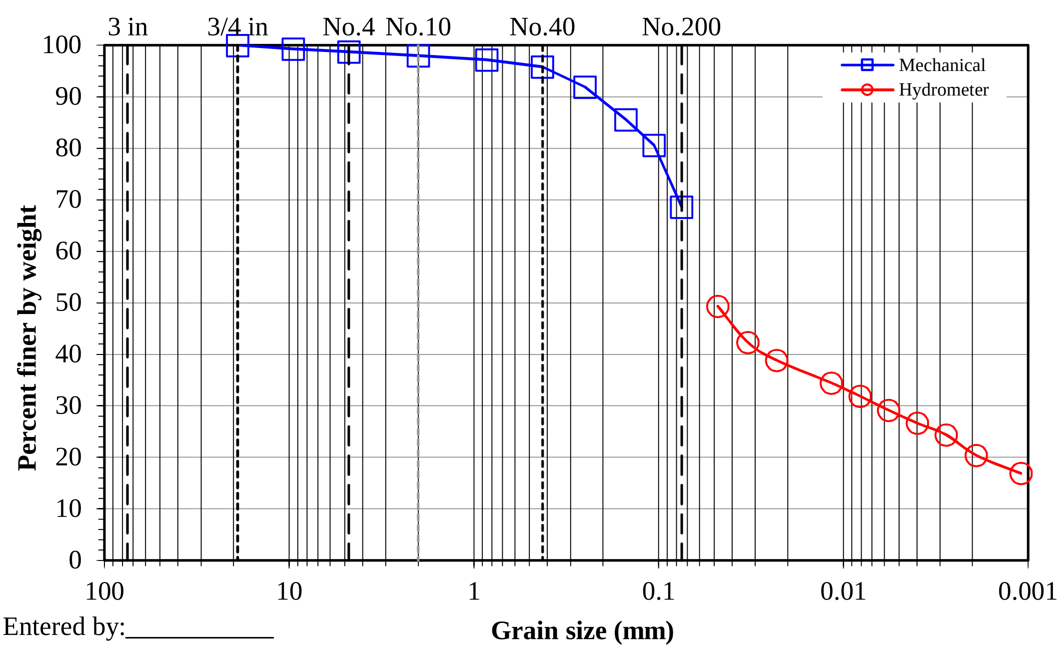
Hydrometer data

Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	98.00
Cylinder ID:	T3	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	54.10	9.5	99.3	<=1st Split
No.4	1.37	4.75	98.7	
No.10	3.07	2	98.0	<=Split hyd.
No.20	4.94	0.85	97.2	
No.40	8.21	0.425	95.8	
No.60	17.25	0.25	91.9	
No.100	32.03	0.15	85.6	
No.140	43.64	0.106	80.6	
No.200	71.52	0.075	68.6	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	33	0.0478	49.34
2	22	29	0.0329	42.34
4	22	27	0.0229	38.84
15	22	24.5	0.0116	34.46
30	22.1	23	0.0081	31.90
60	21.9	21.5	0.0057	29.15
120	22.1	20	0.0040	26.65
240	22	18.75	0.0028	24.40
492	21.9	16.5	0.0019	20.40
1443	21.9	14.5	0.0011	16.90

Gravel (%): 1.3
Sand (%): 30.1
Fines (%): 68.6



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JAB/BRR/EH

Boring No.:
Sample: B3TP-3
Depth: 0-15'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928
Split:	Yes
First Split sieve:	3/8"
Second split:	No

	Moist	Dry
Total sample wt. (g):	9290.9	8833.5
+3/8" Coarse fraction (g):	47.94	46.11
-3/8" Split fraction (g):	212.21	201.75
Hydrometer fraction (g):	83.68	80.77
First Split fraction:	0.995	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	171.32	339.33	49.45
Dry soil + tare (g):	169.45	328.87	48.17
Tare (g):	122.41	127.12	12.64
Water content (%):	3.98	5.18	3.60

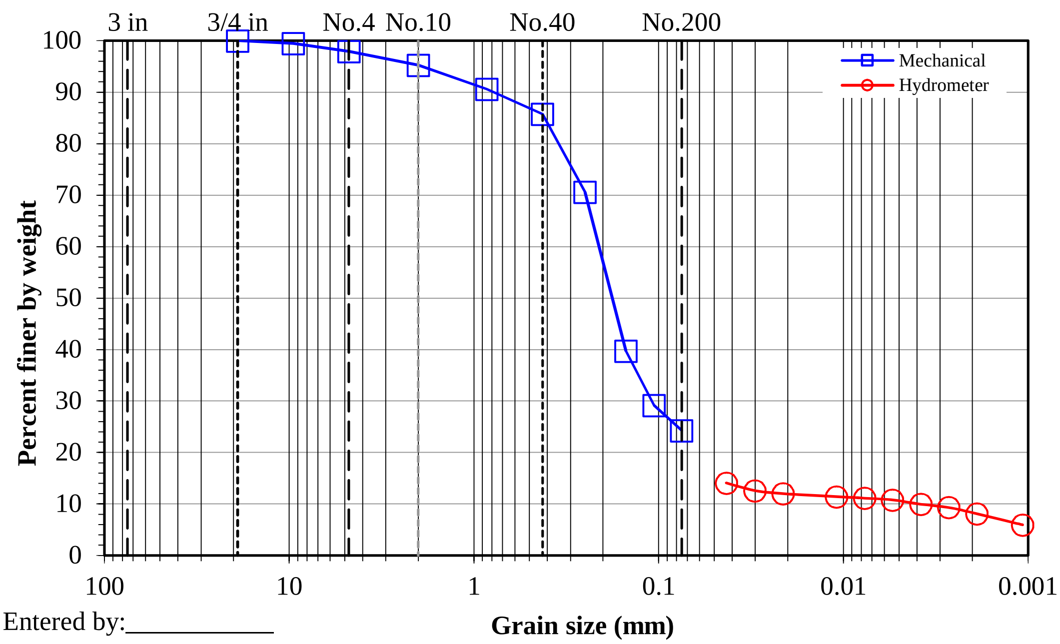
Hydrometer data

Hyd. split:	No.10		
Gs:	2.65	Assumed	
Bulb No.	6	Hyd. fraction:	95.26
Cylinder ID:	N16	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	46.11	9.5	99.5	<=1st Split
No.4	3.18	4.75	97.9	
No.10	8.56	2	95.3	<=Split hyd.
No.20	18.00	0.85	90.6	
No.40	27.85	0.425	85.7	
No.60	58.55	0.25	70.6	
No.100	121.17	0.15	39.7	
No.140	142.63	0.106	29.2	
No.200	152.51	0.075	24.3	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	16.75	0.0430	14.08
2	22	15.5	0.0301	12.60
4	22	15	0.0212	12.01
15	22	14.5	0.0109	11.42
30	22	14.25	0.0077	11.13
60	21.9	14	0.0054	10.79
120	22	13.25	0.0038	9.95
239	21.9	12.75	0.0027	9.32
474	21.8	11.75	0.0019	8.10
1430	21.6	10	0.0011	5.95

Gravel (%): 2.1
Sand (%): 73.6
Fines (%): 24.3



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP/JAB/EH/BRR

Boring No.:
Sample: B3TP-3
Depth: 15-30'
Description: Lean CLAY with sand, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	No	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	260.92	217.49
Hydrometer fraction (g):	65.96	56.18

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	384.53	47.86
Dry soil + tare (g):	341.10	42.64
Tare (g):	123.61	12.66
Water content (%):	19.97	17.41

Hydrometer data

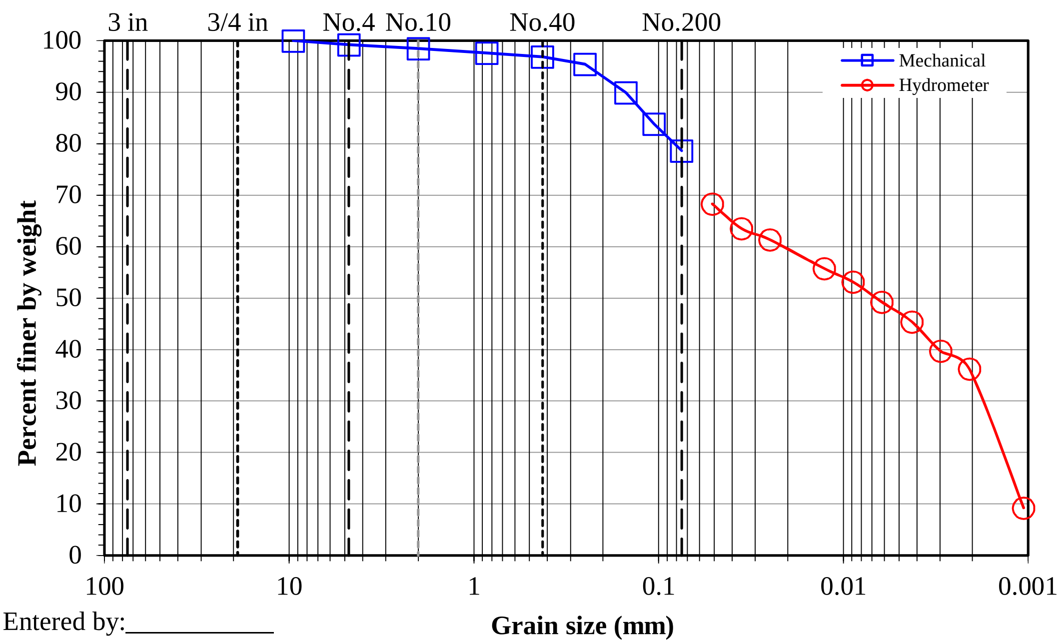
Hyd. split:	No.10			
Gs:	2.7	Assumed		
Bulb No.	6		Hyd. fraction:	98.48
Cylinder ID:	N18		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	100.0
No.4	1.74	4.75	99.2
No.10	3.31	2	98.5
No.20	5.15	0.85	97.6
No.40	6.80	0.425	96.9
No.60	9.89	0.25	95.5
No.100	21.91	0.15	89.9
No.140	35.12	0.106	83.9
No.200	46.50	0.075	78.6

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.9	44.25	0.0512	68.30
2	21.9	41.5	0.0357	63.53
4	21.9	40.25	0.0250	61.36
15	21.9	37	0.0127	55.73
30	21.9	35.5	0.0089	53.13
60	21.9	33.25	0.0062	49.23
123	22	31	0.0043	45.39
240	21.9	27.75	0.0030	39.70
478	21.9	25.75	0.0021	36.23
1434	21.7	10.25	0.0011	9.24

Gravel (%): 0.8
Sand (%): 20.6
Fines (%): 78.6



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Reviewed:___________

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Classification of Soils for Engineering Purposes

(*ASTM D2487*)

Project: **Stantec**
No: **M00287-022**
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR

Sample Info.								
Boring No.								
Sample:	B3TP-1	B3TP-1	B3TP-2	B3TP-2	B3TP-3	B3TP-3		
Depth:	0-10'	10-20'	0-15'	15-25'	0-15'	15-30'		
Liquid Limit (%):	29	34	31	30	NP	29		
Plastic Limit (%):	17	15	14	15	NP	15		
Plastic Index (%):	12	19	17	15	NP	14		
Gravel (%):	3.3	0.9	0.8	1.3	2.1	0.8		
Sand (%):	69.3	23.6	32.7	30.1	73.6	20.6		
Fines (%):	27.4	75.5	66.5	68.6	24.3	78.6		
D_{60} (mm):								
D_{30} (mm):								
D_{10} (mm):								
Cu:								
Cc:								
Group Symbol:	**SC**	**CL**	**CL**	**CL**	**SM**	**CL**		
Group Name:	**Clayey SAND**	**Lean CLAY with sand**	**Sandy lean CLAY**	**Sandy lean CLAY**	**Silty SAND**	**Lean CLAY with sand**		

Entered by:___________

Reviewed:___________

Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

(ASTM D2974)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 12/31/2019
By: BF/BSS/JAB

Sample Info.	Boring No.								
	Sample:	B1TP-1	B1TP-2	B1TP-3	B2TP-1	B2TP-2	B2TP-3	B3TP-1	
	Depth:	10-15'	10-20'	0-10'	20-25'	0-15'	12-15'	10-20'	
	Test Method:	C	C	C	C	C	C	C	
	Furnace temp. (°C)	440	440	440	440	440	440	440	
Moisture	Wet soil + tare (g)	680.76	630.70	611.32	614.17	599.84	552.15	569.66	
	Dry soil + tare (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Tare (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Ash / Organic Info	Mass of crucible and oven-dried sample (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Mass of crucible and ash (g)	648.81	622.08	584.01	572.54	578.24	521.82	530.70	
	Mass of crucible (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Moisture Content, w (%) [a]		**10.2**	**2.6**	**12.1**	**17.7**	**9.4**	**18.0**	**16.7**	
Ash Content (%)		**98.5**	**99.2**	**99.2**	**96.9**	**98.9**	**97.2**	**96.8**	
Organic Matter (%)		**1.5**	**0.8**	**0.8**	**3.1**	**1.1**	**2.8**	**3.2**	

[a] Moisture contents are by proportion of oven-dried mass (geotechnical convention).

Entered by:___________

Reviewed:___________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

IGES

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Sample Description: Lean CLAY with sand, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	142.03	
Dry soil + tare (g)	139.46	
Tare (g)	123.63	
Water content, w (%)	16.2	

Initial water temperature: 19.0 °C
Date test started: 12/27/2019
Time at beginning of test: 10:22

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	19.0	1	18.4	1	18.0
2	1	19.0	1	18.4	1	18.0

Dispersive classification: **Grade 1-Nondispersive**

Entered: ________
Reviewed: ________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

IGES

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Sample Description: Sandy lean CLAY, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	178.14	
Dry soil + tare (g)	169.56	
Tare (g)	114.72	
Water content, w (%)	15.6	

Initial water temperature: 18.9 °C
Date test started: 12/27/2019
Time at beginning of test: 10:24

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	18.9	1	18.3	1	18.0
2	1	18.9	1	18.3	1	18.0

Dispersive classification: Grade 1-Nondispersive

Entered: ________
Reviewed: ________

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Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BSS

Sample: B3TP-1 & B3TP-2 & B3TP-3
Depth: 10-30'
Sample Description: Sandy lean CLAY, brown
Engineering Classification: CL
As-received water content (%): Not requested

Method: ASTM D698 B
Mold Id. Inc 3
Mold volume (ft^3): 0.0332

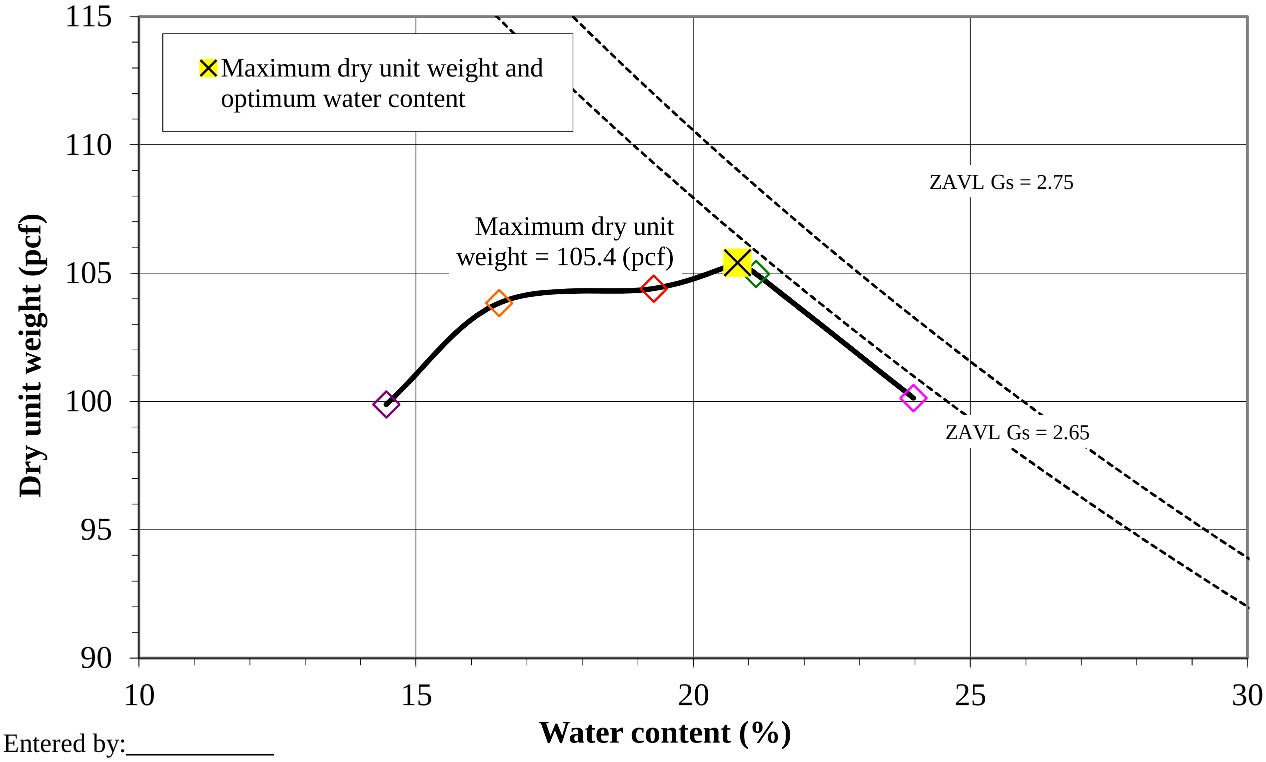
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Optimum water content (%): 20.8
Maximum dry unit weight (pcf): 105.4

Point Number	-2%	+2%	+4%	+6%	As Is			
Wt. Sample + Mold (g)	5945.2	6099.0	6138.5	6093.1	6045.3			
Wt. of Mold (g)	4221.2	4221.2	4221.2	4221.2	4221.2			
Wet Unit Wt., γ_m (pcf)	114.3	124.5	127.2	124.1	121.0			
Wet Soil + Tare (g)	971.48	1138.75	1103.65	1005.38	941.90			
Dry Soil + Tare (g)	890.21	990.52	948.61	852.61	840.16			
Tare (g)	328.25	221.93	215.02	215.35	223.51			
Water Content, w (%)	**14.5**	**19.3**	**21.1**	**24.0**	**16.5**			
Dry Unit Wt., γ_d (pcf)	**99.9**	**104.4**	**105.0**	**100.1**	**103.8**			

Comments:

Test specimen consisted of material from B3TP-1 @ 10-20', B3TP-2 @ 15-25', and B3TP-3 @ 15-30'. Due to insufficient sample quantity, points +4%, +6%, and As Is contained previously compacted material .



Entered by:___________

Reviewed:___________

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Clousres; Delta, UT
Date: 1/15/2020
By: EH

Boring No.:
Sample: B3TP-1, B3-TP-2, & B3TP-3
Depth: 10-30'
Sample Description: Sandy lean CLAY, brown
Sample Type: Laboratory Compacted
Compaction Specifications: 95 (%) Dry unit weight at 20.8 (%) w

	Initial (o)	Final (f)
Sample Height, H (in)	2.994	2.988
Sample Diameter, D (in)	2.413	2.400
Sample Length, L (cm)	7.605	7.589
Sample Area, A (cm^2)	29.503	29.195
Sample Volume, V (cm^3)	224.37	221.55
Wt. Rings + Wet Soil (g)	435.45	452.38
Wt. Rings (g)	0	0
Wet Unit Wt., γ_m (pcf)	121.2	127.5
Wet Soil + Tare (g)	292.31	578.61
Dry Soil + Tare (g)	263.64	486.29
Tare (g)	127.12	127.15
Weight of solids, Ws (g)	359.87	359.87
Water Content, w (%)	21.00	25.71
Dry Unit Wt, γ_d (pcf)	100.1	101.4
Void ratio, e, for assumed Gs	0.68	0.69
Saturation (%), for assumed Gs	83.0	100 [a]
Average K[b] (cm/sec)	**1.5E-05**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Optimum water content (%)	20.8	
Maximum dry unit weight (pcf)	105.4	
Gs	2.7	Assumed
Cell No.	2	
Station No.	3	
Permeant liquid used	De-aired tap water	
Total backpressure (psi)	35	
Effective horiz. consolidation stress (psi)	3	
Effective vert. consolidation stress (psi)	3	

	Initial (o)	Final (f)
B value	0.58	0.96
External Burette (cm^3)	14.90	23.70
Cell Pressure (psi)	0.0	38.0
Backpressure bottom (psi)	35.0	
Backpressure top (psi)	35.0	
System volume coefficient (cm^3/psi)	0.158	
System volume change (cm^3)	5.99	
Net sample volume change (cm^3)	-2.81	
Bottom burette ground length, l_b (cm)	82.25	
Top burette ground length, l_t (cm)	81.95	
Burette area, a (cm^2)	0.197	
Conversion, reading to cm head (cm/rd)	5.076	

Start Date and Time: 1/14/20 16:34

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_T	K[b] (cm/sec)
30.0	1.21 1.27	8.66 8.59	38.14	37.46	1.5E-05	23.5 23.5	0.92	1.4E-05
30.0	1.27 1.34	8.59 8.52	37.46	36.75	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.34 1.41	8.52 8.45	36.75	36.06	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.41 1.47	8.45 8.38	36.06	35.38	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.47 1.55	8.38 8.31	35.38	34.61	1.9E-05	23.5 23.5	0.92	1.7E-05

Comments:
Test specimen was remolded to 95% of ASTM D698 B (which inlcuded combined material from B3TP-1 @ 10-20', B3TP-2 @ 15-25', and B3TP-3 @ 15-30') at optimum water content. Test specimen comprised of combined material.

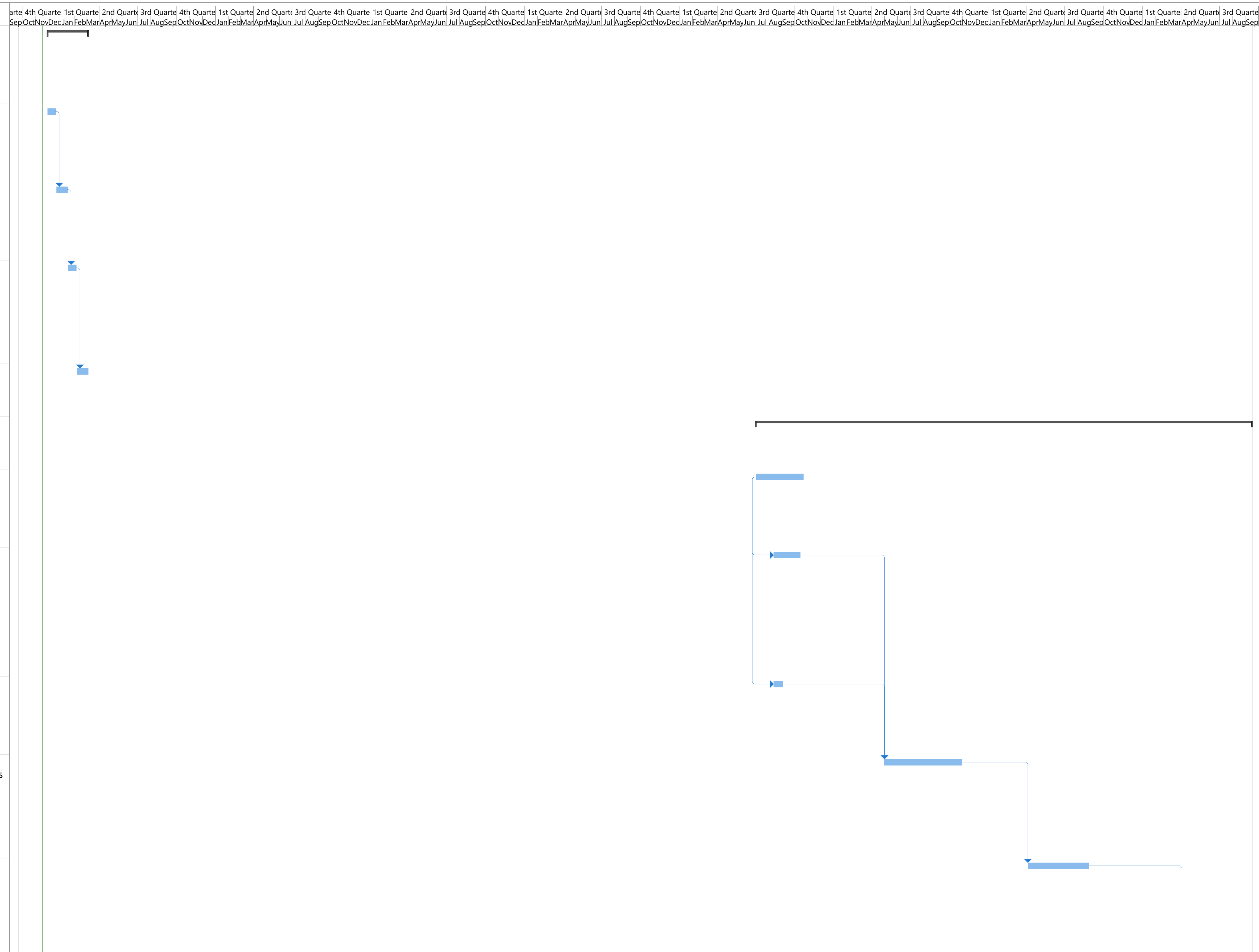
Entered by:___________
Reviewed:___________

Appendix E

Closure Schedule

Bottom Ash Basin Closure Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Closure Plan**	**70 days**	**Mon 11/30/20**	**Fri 3/5/21**	
2		Submit BB Basin Closure Plan to UDEQ	15 days	Mon 11/30/20	Fri 12/18/20	
3		UDEQ Review	20 days	Mon 12/21/20	Fri 1/15/21	2
4		Revise and Submit WW Basin Clsoure Plan per UDEQ Review	15 days	Mon 1/18/21	Fri 2/5/21	3
5		UDEQ Approval of Closure Plan	20 days	Mon 2/8/21	Fri 3/5/21	4
6		**Bottom Ash Basin Closure**	**839 days**	**Tue 7/1/25**	**Fri 9/15/28**	
7		Dewater and Decant Bottom Ash Basin Cells	80 days	Tue 7/1/25	Mon 10/20/25	
8		Cut Down Crest and Reposition Existing Bottom Liner Anchor Trench	45 days	Tue 8/12/25	Mon 10/13/25	7SS+30 days
9		Redistribute Bottom Ash Within Cells	15 days	Tue 8/12/25	Mon 9/1/25	7SS+30 days
10		General Fill Placement 1st Construction Season	131 days	Fri 5/1/26	Fri 10/30/26	8FS+5 days,9FS+5 days
11		General Fill Placement 2nd Construction Season	104 days	Mon 4/5/27	Thu 8/26/27	10FS+110 days

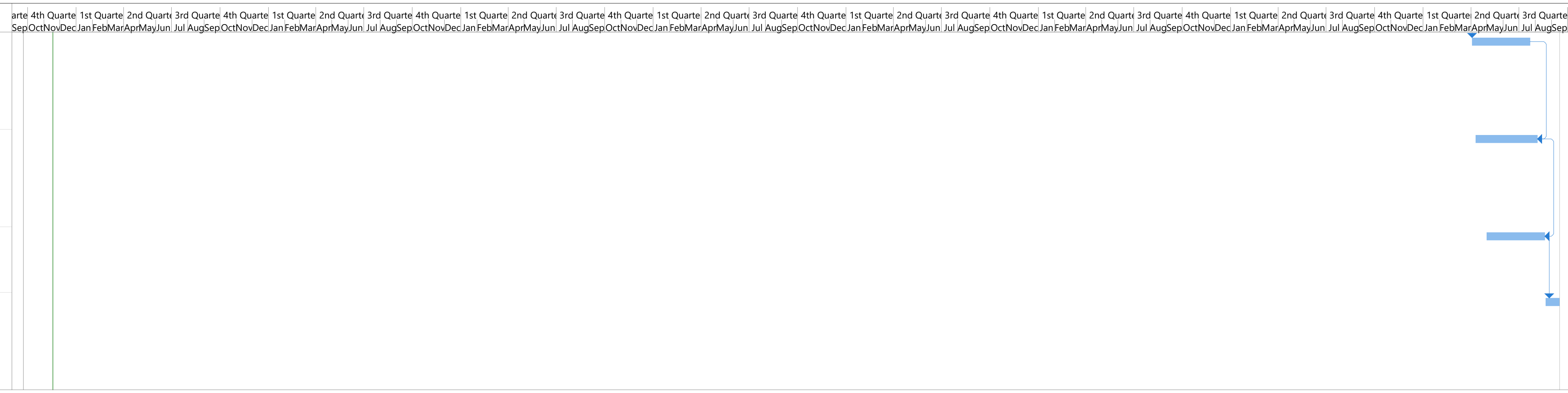


Project: WW Basin Closure Sche
Date: Wed 11/18/20

Task	Summary	Inactive Milestone	Duration-only	Start-only	External Milestone	Manual Progress
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline	
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Progress	

Bottom Ash Basin Closure Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
12		Liner Placement 3rd Construction Season	80 days	Mon 4/3/28	Fri 7/21/28	11FS+156 days
13		Liner Cover Placement Cell 1	85 days	Mon 4/10/28	Fri 8/4/28	12FF+10 days
14		Erosion Control Layer	80 days	Mon 5/1/28	Fri 8/18/28	13FF+10 days
15		Seeding of Bottom Ash Basin Cell Covers	20 days	Mon 8/21/28	Fri 9/15/28	14



Project: WW Basin Closure Sche
Date: Wed 11/18/20

Task		Summary		Inactive Milestone		Duration-only		Start-only		External Milestone		Manual Progress	
Split		Project Summary		Inactive Summary		Manual Summary Rollup		Finish-only		Deadline			
Milestone		Inactive Task		Manual Task		Manual Summary		External Tasks		Progress			

Wastewater Basin Closure Plan

Intermountain Generating Facility

November 19, 2020

Prepared for:

Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624
Attention: Mike Utley

Prepared by:
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PROFESSIONAL ENGINEER
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CHAD TOMLINSON
11/19/20
STATE OF UTAH

Stantec Project Number 233001396

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Peter Bernhard

Reviewed by ______________________________
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Mike Davis

Approved by ______________________________
(signature)

Chad Tomlinson

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Abbreviations

amsl	Above Mean Sea Level
ASTM	American Society for Testing and Materials
the Basin	Wastewater Basin
bgs	Below Ground Surface
CCR	Coal Combustion Residual
ft	Feet
HDPE	High-Density Polyethylene
IPA	Intermountain Power Agency
IPP	Intermountain Power Project
IPSC	Intermountain Power Services Corporation
L.L.	Liquid Limit
LLDPE	Linear Low-Density Polyethylene
N.P.	Non-Plastic
Plan	Closure Plan
P.I.	Plasticity Index
P.L.	Plastic Limit
TDS	Total Dissolved Solids
UAC	Utah Administrative Code Rule
UDEQ	Utah Department of Environmental Quality

1.0 INTRODUCTION

This Closure Plan (Plan) has been prepared to describe the activities which will be performed to obtain final closure of Intermountain Power Services Corporation's (IPSC's) Intermountain Power Project (IPP) Wastewater Basin (the Basin). The site is located approximately ten miles north of Delta, Utah. The Basin has been used to store coal combustion residual (CCR) material, predominantly thickener overflow, which is a slurry comprised of fine particles and water. This material is hydraulically conveyed to the Basin and stored in a saturated condition.

This Plan has been prepared for IPSC by Stantec for review and approval by the Utah State Department of Environmental Quality (UDEQ) Division of Waste Management and Radiation Control.

1.1 PURPOSE AND SCOPE

The CCR waste contained in the Basin could pose both a long-term source of fugitive dust emissions and a potential contamination source to groundwater. Therefore, the purpose of this document is to present the closure plan to eliminate fugitive dust emissions and potential groundwater impacts from the Basin in compliance with applicable regulatory requirements.

This document provides a detailed description of the activities to be performed as part of the proposed Plan – to close and cover the Basin with the CCR waste in place. These activities include:

- Removal of standing water.
- Construction of a divider berm to facilitate staged construction of the cover system over the CCR.
- Placement of pre-loading material (general fill) to promote consolidation and dewatering of the CCR.
- Dewatering of WW Basin solids.
- Construction of a sloping crown for the final cover system.
- Placement of a linear low-density polyethylene (LLDPE) liner to prevent surface water infiltration.
- Capping with 18-inches of general fill to protect LLDPE liner.
- Construction of a 6-inch layer of topsoil and seeding to promote vegetation growth.

The final cover system presented in this Plan will utilize LLDPE liner, overlain by an 18-inch liner protection layer and a 6-inch topsoil layer. The final cover system is designed to achieve the following:

- Provides a cover system that has a permeability less than or equal permeability rate of the bottom liner system of the CCR unit.
- Minimizes infiltration into the underlying CCR waste material.
- Provides an erosion protection layer consisting of a topsoil and vegetation.

This cover system has been designed to meet the Utah Administrative Code Rule (UAC) R315-319-102(d)D3) regulations for Closure and Post-Closure Care – Criteria for Conducting the Closure or Retrofit of CCR Units as discussed in Section 2.1.2.

In addition, a post closure monitoring plan has been designed to monitor the performance of the proposed Plan.

2.0 PROJECT BACKGROUND

The IPP is a 1,900-megawatt coal-fired, steam electric generation station located on an approximately 4,600-acre site in the Sevier Desert approximately 10-miles North of Delta, Utah. The IPP is owned by the Intermountain Power Agency (IPA) and operated by IPSC. The IPP began generating power in 1986 and has operated continuously since that time. The IPP delivers power to users located in Utah and Southern California. In May 2017, IPSC announced plans to cease power generation using coal and to develop new, natural-gas fueled generation at the project site by 2025. As a result of this transition, there are several CCR units at the plant that must be closed.

An Initial written closure plan (Stantec, 2016) was developed in 2016 to comply with UAC R315-319-102(b) that requires IPSC to submit a written closure plan to the Division of Waste Management and Radiation Control. The basis of the 2016 closure plan was that the existing CCR material would be left in place.

2.1 APPLICABLE REGULATORY REQUIREMENTS

2.1.1 UDEQ Requirements

A review of current UDEQ regulations/guidelines was conducted by Stantec to determine if there is a presumptive requirement for closure of the Basin following cessation of its operation. The review identified the UAC R315-319-102 titled "Closure and Post-Closure Care – Criteria for Conducting the Closure or Retrofit of CCR Units". These criteria have been in effect since September 1, 2016 (UDEQ, 2016). UAC R315-319-102 outlines the closure and post-closure process, minimum reporting, and performance criteria required for CCR impoundments. UAC R315-319-102 was used as a reference guideline during the development of the proposed Plan. Specifically, the UDEQ rule includes the following requirements, summarized in **Table 2.1**, for the closure of an inactive CCR surface impoundments:

Table 2.1 Closure Performance Standards When Leaving CCR In Place (R315-319.10(d))

Section R315-319.102(d)	Description of Requirement	Wastewater Basin Closure Design
(1)(i)	Control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere	The LLDPE liner will act to prevent infiltration of liquids into the Basin and prevent surface water from contacting the CCR.
(1)(ii)	Preclude the probability of future impoundment of water, sediment, or slurry	The cover and surrounding area will be graded to shed stormwater away from the cover. Diversion channels will be maintained

Section R315-319.102(d)	Description of Requirement	Wastewater Basin Closure Design
		upstream of the Basin to prevent run-on from precipitation.
(1)(iii)	Include measures to provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure period	Dewatering the Basin and construction of a 3% graded crown to maintain positive drainage even after nominal amounts of settlement and/or subsidence has occurred.
(1)(iv)	Minimize the need for further maintenance of the CCR unit	The cover will be vegetated with a native seed mix. Once established, the cover will require little or no long-term maintenance.
(1)(v)	Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.	The construction of a divider berm will allow construction to occur on part of the Basin while deposition of CCR slurry can occur in other parts of the Basin.
(2)(i)	Eliminate free liquids by removal or solidifying remaining wastes and waste residues	Dewatering sumps will be excavated to remove water from the CCR deposit. General fill with a 3% gradient will be placed to partially stabilize and account for any nominal amount of settlement. The use of LLDPE liner accommodates larger differential settlement then high density polyethylene (HDPE) liners; therefore, it is preferred to HDPE. .
(2)(ii)	Stabilize remaining wastes to sufficiently support final cover system	
(3)(i)(A)	The permeability of the final cover system shall be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1x10^{-5}$ cm/sec, whichever is less.	The Basin cover system incorporating a LLDPE geomembrane is equivalent to the basin bottom HDPE liner.
(3)(i)(B)	The infiltration of liquids through the closed CCR unit shall be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.	The low permeability layer consists of a LLDPE liner overlain by an 18-inches thick layer of general fill to provide liner protection and to minimize the infiltration of surface water.
(3)(i)(C)	The erosion of the final cover system shall be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.	The design of the soil cover includes a 6-inch thick erosion protection layer. The topsoil layer will be fertilized and seeded with a native seed mix to establish vegetation and protect against erosion.
(3)(i)(D)	The disruption of the integrity of the final cover system shall be minimized through a design that accommodates settling and subsidence	The Basin includes dewatering, preloading general fill and 3% gradient crown to accommodate nominal amounts of settlement. In addition, the inactive portion of the Basin will be surcharged early in the closure process to facilitate consolidation and dewatering of the CCR material.

Source: Utah Administrative Code Rule R315-319 (UDEQ, 2020)

2.1.2 Performance Standards for Surface Impoundment Covers

The UDEQ final rule for disposal of coal combustion residuals (UDEQ, 2016) requires that the permeability of the cover surface for Basin be less than or equal to the permeability of the bottom liner, or 1 x 10^{-5} cm/sec, whichever is less. The existing liner system beneath Basin is an 80-mil thickness high density polyethylene (HDPE) geomembrane on top of a prepared subsoil bedding surface. The liner system was initially constructed in 1986.

As the existing liner system beneath the Basin is an high density polyethylene (HDPE) liner it is necessary the cover system incorporates a liner system of similar permeability. An LLDPE geomembrane is incorporated in the cover system due to its elongation properties, allowing for differential settlements to occur while being resistant to impact and puncture. The LLDPE liner meets the UDEQ requirement of equal permeability of the bottom liner and is appropriate for use in the cover system.

3.0 SITE CONDITIONS

This section presents a summary of the Basin's characteristics as well as a description of the geological and hydrogeological conditions at the site. The majority of this information has been obtained from the Coal Combustion Residual Units Initial Closure Plan (Stantec, 2016), Specific Site Assessment for Coal Combustion Waste Impoundments at Intermountain Generating Station (GEI, 2011), and IPP Coal Combustion Waste Ponds – Geotechnical Stability Analysis Report (Gerhart Cole, 2013).

3.1 WASTEWATER BASIN DESCRIPTION

The Basin was commissioned in 1986. The major waste sources to the Basin is flue gas emissions control residuals. The Basin was designed and constructed with an 80 mil HDPE liner to minimize seepage from the basin.

Figure 3-1, the Basin current conditions. The Basin contains approximately 1,300,000 CY of waste, covering an area of approximately 51 acres at closure (Stantec, 2016). It is impounded by approximately 6,000 feet of perimeter berm, approximately 15 feet high, with a crest width of approximately 20 feet, and primarily constructed below native ground. The top of the berm is elevated slightly above the surrounding ground elevation to prevent surface water run-on into the Basin. The Basin bottom elevation is 4,630.0 feet (ft) above mean sea level (amsl) and the top of the basin berm is at elevation 4,650.0 ft amsl (20 ft depth). Refer to Figure 3-2 for a typical cross-section of the berm. The upstream and downstream berm side slopes are 3H:1V. The existing operating procedures requires that a minimum pond freeboard depth of three (3) ft be maintained to provide adequate storage for the 50-year, 24-hr storm event (Stantec, 2016).

Figure 3-1 – Wastewater Basin Current Conditions

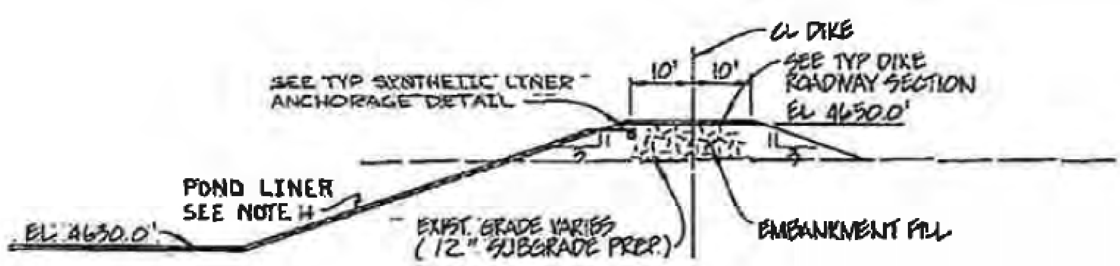

Figure 3-2 – Existing Typical Wastewater Basin Cross-Section

Based on correspondence with IPSC staff, only a portion of the Basin will need to remain active to meet the needs of the operational period of the Plant. The area to remain active is north of dividing berm on Sheet 410 of **Appendix A**. A large portion of the Basin, south of the dividing berm on Sheet 410 of **Appendix A**, is currently storing wastewater but could begin dewatering once the dividing berm has been constructed.

3.2 SITE GEOLOGY

The Wastewater Basin is near the center of the northern Sevier Desert in the Basin and Range Physiofgraphic Province (Figure 3-3). The area encompassing the Basin is located in the Sevier Lake drainage system. The ground surface within this area is relatively flat, sloping only slightly to the west. No major drainages cross the area.

The geology of the site is primarily comprised of interbedded lenses of sand and silty sand overlying lacustrine deposits. These surficial sediments are approximately 20 feet thick. The top few feet of the deposit are comprised of eolian sand, fluvial sand, and fine gravel. The underlying unit consists of fine-grained silts and clays of lacustrine origin. This unit is thickly bedded and extends to a depth of at least one hundred feet below ground surface (bgs). Both of the two major subsurface units dip slightly toward the west, paralleling the existing topographic slope.

Figure 3-3 – IPP Physiographical Location

3.3 GROUNDWATER

Groundwater levels underlying the Basin indicate a relatively flat groundwater surface roughly paralleling the ground surface. The average groundwater surface gradient is about 0.5 percent to the west-southwest. The depths of the groundwater surface in the area range between 20 to 30 ft bgs.

Groundwater levels are measured and recorded semi-annually from 37 wells at the site as part of the Plant groundwater monitoring program (Stantec, 2020). The results of the groundwater monitoring program are documented in annual groundwater monitoring reports which are submitted to UDEQ. A brief description of groundwater conditions in the vicinity of the Basin are summarized here from the *June 2020 Semi-Annual Progress Report* (Stantec, 2020).

Based on measurements collected in March 2020, groundwater elevations in the vicinity of the Basin range between 4634.61 ft amsl (up-gradient of the Basin) and 4620.88 feet amsl (down-gradient of the Basin). The groundwater flow direction at the site is predominantly from northeast to southwest (Stantec, 2020).

The monitoring wells and associated groundwater elevations in the vicinity of the Basin that were sampled as part of the June 2020 Semi-Annual Progress Report (Stantec, 2020) are presented in **Table 3.1**.

Table 3.1 Representative Wells for Wastewater Basin

Well I.D.	Location	Groundwater Elevation (ft amsl) March 2020	Depth to Groundwater (ft bgs) March 2020
WW-U-1	Northeast of Wastewater Basin	4634.61	30.42
RW-4	Northwest of Wastewater Basin	4621.28	19.80
WWC-5	Northwest of Wastewater Basin	4621.36	20.39
WWC-4	West of Wastewater Basin	4621.16	19.42
WWC-3	Southwest of Wastewater Basin	4620.88	18.02
WWC-2	South of Wastewater Basin	4621.31	23.80
WWC-1	Southeast of Wastewater Basin	4621.87	22.85
WWC-8	Southeast of Wastewater Basin	4620.69	27.11
WWC-11	South of Wastewater Basin	4619.91	22.01

Groundwater data for the Basin indicates that most wells show little seasonal water level variation.

Water quality is monitored semi-annually at the Plant. During each sampling event, groundwater samples are collected from the representative wells listed in Table 3.1. All the groundwater samples are analyzed for water quality parameters.

As reported to the UDEQ in the past, and as is the current status based upon existing information, the plume of groundwater containing total dissolved solids (TDS) concentrations in excess of background concentrations is located within the uppermost aquifer beneath the IPSC-owned lands. The TDS plume is positioned well within the physical confines of IPSC-owned property and as such poses minimal risk to potential off-site receptors. The plume monitoring and corrective actions being taken by IPSC are addressed in the Updated Corrective Action Plan (Stantec, 2016).

4.0 CLOSURE DESIGN

The following sections contain an overview of the anticipated closure activities for the Basin. Design drawings are presented in **Appendix A** and construction specification are provided in **Appendix B**. The regulations described in Section 2.1 were used as guidance for this closure design. The recommended closure has been chosen to achieve the following performance objectives:

- Provides a cover system that has a permeability less than or equal permeability rate of the bottom liner system of the CCR unit.
- Minimizes infiltration into the underlying CCR waste material.
- Provides an erosion protection layer consisting of a topsoil and vegetation.

4.1 CLOSURE STEPS

The closure of the Basin will be completed in steps as described in the following sections. The purpose of implementing the closure of the Basin in steps is to achieve the following:

- Bifurcate the Basin into operating and non-operating portions by construction of a divider berm to reduce the footprint of the Basin receiving CCR material.
- Allow for pumping of standing water on the southern (non-operating) portion of the Basin to begin to dry the CCR solids in this area.
- Allow for placement of fill on the southern (non-operating) portion of the Basin to allow for pre-consolidation of the CCR solids prior to installation of the final cover system to mitigate the potential for differential settlement of the final cover system.
- Allow for pumping of standing water on the Northern (operating) portion of the Basin to begin to dry the CCR solids in this area.
- Allow for placement of fill on the Northern (operating) portion of the Basin to allow for pre-consolidation of the CCR solids prior to installation of the final cover system to mitigate the potential for differential settlement of the final cover system.
- Install LLDPE liner cover over 3% sloped crown.
- Construction of an 18-inch soil protection layer.
- Construction of an 6-inch topsoil / vegetation layer.
- Monitor closure performance.

The closure design is presented in **Appendix A** and the major Plan activities are described in the following subsections and construction specifications are provided in **Appendix B**.

4.1.1 Step 1 Divider Berm Construction

The first step of the closure will involve constructing a divider berm to bifurcate the Basin into operating and non-operating cells. To facilitate the construction of the divider berm, the standing water, located predominantly in the western half of the Basin (refer to **Figure 3-1**) will be pumped to the existing evaporation ponds. The divider berm is shown on Sheet C-410 of **Appendix A.** The berm crest will be 100-feet wide and will extend at least 5-feet above the level of the existing Basin solids as show by Section A on Sheet C-411 of **Appendix A**.

The divider berm shall be constructed out of clay materials from Borrow Area 3 to limit migration of free water from the operating cell to the non-operating cell. The divider berm will likely be constructed starting at the east embankment, where the Basin solids are already dry at the surface and advance towards the west embankment. A 5-foot deep minimum cut-off trench will be constructed and backfilled with clay material from Borrow Area 3 (shown on Sheet C-410 & C-411 of **Appendix A**) in the western portion of the WW Basin to further preclude water from entering the non-operating cell. The floor of the clay trench shall be sloped towards the west side of the Basin to aid dewatering efforts and construction of the divider berm. Material cut for the clay trench shall be deposited in the inactive portion of the Basin. Placement specifications for the divider berm are presented in **Appendix B**.

4.1.2 Step 2 Initial Fill Placement and Dewatering of Southern Portion Basin Solids

Following pumping of the standing water and construction of the divider berm, fill placement on the southern (non-operating) portion of the Basin will begin. The initial fill placement design has been developed to facilitate achievement of the required slope and grade for placement of the LLDPE liner. Initial fill placement on the southern (non-operating portion) of the Basin well in advance of constructing the final cover system provides the following benefits:

- Allows for pre-loading and consolidation of the Basin solids to reduce the amount of settlement that is anticipated following installation of the final cover.
- Consolidation of the Basin solids will facilitate dewatering of the material.

The fill placement on the southern portion shall generally be advanced from the east side of the divider berm towards the dewatering sump / pumping area located in the southwest corner of the Basin. Advancement of fill in this manner will force the water in the Basin solids towards the dewatering sump. Water collected in the dewatering sump will be pumped, as needed, to the active (northern) portion of the Basin or to the existing evaporation ponds.

At the end of Step 2, the fill/subgrade will primarily match the required lines and grades required for installation of the final cover; however, the area encompassing the dewatering sump will remain open to accommodate continued dewatering.

As part of the initial fill placement, any Basin solids currently located outside the actual footprint of the Basin will be placed into the basin prior to that area receiving fill.

Soil from the onsite Borrow Area 3 will be used to construct the pre-load fill. Although constructed of the same material as the cover soil layer, the soil placed as part of the pre-load fill (general fill) will be compacted at a higher density to reduce the potential of settlement within the soil cover itself. The pre-load fill will be constructed to the design grades as shown in the design drawings presented in **Appendix A**. Placement specifications for the general fill are presented in **Appendix B**.

4.1.3 Step 3 Initial Fill Placement and Dewatering of Northern Portion of Basin

Step 3 will involve fill placement and dewatering of the northern portion of the Basin once discharges from the Plant to the Basin have ceased and the inlet has been capped to preclude any further discharge of CCR material. Prior to placement of fill, standing water in the northern portion of the Basin will be decanted and pumped to the existing evaporation ponds. Similar to Step 2 for the southern portion of the Basin, fill placement will commence to consolidate the solids in a manner that will promote water to be forced to the northwest corner of the Basin. The water will then be pumped from a dewatering sump to the evaporation ponds. The fill/cover subgrade placement will be constructed to the design grades as shown in the design drawings presented in **Appendix A**. Placement specifications for the general fill are presented in **Appendix B**.

4.1.4 Step 4 Final Subgrade Grading

The dewatering sumps shall remain open to support dewatering until instructed by the Engineer. Once the dewatering sumps are no longer required, these areas shall be backfilled with general fill to the designed grades shown in the design drawings presented in **Appendix A**.

The final fill/subgrade surface to receive the LLDPE will be smooth and free of all rocks, stones, sticks, roots, sharp objects, or debris of any kind. The surface will be a firm, unyielding foundation for the membrane with no sudden, sharp, or abrupt changes or break in grade. Placement specifications for the general fill and prepared liner subgrade are presented in **Appendix B**.

4.1.5 Step 5 Final Cover Construction

The cover system has been designed to minimize infiltration of precipitation control runoff, sustain native vegetation, and minimize erosion. The final cover system will require minimal maintenance. The cover system will consist of a LLDPE liner barrier overlain by a soil cover (general fill) and a vegetated erosion control layer (topsoil).

4.1.5.1 Linear Low-Density Polyethylene (LLDPE) Liner Installation

Due to the low-strength characteristics of the Basin solids, there is a potential for differential settlement following construction of the final cover. Placement of pre-load fill and dewatering of the CCR solids in advance of the cover placement will mitigate post-cover installation settlement. However, ongoing settlement of the CCR will be unpredictable and non-uniform so a LLDPE liner has been selected because it can accommodate large amounts of differential settlement without impacting performance. The LLDPE liner will be supplied by an approved manufacturer and installed in accordance with manufacturer's installation instructions and the project specifications which are provided in **Appendix B**.

4.1.5.2 Liner Protection Layer

An 18-inch thick liner protection layer will be installed over the liner. Soil used for this protective layer will be from the upper silty sand material within Borrow Area 3. Design drawings for the cover system are provided in **Appendix A**.

4.1.5.3 Erosion Protection Layer

Section 3(i)c of the UDEQ CCR Regulations states that "erosion of the final cover system shall be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material capable of sustaining native plant growth." To provide an earthen material that promotes soil moisture storage and reduce the potential for soil erosion of the cover, this material will be a blend of clay and silty sand material obtained from Borrow Area 3.

4.1.5.4 Seedbed Preparation

Seedbed preparation and seeding will take place in the fall or early spring after grading and topsoil placement is complete. Following final placement of the topsoil, it will be tilled to a depth of 6-inches by ripping, discing, or other approved method to loosen compacted soil and leave a roughened, friable surface. Slopes shall be tilled on the contour leaving furrows perpendicular to the slope where practicable to reduce erosion and improve water capture and retention within the topsoil. Soil furrows and roughness are planned to shelter the seeds from wind and reduce development of erosion features, as well as collect water needed for the seeds to germinate.

4.1.5.5 Seeding

Following tilling the seed mix will be seeded over the entire area. Seeding will occur in late Fall (mid-October or later) or in early Spring (before the first of May). Reclamation seed mixtures shall be similar to the native plant species found at the site. Seed mixture should provide forage and cover species, which are similar to pre-disturbance conditions.

Immediately following seeding, the site will be mulched with weed-free straw or hay at a rate of 2 tons/acre. The straw or hay will be crimped into the soil to secure the mulch and to reduce movement by wind. Hydromulching with a wood fiber mulch may be used as an alternative to straw or hay and applied at a rate of 1.5 tons/acre along with a tackifier to bind the mulch to the soil.

Specifications for seeding and mulching of the soil cover are presented in **Appendix B**. If an alternative seeding method is utilized, IPSC will notify UDEQ and provide a modified seeding plan for the alternative method prior to commencing seeding operations. Reclaimed borrow areas will also be re-vegetated to control runoff, reduce erosion, and blend into the surrounding topography.

4.1.5.6 Seed Mix Design

Seed mix selection will be based on a combination of plant species, characteristics, and conditions at the site. Seed species selection criteria will be based on soil texture and chemistry, precipitation, temperature and growing season, seed availability, and ease of species establishment. The following recommendations should be used in determining the proposed seed mixture:

- Native Plants are better adapted to the harsh desert climate of central Utah.
- Seed mixture should reflect the type of plants that grew prior to disturbance.
- Seed should come from a similar elevation and latitude to the site.
- Seed should be applied at a seeding rate between 14 to 28 pure live seed (PLS) pounds per acre for drill seeding (rates may be higher for broadcast seeding).

The seed mix should be comprised of a variety of native shrubs, grasses and forbs to provide habitat diversity and maximize evapotranspiration at the site.

4.1.6 Stormwater Controls

There is currently no inflow into the Basin from any upstream catchments. Stormwater controls, to prevent surface water from entering the Basin, will not be required.

4.2 BORROW SOURCE INVESTIGATOIN

The borrow source planned for the divider berm, general fill and soil cover will be obtained from an approximate 59-acre area west of the Evaporation Ponds and labeled as Borrow 3 on Sheet G-003 of **Appendix A**. Borrow material characterization was completed by soil laboratory testing methods on samples collected from excavated test pits within the borrow area. Five-gallon bucket composite samples were collected for each material type encountered in each of the 3 test pits. The associated test pit logs and laboratory testing are provided in **Appendix C** and **Appendix D**.

4.2.1 Borrow Source Sampling

Following the collection of the composite samples from the test pits, the samples were sent to Intermountain GeoEnvironmental Services, Inc. (IGES) in Salt Lake City, Utah for geotechnical and hydrological testing. The testing program is summarized in **Table 4.1**.

Table 4.1 Geotechnical and Hydrological Testing

Test	ASTM Method	Number of Samples	Comments
Organic Content	D2974	1	1 per borrow source
Atterberg Limits	D4318 a	6	2 per test pit sample
USCS Classification	D2487	6	2 per test pit sample
Particle-Size Distribution	D6913	6	2 per test pit sample
Hydrometer Analysis	D7928	6	2 per test pit sample
Crumb Test	D6572	2	2 per borrow source
Standard Proctor	D698 b	1	1 per borrow source
Hydraulic Conductivity	D5084	1	1 per borrow source

Source: IGES Laboratory Testing Results (IGES, 2020)

The test results are summarized in Table **4.2**. Complete laboratory reports for the testing are presented in **Appendix D**.

Table 4.2 Geotechnical and Hydrological Testing on Composite Samples

Soil Test	B3TP1	B3TP1	B3TP2	B3TP2	B3TP3	B3TP3	Comb. B3 TP1-3
Composite Sample Depth	0-10’	10-20’	0-15’	15-25’	0-15’	15-30’	10-30’
USCS Classification	SC	CL	CL	CL	SM	CL	CL
Standard Proctor Compaction Test (MDD lbs/ft^3)	-	-	-	-	-	-	105.4
Optimum Moisture Content (OMC%)	-	-	-	-	-	-	20.8
Particle Size Distribution %Gravel %Sand %Fines	 3.3 69.3 27.4	 0.9 23.6 75.5	 0.8 32.7 66.5	 1.3 30.1 68.6	 2.1 73.6 24.3	 0.8 20.6 78.6	-
Atterberg Limits LL[a/] (%) PL[b/] (%) PI [c/] (%)	 29 17 12	 34 15 19	 31 14 17	 30 15 15	N.P.[d/]	 29 15 14	
Organic Matter (%)		3.2					

Crumb Test[e]				Grade 1	Grade 1			
Average Hydraulic Conductivity K (cm/sec)								1.5E-05

Notes:

[a]/ LL: Liquid Limit

[b]/ PL Plastic Limit

[c]/ PI: Plasticity Index

[d]/ N.P.: Non-Plastic

[e]/ Crumb Test Results: Grade 1 – Nondispersive

5.0 POST CLOSURE OPERATION AND MAINTENANCE PLAN

This section describes activities that will be conducted as part of the post-closure process. Utah Administrative Code Rule R315-319-104 titled Closure and Post-Closure Care – Post-Closure Care Requirements (UDEQ, 2016) require that a post-closure plan be developed and implemented for a period of 30 years once closure and reclamation activities have been completed. Post-closure is the process which is used to allow a facility to stabilize to the point where it no longer presents a threat to human health or the environment. During this period, the facility will be routinely monitored to ensure that the integrity of the soil cover is not compromised by erosion and settlement and ensure that the soil cover's performance is acceptable. Therefore, this post-closure plan will provide the following:

- A plan for inspection and maintenance of the soil cover.
- A description of the proposed use of the property during the post-closure care period.

IPSC may petition for the UDEQ to terminate the post-closure period earlier if they can demonstrate that the soil cover has stabilized and is protective of groundwater.

5.1 COVER INTEGRITY MONITORING AND MAINTENANCE

Following construction of the soil cover, routine monitoring will be performed to identify the need for maintenance of the soil covers. The monitoring will include both visual inspection and surveying of the soil cover to ensure that their integrity is not being compromised. The monitoring plan, including the individual monitoring tasks, inspection locations, schedule, monitoring criteria, and possible maintenance is summarized in **Table 5.1**.

Table 5.1 Post-Closure Monitoring Summary

Monitoring Activity	Purpose	Monitoring Frequency	Monitoring Locations	Monitoring Method	Comments	Actions Items
Visual Cover Inspection	Visually inspect soil cover surface for ponding, sags, drainage interruptions, surface erosion, and vertical cracking.	Semi-Annually and Following major storm events of 1-inch or more of rainfall in 24-hrs.	Entire Basin area.	Visual	The locations of ponding, sags, drainage interruptions, surface erosion, and vertical cracking shall be noted on the inspection form.	Ponding, sags, and drainage interruptions will be repaired, regraded, and re-vegetated.
Vegetation Inspection	Inspect soil cover for vegetation establishment.	Semi-Annually	Entire basin area.	Visual	Any areas showing vegetation distress such as bare areas or significantly lower vegetative establishment compared to rest of the soil cover will be noted on the inspection form.	Bare areas will be repaired during the next seeding season.
Groundwater Monitoring	Detect potential migration of spent liquor from the Wastewater Basin.	Semi-Annually	In accordance with the approved groundwater monitoring well list for the Plant.	In accordance with the approved groundwater monitoring parameter list for the Plant	None	Record significant deviations in groundwater quality to UDEQ.

5.1.1 Visual Cover Inspection

Visual inspections of the soil cover will be performed to identify damage to or degradation of the soil cover including; the formation of rills, loss of vegetation over significant portions of the soil cover, and formation of visible animal burrows or trails over the soil cover. The visual inspections will be performed across the entire soil cover. Visual inspections of the soil cover will be performed semi-annually and following major storm events. The results of the visual inspections will be documented in site inspection reports and retained on-site for UDEQ review upon request.

5.1.2 Vegetation Monitoring

During the semi-annual soil cover monitoring, the cover vegetation will be inspected for burned areas, overall establishment, disease or pests, and noxious weed infestations. The inspections will be performed during the semi-annually visual inspection of the soil cover. Any areas showing vegetation distress such as bare areas or significantly lower vegetative establishment compared to rest of the soil cover will be clearly noted on the inspection form.

5.2 SOIL COVER MAINTENANCE

The purpose of the final cover maintenance procedures is to maintain the integrity of the soil cover over the long-term. Semi-annual visual inspections and settlement monitoring will provide identification of erosion and settlement. A site representative, designated by IPSC, will be responsible for documenting the location and extent of repairs.

All final cover repairs and/or reconstruction shall be conducted in a manner directed to maintain the integrity of the as-built final cover system. Repair of fill materials will be performed to maintain the 18-inch general fill and 6-inch erosion protection layers. The methods of repair will be performed for the following principal modes of final cover distress:

- Settlement related sags and drainage interruptions, which interfere with controlled flow and discharge of surface waters from the soil cover surface
- Surface erosion because of overflow associated with intense rains
- Local surficial slumping on slopes resulting from intense rains
- Vertical or near vertical cracking of cover soils as a result of settlement.

5.2.1 Depressions, Ponding, Drainage Interruptions and Surface Erosion

Any repairs of depressions in the final soil cover will be completed on an annual basis. If significant sags or ponding is identified during other times of the year, the IPSC representative will accurately locate the limits of the depressions. The IPSC representative will be responsible for directing fill placement in the sag area to reestablish the intended grade of the cover. The permanent repair of sags and ponding, when necessary, will be performed by adding sufficient cover soil material necessary to maintain the design slope. Cover soil will be placed in accordance with the design specifications. An IPSC representative shall inspect and certify any fill placed in the final cover layers. Repaired areas shall also be re-seeded in accordance with the design specifications.

5.3 POST-CLOSURE INSPECTION AND MAINTENANCE REPORTING

All copies of the operator’s inspection and maintenance reports will be retained on-site for UDEQ review upon request to demonstrate that the site has been inspected on a routine basis to evaluate the integrity and stability of the soil cover and stormwater diversion systems. Any repairs or maintenance performed will be discussed in detail in maintenance reports.

5.4 GROUNDWATER MONITORING

The current groundwater monitoring and corrective actions being taken by IPSC are addressed in the Updated Corrective Action Plan (Stantec, 2016) and will be continued to be followed during the post-closure phase until conditions warrant revisions to the groundwater monitoring plan.

6.0 CLOSURE SCHEDULE

Per the requirements of UAC R315-319-102(b)(1)(vi), a preliminary closure schedule has been developed for the Basin. The schedule showing key construction milestones is presented in **Appendix E**. The schedule was developed based on the stepped closure approach discussed in Section 3 and was based on the following assumptions:

- Bifurcation for the Basin and fill placement and dewatering of the southern portion of the Basin will be conduct prior to the cessation of CCR flows to the northern portion of the Basin.
- Fill placement and dewatering of the northern portion of the Basin would commence following conversion to gas and cessation of flows, which is anticipated to be July 1, 2025.
- Prior to construction of the final cover system, the schedule included 100 days to complete dewatering of the Basin.
- Construction of the final cover system will on the northern and southern portions of the Basin will occur concurrently following fill placement and dewatering the northern portion of the Basin.
- Seeding of the final cover system was fixed to only occur in the late fall to improve vegetation establishment.

Based on the schedule developed, closure activities for the Basin are anticipated to be completed by November 5, 2026.

7.0 REFERENCES

GEI, 2011. Specific Site Assessment for Coal Combustion Waste Impoundments at Intermountain Generating Station. Delta, Utah. April 2011.

Gerhart Cole, 2013. IPP Coal Combustion Waste Ponds. Geotechnical Stability Analysis Report. April 2013.

IGES, 2014. Geotechnical Laboratory Testing Results – IPSC CCR Unit Closures, Delta, UT.

Stantec, 2016. Coal Combustion Residual (CCR) Units Initial Closure Plan. Intermountain Generating Facility. Delta, Utah. October 13, 2016.

Stantec, 2020. June 2020 Semi-Annual Progress Report. Intermountain Generating Facility. Delta, Utah. June 25, 2020.

UDEQ, 2016. R315. Environmental Quality, Waste Management and Radiation Control, Waste Management. R315-319. Coal Combustion Residual Requirements., Issued September 2016.

Appendix A

IPSC CCR Wastewater Basin Closure Design

PRELIMINARY DESIGN PHASE - 10/02/2020

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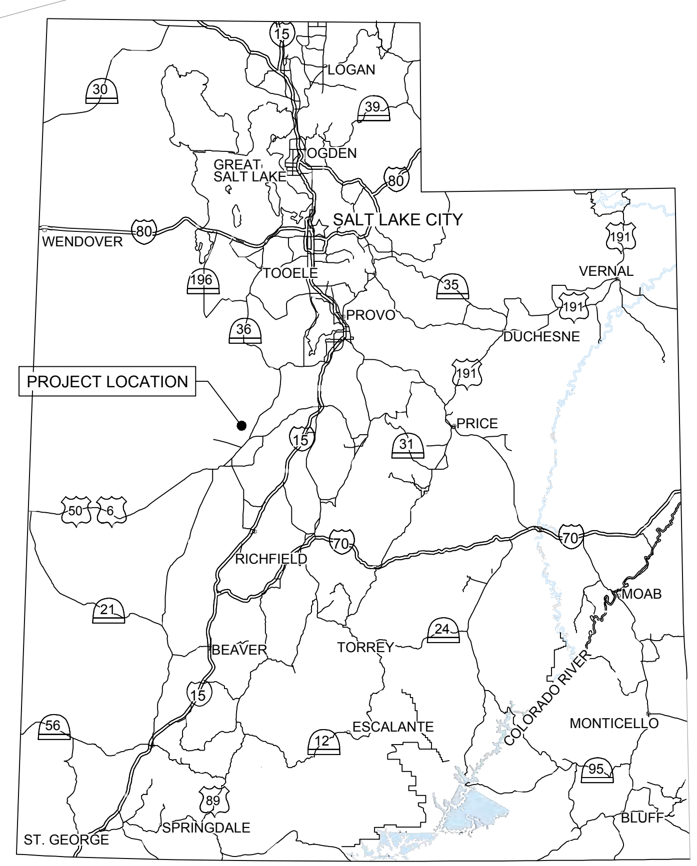
INTERMOUNTAIN POWER SERVICE CORP

Stantec

INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN

CLOSURE DESIGN SUBMITTAL - OCTOBER 2020



AREA MAP
NTS

INDEX OF DRAWINGS

DRAWING NO	DRAWING NAME
G-001	COVER SHEET AND DRAWING INDEX
G-002	GENERAL NOTES AND SYMBOLS
G-003	EXISTING SITE LAYOUT
C-400	WASTEWATER BASIN CLOSURE - EXISTING CONDITIONS
C-410	WASTEWATER BASIN CLOSURE - STEP 1 DIVIDER BERM LAYOUT
C-411	WASTEWATER BASIN CLOSURE - STEP 1 DIVIDER BERM SECTIONS
C-420	WASTEWATER BASIN CLOSURE - STEP 2 INITIAL FILL PLACEMENT AND DEWATERING OF SOUTH PORTION OF BASIN
C-421	WASTEWATER BASIN CLOSURE - STEP 2 INITIAL FILL PLACEMENT SECTIONS
C-430	WASTEWATER BASIN CLOSURE - STEP 3 INITIAL FILL PLACEMENT AND DEWATERING OF NORTH PORTION OF BASIN
C-431	WASTEWATER BASIN CLOSURE - STEP 3 INITIAL FILL PLACEMENT SECTIONS
C-440	WASTEWATER BASIN CLOSURE - STEP 4 SUBGRADE PLACEMENT
C-450	WASTEWATER BASIN CLOSURE - STEP 5 FINAL COVER DESIGN
C-451	WASTEWATER BASIN CLOSURE - STEP 5 FINAL COVER SECTIONS
C-460	WASTEWATER BASIN CLOSURE - STEP 5 FINAL COVER CONTROL POINTS
C-461	WASTEWATER BASIN CLOSURE - STEP 5 FINAL COVER CONTROL POINTS TABLE
C-470	WASTEWATER BASIN CLOSURE - BORROW SOURCE 3 - PHASE 1 EXCAVATION PLAN
C-471	WASTEWATER BASIN CLOSURE - BORROW SOURCE 3 - PHASE 1 EXCAVATION SECTIONS
C-472	WASTEWATER BASIN CLOSURE - BORROW SOURCE 3 - PHASE 1 STAGE STORAGE CURVE
C-480	WASTEWATER BASIN CLOSURE - DETAILS

DWG FILE: C:\pwwrk\dms40954\G-001.dwg PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM BY: WOOLSEY, ROGER

CIVIL GENERAL NOTES

GENERAL

1. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
2. THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL DEBRIS FROM DEMOLITION AT CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL RESTORE ALL SURVEY MONUMENTS THAT ARE DAMAGED OR DESTROYED DURING CONSTRUCTION.

UTILITIES

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES IN AND AROUND THE AREAS OF NEW CONSTRUCTION.
2. THE CONTRACTOR SHALL PROTECT ALL REMAINING EXISTING UTILITIES.
3. LOCATIONS OF UNDERGROUND AND ABOVE GROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS AND ELEVATIONS AND SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT UTILITY LINES WHETHER SHOWN OR NOT SHOWN.
4. PRIOR TO ANY EXCAVATION IN THE VICINITY OF ANY EXISTING UNDERGROUND FACILITIES, INCLUDING ALL WATER, SEWER, STORM DRAIN, GAS, PETROLIUM PRODUCTS, OR OTHER PIPELINES; ALL BURIED ELECTRIC POWER, COMMUNICATIONS, OR TELEVISION CABLES; ALL TRAFFIC SIGNAL AND STREET LIGHTING FACILITIES; AND ALL ROADWAY, STATE HIGHWAY, AND RAILROAD RIGHTS-OF-WAY, THE CONTRACTOR SHALL NOTIFY THE RESPECTIVE AUTHORITIES REPRESENTING THE OWNERS OR AGENCIES RESPONSIBLE FOR SUCH FACILITIES NOT LESS THAN 3 DAYS NOR MORE THAN 7 DAYS PRIOR TO EXCAVATION SO THAT A REPRESENTATIVE OF SAID OWNERS OR AGENCIES CAN BE PRESENT DURING SUCH WORK IF THEY SO DESIRE. IN THE CASE OF THE UNDERGROUND UTILITY SERVICE ALERT CENTER, THIS NOTICE WILL GIVE THEM TIME TO MARK THE LOCATION OF THE UTILITIES. THE CONTRACTOR SHALL ALSO NOTIFY THE REGIONAL OR LOCAL UNDERGROUND SERVICE ALERT COMPANY AT LEAST 3 DAYS, BUT NO MORE THAN 7 DAYS, PRIOR TO SUCH EXCAVATION.

EROSION CONTROL

1. THE CONTRACTOR SHALL SUBMIT AN EROSION CONTROL PLAN FOR WORK DURING THE CONSTRUCTION, SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER PRIOR TO THE START OF CONSTRUCTION.
   a. ALL SLOPES SHALL BE PROTECTED FROM EROSION DURING ROUGH GRADING OPERATIONS AND THEREAFTER, UNTIL INSTALLATION OF FINAL GROUNDCOVER.
   b. ALL SLOPE PROTECTION SWALES SHALL BE CONSTRUCTED AT THE SAME TIME AS BANKS ARE GRADED.
   c. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF EROSION CONTROL MEASURES CONTAINED WITHIN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL ALSO PROVIDE ANY ADDITIONAL EROSION CONTROL MEASURES (E.G. HYDROSEEDING, MULCHING OF STRAW, SAND BAGGING, DIVERSION DITCHES, ETC.) DICTATED BY FIELD CONDITIONS TO PREVENT EROSION OR THE INTRODUCTION OF DIRT, MUD, OR DEBRIS INTO EXISTING WATERWAYS, OR ONTO ADJACENT PROPERTIES DURING ANY PHASE OF CONSTRUCTION OPERATIONS.

CIVIL GENERAL NOTES - CONTINUED

SURVEY AND CONTROL

1. TOPOGRAPHY AND AERIAL IMAGERY BASED ON A NOVEMBER 2019 OLYMPUS AERIAL SURVEYS INC. SURVEY.
2. SURVEY IN LOCAL PLANT COORDINATE SYSTEM AND LOCAL DATUM IN INTERNATIONAL FEET.

PERMITTING

OWNER WILL BE RESPONSIBLE FOR OBTAINING PERMITS FROM THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY.

GENERAL CIVIL SYMBOLS

Symbol	Description
4600	MAJOR CONTOURS
	MINOR CONTOURS
4600	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
P/L	PROPERTY LINE
R/W	RIGHT-OF-WAY LINE
	EASEMENT LINE
TEMP ESMT	TEMPORARY EASEMENT LINE
	TRAIL OR DIRT ROAD
	FLOW LINE
	RAILROAD
	GUARDRAIL (PERMANENT)
	GUARDRAIL (REMOVABLE)
	VEGETATION
	WELL
	NEW
	EXISTING
	CENTERLINE
3:1	BERM SLOPE (HORZ TO VERT)

GEOTECHNICAL SYMBOLS

Symbol	Description
B-X	SOIL BORING LOCATION
	TEST PIT LOCATION
XX	OBSERVATION HOLE
MW	MONITORING WELL

STRUCTURES

Symbol	Description
	SITE OR RETAINING WALL
x x	FENCE (CHAINLINK)
	FENCE (WOOD)
	STRUCTURE
	STRUCTURE (BELOW GRADE)
	CONVEYOR SYSTEM

CONTROL SYMBOLS

Symbol	Description
BM-XX	BENCH MARK
###	SITE COORDINATE NUMBER
N XXXXXXX E XXXXXXX	SITE COORDINATES
EL XXXX.XX	MONUMENT
	HORZ AND VERT CONTROL POINT
XXX.XX	FINISHED ELEVATION
(XXX.XX)	EXISTING ELEVATION

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrkdir\dms40954\G-002.dwg

REV 050215

REV	DATE	BY	DESCRIPTION
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A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE: NTS

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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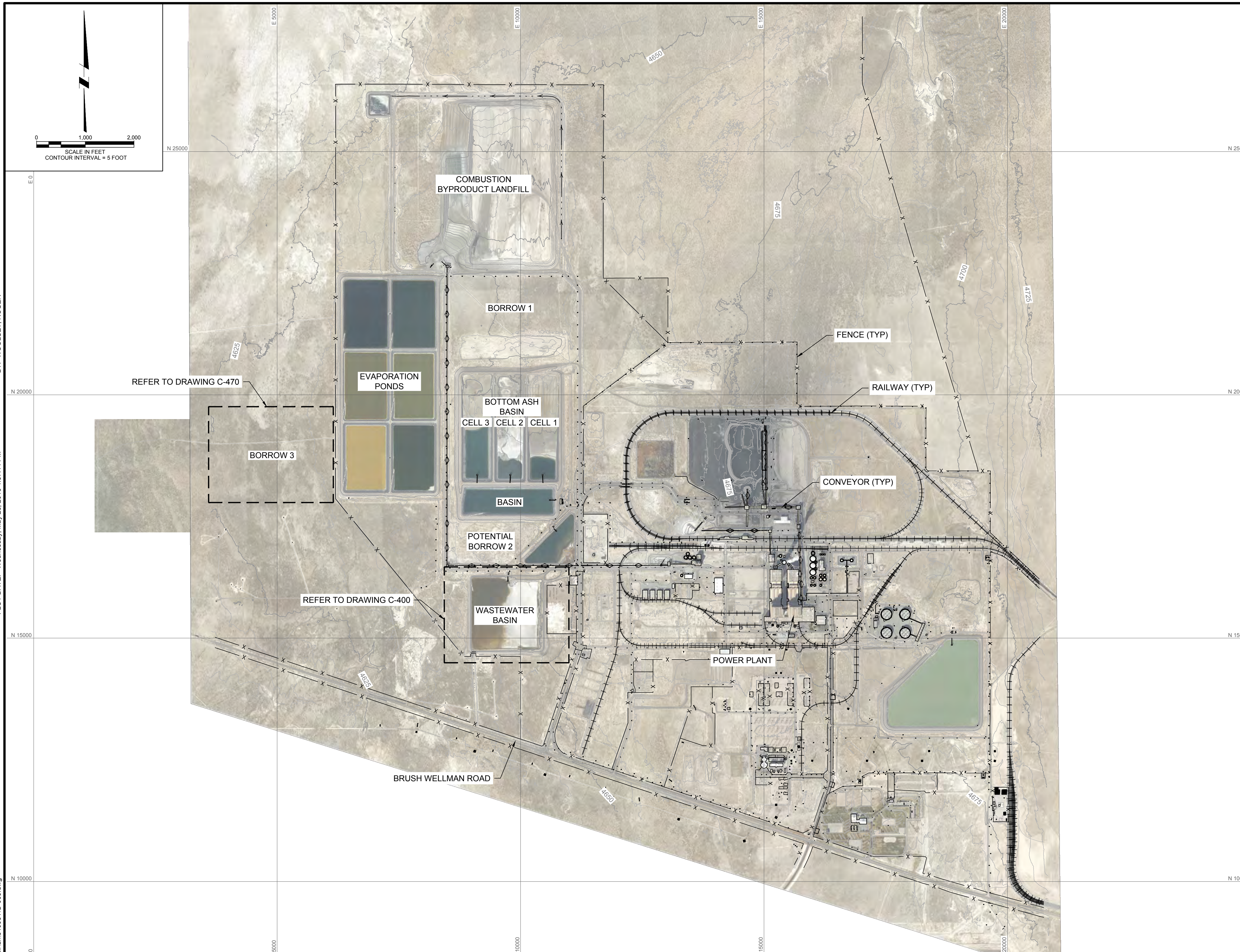
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
GENERAL
WASTEWATER BASIN CLOSURE
GENERAL NOTES AND SYMBOLS

SHEET G-002

Job# 233001396



KEY PLAN

LEGEND

- EXISTING CONTOURS
- EXISTING RAILWAY
- CONVEYOR SYSTEM
- FENCE
- POWER POLE

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrkdir\dms40954\G-003.dwg

REV	DATE	BY	DESCRIPTION
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A	09/11/2020	CF	ISSUED FOR INTERNAL REVIEW

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CHECKED C. TOMLINSON

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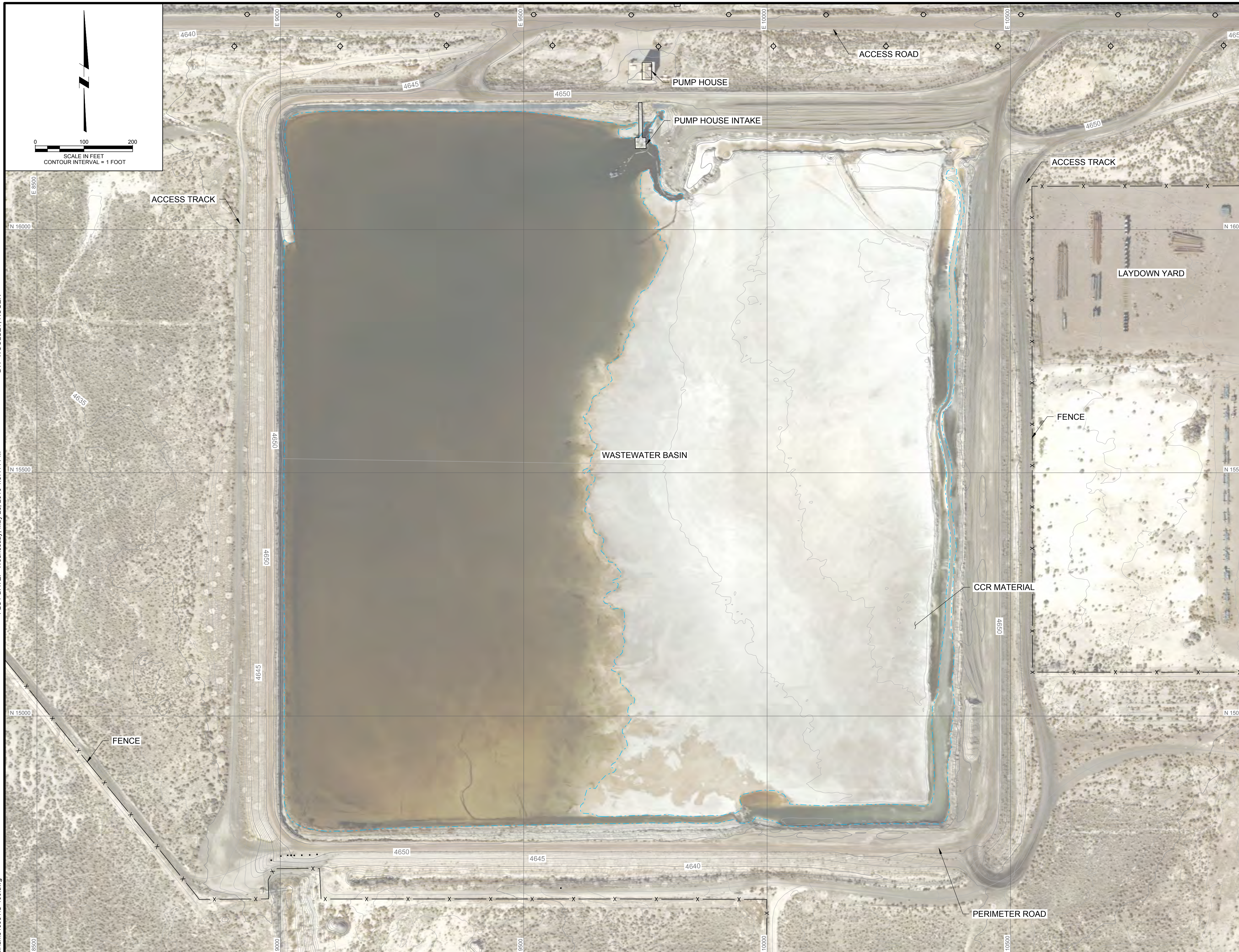
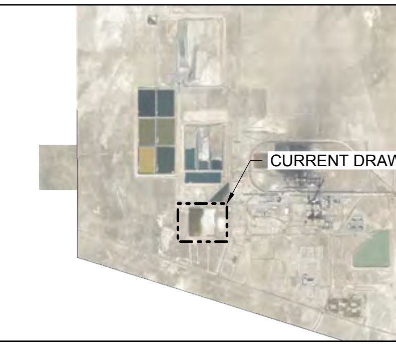
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
EXISTING SITE LAYOUT

SHEET G-003

Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
— x —	FENCE
- · - · -	WATER LEVEL
○	POWER POLE

GENERAL SHEET NOTES

1. CONDITIONS OF WASTE WATER BASIN BASED ON SURVEY COMPLETED ON NOVEMBER 2019. ACTUAL EXTENT OF BASIN SOLIDS MAY VARY AT TIME OF CLOSURE.
2. ELEVATIONS OF SOLIDS WITHIN INUNDATED PORTION OF WASTE WATER BASIN ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ELEVATION OF SOLIDS AND NOTIFY ANY DISCREPANCIES BETWEEN ACTUAL AND DESIGN ELEVATIONS PRIOR TO COMMENCING WORK.
3. PUMP HOUSE TO REMAIN OPERATIONAL AND CONTRACTOR SHALL PLAN THE SEQUENCING OF WORK WITH THE OWNER TO ALLOW FOR THIS OPERATION AND MAINTENANCE OF THE "ACTIVE" PORTION OF THE BASIN.

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
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REV	DATE	BY	DESCRIPTION
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A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

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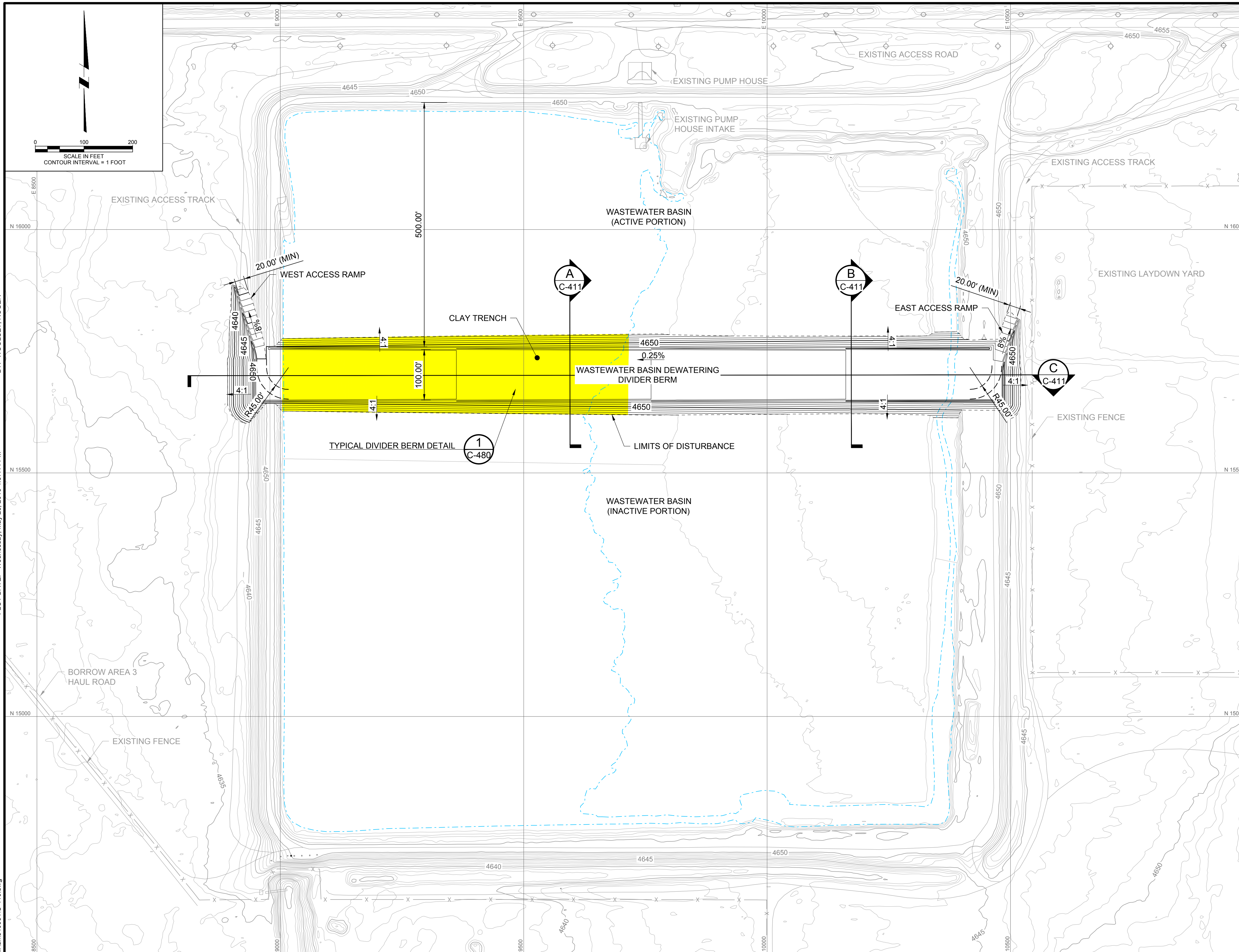
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
EXISTING CONDITIONS

SHEET C-400

Job# 233001396



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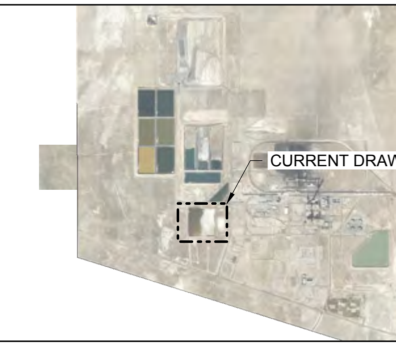

LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
	LIMITS OF DISTURBANCE
x	EXISTING FENCE
	EXISTING WATER LEVEL
○	EXISTING POWER POLE
	CLAY TRENCH

GENERAL SHEET NOTES

1. DIVIDER BERM CONSTRUCTED BY OTHERS.
2. SOUTHERN PORTION OF WASTEWATER BASIN WILL BE DECOMMISSIONED AND DEWATERED FIRST.
3. MATERIAL CUT FOR CLAY TRENCH SHALL BE DEPOSITED IN INACTIVE PORTION OF POND.
4. CLAY FOR DIVIDING BERM SHALL BE OBTAINED FROM BORROW SOURCE 3.
5. AREA ADJACENT TO DIVIDER BERM SHALL BE DEWATERED SUFFICIENTLY TO CONSTRUCT CLAY TRENCH WHERE NOTED.

QUANTITY TABLE

DESCRIPTION	CUT (CY)	FILL (CY)
CLAY TRENCH	27,410	-
CLAY DIVIDING BERM	-	73,660

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
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REV	DATE	BY	DESCRIPTION
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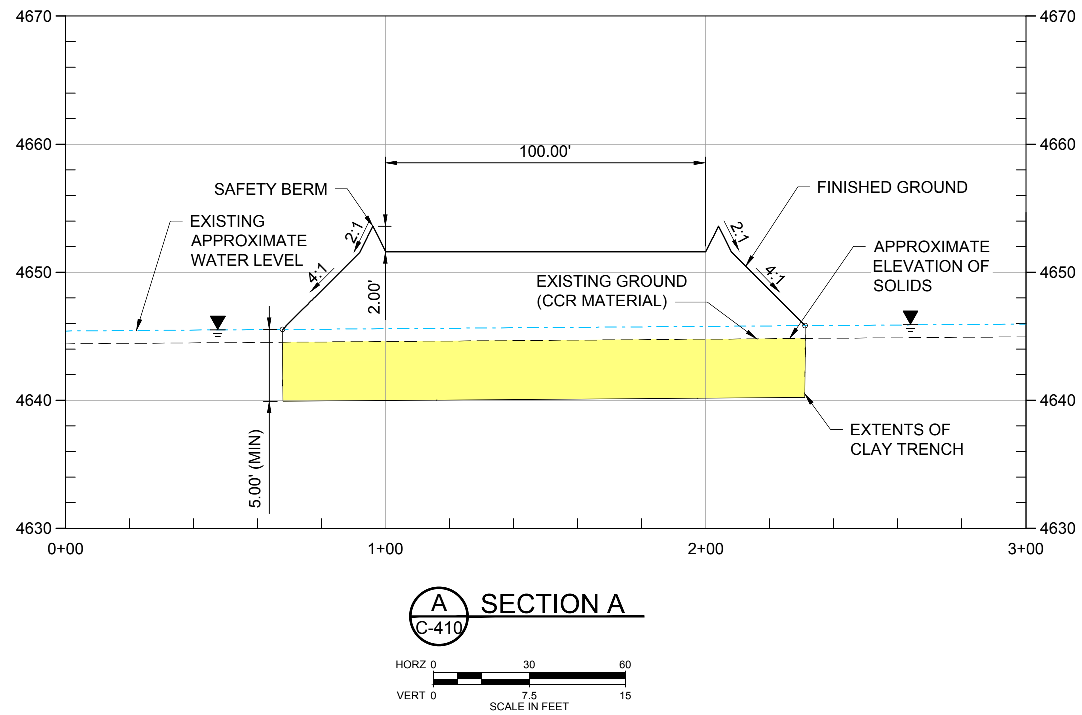
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 1 DIVIDER BERM LAYOUT

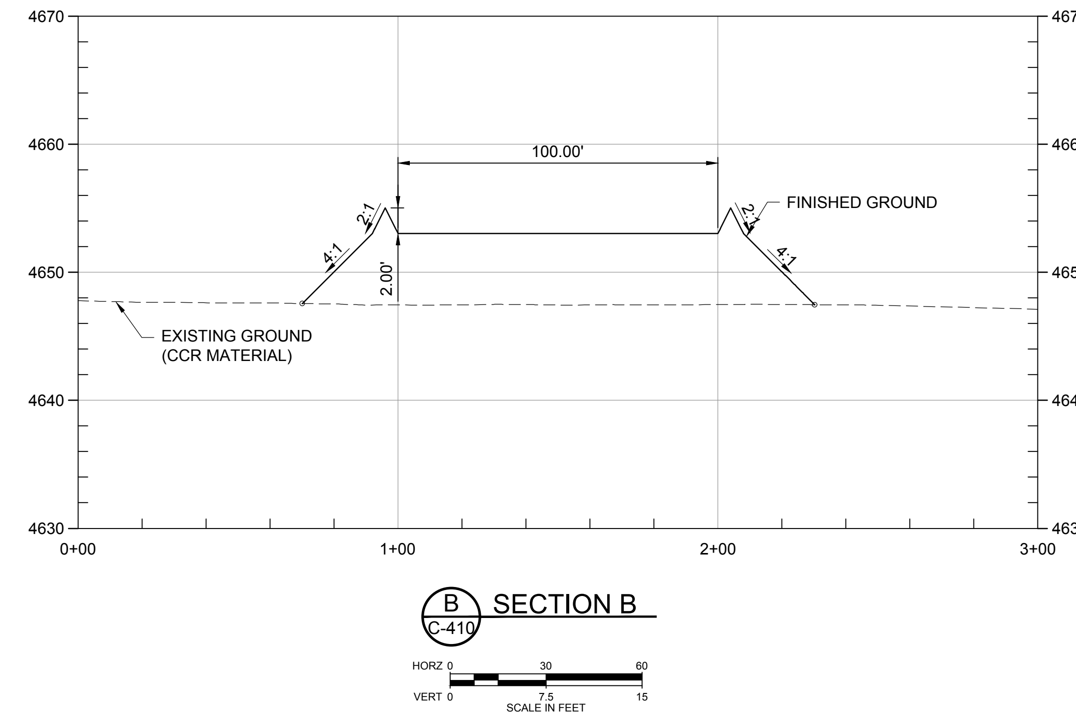
SHEET C-410
Job# 233001396

GENERAL SHEET NOTES

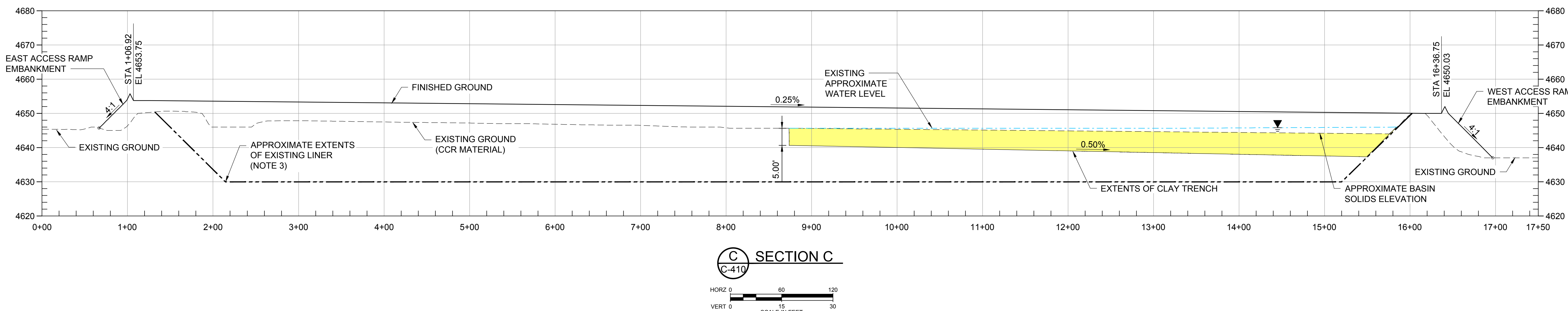
1. FLOOR OF CLAY TRENCH TO BE SLOPED TOWARDS THE WEST TO FACILITATE CONSTRUCTION.
2. WATER PUMPED DURING DEWATERING SHALL BE PUMPED TO OPERATING PORTION OF WASTEWATER BASIN.
3. CONTRACTOR SHALL ENSURE PROTECTION OF EXISTING LINER WHEN EXCAVATING BASIN SOLIDS NEAR EMBANKMENT.



A SECTION A C-410



B SECTION B C-410



C SECTION C C-410

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrkdir\dms40954\C-411.dwg

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE: 1"=100'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/02/2020

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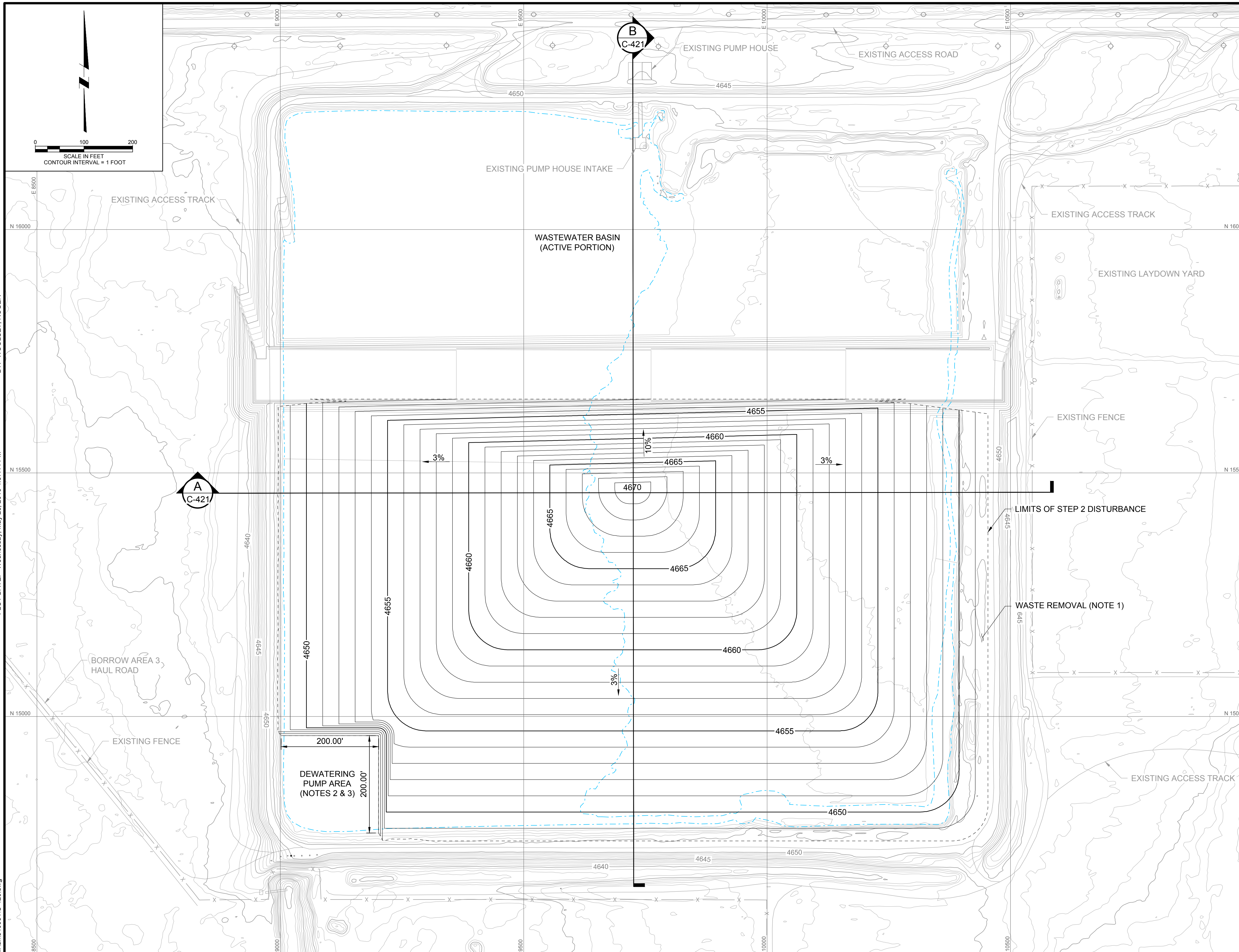
INTERMOUNTAIN POWER SERVICE CORP

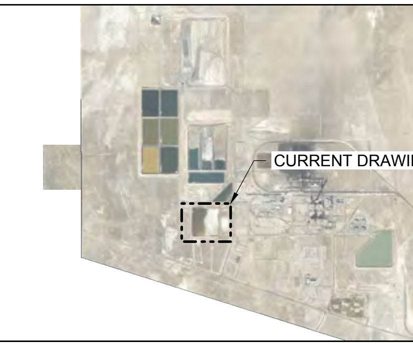
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 1 DIVIDING BERM SECTIONS

SHEET C-411

Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
	LIMITS OF DISTURBANCE
	EXISTING WATER LEVEL
	EXISTING POWER POLE
x	EXISTING FENCE

GENERAL SHEET NOTES

1. WASTE SHALL BE REMOVED AROUND EXISTING EMBANKMENT (BY OTHERS) TO FACILITATE COVER SYSTEM CONSTRUCTION.
2. TEMPORARY SUCTION PUMP AND DISCHARGE LINES SHALL BE PROVIDED BY CONTRACTOR.
3. PUMPED WATER SHALL BE ROUTED TO THE EVAPORATION POND.
4. FILL QUANTITIES ARE BASED ON THE APPROXIMATE TOP OF WASTEWATER BASIN SOLIDS OF 4645 FT AMSL AND REPRESENT IN PLACE QUANTITIES.
5. DEWATERING AREA TO REMAIN OPEN TO SUPPORT DEWATERING UNTIL INSTRUCTED BY ENGINEER.

QUANTITY TABLE

DESCRIPTION	GENERAL FILL (CY)
STEP 2	451,650

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

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DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

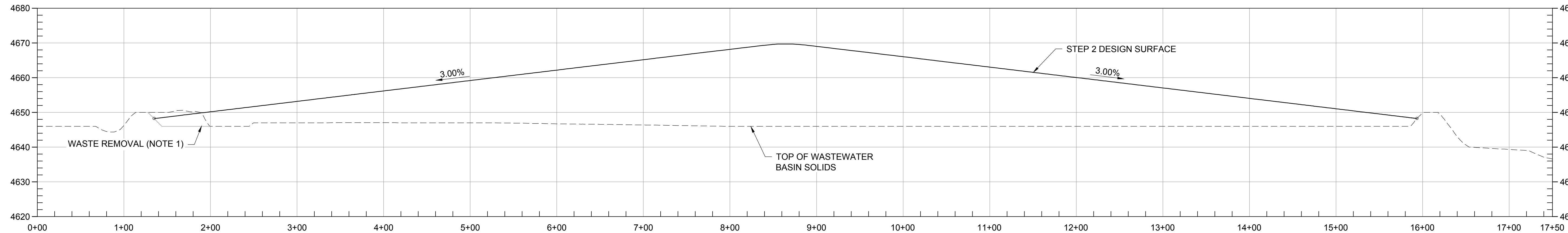
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 2 INITIAL FILL PLACEMENT
AND DEWATERING SOUTH PORTION

SHEET C-420

Job# 233001396

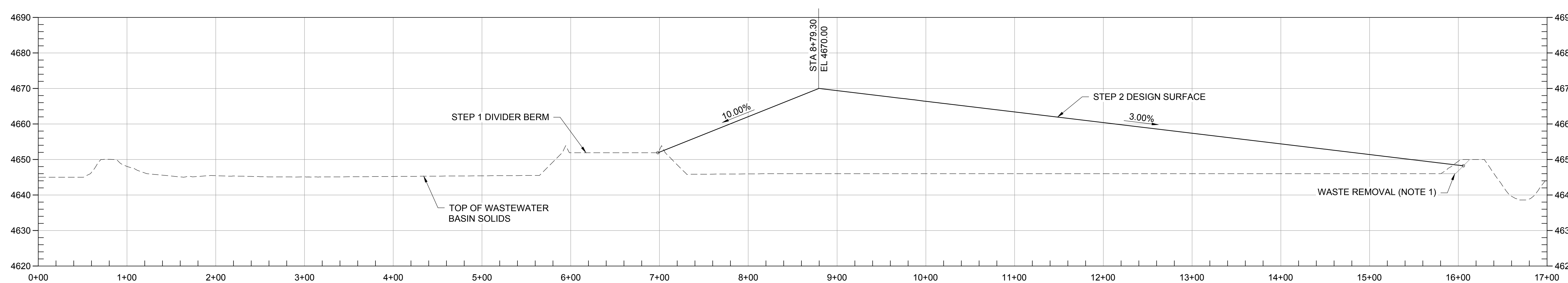
GENERAL SHEET NOTES

1. WASTE SHALL BE REMOVED AROUND EXISTING EMBANKMENT (BY OTHERS) TO FACILITATE COVER SYSTEM CONSTRUCTION.



A C-420 SECTION A

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET



B C-420 SECTION B

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40954\C-421.dwg

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

WARNING
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DRAWN C. FOWLER
CHECKED C. TOMLINSON

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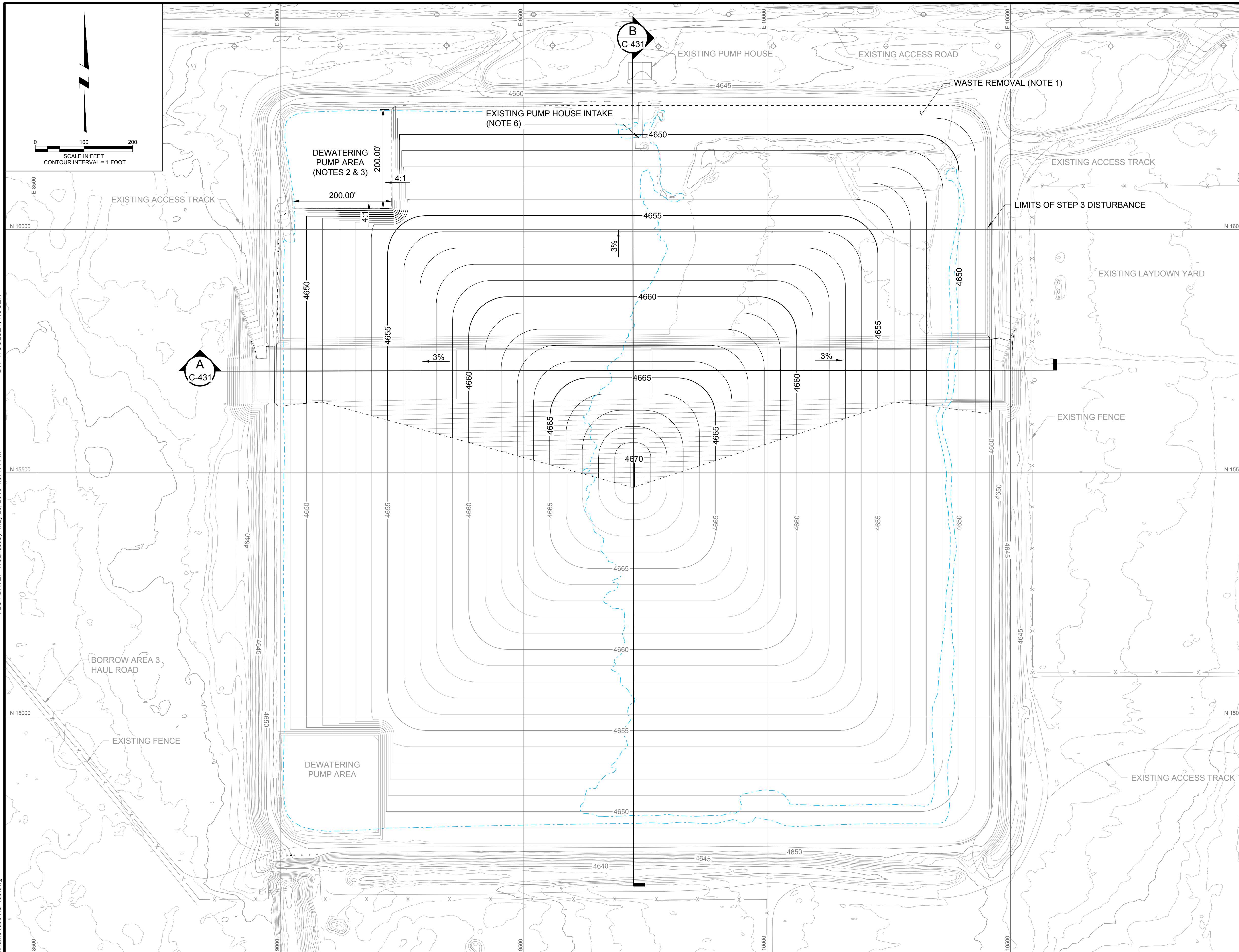
INTERMOUNTAIN POWER SERVICE CORP

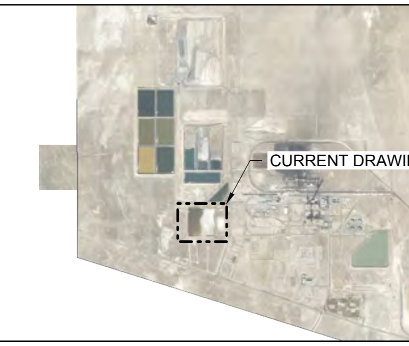
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 2 INITIAL FILL PLACEMENT SECTIONS

SHEET C-421

Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
	LIMITS OF DISTURBANCE
	EXISTING WATER LEVEL
	EXISTING POWER POLE
	EXISTING FENCE

GENERAL SHEET NOTES

1. WASTE SHALL BE REMOVED AROUND EXISTING EMBANKMENT (BY OTHERS) TO FACILITATE COVER SYSTEM CONSTRUCTION.
2. TEMPORARY SUCTION PUMP AND DISCHARGE LINES SHALL BE PROVIDED BY CONTRACTOR.
3. PUMPED WATER SHALL BE ROUTED TO THE EVAPORATION POND.
4. FILL QUANTITIES ARE BASED ON THE APPROXIMATE TOP OF WASTEWATER BASIN SOLIDS OF 4645 FT AMSL AND REPRESENT IN PLACE QUANTITIES.
5. DEWATERING AREA TO REMAIN OPEN TO SUPPORT DEWATERING UNTIL INSTRUCTED BY ENGINEER.
6. EXISTING PUMP HOUSE INTAKE SHALL BE REMOVED TO THE EXTENT REQUIRED TO SUPPORT FILL PLACEMENT.

QUANTITY TABLE

DESCRIPTION	GENERAL FILL (CY)
STEP 3	254,565

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

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DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

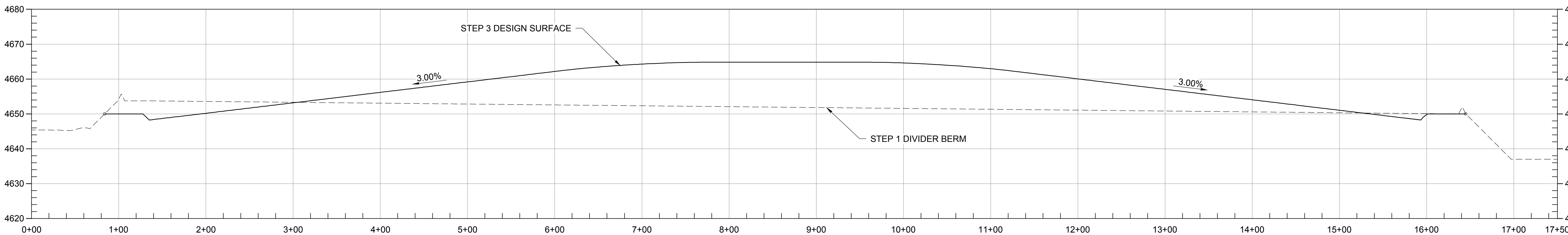
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 3 INITIAL FILL PLACEMENT
AND DEWATERING NORTH PORTION

SHEET C-430

Job# 233001396

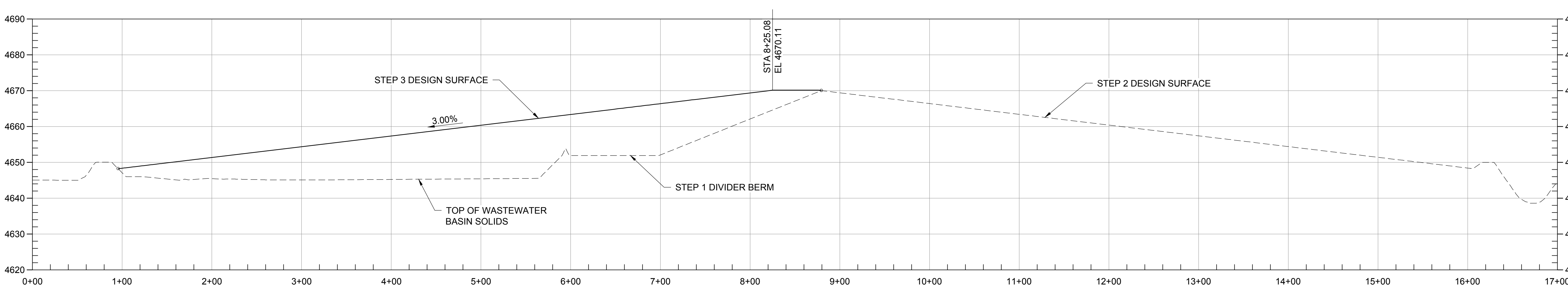
BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrkdir\dms40954\C-430.dwg

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40954\C-431.dwg



A C-430 SECTION A

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET



B C-430 SECTION B

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

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DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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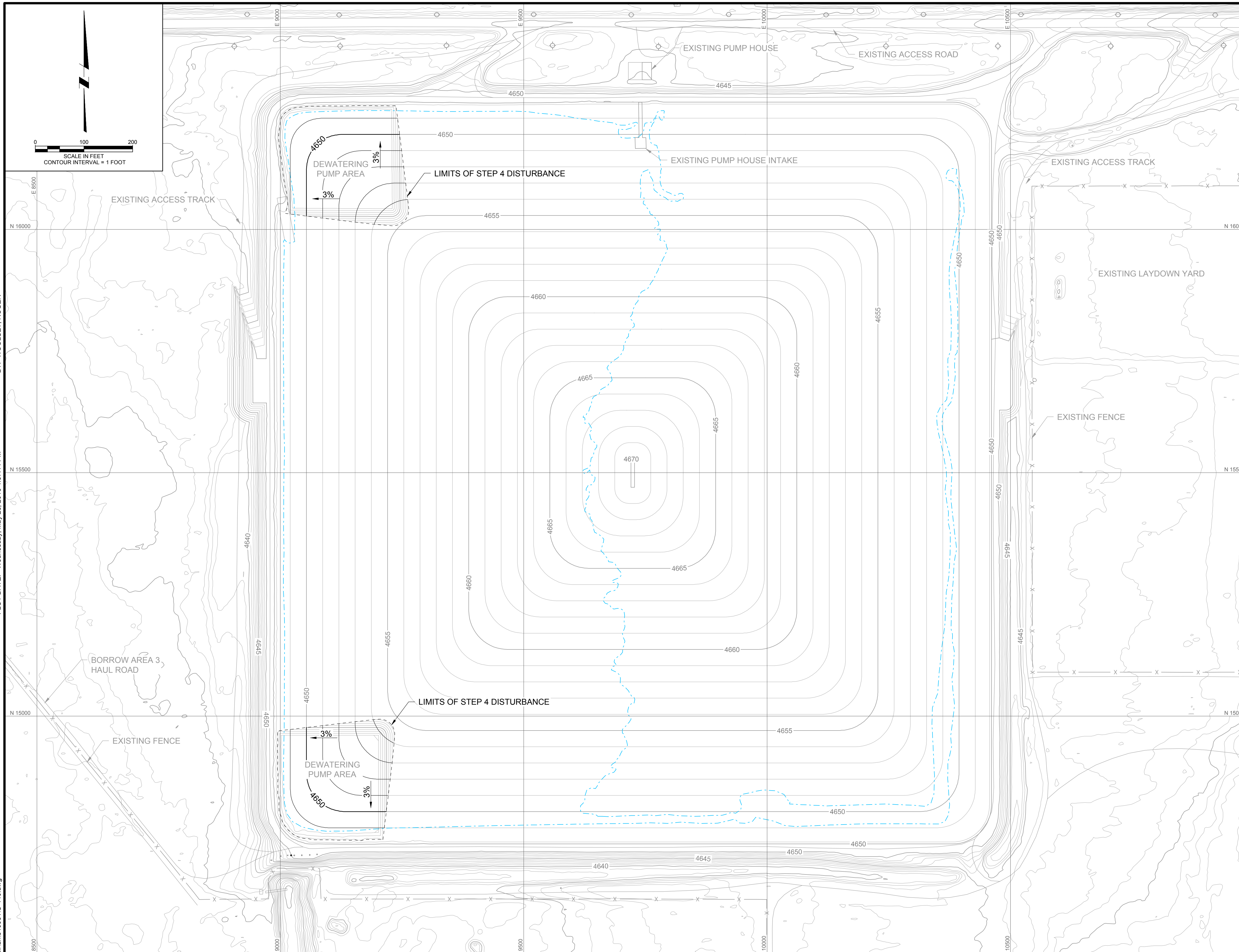
INTERMOUNTAIN POWER SERVICE CORP

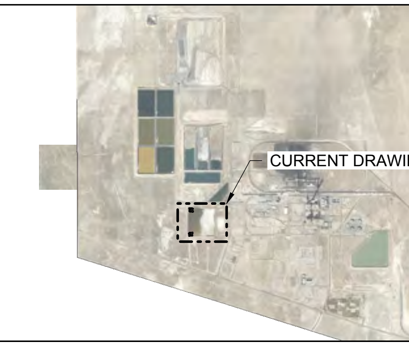
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 3 FILL PLACEMENT SECTIONS

SHEET C-431

Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
- - - -	LIMITS OF DISTURBANCE
- · - ·	EXISTING WATER LEVEL
○	EXISTING POWER POLE
— x —	EXISTING FENCE

GENERAL SHEET NOTES

1. FILL QUANTITIES ARE BASED ON THE APPROXIMATE TOP OF WASTEWATER BASIN SOLIDS OF 4645 FT AMSL AND REPRESENT IN PLACE QUANTITIES.

QUANTITY TABLE

DESCRIPTION	GENERAL FILL (CY)
STEP 4	16,560

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE: 1"=100'

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

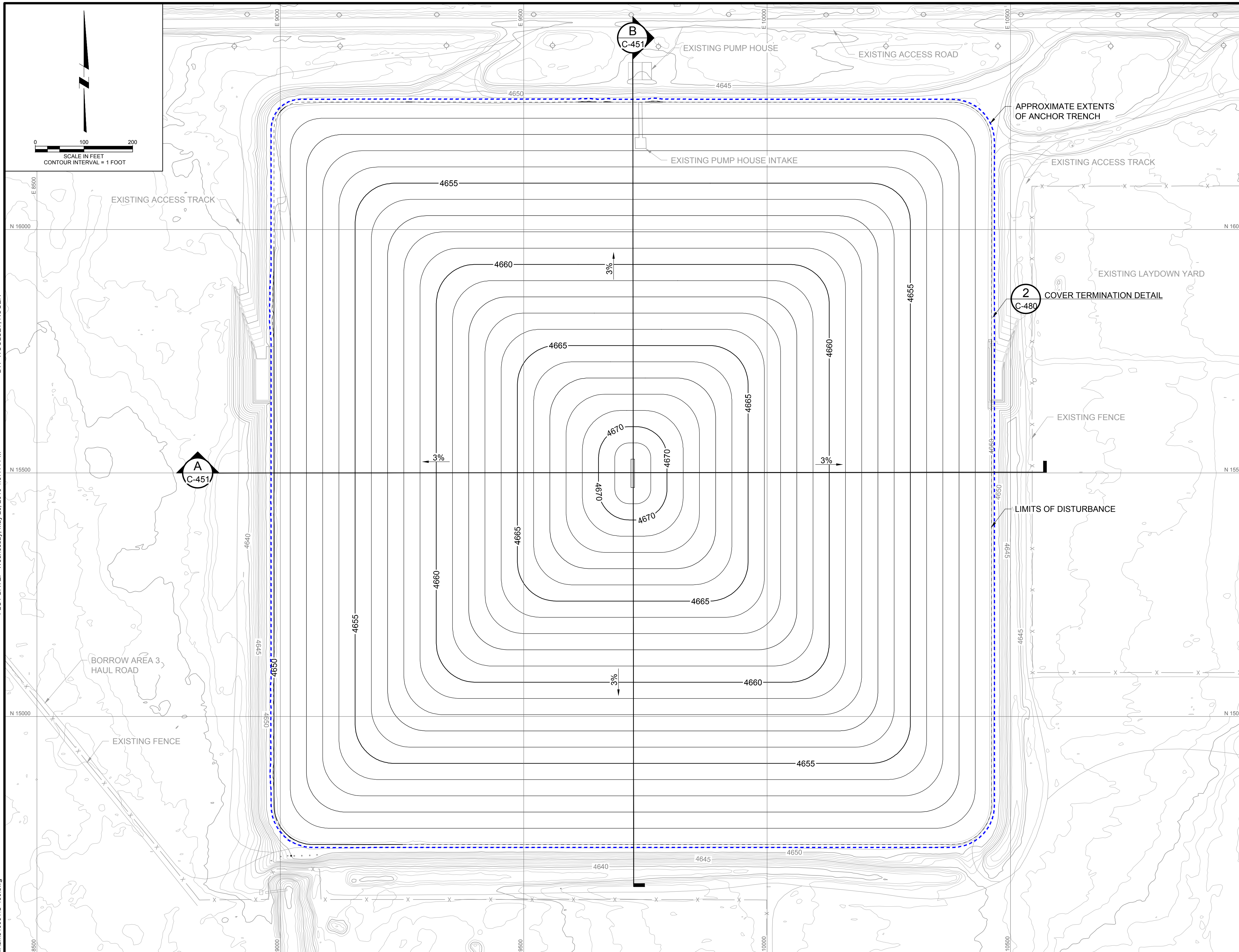
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 4 SUBGRADE PLACEMENT

SHEET C-440

Job# 233001396

BY: WOOLSEY, ROGER PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40954\C-440.dwg

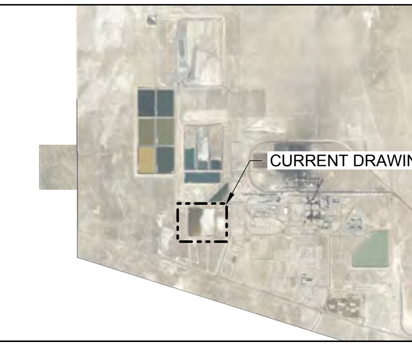


BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40954\C-450.dwg

KEY PLAN



LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
	LIMITS OF DISTURBANCE
	APPROXIMATE EXTENTS OF ANCHOR TRENCH
	EXISTING WATER LEVEL
	EXISTING POWER POLE
	EXISTING FENCE

GENERAL SHEET NOTES

1. FILL QUANTITIES ARE BASED ON THE APPROXIMATE TOP OF WASTEWATER BASIN SOLIDS OF 4645 FT AMSL AND REPRESENT IN PLACE QUANTITIES.
2. REFER TO SHEET C-480 FOR TYPICAL SOIL COVER DETAIL.

QUANTITY TABLE

DESCRIPTION	18" GENERAL FILL (CY)	6" TOPSOIL (CY)	LINER (SF)	ANCHOR TRENCH (FT)
STEP 4 AND 5	130,555	41,385	2,243,930	5,912

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

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CHECKED C. TOMLINSON

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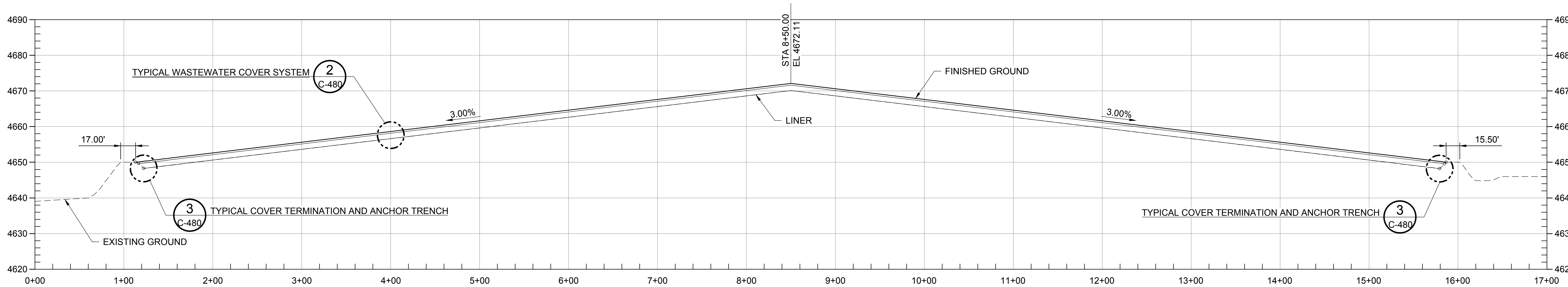
INTERMOUNTAIN POWER SERVICE CORP

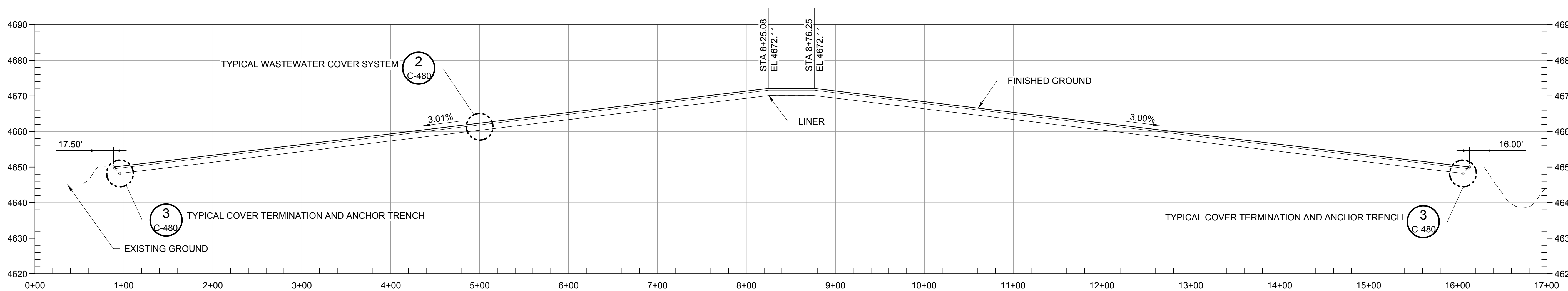
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 5 FINAL COVER DESIGN

SHEET C-450

Job# 233001396



A
C-450
SECTION A



B
C-450
SECTION B

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40954\C-451.dwg

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

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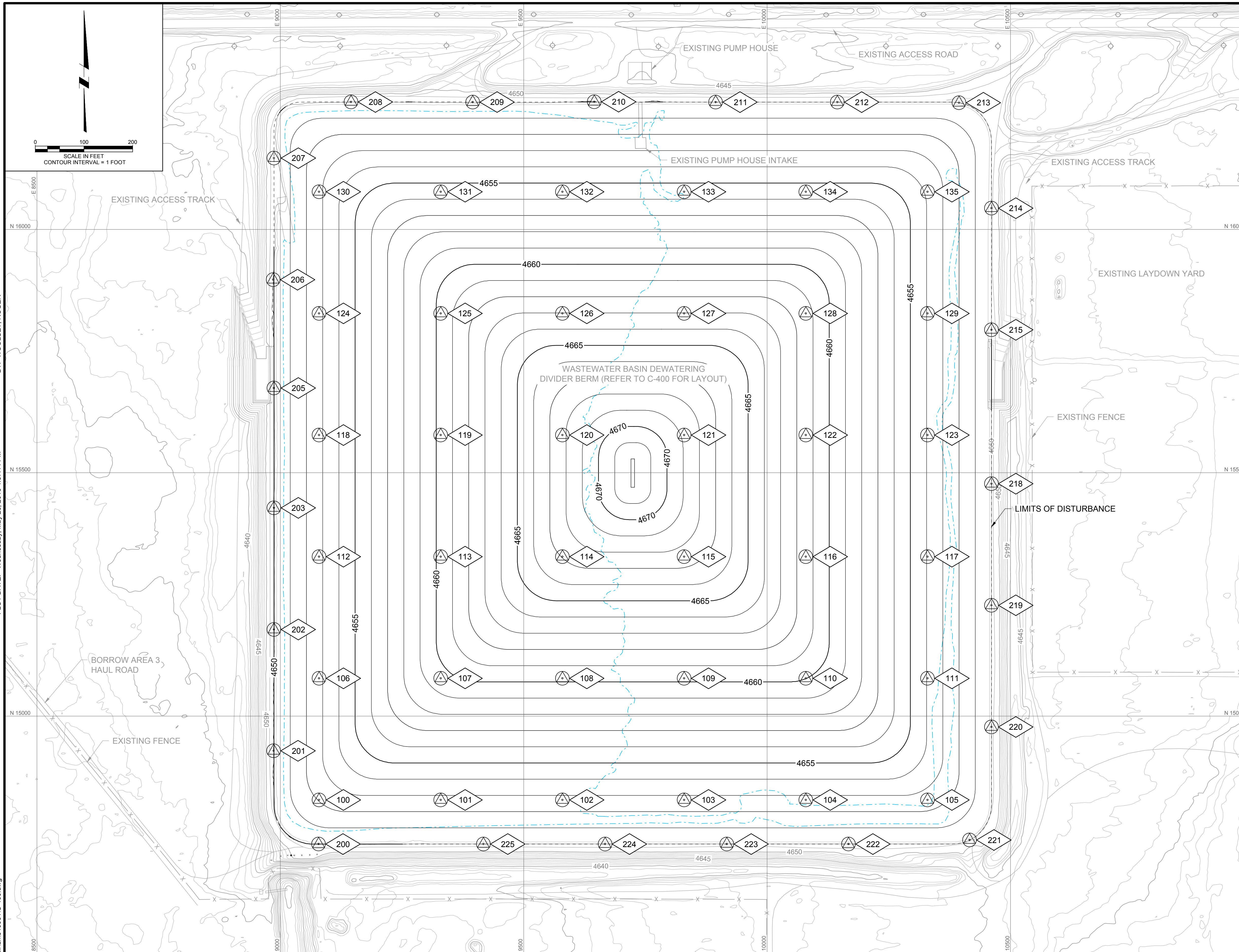
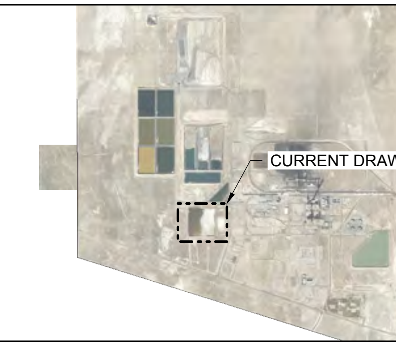
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 5 FINAL COVER SECTIONS

SHEET C-451
Job# 233001396



KEY PLAN



LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
- - - -	LIMITS OF DISTURBANCE
- · - ·	EXISTING WATER LEVEL
○	EXISTING POWER POLE
—x—	EXISTING FENCE

GENERAL SHEET NOTES

1. REFER TO SHEET C-461 FOR CONTROL POINT TABLE.
2. CONTROL POINT LOCATIONS ARE PROVIDED FOR INFORMATION ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING UP CONTROL POINTS SUFFICIENT TO MEET THE DESIGN LINES AND GRADES.

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40954\C-460.dwg

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE: 1"=100'

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 5 FINAL COVER CONTROL POINTS

SHEET C-460

Job# 233001396

GENERAL SHEET NOTES

1. REFER TO SHEET C-460 FOR CONTROL POINT LOCATIONS.
2. CONTROL POINT LOCATIONS ARE PROVIDED FOR INFORMATION ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING UP CONTROL POINTS SUFFICIENT TO MEET THE DESIGN LINES AND GRADES.

FINAL COVER POINT TABLE

POINT	NORTHING	EASTING	ELEVATION (FT)
100	14827.47	9079.69	4652.04
101	14827.47	9329.69	4652.72
102	14827.47	9579.69	4652.72
103	14827.47	9829.69	4652.72
104	14827.47	10079.69	4652.72
105	14827.47	10329.69	4652.51
106	15077.47	9079.69	4652.78
107	15077.47	9329.69	4659.54
108	15077.47	9579.69	4660.22
109	15077.47	9829.69	4660.22
110	15077.47	10079.69	4660.01
111	15077.47	10329.69	4653.94
112	15327.47	9079.69	4652.78
113	15327.47	9329.69	4660.28
114	15327.47	9579.69	4667.04
115	15327.47	9829.69	4667.51
116	15327.47	10079.69	4661.44
117	15327.47	10329.69	4653.94
118	15577.47	9079.69	4652.78
119	15577.47	9329.69	4660.28
120	15577.47	9579.69	4667.78
121	15577.47	9829.69	4668.83
122	15577.47	10079.69	4661.44
123	15577.47	10329.69	4653.94
124	15827.47	9079.69	4652.78
125	15827.47	9329.69	4660.28
126	15827.47	9579.69	4663.03
127	15827.47	9829.69	4663.03
128	15827.47	10079.69	4661.33
129	15827.47	10329.69	4653.94
130	16077.47	9079.69	4652.78
131	16077.47	9329.69	4655.53
132	16077.47	9579.69	4655.53
133	16077.47	9829.69	4655.53
134	16077.47	10079.69	4655.53
135	16077.47	10329.69	4653.83

FINAL COVER POINT TABLE

POINT	NORTHING	EASTING	ELEVATION (FT)
200	14736.84	9078.82	4650.00
201	14928.44	8986.51	4649.98
202	15177.80	8987.12	4650.00
203	15427.73	8987.00	4650.00
205	15674.12	8987.12	4650.00
206	15896.62	8985.48	4649.95
207	16146.53	8987.19	4650.00
208	16261.83	9145.41	4650.00
209	16261.78	9395.34	4650.00
210	16262.44	9645.06	4649.98
211	16261.61	9894.29	4650.01
212	16261.61	10144.29	4650.01
213	16260.42	10394.22	4650.01
214	16043.74	10460.73	4650.01
215	15793.74	10460.73	4650.01
218	15477.50	10460.76	4650.01
219	15227.58	10460.79	4650.00
220	14977.58	10460.73	4650.01
221	14745.16	10415.74	4650.01
222	14736.84	10167.19	4650.00
223	14736.84	9917.19	4650.00
224	14736.84	9667.19	4650.00
225	14736.84	9417.19	4650.00

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrkdir\dms40954\C-461.dwg

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
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SCALE: NTS

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DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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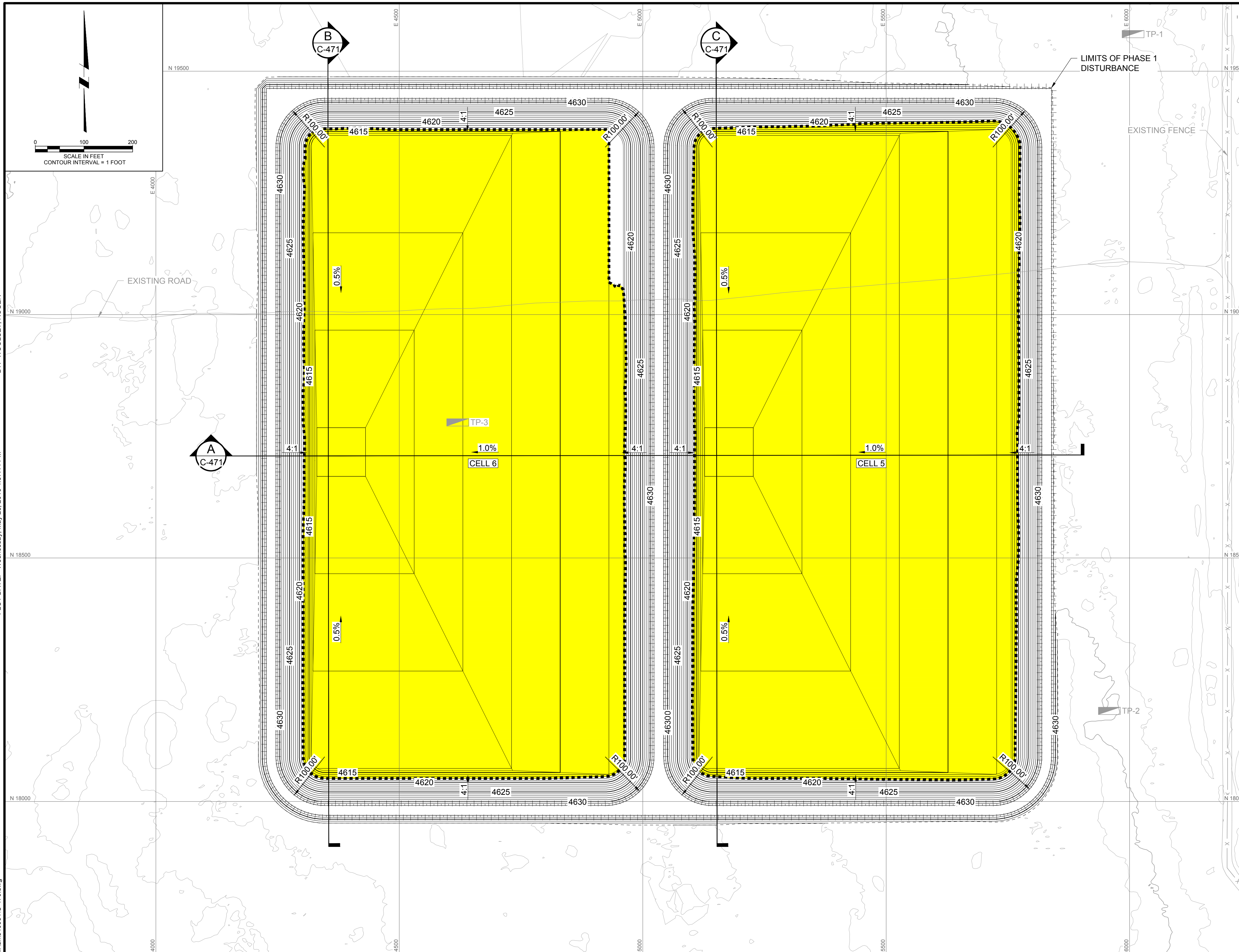
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
STEP 5 FINAL COVER CONTROL POINTS TABLE

SHEET C-461

Job# 233001396



KEY PLAN

CURRENT DRAWING

LEGEND

4600	EXISTING CONTOURS
4600	DESIGN CONTOURS
	LIMITS OF DISTURBANCE
x	EXISTING FENCE
	EXSTING TEST PIT
	CLAY EXCAVATION

GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.

QUANTITY TABLE

DESCRIPTION	6" STRIP (CY)	GEN FILL (CY)	CLAY (CY)
EXCAVATION	46,210	668,605	257,175

QUANTITY TABLE

DESCRIPTION	FILL (CY)
EMBANKMENT FILL	45,450

REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

WARNING: IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
BORROW SOURCE 3
PHASE 1 EXCAVATION PLAN

SHEET C-470

Job# 233001396

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
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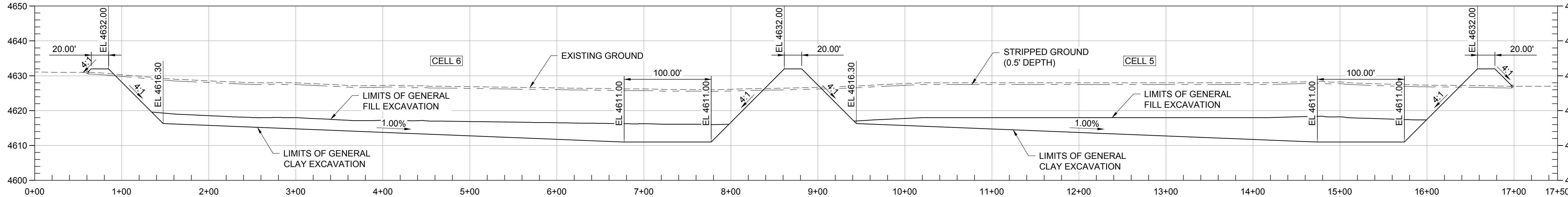
GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.



A C-470 SECTION A

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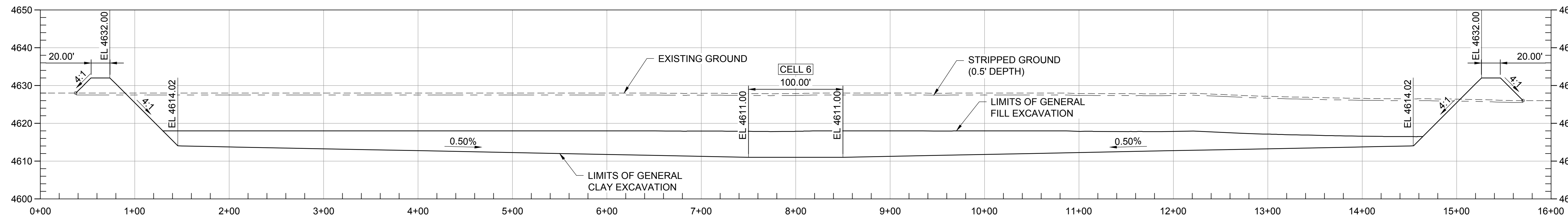
SCALE IN FEET



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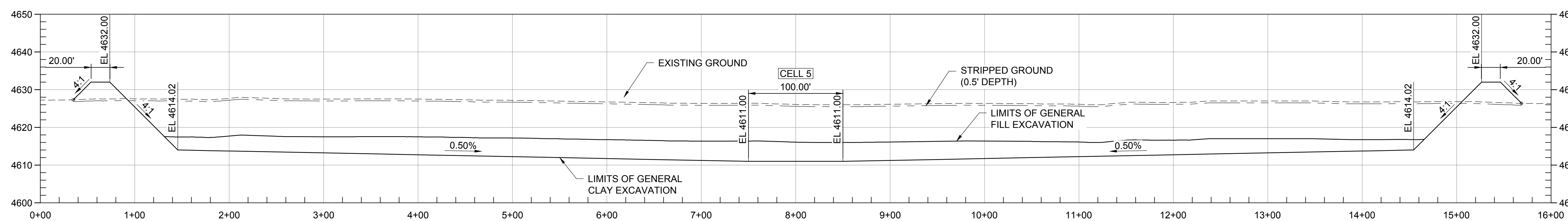

C C-470 SECTION C

HORZ 0 60 120
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SCALE IN FEET

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

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REV	DATE	BY	DESCRIPTION
B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
A	09/11/2020	RNW	ISSUED FOR INTERNAL REVIEW

SCALE 1"=100'

WARNING 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/02/2020

NOT FOR CONSTRUCTION
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Stantec

INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
BORROW SOURCE 3
PHASE 1 EXCAVATION SECTIONS

SHEET C-471

Job# 233001396

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

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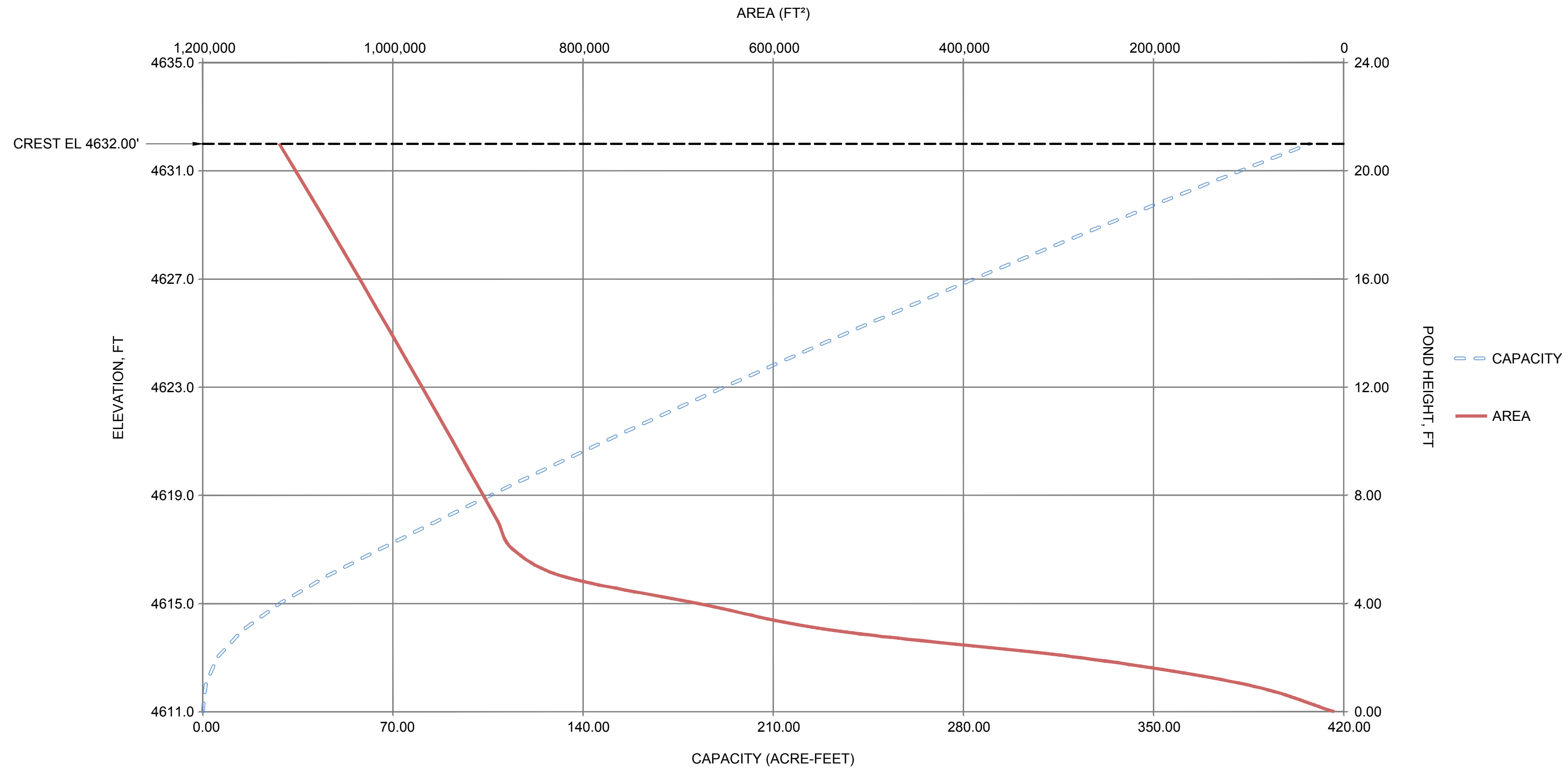
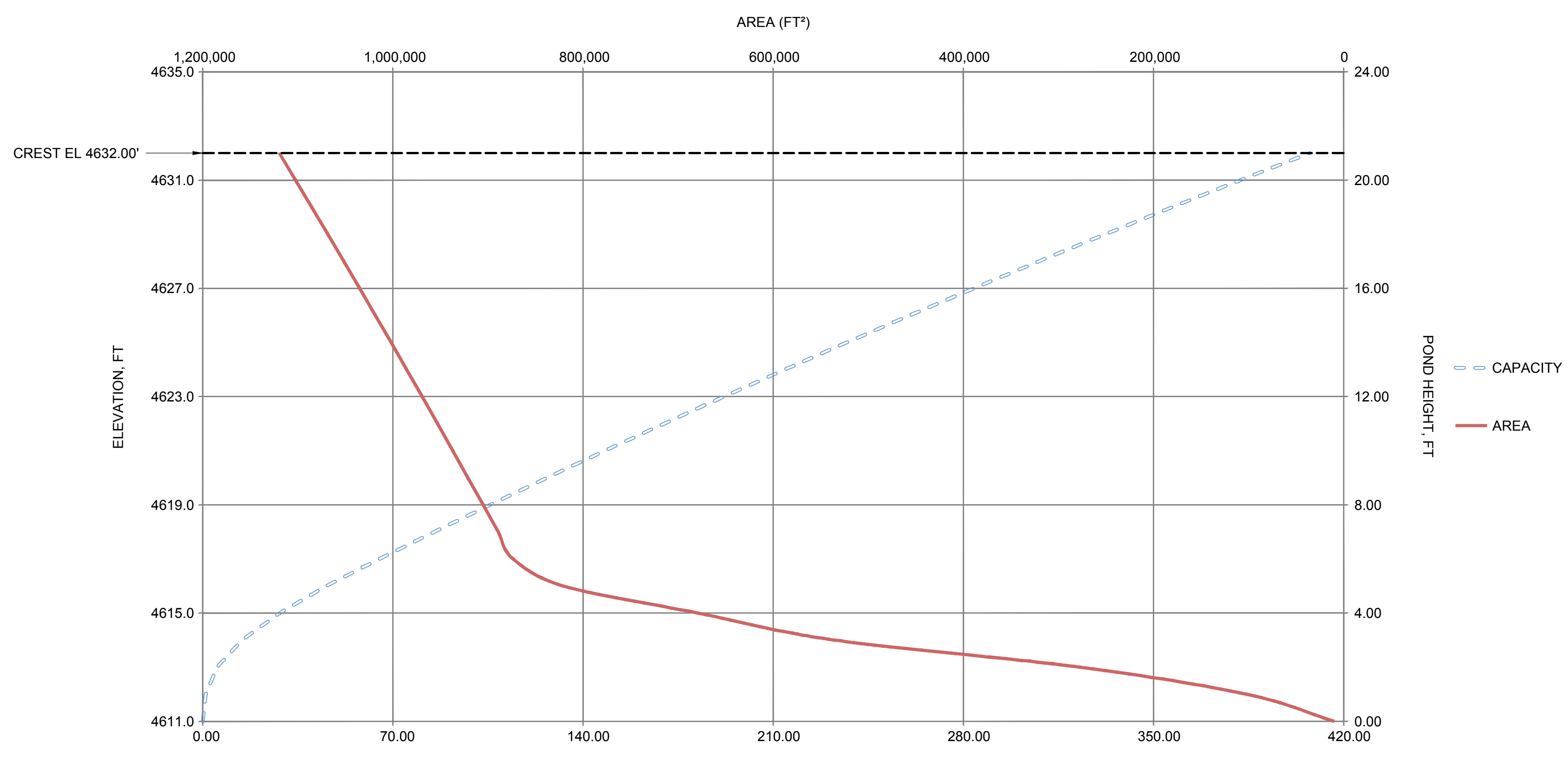


AREA CAPACITY CURVE - EVAP POND 5

AREA CAPACITY TABLE - EVAP POND 5

ELEVATION (FT)	AREA (FT²)	CAPACITY (ACRE-FT)
4611.00	10,000.00	0.00
4612.00	102,000.00	1.10
4613.00	277,200.00	5.29
4614.00	535,416.14	14.46
4615.00	678,982.01	28.36
4616.00	820,758.87	45.55
4617.00	873,625.86	65.00
4618.00	889,315.00	85.23
4619.00	905,104.51	105.83
4620.00	920,994.37	126.79
4621.00	936,984.59	148.12
4622.00	953,075.17	169.81
4623.00	969,266.11	191.88
4624.00	985,557.40	214.31
4625.00	1,001,949.05	237.13
4626.00	1,018,441.06	260.32
4627.00	1,035,033.43	283.89
4628.00	1,051,726.16	307.84
4629.00	1,068,519.24	332.18
4630.00	1,085,412.68	356.90
4631.00	1,102,406.48	382.01
4632.00	1,119,500.64	407.52

CREST EL 4632.00'



AREA CAPACITY CURVE - EVAP POND 6

AREA CAPACITY TABLE - EVAP POND 6

ELEVATION (FT)	AREA (FT²)	CAPACITY (ACRE-FT)
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4612.00	102,000.00	1.10
4613.00	277,200.00	5.29
4614.00	535,416.14	14.46
4615.00	678,982.01	28.36
4616.00	820,758.87	45.55
4617.00	873,625.86	65.00
4618.00	889,315.00	85.23
4619.00	905,104.51	105.83
4620.00	920,994.37	126.79
4621.00	936,984.59	148.12
4622.00	953,075.17	169.81
4623.00	969,266.11	191.88
4624.00	985,557.40	214.31
4625.00	1,001,949.05	237.13
4626.00	1,018,441.06	260.32
4627.00	1,035,033.43	283.89
4628.00	1,051,726.16	307.84
4629.00	1,068,519.24	332.18
4630.00	1,085,412.68	356.90
4631.00	1,102,406.48	382.01
4632.00	1,119,500.64	407.52

CREST EL 4632.00'

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DESIGNED P. BERNHARD

DRAWN R. WOOLSEY

CHECKED C. TOMLINSON

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Stantec

INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN

CIVIL

WASTEWATER BASIN CLOSURE

BORROW SOURCE 3

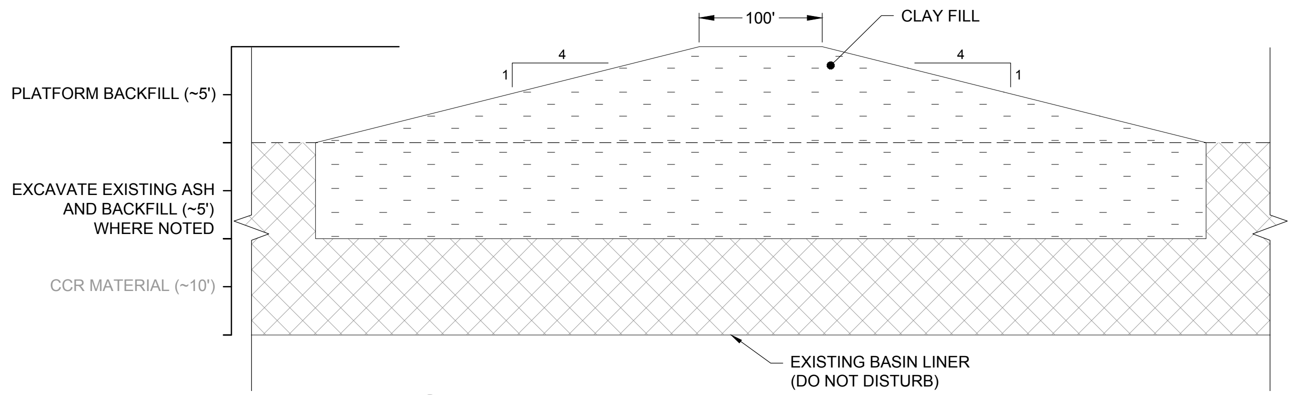
PHASE 1 STAGE STORAGE CURVE

SHEET C-472

Job# 233001396

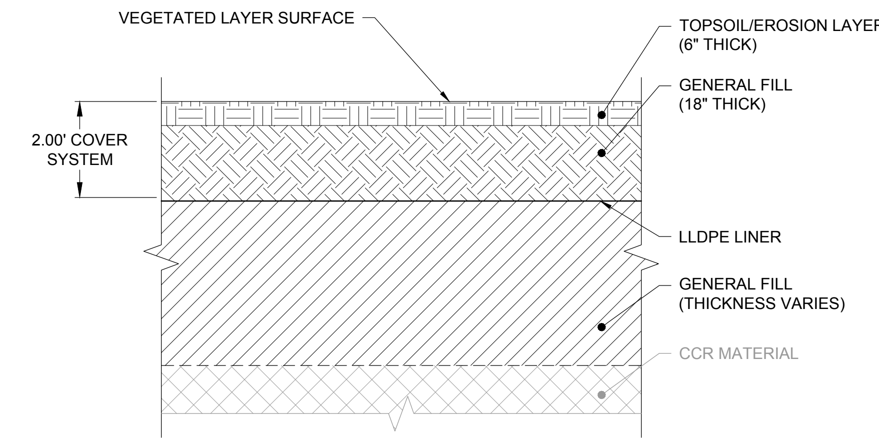
GENERAL SHEET NOTES

1. REFER SPECIFICATION 31 80 00 FOR LLDPE LINER SPECIFICATION.
2. REFER TO SPECIFICATION 31 00 00 FOR EARTHWORK SPECIFICATION.
3. GEOMEMBRANE SHALL BE PROTECTED IN AREAS OF HEAVY TRAFFIC BY PLACING PROTECTIVE COVER OVER THE GEOMEMBRANE.



1 / C-410 WASTEWATER BASIN DEWATERING DIVIDER BERM

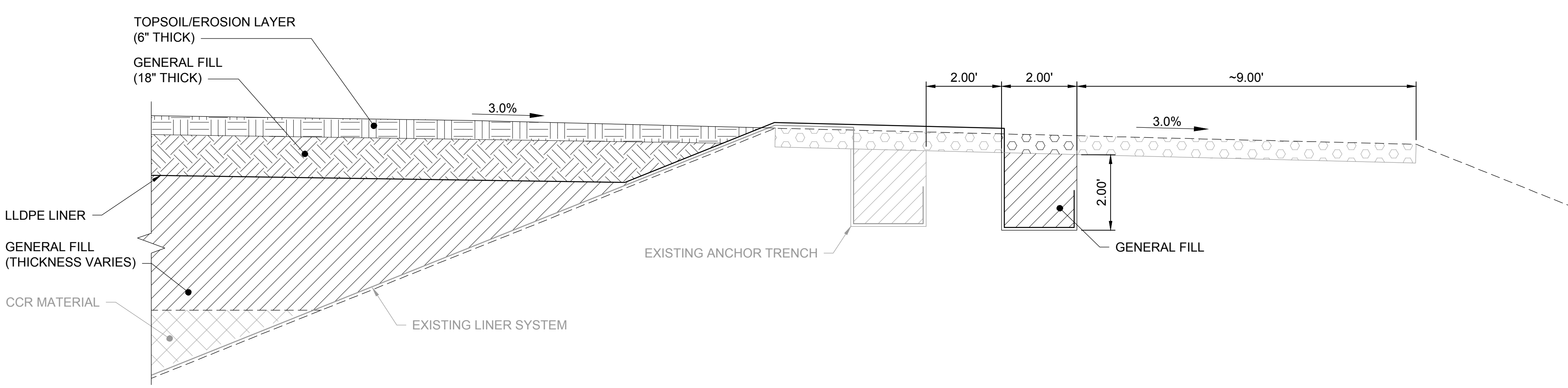
NOT TO SCALE



2 / C-451 TYPICAL WASTEWATER BASIN COVER SYSTEM

0 2 4

SCALE IN FEET



3 / C-451 WASTE WATER BASIN TYPICAL SECTION COVER - CREST TRANSITION

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BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

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B	10/02/2020	RNW	ISSUED FOR CLIENT REVIEW
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CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN

CIVIL

WASTEWATER BASIN CLOSURE DETAILS

SHEET C-480

Job# 233001396

Appendix B

Construction Specifications

IPP CCR CLOSURE TECHNICAL SPECIFICATIONS

DIVISION 02 - SITEWORK

SECTION 02222 – EARTHWORK AND GRADING

PART 1 -- GENERAL

1.1 SUMMARY

A. The Contractor shall be responsible for all activities required to ensure that the designated areas are free from objectionable materials, in accordance with the Contract Documents.

B. Contractor shall be responsible for the excavation and grading of the site to configuration in accordance with the details and to the lines and grades indicated by the project drawings.

C. Contractor shall be responsible for construction of the soil covers to the grades and specifications presented herein.

D. The Contractor shall be responsible for development of borrow areas.

1.2 RELATED SPECIFICATION

A. The following specifications contain requirements that relate to this specification:

- 02272 – Geomembranes

1.3 DEFINITIONS

A. Company: Intermountain Power Service Corp.

B. Engineer: Stantec

C. Contractor: The party to whom the Contract for the work described herein has been awarded and any of its authorized representatives.

1.4 CONTRACTOR SUBMITTALS

A. The Contractor shall submit the following documents for Engineer approval and acceptance prior to mobilization:

1. Samples:

a. The Contractor shall submit samples of materials proposed for the Work.

b. Sample sizes shall be determined by the testing laboratory.

PART 2 -- EQUIPMENT AND MATERIALS

2.1 EQUIPMENT

A. Conventional earth-moving equipment shall be used for the material acquisition. All equipment shall be decontaminated prior to arrival at the site, in good working condition, and suitable for its intended use.

2.2 MATERIALS

A. The following materials shall be furnished by the Contractor from designated soil borrow areas or supplied by the Company as specified below.

1. General Fill: General fill material shall be obtained from the identified borrow areas located on the drawings and shall conform to the gradation limits given in Table 1 below, when tested in accordance with ASTM D 422:

Table 1: General Fill Gradation Requirements

U.S. Standard Sieve Size	% Passing	
	Coarse Range	Fine Range
1.5-inch	100	100
¾-inch	90	100
No.4	65	100
No. 40	30	80
No. 200	10	50

2. Compacted Clay Layer, Clay Trench, and Clay Dividing Berm: Compacted Clay Layer, Clay Trench and Clay Dividing Berm material shall be obtained from the identified borrow areas located on the drawings and shall conform to the gradation limits given in Table 2 below, when tested in accordance with ASTM D 422:

Table 2: Compacted Clay Layer, Clay Trench and Clay Dividing Berm Gradation Requirements

U.S. Standard Sieve Size	% Passing	
	Coarse Range	Fine Range
1-inch	100	100
¾-inch	95	100
No.4	90	100
No. 40	80	100
No. 200	60	100

Note that clay clay material can be used for gernal fill if necessary.

3. Topsoil / Erosion Layer: Topsoil / Erosion Layer material shall be 1.5-inch minus material, shall be a blend of 50% clay material and 50% slty sand to promote soil moisture storage and reduce the potential for soil erosion. The Topsoil / Erosion Layer shall conform to the gradation limits given in Table 3 below, when tested in accordance with ASTM D 422.

Table 3: Topsoil / Erosion Layer Material Gradation Requirements

`	% Passing	
	Coarse Range	**Fine Range**
1.5-inch	100	100
¾-inch	90	100
No. 4	65	100
No. 40	50	95
No. 200	30	75

PART 3 -- EXECUTION

3.1 EXCAVATION

A. General

1. Excavation is unclassified and includes excavation to required grade, or subgrade elevations, regardless of the character of materials or obstruction encountered.

2. Tolerances for all excavated surfaces shall be within ±0.1 foot of the elevation as specified in the design drawings.

3. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable state safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

4. The Contractor shall provide quantity surveys where so required to verify quantities for Unit Price Contracts.

5. Survey shall be performed prior to beginning Work and upon completion by a surveyor licensed in the State of Utah.

6. If stockpiles will be used, the material shall be transported and stockpiled in an approved stockpiling area.

B. Disposal Of Excess Excavated Material

1. The Contractor shall be responsible for the removal and stockpiling of any excess excavated material according to Section 01552 – Staging and Stockpile Areas.

2. Material shall be disposed of at an approved on-Site disposal area.

3.2 FILL PLACEMENT AND COMPACTION

A. Material Placement

1. Material shall be placed and spread evenly in approximately horizontal layers.

2. Lift thicknesses are specified by material types in the following sections.

3. Unless otherwise approved by the Engineer, loose lift thickness shall not exceed 6 inches, prior to compaction by hand operated compactors.

B. General Fill:

1. General Fill shall be spread in 18-inch loose lifts using equipment meeting the ground pressure requirements described in Section 02272 – Geomembrane to prevent damage to the geomembrane. The equipment shall have GPS elevation grade control capability.

2. Following placement and grading of each lift, the surface shall be compacted with a number of passes by equipment that is capale of achieving the required degree of compaction stated in Table 4.

3. Following placement and grading of the general fill for the liner protection layer, the surface shall be compacted with a number of passes (tracked) by the low-groud-pressure (LGP) dozer. The Contractor shall determine the appropriate number of passes to achieve the required degree of compaction stated in Table 4.

4. Moisture contents of the general fill during placement shall comply with Table 4.

C. Compacted Clay Layer, Clay Trench and Clay Divider Berm:

1. Compacted Clay Layer shall be spread in 8-inch loose lifts. The equipment used to spread lifts shall have GPS elevation grade control capability.

2. Clay Trench and Clay Divider Berm shall be spread in 12-inch loose lifts. The equipment used to spread lifts shall have GPS elevation grade control capability.

3. Following placement and grading of each lift, the surface shall be compacted with a number of passes by equipment that is capale of achieving the required degree of compaction stated in Table 4. The Contractor shall determine the appropriate number of passes.

4. Moisture contents of the Compacted Clay Layer, Clay Trench and Clay Divider Berm during placement shall comply with Table 4.

5. Where clay is to be used as General Fill the contractor shall place, spread, and compact the layer in accordance with Section 3.2.B

D. Topsoil / Erosion Layer:

1. Topsoil Layer shall be spread in one loose lift using equipment meeting the ground pressure requirements described in Section 02272 – Geomembrane to prevent damage to the geomembrane, graded to achieve final design grades, and compacted to meet the requirements of Table 4, by tracking to achieve the final thickness.

2. The surface of the layer shall be tracked into place to maintain the surface of the material, in the event of heavy rain, prior to vegetation.

E. Compaction Requirements:

1. Compaction equipment shall be of the appropriate type and weight for the fill materials being placed in order to achieve the compaction requirements of this Specification and meet the ground pressure requirements described in Section 02272 – Geomembrane where applicable.

2. The Contractor shall submit compaction procedures to the Engineer as part of the Construction Plan submitted. Procedures shall include details of the equipment proposed for use and the number of passes required. The Contractor shall state in the procedures, the steps that will be taken to control moisture content of the fill materials. Approval of the compaction procedures shall be given by the Engineer prior to Contractor undertaking any compaction work.

3. Coverages of Compaction Equipment: Coverages of the compaction equipment shall be carried out so that the compactive effort is uniformly distributed in a systematic manner over the entire lift. Compaction of individual lanes of a lift shall be completed before beginning compaction of adjacent portions of the lift. Individual lanes shall be overlapped by at least 1 ft.

4. In locations where compaction by normal mechanical equipment is not possible and compaction can only be completed by hand tamping, fill shall be moistened, placed and compacted with the aid of pneumatic or hand tampers. Pneumatic and hand tampers shall provide a minimum of 9 psi compactive force.

5. Compaction shall meet the requirements given in Table 4 below in accordance with:

   ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (400 ft-lbf/ft^3) where the material is graded such that 10 percent or more passes a No. 4 sieve.

Table 4: Compaction Requirements for Fill Materials

Location or Use of Fill or Backfill	Percentage of Maximum Dry Density	Percentage of Optimum Moisture
General Fill	90% (±3% of MDD)	±2%
General Fill (Liner Protective Layer)	90% (±3% of MDD)	±2%
Compacted Clay Layer (CB Landfill)	95% (minimum)	±2%
Clay Trench (Wastewater Basin)	90% (±3% of MDD)	NA
Clay Divider Berm (Wastewater Basin)	90% (minimum)	±2%
Erosion Protection Layer (topsoil)	85% (+5%)	±2%

F. Moisture Content

1. For General Fill, Compacted Clay Layer, Clay Divider Berm and Topsoil, the moisture contents of materials to be placed and compacted or scarified and compacted shall be within +2.0 and -2.0 percent of the Optimum Moisture Content (OMC) as

determined by ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3).

2. The moisture content of materials shall be uniform throughout each layer of material placed prior to and during compaction.

3. Perform wetting and drying operations as necessary in order to achieve the required moisture contents prior to compaction.

4. Materials too dry for compaction shall be pre-wetted in the borrow areas. Supplemental water, if required, shall be added to the material at the placement area prior to compaction; by uniform sprinkling, followed by uniform mixing, prior to compaction.

5. Materials too wet for compaction shall be dried to the proper moisture content before compaction. Mixing of wet materials with drier materials may also be performed to achieve the appropriate moisture content, as approved by the Engineer.

6. If the moisture content of fill material placed into the work falls outside the required limits, the Contractor shall condition the material to bring it to within the required limits. If the material cannot be brought readily to the specified moisture content, the Contractor shall remove the material from the work.

3.3 MATERIALS TESTING

A. Samples:

1. Soils testing of samples submitted by the Contractor will be performed by a testing laboratory of the Contractor's choice and at the Contractor’s expense.

2. The Engineer may direct the Contractor to supply samples for testing of any material used in the Work.

3. Particle-size analyses of soils and aggregates will be performed using ASTM D 422 - Standard Test Method for Particle-size Analysis of Soils.

4. References in this Section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D 2487.

5. The Contractor shall be bound by applicable provisions of ASTM D 2487 in the interpretation of soil classifications.

B. Field and Laboratory Testing:

1. Field soils testing will be performed by a testing laboratory of the Contractor's choice at the Contractor's expense at the frequency given in Table 5 below.

Table 5: Minimum Required QC Field and Laboratory Testing Methods and Frequencies

Material	Test Name	Testing Method	Minimum QC Testing Frequency
General Fill / Liner Protective Layer	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 10,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 20,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Compacted Clay Layer (CB Landfill)	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 5,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per10,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Clay Ternch / Clay Dividing Berm	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 5,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 10,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Topsoil/Erosion Layer	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 2,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 5,000CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test

Notes:
1. The Engineer may revise the listed frequencies and test methods during the work.
2. Standard Proctor testing shall be performed at the frequencies listed in the table and as needed to obtain Proctor values representative of the placed material.

C. Contractor's Responsibilities:

1. Re-working to Attain Specified Limits: When the test results indicate that compaction, water content, or relative compaction is not in conformance with specified limits, the Contractor shall make immediate adjustments in procedures as necessary to conform to the specified limits. Re-working to attain the specified limits may include removal, rehandling reconditioning, re-rolling, or combinations of these procedures. The Contractor shall perform all re-work required to achieve the specified compaction water content and relative compaction at no cost to the Company.

2. Confirmation of In-Situ Material Properties: The Contractor shall independently confirm the geotechnical properties of the proposed Cover Soil material and determine the appropriate moisture conditioning and compaction methods to ensure that cover material meets the project specifications and are constructed to the design lines and grades as provided in the design drawings. Claims arising from material shrinkage and/or swelling will not be entertained.

- END OF SECTION -

SECTION 02272 –GEOMEMBRANES

PART 1 -- GENERAL

1.1 SUMMARY

A. The CONTRACTOR shall supply all labor, equipment, materials, and appurtenances for the complete installation of geomembranes as per contract documents.

B. Sufficient geomembrane material shall be furnished to cover all lined areas, including seam overlaps and anchor trenches. One percent shall be added to the length of each panel to allow for shrink and wrinkles. The geomembrane shall be installed in a relaxed condition and shall be free of tension or stress upon completion of the installation.

1.2 SUBMITTALS

A. Prior to installation of geomembrane material, the CONTRACTOR shall submit the following for the ENGINEER's approval:

1. Resin Data, including a certification stating that the resin meets the specification requirements (see Paragraph 2.3.C).

2. Statement certifying that geomembrane materials have been tested and inspected in accordance with Paragraph 1.5.

3. Statement certifying no recycled polymer and no more than 10% rework of the same type of material is added to the resin (product run may be recycled).

4. Specification sheet stating that the geomembrane meets the specification requirements (see Paragraph 2.3.E)

5. Installation layout drawings showing the proposed panel layout to cover the lined area shown, with proposed size, number, position, and sequence of placing all sheets and indicating the location and direction of all field joints and penetrations. Installation layout drawings shall also show complete details and/or methods for anchoring, field joints, seals at existing structures, etc.

6. Four 8-inch x 10-inch samples of the material proposed for the lining

7. A Statement of Qualifications for the geomembrane manufacturer and installation contractor with sufficient detail to satisfy the experience requirements of Paragraph 1.3.

8. Installation Contractor's Quality Control Plan.

B. Placement of geomembrane material shall not commence until the submittals required in Paragraph 1.2 A have been approved by the ENGINEER.

C. Upon completion of geomembrane installation, the CONTRACTOR shall submit the following:

1. Certificate stating the geomembrane has been installed in accordance with the Contract Documents.

2. Material and installation warranties

3. As-built drawings showing actual geomembrane placement and seams including complete details.

1.3 QUALIFICATIONS

A. **Qualifications of Manufacturer:** The manufacturer shall have at least five years continuous experience in manufacturing polyethylene geomembrane and/or experience totaling not less than 5 million square feet of manufactured polyethylene geomembrane.

1. The following manufacturers are approved by the COMPANY:

   a. Agru America

   b. Solmax

B. **Qualifications of Installation Contractor:** The installation contractor shall be the manufacturer, or shall be trained to install the manufacturer's material, and shall have experience of not less than 3 projects and not less than 1,000,000 square feet of successfully installed polyethylene geomembrane.

1. Field Installation Supervisor: Installation shall be performed under the constant direction of a Field Installation Supervisor who shall remain on site and be responsible, throughout the geomembrane installation, for layout, seaming, testing, repairs, and all other activities by the Installer. The Field Installation Supervisor shall have installed or supervised the installation of not less than 1,000,000 square feet of polyethylene geomembrane.

2. Master Seamer: Seaming shall be performed under the direction of a Master Seamer (who may also be the Field Installation Supervisor) who has seamed not less than 1,000,000 square feet of polyethylene geomembrane, using the same type of seaming apparatus specified for this project. The Field Installation Supervisor and/or Master Seamer shall be present whenever seaming is performed.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

ASTM D792	Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1004	Test Method for Initial Tear Resistance of Plastic Film and Sheeting
ASTM D1238	Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1505	Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1603	Test Method for Carbon Black in Olefin Plastics
ASTM D3895	Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D4218	Standard Test Method for Determination of Carbon Black in Polyethylene Compounds
ASTM D4833	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

ASTM D5199	Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
ASTM D5397	Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D5994	Standard Test Method for Measuring Core Thickness of Textured Geomembranes
ASTM D6392	Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
ASTM D6693	Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
ASTM D7240	Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique (Conductive Geomembrane Spark Test)
GRI GM 13	Test Methods, Test Properties, and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
GRI GM 14	Standard Guide for Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes
GRI GM 17	Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

1.5 QUALITY CONTROL

A. All WORK shall be constructed, monitored and tested in accordance with the requirements of the Installation Contractor's Quality Control Plan (CQP), which shall be submitted in accordance with Paragraph 1.2 A.

B. The CONTRACTOR shall be aware of all activities outlines in the CQP, and the CONTRACTOR shall account for these activities in the construction schedule. No additional costs to the COMPANY shall be allowed by the CONTRACTOR as a result of the performance of the CQP activities.

1.6 QUALITY ASSURANCE

A. The COMPANY shall conduct quality assurance monitoring and testing of the geomembrane installation under the direction of the ENGINEER. This testing is defined in Part 3 of the Specification and include, but are not limited to, trial welds (Section 3.2.F.5) and seam testing (Section 3.3).

1.7 WARRANTY

A. The CONTRACTOR shall procure and provide copies of the manufacturer's warranty for the geomembrane system and all appurtenances. The warranty shall cover materials for a period of 5 years prorated and workmanship for a period of 1 year from the date of the COMPANY's acceptance of the project. The warranty shall not be prorated for workmanship, but shall be a full replacement value warranty. Should defects or premature loss of use within the scope of the above warranty occur, repair and/or replacement of damaged material shall be performed by the CONTRACTOR at no cost to the COMPANY.

PART 2 -- PRODUCTS

2.1 SCHEDULE OF GEOMEMBRANES

TABLE 1 – SCHEDULE OF GEOMEMBRANES

Application	Geomembrane
Bottom Ash Basin Cover Geomembrane	60-mil HDPE, Textured (Single Side)
Wastewater Basin Cover Geomembrane	60-mil LLDPE, Textured (Single Side)

2.2 APPROVED GEOMEMBRANE PRODUCTS

A. 60-mil HDPE, Textured (Single Side)

1. Solmax HDPE Single Textured

2. Agru America HDPE MicroSpike Single Sided

B. 60-mil LLDPE, Textured (Single Side)

1. Solmax LLDPE Single Textured

2. Agru America LLDPE MicroSpike Single Sided

2.3 "OR EQUAL" PRODUCTS

A. CONTRACTOR shall provide the COMPANY approved geomembrane products listed in Paragraph 2.2, or provide "or equal" products that meet the requirement indicated below.

B. **Materials:** The material shall be black, coextruded high-density polyethylene (HDPE) geomembrane or black, coextruded linear low-density polyethylene (LLDPE) geomembrane as listed below and as shown on the Contract Drawings.

C. The geomembrane shall be manufactured from new, first quality resin produced in the United States and shall be compounded and manufactured specifically for producing geomembrane. Natural resin (without carbon black) shall meet requirements listed in Table 2:

TABLE 2 – RESIN PROPERTIES

Property	Test Method	HDPE Value	LLDPE Value
Density (g/cm3)	ASTM D 792 / ASTM D 1505	≥0.932	≤0.926
Melt Flow Index (g/10 min)	ASTM D 1238 (190/2.16)	≤1.0	≤1.0

Reprocessed materials shall not be acceptable. No post-consumer resin of any type shall be added to the formulation.

D. **Fabrication:** The geomembrane shall have a minimum 20-foot seamless width. The geomembrane shall be supplied in rolls with labels identifying the thickness of material, the length and width of the roll, the lot and roll numbers, and the name of the manufacturer.

E. Properties:

1. The geomembrane shall not exceed a combined maximum total of 1 percent by weight of additives other than carbon black.

2. The geomembrane shall be free of holes, pinholes, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

3. The finished product shall be uniform in color, thickness, and surface texture and shall meet the **minimum** average specifications listed in Table 3 and as stipulated in GRI Test Method GM13 and GM17 for HDPE and LLDPE liners, respectively.

F. Manufacturer Quality Control

1. All resins and additives used in the fabrication of the geomembrane shall be sampled, tested, and approved by the MANUFACTURER before being eligible for use. Sampling and testing of the resins and additives shall be performed in accordance with the Manufacturer's Quality Control program.

2. All roll goods shall be inspected for defects and impurities. Geomembrane thickness shall be measured for each roll.

3. All geomembrane sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements listed in Paragraph 2.3.E and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be corrected during installation.

4. The geomembrane shall be tested by the MANUFACTURER for the listed properties provided in the tables in Part 2. A log shall be maintained showing the testing date, time and results. Any rolls not meeting the visual inspection or requirements of the specification shall be rejected.

5. Certification that the material has been inspected, tested, and meets all requirements shall be submitted to the ENGINEER. Test results shall be made available to the ENGINEER upon request.

TABLE 3 – GEOMEMBRANE PROPERTIES

Tested Property	Test Method	Frequency	Textured HDPE	Textured LLDPE
Thickness, (minimum average) mil; Lowest individual reading (-10%);	ASTM D 5199 (Sm.) / ASTM D 5994 (Tx.)	every roll	60 54	60 54
Density, g/cm^3	ASTM D 792 / ASTM D 1505	200,000 lb	0.94	0.94
Tensile Properties (each direction) Strength at Yield, lb/in-width Strength at Break, lb/in-width Elongation at Yield, % Elongation at Break, %	ASTM D 6693, Type IV Dumbell, 2 ipm G.L. 1.3 in (33 mm) G.L. 2.0 in (51 mm)	20,000 lb	126 90 12 100	N/A 120 N/A 250
Tear Resistance, lb	ASTM D 1004	45,000 lb	42	33
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	90	66
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lb	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note(1)	Note(1)
Asperity Height, mil	ASTM D 7466	second roll	18	18
Notched Constant Tensile Load(2), hr	ASTM D 5397, Appendix	200,000 lb	300	N/A
Oxidative Induction Time, min	ASTM D 3895, 200° C; O_2, 1 atm	200,000 lb	≥100	≥100

NOTES:
(1)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3. *Modified

PART 3 -- EXECUTION

3.1 STORAGE

A. After delivery, all roll goods shall be stored so as to be protected from puncture, dirt, grease, moisture and excessive heat which may result in damage or degradation of the material. Damaged material shall be stored separately for repair or replacement. The rolls shall be stored on a prepared smooth surface and should not be stacked more than two rolls high.

3.2 INSTALLATION

A. **General:** The geomembrane shall be installed in accordance with the following specifications and approved procedures submitted with the shop drawings.

B. Subgrade Preparation and Inspection:

1. Surfaces to be lined shall be smooth and free of all rocks, stones, sticks, roots, sharp objects, or debris of any kind. The surface shall provide a firm, unyielding foundation for the membrane with no sudden, sharp, or abrupt changes or break in grade.

2. The CONTRACTOR shall, on a daily basis, approve the surface on which the geomembrane shall be installed. The surface shall be smooth, clean and free of foreign material, sharp objects, frost, standing water or excessive moisture. Installation shall proceed only if the surface conditions are found satisfactory.

C. Equipment:

1. Welding equipment and accessories shall meet the following requirements:

a. Gauges showing temperatures in apparatus such as extrusion welder or fusion welder shall be present.

b. An adequate number of welding apparati shall be available to avoid delaying work.

c. Power source must be capable of providing constant voltage under combined line load.

D. Deployment:

1. Each panel shall be assigned a simple and logical identifying code.

2. The coding system shall be subject to approval by the ENGINEER and shall be determined at the job site.

3. The CONTRACTOR shall visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.

4. Deployment of geomembrane panels shall be performed in a manner that shall comply with the following guidelines:

a. Geomembranes shall be installed according to site-specific specifications and MANUFACTURER recommendations.

b. The geomembrane shall be placed in such a manner as to assure minimum handling.

c. Only those sheets of material which can be anchored and sealed together that same day shall be unpackaged and placed in position.

d. Deployment of the geomembrane shall proceed with ambient temperatures greater than 32° F. Placement can proceed below 32° F only after it has been verified by the ENGINEER that the material can be seamed in accordance with GRI GM9 (Cold weather seaming of geomembranes).. Placement shall not be done during any precipitation, in the presence of excessive moisture (fog, rain, dew) that deposits a residue on the liner that is detectable for sight or touch and could adversely impact the performance of the seam welding process.

e. Placement shall not be done in the presence of excessive winds which could adversely impact the ability to complete the seam welding process. In areas where wind is prevalent, installation should be started at the upwind side of the project and proceed downwind. The leading edge of the geomembrane shall be secured at all times with sandbags or other means sufficient to hold it down during high winds.

f. Geomembrane shall be unrolled using methods that shall not damage geomembrane and shall protect underlying surface from damage (spreader bar, protected equipment bucket).

g. Ballast (commonly sandbags) which shall not damage geomembrane shall be placed on geomembrane to prevent wind uplift.

h. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage it. Smoking shall not be permitted on the geomembrane.

i. No vehicle traffic shall travel on the geomembrane other than an approved low ground pressure vehicle.

j. Geomembrane shall be protected in areas of heavy traffic by placing protective cover over the geomembrane. Protective cover is material as approved by the ENGINEER that is placed over the geomembrane to reduce the ground pressure of heavy traffic to less than 8 psi on the liner.

5. Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

E. Lining sheets shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Lining to concrete seals shall be made with a mechanical anchor or as approved by the ENGINEER. All piping, structures, and other projections through the lining shall be sealed with approved sealing methods.

F. Field Seams:

1. Seams shall meet the following requirements:

   a. To the maximum extent possible, seams shall be oriented parallel to line of slope, i.e., down and not across slope.

   b. The number of field seams in corners, odd-shaped geometric locations and outside corners shall be minimized.

   c. Slope seams (panels) shall extend a minimum of five-feet beyond the grade break into the flat area.

   d. Be designated using a sequential seam numbering system compatible with panel numbering system, and that is agreeable to the ENGINEER.

   e. Seam overlaps shall be aligned to be consistent with the requirements of the welding equipment being used.

2. During welding operations provide at least one Master Seamer who shall provide direct supervision over other welders as necessary.

3. Extrusion Welding

   a. Hot-air tack adjacent pieces together using procedures that do not damage the geomembrane.

   b. Clean geomembrane surfaces by disc grinder or equivalent.

   c. Purge welding apparatus of heat-degraded extrudate before welding.

4. Hot Wedge Welding

   a. Welding apparatus shall be a self-propelled device equipped with an electronic controller which displays applicable temperatures.

   b. Clean seam area of dust, mud, moisture and debris immediately ahead of hot wedge welder.

   c. Protect against moisture build-up between sheets.

5. Trial Welds

   a. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.

   b. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.

   c. Minimum of two trial welds per day, per welding apparatus, one made prior to the start of work and one completed at mid shift.

   d. Cut four, one-inch wide by six-inch long test strips from the trial weld.

   e. Quantitatively test specimens for peel adhesion, and then for shear strength.

f. Trial weld specimens shall pass when the results shown in the Table 4 are achieved in both peel and shear test:

TABLE 4 – SEAM PROPERTIES

Property	Test Method	Minimum Values	
		60-mil HDPE	**60-mil LLDPE**
Peel Strength (fusion) ppi (1), (2)	ASTM D6392	91	75
Peel Strength (extrusion) ppi (1), (2)	ASTM D6392	78	66
Shear Strength (fusion and ext.) ppi	ASTM D6392	120	90

Notes:
1) The break, when peel testing, occurs in the geomembrane material itself, not through peel separation (FTB).
2) The break is ductile.

g. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.

h. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed trial weld.

i. Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the geomembrane installation. CONTRACTOR shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds.

j. Defects and Repairs

1) Examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.

2) Repair and non-destructively test each suspect location in both seam and non-seam areas. Do not cover geomembrane at locations that have been repaired until test results with passing values are available.

G. **Anchor Trench:** The geomembrane shall be placed and secured in an earth anchor trench as indicated in the Contract Drawings. The installer shall coordinate with the earthwork contractor regarding excavation and backfilling of the anchor trench. Care shall be taken when backfilling the trenches to prevent any damage to the geomembrane. If damage occurs, it shall be repaired prior to backfilling.

3.3 SEAM TESTING

A. Field Destructive Testing

1. Destructive seam tests shall be performed to evaluate bonded seam strength. The frequency of sample removal shall be one sample per 500 linear feet of seam. Location of the destructive samples shall be selected by the ENGINEER. Field testing shall take place as soon as possible after completion of the seam.

   a. At the sole discretion of the ENGINEER, destructive seam tests may be reduced in frequency by following the procedures of Geosynthetic Research Institute (GRI) Standard Guide GM 14.

2. Sample labeling shall be the responsibility of the ENGINEER and shall include test number, seam number, seaming machine number, job number, date welded, and welding tech number.

3. The samples shall be approximately 12 inches x 25 inches. The samples shall then be cut into two samples approximately 12 inches x 12 inches: one for field testing and one for archiving or independent testing.

4. The sample for field testing shall have ten coupons cut and be tested with a tensiometer adjusted to a pull rate as shown below. The strength of four out of five specimens shall meet or exceed the values below, and the fifth value must meet or exceed 80% of the value below.

   a. Seam must exhibit film tear bond (FTB). Welds shall have less than 25% incursion into the weld.

   b. Peel and shear values shall meet or exceed the values in Table 4 (at 2 inches/minute)

5. All destructive weld test data shall be logged by the ENGINEER.

6. If a test fails, additional samples shall be cut, approximately ten feet on each side of the failed test, and retested. This procedure shall be repeated until a sample passes. Then the area of the failed seam between the two tests that pass shall be capped or reconstructed.

B. Non-Destructive Testing

1. The CONTRACTOR shall non-destructively test all seams their full length for continuity using an air pressure or vacuum test.

2. Air Pressure Testing

   a. Air pressure testing shall be performed on all seams welded with a double seam fusion welder.

   b. The equipment used for air pressure testing shall consist of an air tank or pump capable of producing a minimum of 35 psi and a sharp needle with a pressure gauge attached to insert into the air chamber.

   c. Both ends of the seam to be tested shall be heated and squeezed together.

d. The needle with gauge shall be inserted into the air channel and the channel shall be pressurized to 30 psig.

e. If the pressure in the air channel drops by more than 4 psig over a period of five minutes, then the seam has failed.

f. If the seam fails the air pressure test, the leak shall be located and the area cut away. Air pressure testing shall be performed on the remaining portions of the seam until all portions of the seam pass the test.

g. The area cut away shall be repaired with a patch. The patch shall be tested according to the procedures outlined below for vacuum testing.

3. Vacuum Testing

a. Vacuum testing shall be performed on all seams welded with an extrusion welder.

b. The equipment used for vacuum testing shall consist of a vacuum pumping device, a vacuum box, and a foaming agent in solution.

c. The section of seam to be tested shall be wetted with a foaming agent and the vacuum box shall be placed over the wetted area. Air shall be evacuated from the vacuum box until a seal between the box and the geomembrane has been formed.

d. The minimum vacuum shall be equivalent to 5 psig (10 inches of mercury).

e. If fusion welded seams are being tested, the overlap flap must be cut off prior to testing.

f. The seam shall be observed through the viewing window for bubbles emitting from the seam.

g. If no bubbles are observed, the box shall be moved on to the next area for testing. If bubbles are observed, the area of the leak shall be marked for repair.

h. After completion of repairs, the repair seam shall be retested according to the requirements of paragraph 3.3B.

3.4 INSPECTION AND REPAIR

A. **Field Inspection:** All seals to penetrations as well as all seams and non-seam areas of the geomembrane shall be inspected for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection. Each suspect location shall be non-destructively tested as appropriate and repaired accordingly.

B. Repair Procedures:

1. Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.

2. Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.

3. CONTRACTOR shall be responsible for repair of defective areas.

4. Agreement upon the appropriate repair method shall be decided between ENGINEER and CONTRACTOR by using one of the following repair methods:

   a. Patching- Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.

   b. Abrading and Re-welding- Used to repair short section of a seam.

   c. Spot Welding- Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.

   d. Capping- Used to repair long lengths of failed seams.

   e. Flap Welding- Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.

   f. Remove the unacceptable seam and replace with new material.

5. The following procedures shall be observed when a repair method is used:

   a. All geomembrane surfaces shall be clean and dry at the time of repair.

   b. Surfaces of the polyethylene which are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.

   c. Extend patches or caps at least 6 inches for extrusion welds and 4 inches for wedge welds beyond the edge of the defect, and around all corners of patch material.

6. Repair Verification

   a. Number and log each patch repair (performed by ENGINEER).

   b. Non-destructively test each repair using methods specified in this Specification.

7. The CONTRACTOR shall also keep detailed record drawings showing the location, size, type, and frequency of all repairs made during the installation of the geomembrane. These record drawings shall be updated by the CONTRACTOR on a daily basis and submitted to the COMPANY upon completion of the project. Inspection of these record drawings shall be made available to the ENGINEER or the COMPANY for verification and review at any time during the construction period.

3.5 ACCEPTANCE

A. The CONTRACTOR shall retain all ownership and responsibility for the geomembrane system until acceptance by the ENGINEER. Final acceptance shall occur when the following conditions are met:

   1. Installation is finished.

2. Verification of the adequacy of all field seams and repairs is complete.

3. Submittals required in Paragraph 1.2 D have been accepted by the ENGINEER.

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SECTION 02930 - SEEDING

PART 1 -- GENERAL

1.1 SUMMARY

A. The Contractor shall apply reclamation seed mix to the completed cover, complete and in place, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Federal Specifications:

FS O-F-241D	Fertilizer, Mixed, Commercial.

B. Commercial Standards:

ANSI/ASTM D 422	Method for Particle-size Analysis of Soils.

1.3 CONTRACTOR SUBMITTALS

A. Furnish submittals for approval.

B. Materials List: A list of all materials to be used in the seeding operations together with the source of those materials. The list shall include mulches, soil amendments, seed mixtures, and erosion control blanketing. Manufacturer's literature showing physical characteristics, applications, and installation instrumentation shall be included.

C. Schedules: The following work plans, before work is started.

1. Delivery schedule at least 10 days prior to the intended date of the first delivery.
2. Seeding Operation: A list of seeding and mulching equipment to be used.

D. Reports

1. Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.
2. Reports for the following materials shall be included.
   a. Fertilizer: For chemical analysis and composition percent.
   b. Seed: For mixture, percent pure live seed, minimum percent germination and hard seed, maximum percent weed content, date tested and state certification.

E. Certificates: Certificates of compliance that materials meet the indicated requirements prior to the delivery of materials.

F. Records:

1. Plant Establishment Period

2. Maintenance Report

3. Maintenance Instructions

1.4 CLEANUP

A. Upon completion of all seeding operations, the portion of the Site used for a work or storage area by the Contractor shall be cleaned of all debris, superfluous materials, equipment, and garbage.

1.5 MAINTENANCE OF LANDSCAPING PLANTING PRIOR TO ACCEPTANCE OF PROJECT

A. General: The Contractor shall be responsible for protecting seeded areas until final acceptance of the Work.

B. Upon completion of seeding, the entire planted area shall be soaked to saturation by a fine spray. Care shall be taken to avoid excessive washing, or puddling on the surface, and any such damage caused thereby shall be repaired by the Contractor.

C. Protection: The Contractor shall provide adequate protection to all newly seeded areas including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until the end of the one-year warranty period.

1.6 FINAL INSPECTION AND GUARANTEE

A. Inspection of seeded areas will be made at final acceptance

B. Written notice requesting inspection shall be submitted to the Engineer at least 10 days prior to the anticipated inspection date.

C. Any delay in completing the Work of this Section beyond a single season will be cause for extending the correction of defects period an equal time.

D. The Contractor shall, without additional expense to the Company, replace seeding which develops defects or dies during the correction period.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Cover soil shall be obtained from onsite borrow sources.

2.2 TOPSOIL

A. General fill and clay to be blended to generate the topsoil shall be obtained from the pre-established borrow source at a location directed by the Company and placed in accordance with Section 02222 – Earthwork and Grading.

2.3 FERTILIZER AND ADDITIVES

A. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.

B. Fertilizers shall be uniform in composition, dry, and free flowing.

C. Chemical fertilizers shall be a mixed uncommercial fertilizer with nitrogen (N), phosphorous (P), and potassium (K) at the following application rates. Nitrogen shall be applied at 70 lbs /acre in the form of ammonium nitrate (33-0-0). This is an equivalent of 23 lbs of total N/acre (70 x 33%). Phosphorous shall be applied at 150 lbs/acre in the form of triple super phosphate (0-44-0). This form of phosphorous contains 20% total P, so the application of total P will be 30 lbs/acre. Potassium shall be applied at 60 lbs/acre in the form of potassium chloride (0-0-60). This form of potassium contains 50% total K, so the application of total K will be 30 lbs/acre. Fertilizer recommendations may be modified as to the forms or blends of fertilizer used as formulations vary by region. The total nutrient application rate for each of the nutrients shall be matched within ±10% of what is recommended. Fertilizers shall be uniform in composition, dry, and free flowing.

2.4 MULCH

A. Wood Cellulose Fiber: shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to aid visual monitoring during application. Composition will include at least 70 percent specially prepared virgin cellulose fiber and shall contain the following properties: recycled cellulose fiber (30 percent minimum), ash content (0.8 to 1.1 percent maximum), water holding capacity (10 to 1 ratio of water to fiber), and pH range from 4.5 to 5.5.

B. Weed free straw mulch, or native hay, for a soil/seed stabilizer shall be clean hay or straw applied at a rate of 2 tons per acre. Mulch shall be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6-inches minimum and 9-inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3 inches.

2.5 SEED MIXTURES

A. All seed shall conform to applicable County, State of Utah, and Federal regulations. Seed shall be mixed by the seed supplier. The Contractor shall furnish the seed supplier's guaranteed germination of each variety listed in the seed mixture. Grass seed shall not be delivered to the Site until samples have been approved by the Engineer. Approval of samples, however, shall not affect the right of the Engineer to reject seed upon or after delivery. Seed which has become wet, moldy, or otherwise damaged prior to use will not be accepted.

B. Seed shall be delivered in strong, clearly marked bags not exceeding 50 pounds each.

C. Seed shall be fresh, clean, and new-crop seed composed of the following varieties mixed in the proportions by weight as indicated. Seed shall be tested for compliance with the minimum percentage of purity and germination requirements. All rates specified shall be pure live seed (PLS).

D. The seed mixture shall not contain more than 5 percent weeds or other species that are not required.

E. Any deviation of the indicated seed mixture composition shall be approved by the Engineer prior to delivery.

SEED MIXTURE	
Common Names	**Drill Seeding Rate (lbs pf Pure Live Seed/Acre)**
Tall Wheatgrass	2.0
Hercules Tall Wheatgrass	2.0
AC Saltlander Green Wheatgrass	4.0
Garrison Creeping Foxtail	2.5
Intermediate Wheatgrass	2.5
FSG423ST Salt Tolerant Alfalfa	1.5
Strawberry Clover	1.5
Total	16.0

PART 3 -- EXECUTION

3.1 GENERAL

A. Delivery of seed and fertilizer may begin only after samples and tests have been approved by the Engineer. Seed and fertilizer furnished shall not be different from the approved sample.

B. Seeding shall not be performed at any time when it may be impaired by climatic conditions.

3.2 SOIL PREPARATION

A. The seeding shall not begin until the Contractor has repaired all areas of settlement, erosion, rutting, etc. and the soils have been placed, compacted, and contoured to finish grade. The Engineer shall be notified of areas that prevent the planting work from being executed.

B. After removal of waste materials in the planting areas, such as weeds, roots, rocks 6 inches and larger, construction materials, etc., the seeding subgrade shall be tilled to a depth of 6 inches and all surface irregularities removed.

C. Areas requiring grading by the Contractor including adjacent transition areas shall be uniformly level or sloping between finish elevations to within 0.10-ft above or below required finish elevations.

D. Any unusual subsoil condition that will require special treatment shall be reported to the Engineer.

E. Topsoil: Topsoil shall be placed in accordance with Section 02222 – Earthworks and Grading. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, excessively compacted or in a condition detrimental to the proposed planting or grading.

F. Fertilizer: Fertilizer shall be applied at the following rates:

  1. Nitrogen shall be applied at 70 lbs /acre in the form of ammonium nitrate (33-0-0). This is an equivalent of 23 lbs of total N/acre (70 x 33%).

  2. Phosphorous shall be applied at 150 lbs/acre in the form of triple super phosphate (0-44-0). This form of phosphorous contains 20% total P, so the application of total P will be 30 lbs/acre.

  3. Potassium shall be applied at 60 lbs/acre in the form of potassium chloride (0-0-60). This form of potassium contains 50% total K, so the application of total K will be 30 lbs/acre.

G. Fertilizer shall be incorporated into the soil to a minimum depth of 6 inches and may be incorporated as part of the tillage operation.

H. Tillage

  1. Preparation. Seed areas shall be filled as needed or have surplus soil removed to attain the finished grade. Drainage patterns shall be maintained as indicated on drawings. Seed areas compacted by construction operations shall be completely pulverized by tillage.

  2. Protection. Finished graded areas shall be protected from damage by vehicular or pedestrian traffic and erosion.

  3. Finish Grading. Finished grade shall be 1-inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing. Make minor adjustments of finish grades as directed by the Engineer.

I. No seeding shall be done when wind velocity exceeds 4 mph, within 4 hours after rain, or if the surface has been compacted without first loosening the ground.

3.3 HYDROSEEDING

A. **Equipment:** Mixing shall be performed in a tank. The tank shall have a built-in continuous agitation and circulation system, of sufficient operating capacity to produce a homogenous slurry of mulch, stabilizer, seed, fertilizer and water in the designated unit proportions for a minimum coverage of one-half acre. The tank shall have a discharge system which will permit attachment of at least 500-feet of hose extensions, a change of elevation of 150-feet in height from tank to discharge nozzle, and still retain enough pressure to apply the slurry to the areas at a continuous and uniform rate.

B. **Proportions:** Proportions of mulch, seed, stabilizer and water per acre shall be as indicated in the approved Revegetation Plan, or as otherwise approved by the ENGINEER.

C. Application

1. With agitation system operating at part speed, water shall be added to the tank and good recirculation shall be established. Materials shall be added in such a manner that they are uniformly blended into the mixture.

2. Slurry distribution shall begin immediately. Application of slurry shall be done only when rain is not anticipated for at least three days after slurry application.

3. The entire tank of each batch of slurry shall be emptied and the slurry evenly applied to areas to be hydroseeded within a 2 hour period following the mixing of each slurry batch. Slurry batches not applied during this time will be rejected.

3.4 DRILL SEEDING

A. **Equipment:** Seeding drill shall be a mechanical grass drill with depth bands and have multiple seed boxes to appropriate to the size and weight of the specified seeds.

B. All seed shall be drilled to one-quarter (1/4) inch to one half (1/2) inch into the soil at the specified seed rate.

C. CONTRACTOR shall drill on-half (1/2) of the required seed in one direction, and then drill the remaining half of the required seed in a direction 90° to the first half.

3.5 SEEDING COMPLETION

A. Mulching: Immediately after seeding, the entire area shall be mulched with one of the two following methods:

1. Weed free straw or native hay at a rate of 2 tons per acre. Weed free straw mulch or native hay for a soil/seed stabilizer shall be clean hay or straw. Mulch shall be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6-inches minimum and 9-inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3-inches.

2. Hydromulching with wood fiber mulch can be used as an alternative to straw or hay and applied at a rate of 1.5 tons/acre along with a tackifier to bind the mulch to the soil.

3.4 INSPECTION

A. At the completion of the work, the Contractor shall request a preliminary inspection by the Engineer to determine the condition of seeding.

B. A final inspection shall be requested 48 hours following seed germination. The Contractor and Engineer will be present for the inspection. Seeded areas considered for final inspection shall show uniform smooth ground surface without eroded ruts or gullies and evidence of uniform seed germination.

3.5 ACCEPTANCE

A. If the installation is found satisfactory, the Company will approve the work in writing.

B. If the installation is found unsatisfactory, the Engineer will submit a punch list of conditions to correct at the Contractor's expense. The Contractor shall be responsible for requesting additional inspections after the conditions of the punch list have been corrected.

C. The final acceptance criteria for seeding will be an average of one seedling (from seeded species) per square foot after the first growing season. Therefore, for seeding performed in late fall, the evaluation of final acceptance will be determined in the fall of next year.

D. Any areas not achieving the acceptance criteria presented above will be re-seeded at the expense of the Contractor.

3.6 REPAIRS

A. Seed shall be re-applied in any area, including washout gullies and/or slopes, where growth has not initiated during the first rainy season, November through April, following initial application. Washout gullies will require the placement of additional topsoil to fill washouts in accordance with Section 02222 – Earthwork and Grading, prior to re-seeding.

- END OF SECTION -

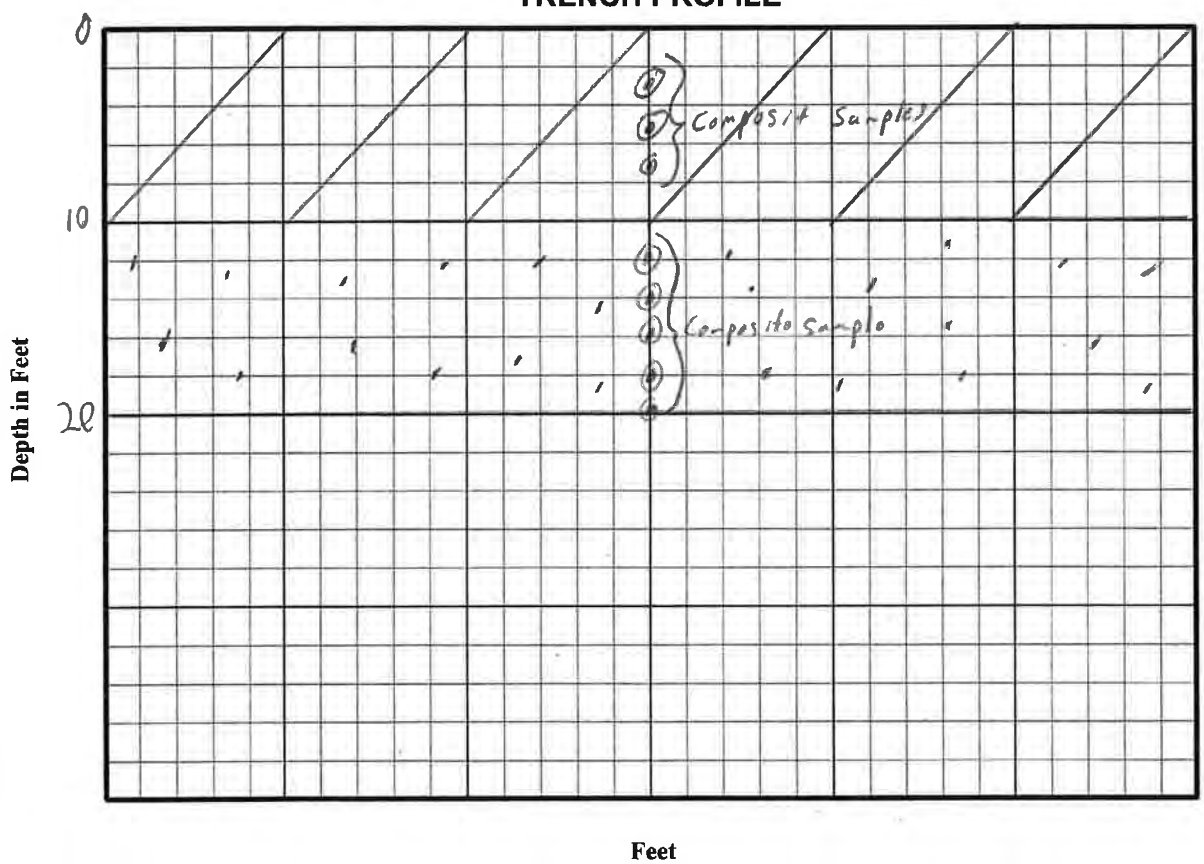
Appendix C

Borrow Area 3 Test Pit Logs

TRENCH TEST PIT LOG FORM

Project IPSC CCR Closures
Project Number 233001396
Sample Location Borrow Area 3
Trench Number B3TP-1
Date 10/29/20
Coordinates: Inside Stake ____ Outside Stake ____
Native/Fill Stake ____
Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' - Light brown in color, clayey sand (SC), low plasticity
10-20' - Light brown in color, transitioning to clay with sand (CL), moderate plasticity

Begin Trench 10:20
Finish Trench 10:35
Trenching Contractor IPSC
Total Depth 20'
Total Length 10'

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closure

Project Number 233001396

Sample Location Borrow Area 3

Trench Number B3TP-2

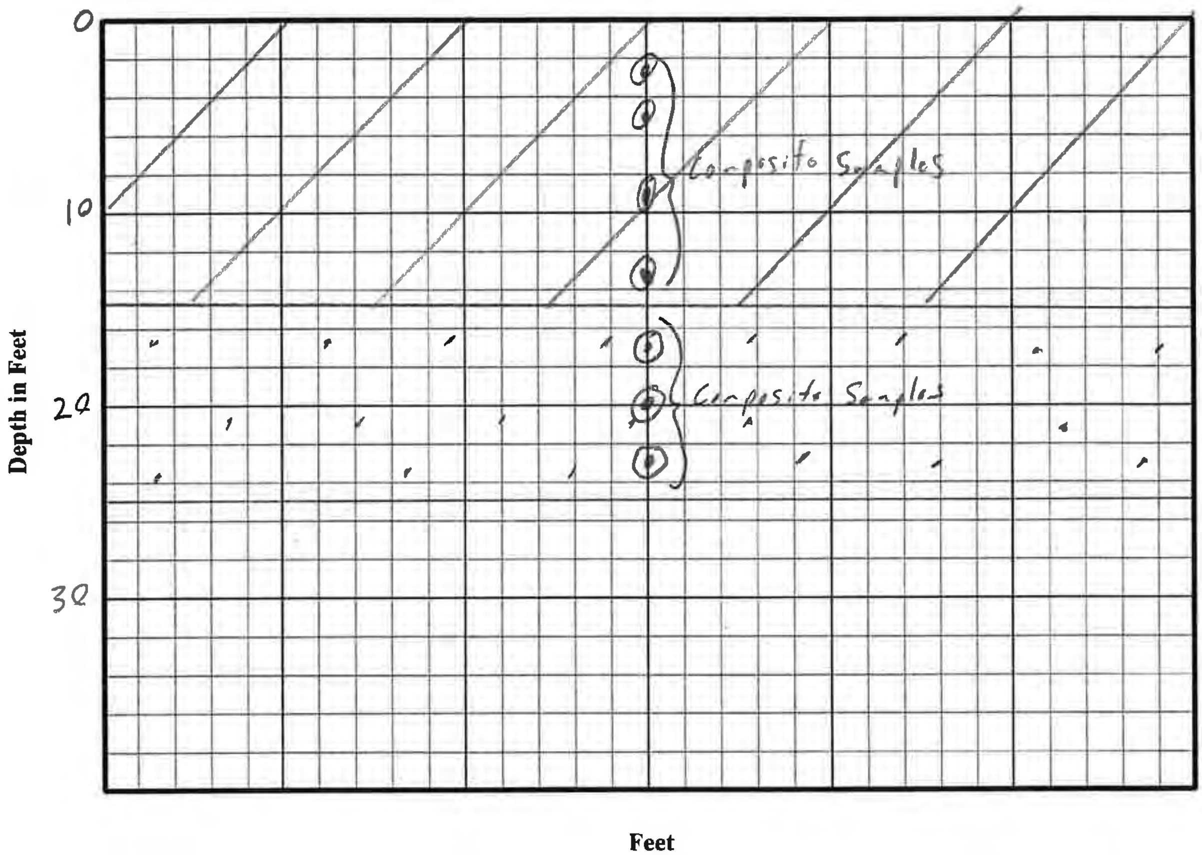
Date 10/29/19

Coordinates: Inside Stake ______ Outside Stake ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-15' - Light brown, sandy Clay, moderate plasticity

15-25' - Same as above.

Begin Trench 10:40

Finish Trench 10:50

Trenching Contractor IPSC

Total Depth 25'

Total Length 10'

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures

Project Number 233001396

Sample Location Borrow Area 3

Trench Number B3TP-3

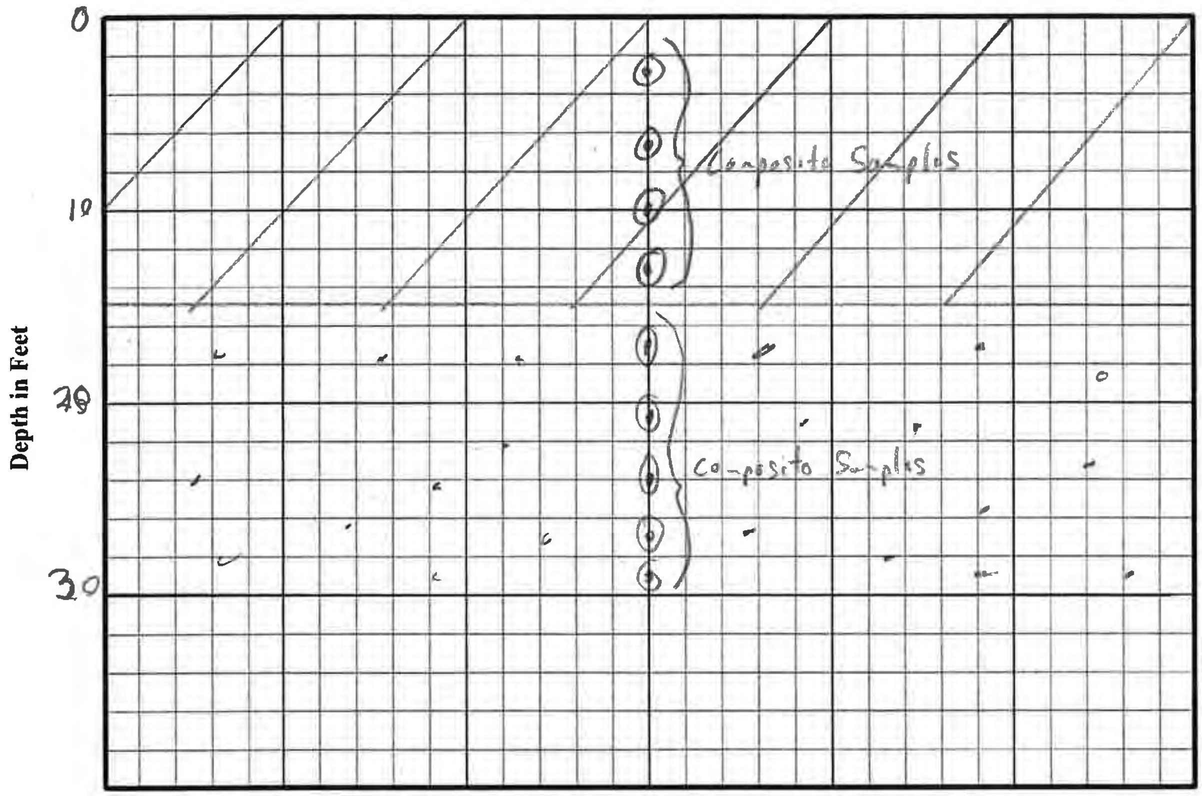
Date 10/29/20

Coordinates: Inside Stake ______ Outside Stake ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE



Feet

Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-15' - Light brown, silty sand, low to no plasticity

15-30' - Light brown, transition from silty sand to clay with sand, moderate plasticity

Begin Trench 10:55

Finish Trench 11:15

Trenching Contractor IPSC

Total Depth 30'

Total Length 10'

Appendix D

Laboratory Test Results

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-1
Depth: 0-10'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/4"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

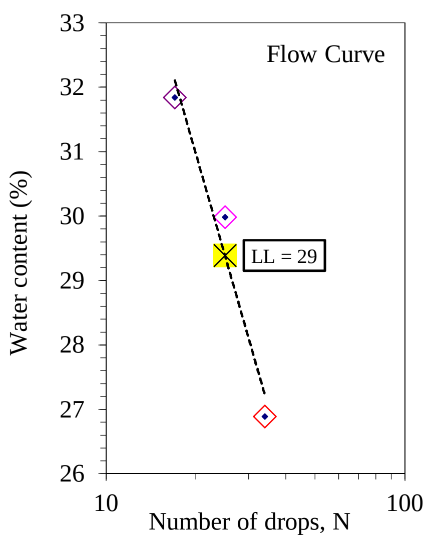
Plastic Limit

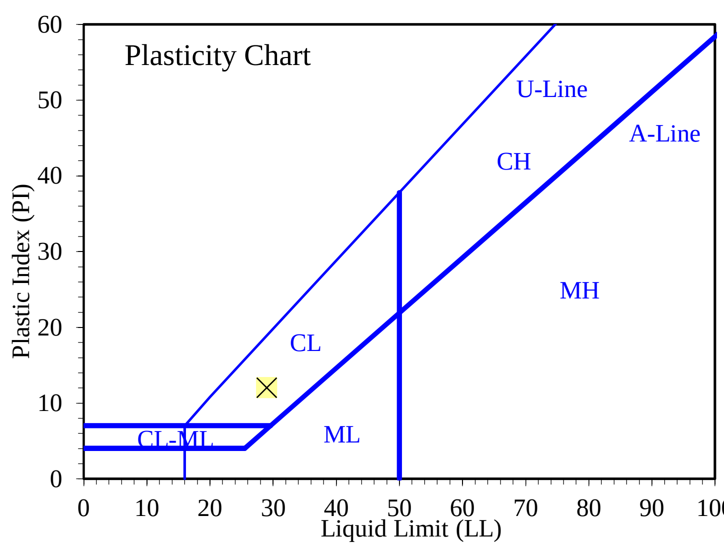
Determination No	1	2				
Wet Soil + Tare (g)	14.37	14.62				
Dry Soil + Tare (g)	13.28	13.51				
Water Loss (g)	1.09	1.11				
Tare (g)	7.08	7.11				
Dry Soil (g)	6.20	6.40				
Water Content, w (%)	17.58	17.34				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	34	25	17			
Wet Soil + Tare (g)	14.56	15.45	16.23			
Dry Soil + Tare (g)	13.03	13.66	14.10			
Water Loss (g)	1.53	1.79	2.13			
Tare (g)	7.34	7.69	7.41			
Dry Soil (g)	5.69	5.97	6.69			
Water Content, w (%)	26.89	29.98	31.84			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**29**
Plastic Limit, PL (%)	**17**
Plasticity Index, PI (%)	**12**





Entered by:____________
Reviewed:____________

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

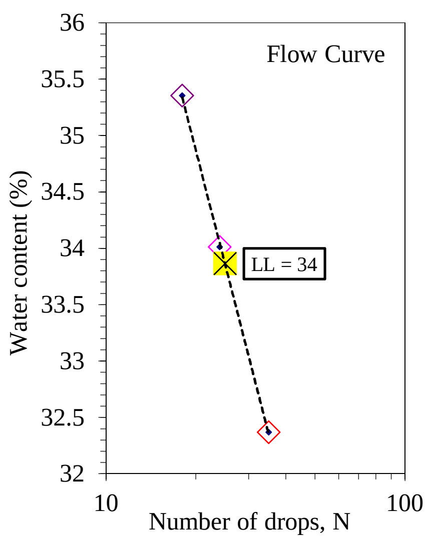
Plastic Limit

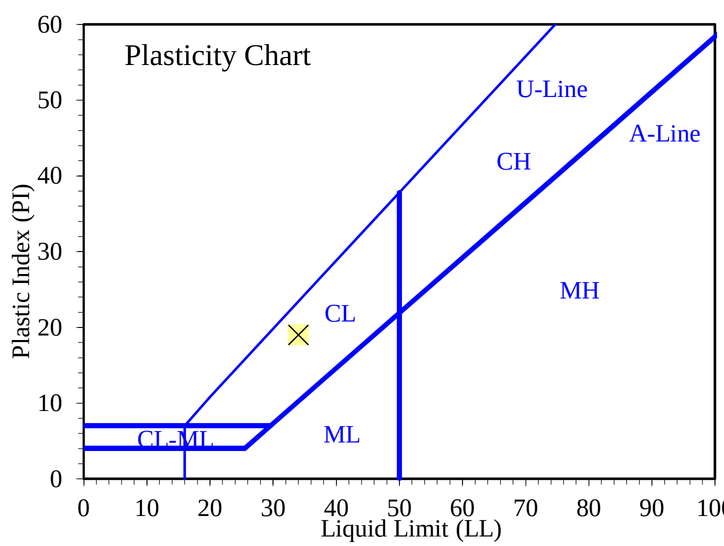
Determination No	1	2				
Wet Soil + Tare (g)	14.56	14.71				
Dry Soil + Tare (g)	13.56	13.73				
Water Loss (g)	1.00	0.98				
Tare (g)	7.03	7.11				
Dry Soil (g)	6.53	6.62				
Water Content, w (%)	15.31	14.80				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	24	18			
Wet Soil + Tare (g)	15.70	16.50	15.24			
Dry Soil + Tare (g)	13.69	14.33	13.20			
Water Loss (g)	2.01	2.17	2.04			
Tare (g)	7.48	7.95	7.43			
Dry Soil (g)	6.21	6.38	5.77			
Water Content, w (%)	32.37	34.01	35.36			
One-Point LL (%)		34				

Liquid Limit, LL (%)	**34**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**19**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils
(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-2
Depth: 0-15'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

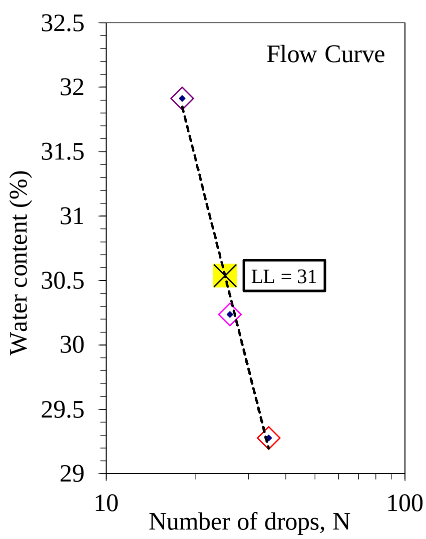
Plastic Limit

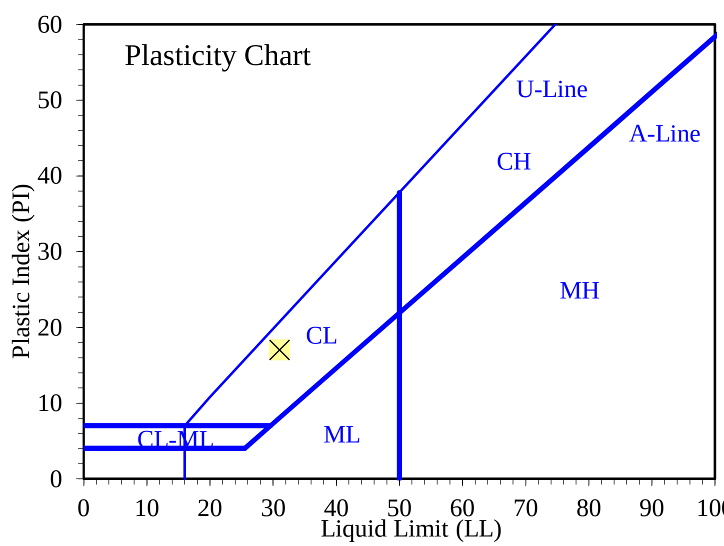
Determination No	1	2				
Wet Soil + Tare (g)	13.77	13.08				
Dry Soil + Tare (g)	12.94	12.34				
Water Loss (g)	0.83	0.74				
Tare (g)	7.05	7.03				
Dry Soil (g)	5.89	5.31				
Water Content, w (%)	14.09	13.94				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	26	18			
Wet Soil + Tare (g)	15.47	14.82	16.03			
Dry Soil + Tare (g)	13.57	13.03	13.86			
Water Loss (g)	1.90	1.79	2.17			
Tare (g)	7.08	7.11	7.06			
Dry Soil (g)	6.49	5.92	6.80			
Water Content, w (%)	29.28	30.24	31.91			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**31**
Plastic Limit, PL (%)	**14**
Plasticity Index, PI (%)	**17**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils
(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

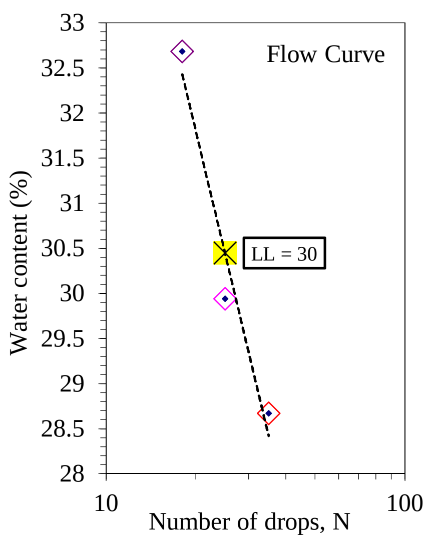
Plastic Limit

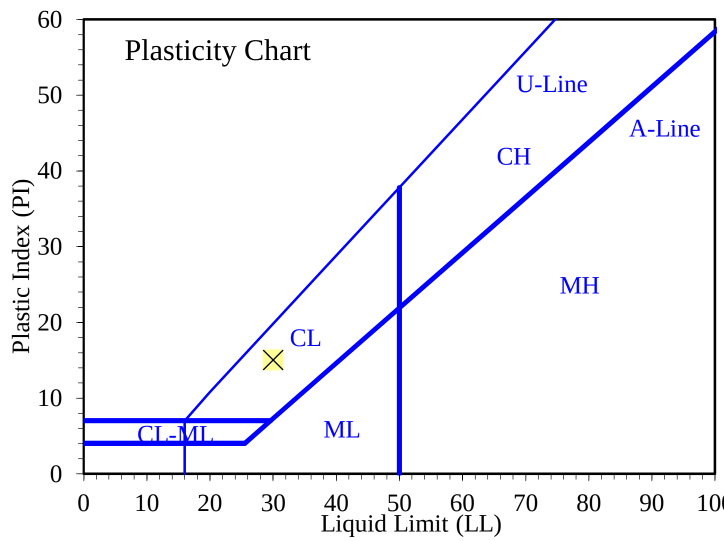
Determination No	1	2				
Wet Soil + Tare (g)	13.81	14.54				
Dry Soil + Tare (g)	12.93	13.56				
Water Loss (g)	0.88	0.98				
Tare (g)	7.03	7.13				
Dry Soil (g)	5.90	6.43				
Water Content, w (%)	14.92	15.24				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	25	18			
Wet Soil + Tare (g)	14.98	16.02	14.94			
Dry Soil + Tare (g)	13.30	14.02	13.10			
Water Loss (g)	1.68	2.00	1.84			
Tare (g)	7.44	7.34	7.47			
Dry Soil (g)	5.86	6.68	5.63			
Water Content, w (%)	28.67	29.94	32.68			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**30**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**15**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.:
Sample: B3TP-3
Depth: 0-15'
Description: SILT, brown
Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

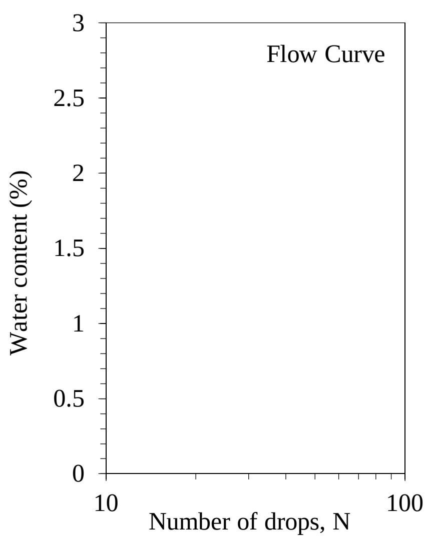
Plastic Limit

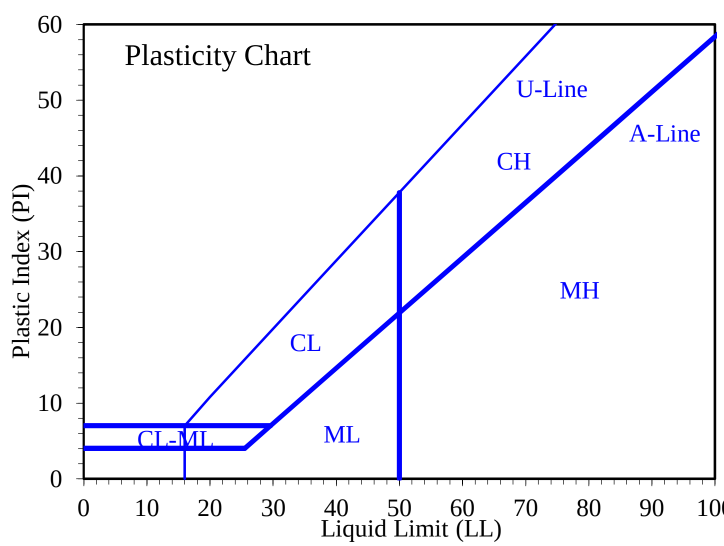
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils
(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR

Boring No.:
Sample: B3TP-3
Depth: 15-30'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.4
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

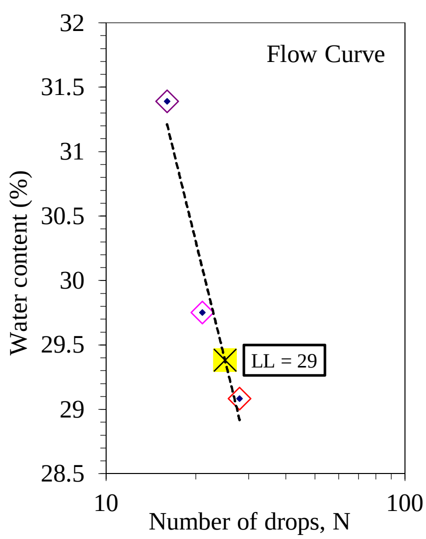
Plastic Limit

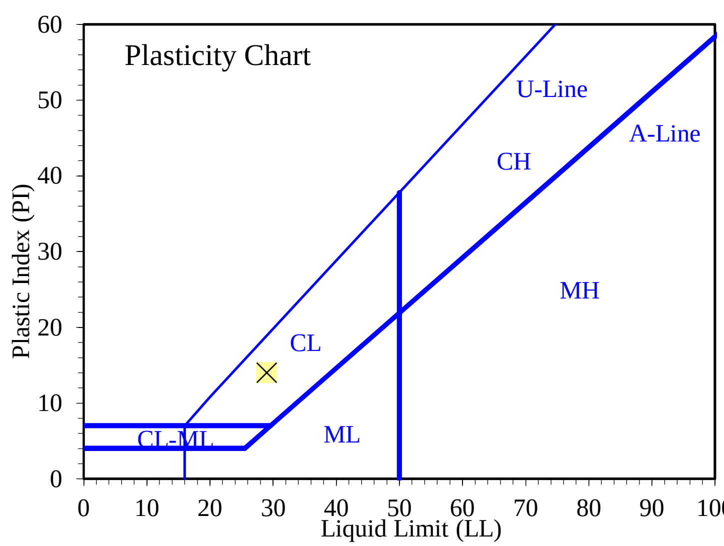
Determination No	1	2				
Wet Soil + Tare (g)	13.22	13.61				
Dry Soil + Tare (g)	12.41	12.75				
Water Loss (g)	0.81	0.86				
Tare (g)	7.12	7.07				
Dry Soil (g)	5.29	5.68				
Water Content, w (%)	15.31	15.14				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	28	21	16			
Wet Soil + Tare (g)	13.54	13.77	17.19			
Dry Soil + Tare (g)	12.08	12.22	14.93			
Water Loss (g)	1.46	1.55	2.26			
Tare (g)	7.06	7.01	7.73			
Dry Soil (g)	5.02	5.21	7.20			
Water Content, w (%)	29.08	29.75	31.39			
One-Point LL (%)	29	29				

Liquid Limit, LL (%)	**29**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**14**





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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-1
Depth: 0-10'
Description: Clayey SAND, brown

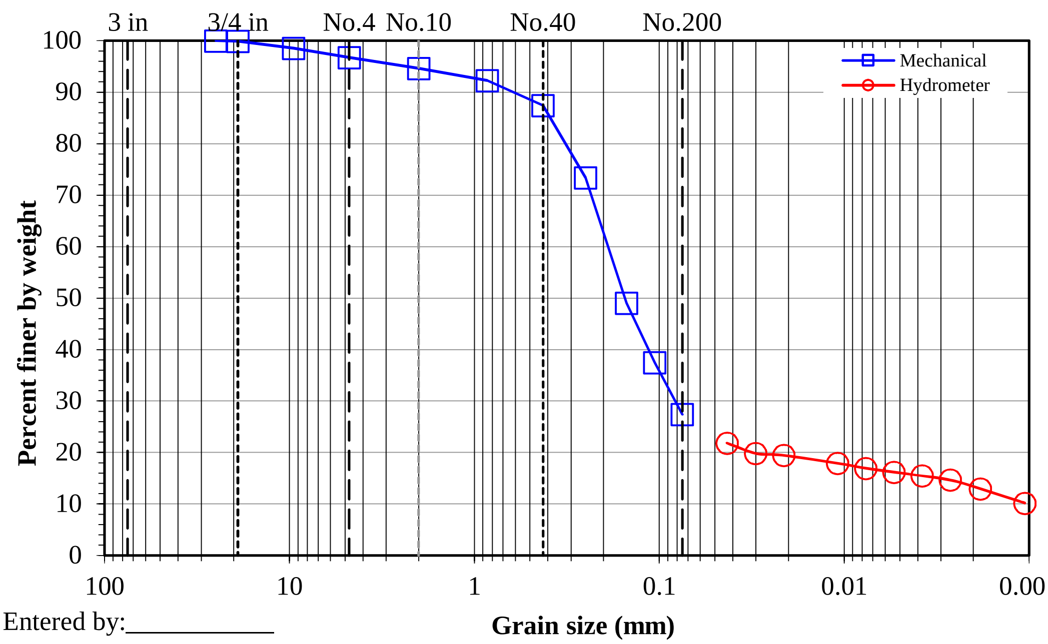
ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9915.5	9258.2
+3/8" Coarse fraction (g):	139.95	137.45
-3/8" Split fraction (g):	368.30	343.63
Hydrometer fraction (g):	65.30	58.84
First Split fraction:	0.985	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	264.47	497.11	30.00
Dry soil + tare (g):	261.94	472.44	27.73
Tare (g):	123.06	128.81	7.06
Water content (%):	1.82	7.18	10.98

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	94.65
Cylinder ID:	T5	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer		Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
6"		150	-		1	22.1	18.5	0.0430	21.83
4"		100	-		2	22.1	17.25	0.0301	19.84
3"		75	-		4	22.1	17	0.0212	19.44
1.5"		37.5	-		15	22.2	16	0.0109	17.91
1"		25	100.0		30	21.9	15.5	0.0077	16.94
3/4"	5.88	19	99.9		60	22	15	0.0054	16.20
3/8"	137.45	9.5	98.5	<=1st Split	120	22.1	14.5	0.0038	15.47
No.4	6.25	4.75	96.7		240	22.1	14	0.0027	14.67
No.10	13.50	2	94.6	<=Split hyd.	500	21.9	13	0.0018	12.97
No.20	21.74	0.85	92.3		1465	21.9	11.25	0.0011	10.18
No.40	38.63	0.425	87.4						
No.60	87.59	0.25	73.4						
No.100	172.67	0.15	49.0						
No.140	212.92	0.106	37.5						
No.200	247.98	0.075	27.4						

Gravel (%): 3.3
Sand (%): 69.3
Fines (%): 27.4



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Description: Lean CLAY with sand, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9285.1	7989.9
+3/8" Coarse fraction (g):	18.33	17.92
-3/8" Split fraction (g):	308.83	265.68
Hydrometer fraction (g):	65.18	57.28
First Split fraction:	0.998	

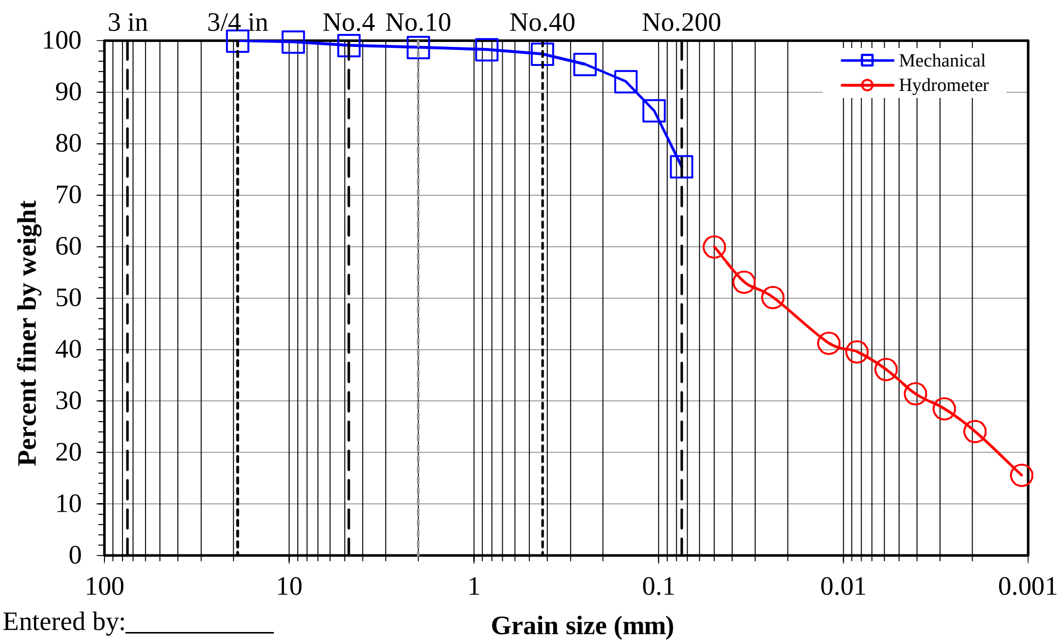
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	147.79	435.66	25.99
Dry soil + tare (g):	147.33	392.51	23.75
Tare (g):	127.04	126.83	7.50
Water content (%):	2.27	16.24	13.78

Hydrometer data				
Hyd. split:	No.10			
Gs:	2.7	Assumed		
Bulb No.	6		Hyd. fraction:	98.76
Cylinder ID:	N3		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	17.92	9.5	99.8	<=1st Split
No.4	1.82	4.75	99.1	
No.10	2.71	2	98.8	<=Split hyd.
No.20	3.99	0.85	98.3	
No.40	6.25	0.425	97.4	
No.60	11.55	0.25	95.4	
No.100	20.49	0.15	92.1	
No.140	35.48	0.106	86.5	
No.200	64.53	0.075	75.5	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	40	0.0500	59.99
2	22	36	0.0345	53.17
4	22	34.25	0.0241	50.18
15	22.1	29	0.0120	41.30
30	22.1	28	0.0084	39.59
60	22.1	26	0.0059	36.18
120	22	23.25	0.0041	31.43
240	22.1	21.5	0.0028	28.51
494	21.9	19	0.0019	24.12
1458	21.9	14	0.0011	15.60

Gravel (%): 0.9
Sand (%): 23.6
Fines (%): 75.5



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Reviewed:___________

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-2
Depth: 0-15'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	8606.1	7443.4
+3/8" Coarse fraction (g):	4.08	3.99
-3/8" Split fraction (g):	245.05	211.93
Hydrometer fraction (g):	65.51	57.75
First Split fraction:	0.999	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	132.04	373.55	35.45
Dry soil + tare (g):	131.95	340.43	32.09
Tare (g):	127.91	128.50	7.10
Water content (%):	2.23	15.63	13.45

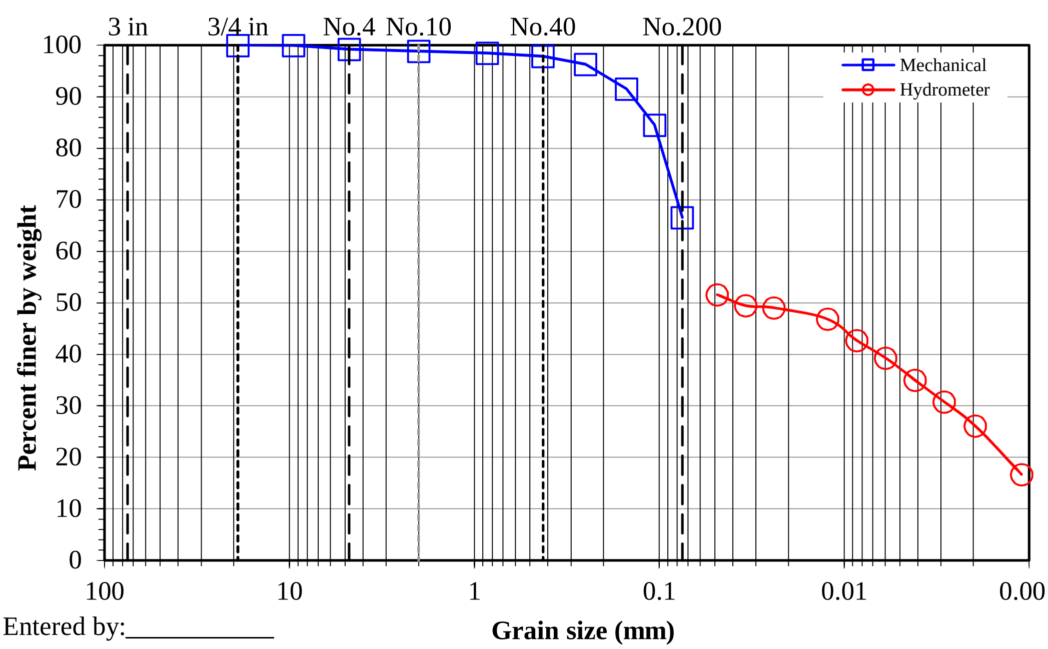
Hydrometer data				
Hyd. split:	No.10			
Gs:	2.7	Assumed		
Bulb No.	6		Hyd. fraction:	98.84
Cylinder ID:	N10		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	100.0
3/8"	3.99	9.5	99.9
No.4	1.58	4.75	99.2
No.10	2.34	2	98.8
No.20	3.08	0.85	98.5
No.40	4.48	0.425	97.8
No.60	7.69	0.25	96.3
No.100	17.86	0.15	91.5
No.140	32.70	0.106	84.5
No.200	70.82	0.075	66.5

<=1st Split (at 3/8")
<=Split hyd. (at No.10)

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.1	35.25	0.0486	51.58
2	22.1	34	0.0341	49.46
4	22.1	33.75	0.0240	49.04
15	22	32.5	0.0123	46.86
30	22.1	30	0.0086	42.69
60	22.1	28	0.0060	39.31
120	22	25.5	0.0041	35.02
240	22	23	0.0029	30.78
497	22	20.25	0.0020	26.13
1450	21.1	15	0.0011	16.70

Gravel (%): 0.8
Sand (%): 32.7
Fines (%): 66.5



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Reviewed:___________

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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Description: Sandy lean CLAY, brown

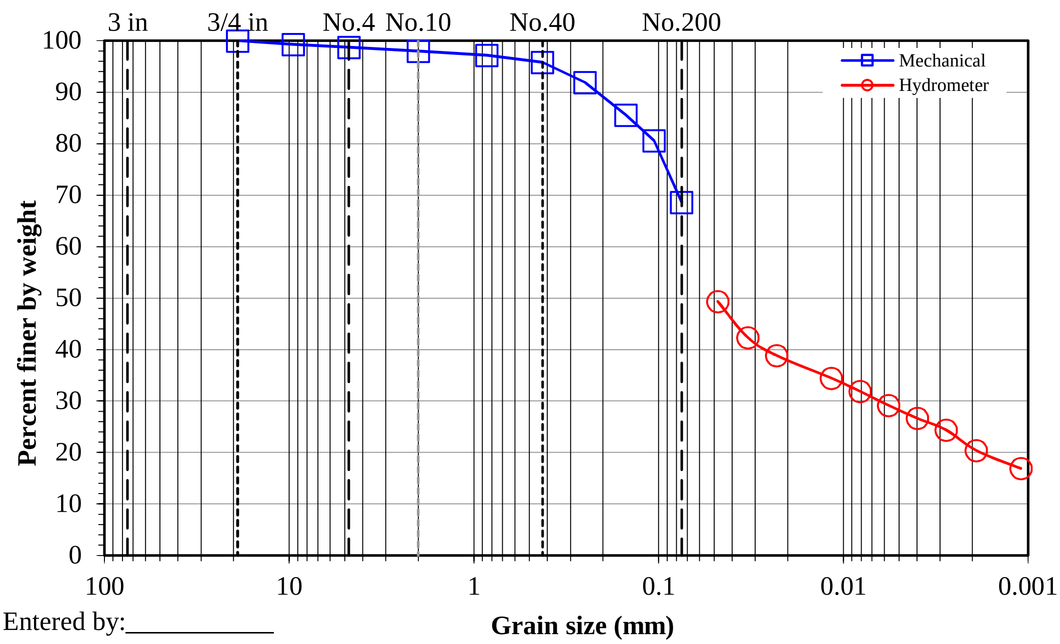
ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	8940.3	7903.2
+3/8" Coarse fraction (g):	56.99	54.10
-3/8" Split fraction (g):	261.81	231.33
Hydrometer fraction (g):	61.80	55.36
First Split fraction:	0.993	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	192.03	389.49	28.99
Dry soil + tare (g):	188.63	359.01	26.74
Tare (g):	125.02	127.68	7.41
Water content (%):	5.35	13.18	11.64

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	98.00
Cylinder ID:	T3	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	54.10	9.5	99.3	<=1st Split
No.4	1.37	4.75	98.7	
No.10	3.07	2	98.0	<=Split hyd.
No.20	4.94	0.85	97.2	
No.40	8.21	0.425	95.8	
No.60	17.25	0.25	91.9	
No.100	32.03	0.15	85.6	
No.140	43.64	0.106	80.6	
No.200	71.52	0.075	68.6	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	33	0.0478	49.34
2	22	29	0.0329	42.34
4	22	27	0.0229	38.84
15	22	24.5	0.0116	34.46
30	22.1	23	0.0081	31.90
60	21.9	21.5	0.0057	29.15
120	22.1	20	0.0040	26.65
240	22	18.75	0.0028	24.40
492	21.9	16.5	0.0019	20.40
1443	21.9	14.5	0.0011	16.90



Gravel (%): 1.3
Sand (%): 30.1
Fines (%): 68.6

Entered by:___________
Reviewed:___________

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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JAB/BRR/EH

Boring No.:
Sample: B3TP-3
Depth: 0-15'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9290.9	8833.5
+3/8" Coarse fraction (g):	47.94	46.11
-3/8" Split fraction (g):	212.21	201.75
Hydrometer fraction (g):	83.68	80.77
First Split fraction:	0.995	

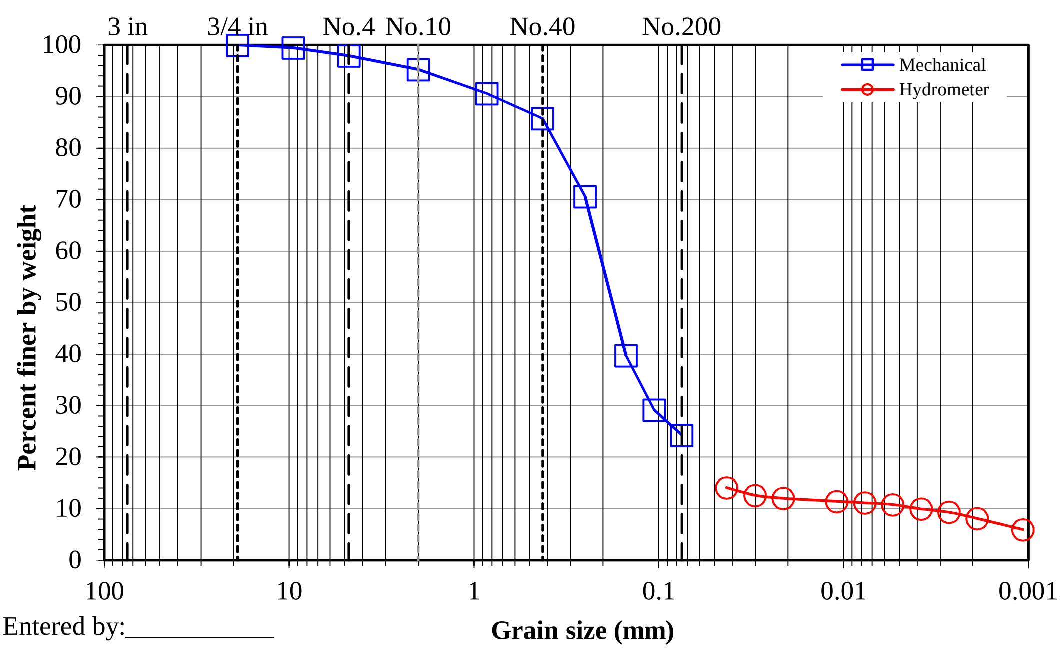
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	171.32	339.33	49.45
Dry soil + tare (g):	169.45	328.87	48.17
Tare (g):	122.41	127.12	12.64
Water content (%):	3.98	5.18	3.60

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.65	Assumed	
Bulb No.	6	Hyd. fraction:	95.26
Cylinder ID:	N16	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	46.11	9.5	99.5	<=1st Split
No.4	3.18	4.75	97.9	
No.10	8.56	2	95.3	<=Split hyd.
No.20	18.00	0.85	90.6	
No.40	27.85	0.425	85.7	
No.60	58.55	0.25	70.6	
No.100	121.17	0.15	39.7	
No.140	142.63	0.106	29.2	
No.200	152.51	0.075	24.3	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	16.75	0.0430	14.08
2	22	15.5	0.0301	12.60
4	22	15	0.0212	12.01
15	22	14.5	0.0109	11.42
30	22	14.25	0.0077	11.13
60	21.9	14	0.0054	10.79
120	22	13.25	0.0038	9.95
239	21.9	12.75	0.0027	9.32
474	21.8	11.75	0.0019	8.10
1430	21.6	10	0.0011	5.95

Gravel (%): 2.1
Sand (%): 73.6
Fines (%): 24.3



Entered by:___________
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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP/JAB/EH/BRR

Boring No.:
Sample: B3TP-3
Depth: 15-30'
Description: Lean CLAY with sand, brown

ASTM Standard(s): ASTM D6913 and ASTM D7928
Split: No
Second split: No

	Moist	Dry
Total sample wt. (g):	260.92	217.49
Hydrometer fraction (g):	65.96	56.18

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	384.53	47.86
Dry soil + tare (g):	341.10	42.64
Tare (g):	123.61	12.66
Water content (%):	19.97	17.41

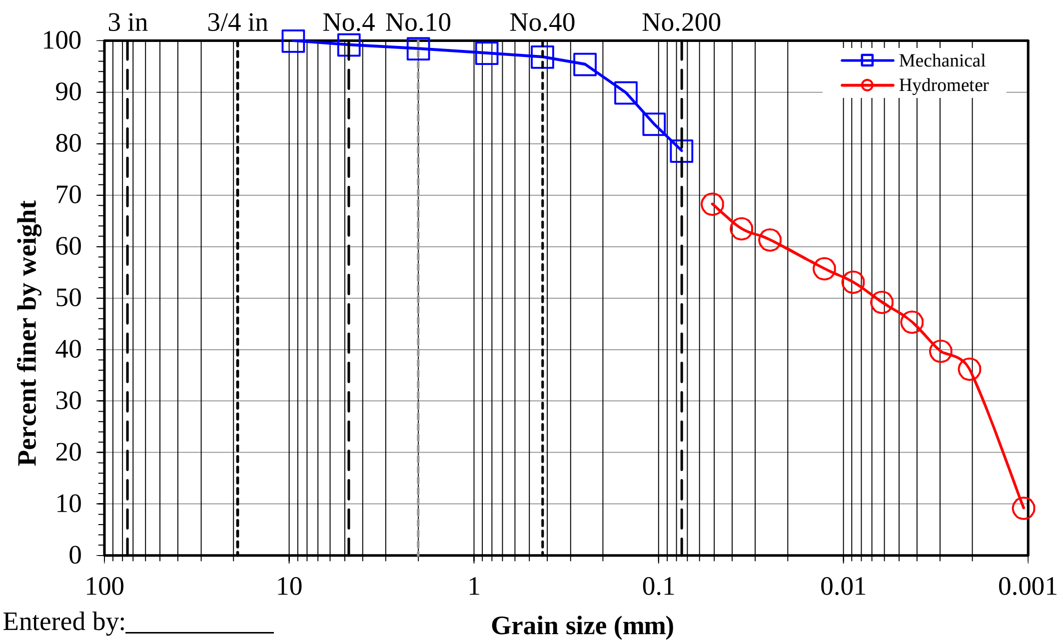
Hydrometer data
Hyd. split: No.10
Gs: 2.7 Assumed
Bulb No. 6 — Hyd. fraction: 98.48
Cylinder ID: N18 — Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	100.0
No.4	1.74	4.75	99.2
No.10	3.31	2	98.5
No.20	5.15	0.85	97.6
No.40	6.80	0.425	96.9
No.60	9.89	0.25	95.5
No.100	21.91	0.15	89.9
No.140	35.12	0.106	83.9
No.200	46.50	0.075	78.6

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.9	44.25	0.0512	68.30
2	21.9	41.5	0.0357	63.53
4	21.9	40.25	0.0250	61.36
15	21.9	37	0.0127	55.73
30	21.9	35.5	0.0089	53.13
60	21.9	33.25	0.0062	49.23
123	22	31	0.0043	45.39
240	21.9	27.75	0.0030	39.70
478	21.9	25.75	0.0021	36.23
1434	21.7	10.25	0.0011	9.24

Gravel (%): 0.8
Sand (%): 20.6
Fines (%): 78.6



Entered by:___________
Reviewed:___________

Classification of Soils for Engineering Purposes

(*ASTM D2487*)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR

Sample Info.								
Boring No.								
Sample:	B3TP-1	B3TP-1	B3TP-2	B3TP-2	B3TP-3	B3TP-3		
Depth:	0-10'	10-20'	0-15'	15-25'	0-15'	15-30'		
Liquid Limit (%):	29	34	31	30	NP	29		
Plastic Limit (%):	17	15	14	15	NP	15		
Plastic Index (%):	12	19	17	15	NP	14		
Gravel (%):	3.3	0.9	0.8	1.3	2.1	0.8		
Sand (%):	69.3	23.6	32.7	30.1	73.6	20.6		
Fines (%):	27.4	75.5	66.5	68.6	24.3	78.6		
D_{60} (mm):								
D_{30} (mm):								
D_{10} (mm):								
Cu:								
Cc:								
Group Symbol:	**SC**	**CL**	**CL**	**CL**	**SM**	**CL**		
Group Name:	**Clayey SAND**	**Lean CLAY with sand**	**Sandy lean CLAY**	**Sandy lean CLAY**	**Silty SAND**	**Lean CLAY with sand**		

Entered by:___________

Reviewed:___________

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Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

(ASTM D2974)

Project: **Stantec**
No: **M00287-022**
Location: IPSC CCR Unit Closures; Delta, UT
Date: 12/31/2019
By: BF/BSS/JAB

Sample Info.	Boring No.								
	Sample:	B1TP-1	B1TP-2	B1TP-3	B2TP-1	B2TP-2	B2TP-3	B3TP-1	
	Depth:	10-15'	10-20'	0-10'	20-25'	0-15'	12-15'	10-20'	
	Test Method:	C	C	C	C	C	C	C	
	Furnace temp. (°C)	440	440	440	440	440	440	440	
Moisture	Wet soil + tare (g)	680.76	630.70	611.32	614.17	599.84	552.15	569.66	
	Dry soil + tare (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Tare (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Ash / Organic Info	Mass of crucible and oven-dried sample (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Mass of crucible and ash (g)	648.81	622.08	584.01	572.54	578.24	521.82	530.70	
	Mass of crucible (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Moisture Content, w (%) [a]		**10.2**	**2.6**	**12.1**	**17.7**	**9.4**	**18.0**	**16.7**	
Ash Content (%)		**98.5**	**99.2**	**99.2**	**96.9**	**98.9**	**97.2**	**96.8**	
Organic Matter (%)		**1.5**	**0.8**	**0.8**	**3.1**	**1.1**	**2.8**	**3.2**	

[a] Moisture contents are by proportion of oven-dried mass (geotechnical convention).

Entered by:___________

Reviewed:___________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Sample Description: Lean CLAY with sand, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	142.03	
Dry soil + tare (g)	139.46	
Tare (g)	123.63	
Water content, w (%)	16.2	

Initial water temperature: 19.0 °C
Date test started: 12/27/2019
Time at beginning of test: 10:22

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	19.0	1	18.4	1	18.0
2	1	19.0	1	18.4	1	18.0

Dispersive classification: **Grade 1-Nondispersive**

Entered: ________
Reviewed: ________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Sample Description: Sandy lean CLAY, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	178.14	
Dry soil + tare (g)	169.56	
Tare (g)	114.72	
Water content, w (%)	15.6	

Initial water temperature: 18.9 °C
Date test started: 12/27/2019
Time at beginning of test: 10:24

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	18.9	1	18.3	1	18.0
2	1	18.9	1	18.3	1	18.0

Dispersive classification: Grade 1-Nondispersive

Entered: ________
Reviewed: ________

Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BSS

Sample: B3TP-1 & B3TP-2 & B3TP-3
Depth: 10-30'
Sample Description: Sandy lean CLAY, brown
Engineering Classification: CL
As-received water content (%): Not requested

Method: ASTM D698 B
Mold Id. Inc 3
Mold volume (ft^3): 0.0332

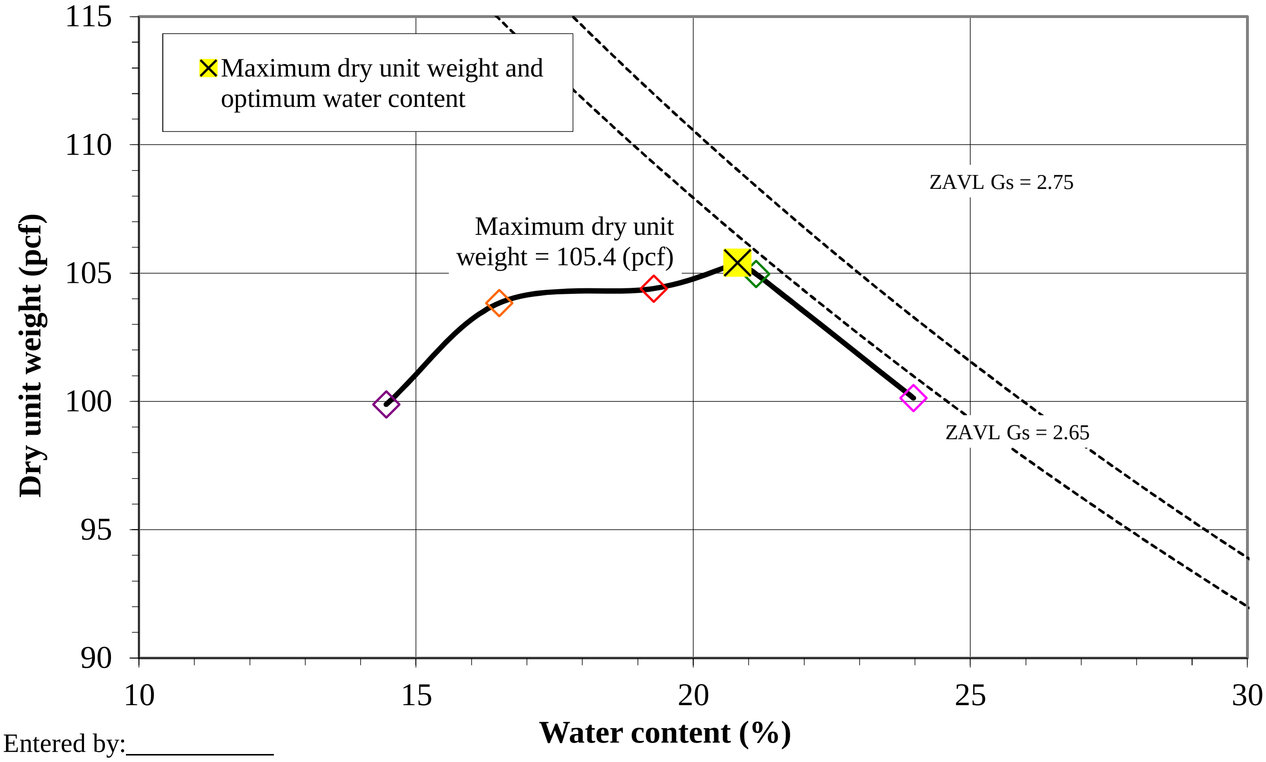
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Optimum water content (%): 20.8
Maximum dry unit weight (pcf): 105.4

Point Number	-2%	+2%	+4%	+6%	As Is			
Wt. Sample + Mold (g)	5945.2	6099.0	6138.5	6093.1	6045.3			
Wt. of Mold (g)	4221.2	4221.2	4221.2	4221.2	4221.2			
Wet Unit Wt., γ_m (pcf)	114.3	124.5	127.2	124.1	121.0			
Wet Soil + Tare (g)	971.48	1138.75	1103.65	1005.38	941.90			
Dry Soil + Tare (g)	890.21	990.52	948.61	852.61	840.16			
Tare (g)	328.25	221.93	215.02	215.35	223.51			
Water Content, w (%)	**14.5**	**19.3**	**21.1**	**24.0**	**16.5**			
Dry Unit Wt., γ_d (pcf)	**99.9**	**104.4**	**105.0**	**100.1**	**103.8**			

Comments:

Test specimen consisted of material from B3TP-1 @ 10-20', B3TP-2 @ 15-25', and B3TP-3 @ 15-30'. Due to insufficient sample quantity, points +4%, +6%, and As Is contained previously compacted material .



Entered by:___________

Reviewed:___________

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Clousres; Delta, UT
Date: 1/15/2020
By: EH

Boring No.:
Sample: B3TP-1, B3-TP-2, & B3TP-3
Depth: 10-30'
Sample Description: Sandy lean CLAY, brown
Sample Type: Laboratory Compacted
Compaction Specifications: 95 (%) Dry unit weight at 20.8 (%) w

	Initial (o)	Final (f)
Sample Height, H (in)	2.994	2.988
Sample Diameter, D (in)	2.413	2.400
Sample Length, L (cm)	7.605	7.589
Sample Area, A (cm^2)	29.503	29.195
Sample Volume, V (cm^3)	224.37	221.55
Wt. Rings + Wet Soil (g)	435.45	452.38
Wt. Rings (g)	0	0
Wet Unit Wt., γ_m (pcf)	121.2	127.5
Wet Soil + Tare (g)	292.31	578.61
Dry Soil + Tare (g)	263.64	486.29
Tare (g)	127.12	127.15
Weight of solids, Ws (g)	359.87	359.87
Water Content, w (%)	21.00	25.71
Dry Unit Wt, γ_d (pcf)	100.1	101.4
Void ratio, e, for assumed Gs	0.68	0.69
Saturation (%), for assumed Gs	83.0	100 [a]
Average K[b] (cm/sec)	**1.5E-05**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Optimum water content (%)	20.8
Maximum dry unit weight (pcf)	105.4
Gs	2.7 Assumed
Cell No.	2
Station No.	3
Permeant liquid used	De-aired tap water
Total backpressure (psi)	35
Effective horiz. consolidation stress (psi)	3
Effective vert. consolidation stress (psi)	3

	Initial (o)	Final (f)
B value	0.58	0.96
External Burette (cm^3)	14.90	23.70
Cell Pressure (psi)	0.0	38.0

Backpressure bottom (psi)	35.0
Backpressure top (psi)	35.0
System volume coefficient (cm^3/psi)	0.158
System volume change (cm^3)	5.99
Net sample volume change (cm^3)	-2.81
Bottom burette ground length, l_b (cm)	82.25
Top burette ground length, l_t (cm)	81.95
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.076

Start Date and Time: 1/14/20 16:34

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_T	K[b] (cm/sec)
30.0	1.21 1.27	8.66 8.59	38.14	37.46	1.5E-05	23.5 23.5	0.92	1.4E-05
30.0	1.27 1.34	8.59 8.52	37.46	36.75	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.34 1.41	8.52 8.45	36.75	36.06	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.41 1.47	8.45 8.38	36.06	35.38	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.47 1.55	8.38 8.31	35.38	34.61	1.9E-05	23.5 23.5	0.92	1.7E-05

Comments:
Test specimen was remolded to 95% of ASTM D698 B (which inlcuded combined material from B3TP-1 @ 10-20', B3TP-2 @ 15-25', and B3TP-3 @ 15-30') at optimum water content. Test specimen comprised of combined material.

Entered by:___________
Reviewed:___________

Appendix E

Closure Schedule

Wawater Basin Closure Schedule

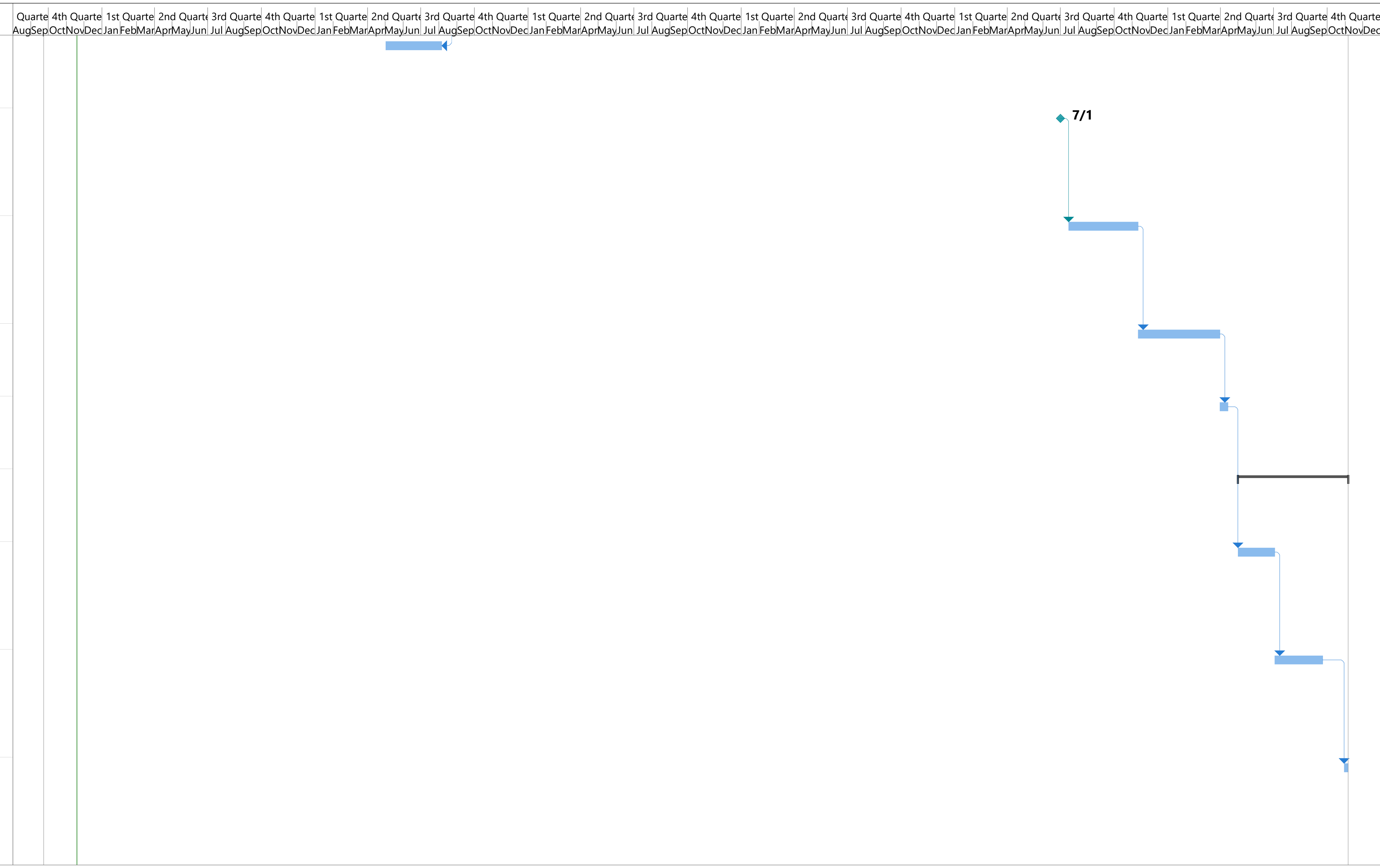
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Closure Plan**	**55 days**	**Mon 11/30/2**	**Fri 2/12/21**		
2		Submit WW Basin Closure Plan to UDEQ	0 days	Mon 11/30/20	Mon 11/30/20		
3		UDEQ Review	20 days	Mon 11/30/2	Fri 12/25/20	2	
4		Revise and Submit WW Basin Clsoure Plan per UDEQ Review	15 days	Mon 12/28/20	Fri 1/15/21	3	
5		UDEQ Approval of Closure Plan	20 days	Mon 1/18/21	Fri 2/12/21	4	
6		**WW Basin Initial Fill Placement and Dewatering**	**1291 days**	**Mon 5/3/21**	**Mon 4/13/26**		
7		Step 1 Divider Berm Construction (including decanting of pond)	35 days	Mon 5/3/21	Fri 6/18/21		
8		Step 2 Southern Cell Fill Placement (1st Season)	100 days	Mon 6/21/21	Fri 11/5/21	7	
9		Step 2 Southen Fill Placement (2nd Season)	50 days	Mon 5/2/22	Fri 7/8/22	8	

Project: WW Basin Closure Sche
Date: Thu 11/19/20

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

Wawater Basin Closure Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
10		Step 2 Southern Cell Dewatering	70 days	Mon 5/2/22	Fri 8/5/22	9FF+20 days	
11		Cease Flows to Northern Portion of WW Basin	0 days	Tue 7/1/25	Tue 7/1/25		
12		Step 3 Northern Fill Placement and Dewatering	85 days	Tue 7/15/25	Mon 11/10/25	11FS+10 days	
13		Final Dewatering of Basin Solids	100 days	Tue 11/11/25	Mon 3/30/26	12	
14		Final Fill Placement	10 days	Tue 3/31/26	Mon 4/13/26	13	
15		**Final Cover Installation**	**135 days**	**Fri 5/1/26**	**Thu 11/5/26**		
16		Liner Installation	45 days	Fri 5/1/26	Thu 7/2/26	14	
17		Cover Installation	58 days	Fri 7/3/26	Tue 9/22/26	16	
18		Cover Seeding	5 days	Fri 10/30/26	Thu 11/5/26	17	



Project: WW Basin Closure Sche
Date: Thu 11/19/20

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

Combustion By-Products Landfill Closure Plan

Intermountain Generating Facility

November 19, 2020

Prepared for:

Intermountain Power Service Corporation
850 West Brush Wellman Road
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Attention: Mike Utley

Prepared by:
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PROFESSIONAL ENGINEER
No. 4777863-2202
CHAD TOMLINSON
11/19/20
STATE OF UTAH

Stantec Project Number 233001396

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Prepared by Peter Bernhard ______________________________
(signature)

Peter Bernhard

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Mike Davis

Approved by Chad Tomlinson ______________________________
(signature)

Chad Tomlinson

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Abbreviations

amsl	Above Mean Sea Level
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
CB	Combustion By-Product
CCR	Coal Combustion Residual
CY	Cubic Yards
FT	Feet
HDPE	High-Density Polyethylene
IPA	Intermountain Power Agency
IPP	Intermountain Power Project
IPSC	Intermountain Power Services Corporation
L.L.	Liquid Limit
N.P.	Non-Plastic
Plan	Closure Plan
P.I.	Plasticity Index
P.L.	Plastic Limit
TDS	Total Dissolved Solids
UAC	Utah Administrative Code Rule
UDEQ	Utah Department of Environmental Quality

1.0 INTRODUCTION

This Closure Plan (Plan) has been prepared to describe the activities to be performed to obtain final closure of Intermountain Power Services Corporation's (IPSC's) Intermountain Power Project (IPP) Combustion By-Product (CB) Landfill. The site is located approximately ten miles north of Delta, Utah. The CB Landfill has been used to store CB waste.

This Plan has been prepared for IPSC by Stantec for review and approval by the Utah State Department of Environmental Quality (UDEQ) Division of Waste Management and Radiation Control.

1.1 PURPOSE AND SCOPE

The CB waste in the CB Landfill could pose both a long-term source of fugitive dust emissions from the surface and a potential threat to groundwater. Therefore, the purpose of this document is to present the closure plan to eliminate fugitive dust emissions and potential groundwater impacts from the CB waste in the CB Landfill in conformance with applicable regulatory requirements.

This document provides a detailed description of the activities to be performed as part of the proposed closure plan, to close and cover the CB Landfill with the CB waste in place.

The cover system presented in this Plan will utilize 18-inch low permeability compacted clay soil layer overlain by a 6-inch topsoil layer. The 18-inch compacted soil layer is designed to provide a low-permeability barrier that achieves the required maximum permeability of $1x10^{-5}$ cm/sec to minimize infiltration into the underlying CB waste material and to achieve a permeability that is equal to or lower than the native soils the CB Landfill was constructed directly over. The overlying topsoil layer will serve as an erosion protection layer and growth media for vegetation. The final cover system is designed to achieve the following:

- Eliminate fugitive dust CB material;
- Reduce infiltration of precipitation into the CB material;
- Minimize disruption of the integrity of the final cover system;
- Provide protection from wind and water erosion;
- Eliminate potential long-term impacts on groundwater; and
- Minimize long-term operation and maintenance.

Introduction

This cover system has been designed to meet the Utah Administrative Code Rule (UAC) R315-319-102(d)D3) regulations for Closure and Post-Closure Care – Criteria for Conducting the Closure or Retrofit of CCR Units as discussed in Section 2.1.2.

In addition, a maintenance plan and post closure monitoring plan have been included, as part of the closure plan, to monitor the performance of the proposed closure.

2.0 PROJECT BACKGROUND

The IPP is a 1,900-megawatt coal-fired, steam electric generation station located on an approximately 4,600-acre site in the Sevier Desert approximately 10-miles North of Delta, Utah. The IPP is owned by the Intermountain Power Agency (IPA) and operated by IPSC. The IPP began generating power in 1986 and has operated continuously since that time. The IPP delivers power to users located in Utah and Sothern California. In May 2017, IPSC announced plans to cease power generation using coal and to develop new, natural-gas fueled generation at the project site by 2025. As a result of this transition, there are several CCR units at the plant that must be closed.

An initial written closure plan (Stantec, 2016) was developed in 2016 to comply with UAC R315-319-102(b) that requires IPSC to submit a written closure plan to the Division of Waste Management and Radiation Control. The basis of the initial written closure plan was closure of the CCR units by leaving CCR material in place.

2.1 APPLICABLE REGULATORY REQUIREMENTS

2.1.1 UDEQ Requirements

A review of current UDEQ regulations/guidelines was conducted to determine if there is a presumptive requirement for closure of the CB Landfill following cessation of its operation. The review identified the UAC R315-319-102 titled “Closure and Post-Closure Care – Criteria for Conducting the Closure or Retrofit of CCR Units” and is in effect as of September 1, 2016 (UDEQ, 2016). UAC R315-319-102 outlines the closure and post-closure process, minimum reporting, and performance criteria required for CCR landfills. UAC R315-319-102 was used as a reference guideline during the development of the proposed Closure Plan. Specifically, the UDEQ rule includes the following requirements, in **Table 2.1**, for the closure of an inactive CCR surface impoundment:

Table 2.1 Closure performance stand when leaving CCR in place (R315-319.10(d))

Section R315-319.102(d)	Description of Requirement	CB Landfill Closure Design
(1)(i)	Control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere	The compacted soil layer will act to prevent infiltration of liquids into the CB Landfill and prevent runoff from contacting the CCR.
(1)(ii)	Preclude the probability of future impoundment of water, sediment, or slurry	The cover and surrounding area will be graded to shed stormwater away from the cover. Diversion channels will be maintained upstream of the Landfill to prevent run-on from precipitation.

(1)(iii)	Include measures to provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure period	The CB Landfill existing waste material is assumed fully consolidated and requires no dewatering or geotechnical stabilization to prepare the material for closure given that material has had frequent heavy haul truck traffic and small amounts of precipitation typical of the site.
(1)(iv)	Minimize the need for further maintenance of the CCR unit	The cover will be vegetated with a native seed mix. Once established, the cover will require little or no long-term maintenance.
(1)(v)	Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.	Partial landfill closure will begin prior to final delivery of waste materials to reduce closure time post final waste delivery.
(3)(i)(A)	The permeability of the final cover system shall be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than $1x10^{-5}$ m/sec, whichever is less.	The CB Landfill was constructed directly over native soils, including unconsolidated sands and silts. The compacted soil layer in the cover system will have a maximum permeability of $1x10^{-5}$ m/sec.
(3)(i)(B)	The infiltration of liquids through the closed CCR unit shall be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.	The compacted soil layer consists of a minimum thickness of 18-inches.
(3)(i)(C)	The erosion of the final cover system shall be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.	The design of the soil cover includes a 6-inch thick erosion protection layer. The erosion protection layer will be fertilized and seeded with a native seed mix to establish vegetation.
(3)(i)(D)	The disruption of the integrity of the final cover system shall be minimized through a design that accommodates settling and subsidence	The CB Landfill existing waste material is assumed stable and requires no dewatering or geotechnical stabilization to prepare the material for closure given that material has had frequent heavy haul truck traffic and small amounts of precipitation typical of the site.

Source: Utah Administrative Code Rule R315-319 (UDEQ, 2020)

2.1.2 Performance Standards for Landfill Covers

The UDEQ final rule for disposal of coal combustion residuals (UDEQ, 2016) requires that the permeability of the cover surface for CB Landfill be less than or equal to the permeability of the bottom liner, or 1×10^{-5} cm/sec, whichever is less. The CB Landfill was constructed directly over native soils, including unconsolidated sands and silts.

3.0 SITE CONDITIONS

This section presents a summary of the CB Landfill's characteristics as well as a description of the geological and hydrogeological conditions at the site. This information has been obtained from the Coal Combustion Residual Units Initial Closure Plan (Stantec, 2016).

3.1 CB LANDFILL DESIGN SUMMARY

This section presents a summary of the design and operating parameters of the CB Landfill

3.1.1 CB Landfill Design Details

The CB Landfill was constructed directly over native soils, including unconsolidated sands and silts. Hydraulic conductivity testing on remolded samples of the perceived foundation material underlying the CB Landfill indicates a hydraulic conductivity of $3.6x10^{-4}$ cm/sec, which is higher than the permeability of the proposed 18-inch thick compacted clay layer. The CB waste is transported to the CB Landfill by a conveyer from the power generating plant and stockpiled at the southwest corner of the CB Landfill area. From the stockpile area, CB waste is loaded onto trucks and placed on the CB Landfill in two (2) foot lifts. The material is then compacted to approximately 90% Standard Proctor Density (SPD). An estimated maximum inventory and aerial extent of waste material to be stored in the CB Landfill at closure is 16,500,000 cubic yards (CY) covering 199 acres, respectively (Stantec, 2016). Refer to **Figure 3.1** showing the CB Landfill as of November 2019.

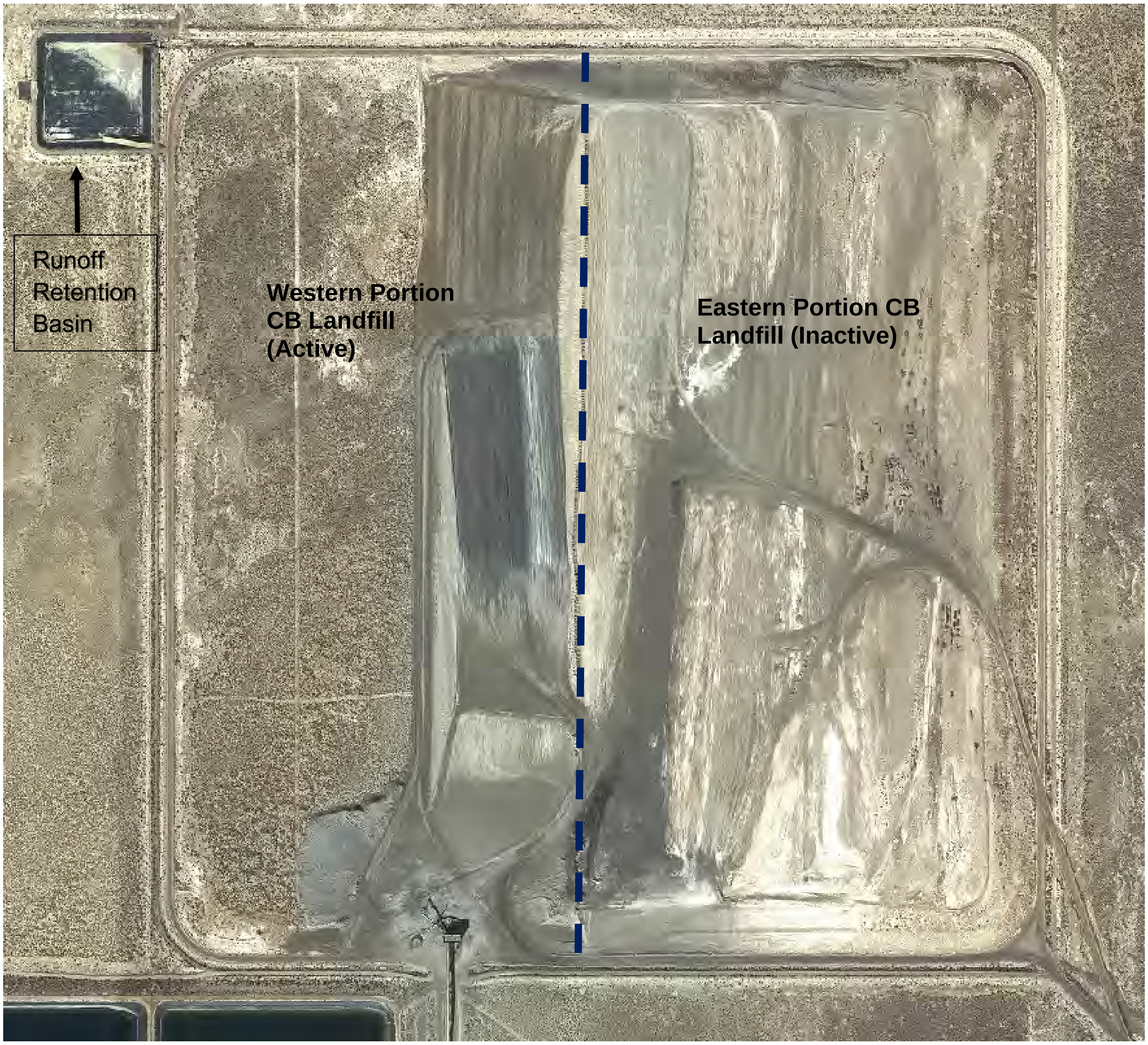

Figure 3-1 – CB Landfill (aerial imagery taken November 2019)

The existing CB Landfill stormwater controls are designed to convey the 50-year, 24-hr storm event. A diversion berm is constructed around the perimeter of the CB Landfill to prevent run-on. Inside of the diversion berm, a diversion ditch captures stormwater that has contacted the CB waste material. The diversion ditch routes the contact water to a high-density polyethylene (HDPE) lined runoff retention basin for containment. Water within the lined retention basin is controlled by evaporation.

Based on correspondence with IPSC staff, only a portion (approximately the western half) of the total expect of the CB Landfill will need to remain active to meet the needs of the operational period. The western area to remain active is shown in **Figure 3-1**. A large portion of the landfill, the eastern portion shown in **Figure 3-1**, is currently storing CB waste but will no longer receive any additional material. Closure of this area could begin as soon as IPSC receives approval of the final closure plan from the regulating agencies.

Stantec assumes the fly ash disposed of in the CB Landfill is stable and will not require dewatering or geotechnical stabilization to prepare the material for closure given that material has had frequent heavy haul truck traffic and the small amounts of precipitation typical of the site. Further, Stantec has assumed that little to no regrading of the eastern portion of the CB Landfill will be necessary prior to placement of the final cover based relatively flat slopes (4H:1V) along the non-active faces of the CB Landfill.

3.2 SITE GEOLOGY

The CB landfill is near the center of the northern Sevier Desert in the Basin and Range Physiographic Province as shown in **Figure 3-2**. The area encompassing the CB Landfill is in the Sevier Lake drainage system and is located on a broad alluvial fan. The ground surface within this area is relatively flat, sloping only slightly to the west. No major drainages cross the area.

The upper unit consists primarily of interbedded lenses of sand and silty sand. This unit is approximately 15 to 20 feet thick. The top few feet of this deposit are comprised of eolian sand, fluvial sand, and fine gravel. The underlying unit consists of fine-grained silts and clays of lacustrine origin. This unit is thickly bedded and extends to a depth of at least one hundred feet below ground surface (bgs). Both of the two major subsurface units dip slightly toward the west, paralleling the existing topographic slope.

Figure 3-2 – IPP Physiographical Location

3.3 GROUNDWATER

Groundwater levels underlying the CB landfill indicate a relatively flat groundwater surface roughly paralleling the ground surface. The average groundwater surface gradient is about 0.5 percent to the west-southwest. The depths of the groundwater surface in the area range between 17 to 45 feet below ground surface (bgs).

Groundwater levels are measured and recorded as part of the Plant groundwater monitoring program (Stantec, 2020). In general, groundwater level measurements are collected semi-annually from 37 wells at the site. The groundwater elevation at each respective well is provided in feet above mean sea level (amsl). The results of the groundwater monitoring program are documented in annual groundwater monitoring reports which are submitted to UDEQ. The *June 2020 Semi-Annual Progress Report* (Stantec, 2020) is summarized throughout the remainder of this section to provide a brief description of groundwater conditions in the vicinity of the CB Landfill.

Based on measurements collected in March-April 2020, groundwater elevations in the vicinity of the CB Landfill range between 4624.6 ft amsl (up-gradient of the CB Landfill) and 4609.5 feet amsl (down-gradient of the pond). The groundwater flow direction at the site is predominantly from northeast to southwest (Stantec, 2020).

The monitoring wells and associated groundwater elevations in the vicinity of the Pond that were sampled as part of the June 2020 Semi-Annual Progress Report (Stantec, 2020) are presented in **Table 3.1**.

Table 3.1 Representative Wells for CB Landfill

Well I.D.	Location	Groundwater Elevation (ft amsl) March 2020	Depth to Groundwater (ft bgs) March 2020
CL-U-1	Northeast of CB Landfill	4624.02	33.46
CL-U-2	Northeast of CB Landfill	4624.56	38.92
CLW-1	South of CB Landfill	4620.71	32.75
CLW-2	South of CB Landfill	4613.46	34.71
CLW-3	Southwest of CB Landfill	4611.16	32.87
CLW-4	Southwest of CB Landfill	4610.89	31.99
CLW-5	West of CB Landfill	4610.90	30.09
CLW-6	West of CB Landfill	4609.55	30.08
CLW-7	Southeast of CB Landfill	4622.64	36.70
CLW-8	South of CB Landfill	4621.68	33.95
CLW-9	West of CB Landfill	4580.43	36.13
CL-U-3	Southeast of CB Landfill	-	41.32

Water quality is monitored semi-annually at the Plant. During each sampling event, groundwater samples are collected from the representative wells listed in Table 2. All of the groundwater samples are analyzed for representative water quality parameters.

As reported to the UDEQ in the past, and as is the current status based upon existing information: the plume of groundwater containing TDS concentrations in excess of background concentrations is located within the uppermost aquifer beneath the IPSC-owned lands. The TDS plume is positioned well within the physical confines of IPSC-owned property and as such poses no risk to potential off-site receptors.

The plume monitoring and corrective actions being taken by IPSC are addressed in the Updated Corrective Action Plan (Stantec, 2016).

4.0 CLOSURE DESIGN

The following sections contain an overview of the anticipated closure activities for the CB Landfill. Design drawings are presented in **Appendix A**. The regulations described in Section 2.1 were used as guidance for this closure design.

4.1 CLOSURE PHASES

The Plan has been chosen to achieve the following performance objectives:

- Eliminate fugitive dust CB material;
- Reduce infiltration of precipitation into the CB material;
- Minimize disruption of the integrity of the final cover system;
- Provide protection from wind and water erosion;
- Eliminate potential long-term impacts on groundwater; and
- Minimize long-term operation and maintenance.

The closure of the CB Landfill will be completed beginning with cover construction on the eastern (non-operating) portion of the CB Landfill followed by cover construction on the western (operating) portion of the CB Landfill following final receipt of CB material. The construction of the final cover on the eastern portion of the CB Landfill could begin as soon as IPSC receives approval of the final closure plan from regulating agencies.

Closure activities to achieve the performance objectives include construction of a cover over the non-operating and operating portions of the CB Landfill. The cover construction will consist of a 18-inch compact clay soil layer, a 6-inch topsoil/vegetation layer and establishing vegetation on the soil cover. In addition, site monitoring will continue to track the performance of the implemented closure. The proposed closure design is presented in **Appendix A** and the major Closure Plan activities are outlined in the following subsections. Construction specifications are provided in **Appendix B**.

4.1.1 Step 1 Cover placement of Eastern Portion of the CB Landfill

4.1.1.1 Cover Infiltration Barrier

An 18-inch thick compacted clay soil layer shall be placed directly on the prepared subgrade to minimize the infiltration of precipitation into the underlying waste. The compacted soil layer shall have a permeability no greater than 1×10^{-5} cm/sec and will be constructed to maintain positive drainage. The compacted soil layer shall be constructed out of clay-rich soils from Borrow Area 3 and if needed Borrow Area 1. Design drawings for the eastern and western portion of the cover system are provided in **Appendix A**. Placement specifications for the compacted soil layer are presented in **Appendix B**.

4.1.1.2 Erosion Layer

Section 3(i)c of the UDEQ CCR Regulations states that "erosion of the final cover system shall be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material capable of sustaining native plant growth." To provide an earthen material that promotes soil moisture storage and reduce the potential for soil erosion of the cover, this material will be a blend of clay material and silty sand material obtained from Borrow Areas 3 and if needed Borrow Area 1.

4.1.2 Seedbed Preparation and Seeding of the CB Landfill

4.1.2.1 Seedbed Preparation

Seedbed preparation and seeding will take place in the fall or early spring after grading and topsoil placement is complete. Following placement of the final lift of soil, it will be tilled to a depth of 6-inches by ripping, discing, or other approved method to loosen compacted soil and leave a roughened, friable surface. Slopes shall be tilled on the contour leaving furrows perpendicular to the slope where practicable to reduce erosion and improve water capture and retention. Soil furrows and roughness are planned to shelter the seeds from wind and reduce development of erosion features, as well as collect water needed for the seeds to germinate.

4.1.2.2 Seeding

Following tilling the seed mix will be applied evenly over the entire area. Seeding will be applied in late Fall (mid-October or later) or in early Spring (before the first of May). Reclamation seed mixtures shall be similar to the native plant species of the site. Seed mixture should provide forage and cover species, which mimic pre-disturbance conditions. In addition, the established community will be adapted to the environmental conditions of the site to protect the area from wind and water erosion.

Immediately following seeding, the site will be mulched with weed-free straw or hay at a rate of 2 tons/acre. The straw or hay will be crimped into the soil to secure the mulch and to reduce movement by wind. Hydromulching with a wood fiber mulch may be used as an alternative to straw or hay and applied at a rate of 1.5 tons/acre along with a tackifier to bind the mulch to the soil.

Specifications for seeding and mulching of the soil cover are presented in **Appendix B**. If an alternative seeding method is utilized, IPSC will notify UDEQ and provide a modified seeding plan for the alternative method prior to commencing seeding operations. Reclaimed borrow areas will also be re-vegetated to control runoff, reduce erosion, and blend into the surrounding topography.

4.1.2.3 Seed Mix Design

Seed mix selection will be based on a combination of factors including plant species, characteristics, and conditions at the site. Soil texture and chemistry, precipitation, temperature and growing season, seed availability, and ease of species establishment will all be used as criteria for the seed mix design. The following recommendations should be used in determining the proposed seed mixture:

- Native Plants are better adapted to the harsh desert climate of central Utah.
- Seed mixture should reflect the type of plants that grew prior to disturbance.
- Seed should come from a similar elevation and latitude to the site.
- Seed should be applied at a seeding rate between 14 to 28 pure live seed (PLS) pounds per acre for drill seeding (rates may be higher for broadcast seeding).

The seed mix should be comprised of a variety of native shrubs, grasses and forbs to provide habitat diversity and maximize transpiration at the site.

4.1.3 Stormwater Controls

An existing diversion berm has been constructed around the perimeter of the CB Landfill to prevent run-on. Inside of the diversion berm, a diversion ditch captures stormwater that has contacted the CB waste material. The diversion ditch routes the contact water to a high-density polyethylene (HDPE) lined runoff retention basin for containment. Water within the lined retention basin is controlled by evaporation. The diversion berm will remain in operation and maintained during cover placement. Once the cover is placed, the vegetative lining will reduce the likelihood of both water and wind erosion and prevent stormwater from contacting the CB waste. After the cover placement the stormwater controls will no longer be required.

4.2 BORROW SOURCE INVESTIGATOIN

The borrow source planned for the compacted soil layer and erosion layer will be obtained from an area directly south of the CB Landfill and labeled as Borrow Areas 1 and 3 on Sheet G-003 of **Appendix A**. Borrow material characterization consisted of excavation test pits, sample collection, and laboratory testing. Five-gallon bucket composite samples were collected for each material encountered in each of the 6 test pits. The associated test pit logs and laboratory testing are provided in **Appendix C** and **Appendix D**.

4.2.1 Borrow Source Sampling

Following the collection of the composite samples from the test pits, the samples were sent to Intermountain GeoEnvironmental Services, Inc. (IGES) in Salt Lake City, Utah for geotechnical and hydrological testing. The testing program is summarized in **Table 4.1** and **Table 4.2**.

Table 4.1 Borrow Area 1 Geotechnical and Hydrological Testing

Test	ASTM Method	Number of Samples	Comments
Organic Content	D2974	3	1 per test pit
Atterberg Limits	D4318 a	7	7 per borrow source
USCS Classification	D2487	8	1 per composite sample
Particle-Size Distribution	D6913	8	1 per composite sample
Hydrometer Analysis	D7928	8	1 per composite sample
Crumb Test	D6572	4	4 per borrow source
Standard Proctor	D698 b	2	2 per borrow source
Hydraulic Conductivity	D5084	2	2 per borrow source
Soil Water Characteristic Curve	D6836	2	2 per borrow source

Source: IGES Laboratory Testing Results (IGES, 2020)

Table 4.2 Borrow Area 3 Geotechnical and Hydrological Testing

Test	ASTM Method	Number of Samples	Comments
Organic Content	D2974	1	1 per borrow source
Atterberg Limits	D4318 a	6	2 per test pit sample
USCS Classification	D2487	6	2 per test pit sample
Particle-Size Distribution	D6913	6	2 per test pit sample
Hydrometer Analysis	D7928	6	2 per test pit sample
Crumb Test	D6572	2	2 per borrow source
Standard Proctor	D698 b	1	1 per borrow source
Hydraulic Conductivity	D5084	1	1 per borrow source

Source: IGES Laboratory Testing Results (IGES, 2020)

The test results are summarized in **Table 4.3** and **Table 4.4**. Complete laboratory reports for the testing are presented in **Appendix D**.

Table 4.3 Borrow Area 1 Geotechnical and Hydrological Testing on Composite Samples

Soil Test	B1TP 1	B1TP1	B1TP2	B1TP2	B1TP2	B1TP3	B1TP3	B1TP3	Comb. B1 TP1-3	Comb. B1 TP2-3
Composite Sample Depth	10-15'	15-25'	0-10'	10-20'	20-25'	0-10'	10-20'	20-30'	0-20'	10-30'
USCS Classification	SM	CL	SM	SM	CL	ML	CL	CL	SM	CL
Standard Proctor Compaction Test (MDD lbs/ft^3)	-	-	-	-	-	-	-	-	117.9	105.3
Optimum Moisture Content (OMC%)	-	-	-	-	-	-	-	-	14	19
Particle Size Distribution %Gravel %Sand %Fines	13.6 48.3 38.1	8.8 31.8 59.4	0 58.9 41.1	0 75 25	0 36 64	0.2 41.3 58.6	0 4.4 95.6	0 6.3 93.7	-	-
Atterberg Limits LL[a/] (%) PL[b/] (%) PI [c/] (%)	N.P.	25 14 11	NP	NP	23 15 8	NP	47 19 28	39 18 21	-	-
Organic Matter (%)	1.5	-	-	0.8	-	0.8	-	-	-	-
Crumb Test[e]	Grade 1	-	-	Grade 3	-	Grade 2	-	Grade 1	-	-
Average Hydraulic Conductivity K (cm/sec)	3.6E-04	-	-	2.1E-04	-	-	-	-	-	-

Notes:

a/ LL: Liquid Limit

b/ PL Plastic Limit

c/ PI: Plasticity Index

d/ N.P.: Non-Plastic

e/ Crumb Test Results: Grade 1 – Nondispersive, Grade 2 – Intermediate, Grade 3 – Dispersive,

Table 4.4 Borrow Area 3 Geotechnical and Hydrological Testing on Composite Samples

Soil Test	B3TP1	B3TP1	B3TP2	B3TP2	B3TP3	B3TP3	Comb. B3 TP1-3
Composite Sample Depth	0-10'	10-20'	0-15'	15-25'	0-15'	15-30'	10-30'
USCS Classification	SC	CL	CL	CL	SM	CL	CL
Standard Proctor Compaction Test (MDD lbs/ft^3)	-	-	-	-	-	-	105.4
Optimum Moisture Content (OMC%)	-	-	-	-	-	-	20.8
Particle Size Distribution %Gravel %Sand %Fines	3.3 69.3 27.4	0.9 23.6 75.5	0.8 32.7 66.5	1.3 30.1 68.6	2.1 73.6 24.3	0.8 20.6 78.6	-
Atterberg Limits LL[a/] (%) PL[b/] (%) PI [c/] (%)	29 17 12	34 15 19	31 14 17	30 15 15	N.P.[d/]	29 15 14	
Organic Matter (%)		3.2					
Crumb Test[e]				Grade 1	Grade 1		
Average Hydraulic Conductivity K (cm/sec)							1.5E-05

Notes:

[a]/ LL: Liquid Limit

[b]/ PL Plastic Limit

[c]/ PI: Plasticity Index

[d/] N.P.: Non-Plastic

[e]/ Crumb Test Results: Grade 1 – Nondispersive

The test pitting and testing results indicated that a continuous clay layer is present at approximately 15 to 20 ft bgs. Based on the grain-size distribution and Atterberg limits testing data, this material is predominantly fine grained and has moderate to high plasticity indicating that it is a suitable material for achieving the required permeability.

5.0 POST CLOSURE OPERATION AND MAINTENANCE PLAN

This section describes activities that will be conducted as part of the post-closure process. Utah Administrative Code Rule R315-319-104 titled Closure and Post-Closure Care – Post-Closure Care Requirements (UDEQ, 2016) require that a post-closure plan be developed and implemented for a period of 30 years once closure and reclamation activities have been completed. Post-closure is the process which is used to allow a facility to stabilize to the point where it no longer presents a threat to human health or the environment. During this period, the facility will be routinely monitored to ensure that the integrity of the soil cover is not compromised by erosion and settlement and ensure that the soil cover's performance is acceptable. Therefore, this post-closure plan will provide the following:

- A plan for inspection and maintenance of the soil cover
- A maintenance plan to be followed if problems develop during the post-closure care period that could result in the release of CB material to the environment
- A description of the proposed use of the property during the post-closure care period.

IPSC may petition for the UDEQ to terminate the post-closure period earlier if they can demonstrate that the soil cover has stabilized and is protective of groundwater.

5.1 COVER INTEGRITY MONITORING AND MAINTENANCE

Following construction of the soil cover, routine monitoring will be performed to identify the need for maintenance of the soil covers. The monitoring will include both visual inspection and surveying of the soil cover to ensure that the integrity is not compromised. The monitoring plan, including the individual monitoring tasks, inspection locations, schedule, monitoring criteria, and possible maintenance is summarized in **Table 5.1**.

Table 5.1 Post-Closure Monitoring Summary

Monitoring Activity	Purpose	Monitoring Frequency	Monitoring Locations	Monitoring Method	Comments	Actions Items
Visual Cover Inspection	Visually inspect soil cover surface for ponding, sags, drainage interruptions, surface erosion, and vertical cracking.	Semi-Annually and Following major storm events of 1-inch or more of rainfall in 24-hrs.	Throughout entire cover.	Visual	The locations of ponding, sags, drainage interruptions, surface erosion, and vertical cracking shall be noted on the inspection form.	Ponding, sags, and drainage interruptions will be repaired and re-vegetated.
Vegetation Inspection	Inspect soil cover for vegetation establishment.	Semi-Annually	Throughout entire cover.	Visual	Any areas showing vegetation distress such as bare areas or significantly lower vegetative establishment compared to rest of the soil cover will be noted on the inspection form.	Bare areas will be repaired during the next seeding season.
Groundwater Monitoring	Detect potential migration of spent liquor from the Wastewater Basin.	Semi-Annually	In accordance with the approved groundwater monitoring well list for the Plant.	In accordance with the approved groundwater monitoring parameter list for the Plant	None	Record significant deviations in groundwater quality to UDEQ.

5.1.1 Visual Cover Inspection

Visual inspections of the soil cover will be performed to identify damage to or degradation of the soil cover including; the formation of rills, loss of vegetation over significant portions of the soil cover, and formation of visible animal burrows or trails over the soil cover. The visual inspections will be performed across the entire soil cover. Visual inspections of the soil cover will be performed semi-annually and following major storm events. The results of the visual inspections will be documented in site inspection reports and retained on-site for UDEQ review upon request.

5.1.2 Vegetation Monitoring

During the semi-annual soil cover monitoring, the cover vegetation will be inspected for burned areas, overall establishment, disease or pests, and noxious weed infestations. The inspections will be performed during the semi-annually visual inspection of the soil cover. Any areas showing vegetation distress such as bare areas or significantly lower vegetative establishment compared to rest of the soil cover will be clearly noted on the inspection form.

5.2 SOIL COVER MAINTENANCE

The purpose of the final cover maintenance procedures is to maintain the integrity of the soil cover over the long-term and to provide maintenance, scheduling, and documentation so that materials and maintenance practices are consistent with the final cover design and specifications. Semi-annual visual inspections and settlement monitoring will provide identification of erosion and settlement. A site representative, designated by IPSC, will be responsible for documenting the location and extent of repairs.

All final cover repairs and/or reconstruction shall be conducted in a manner directed to maintain the integrity of the as-built final cover system. Repair of fill materials will be performed in six to eighteen-inch layers consistent with the cover design layers, procedures, and specifications utilized during the final cover construction. The methods of repair will be performed for the following principal modes of final cover distress:

- Settlement related sags and drainage interruptions, which interfere with controlled flow and discharge of surface waters from the soil cover surface.
- Surface erosion as a result of drainage channel “overflow” associated with intense rains.
- Local surficial slumping on slopes resulting from intense rains.
- Vertical or near vertical cracking of cover soils as a result of settlement.

5.2.1 Depressions, Ponding, Drainage Interruptions and Surface Erosion

Any repairs of depressions in the final soil cover will be completed on an annual basis. If significant sags or ponding is identified during other times of the year, the IPSC representative will accurately locate the limits of the depressions. The IPSC representative will be responsible for directing fill placement in the sag area to facilitate drainage. The permanent repair of sags and ponding, when necessary, will be performed by adding sufficient cover soil material necessary to maintain the design slope. Cover soil will be placed in accordance with the design specifications. An IPSC representative shall inspect and certify any fill placed in the final cover layers. Repaired areas shall also be re-seeded in accordance with the design specifications.

5.3 POST-CLOSURE INSPECTION AND MAINTENANCE REPORTING

All copies of the operator's inspection and maintenance reports will be retained on-site for UDEQ review upon request to demonstrate that the site has been inspected on a routine basis to evaluate the integrity and stability of the soil cover and stormwater diversion systems. Any repairs or maintenance performed will be discussed in detail in maintenance reports.

5.4 GROUNDWATER MONITORING

The current groundwater monitoring and corrective actions being taken by IPSC are addressed in the Updated Corrective Action Plan (Stantec, 2016) and will continue following closure of the CB Landfill until conditions warrant revisions to the groundwater monitoring plan.

6.0 CLOSURE SCHEDULE

Per the requirements of UAC R315-319-102(b)(1)(vi), a preliminary closure schedule has been developed for the CB Landfill. The schedule showing key dates is presented in **Appendix E**. The schedule was developed based on the closure approach discussed in Section 3 and was based on the following assumptions:

- Closure of the eastern portion of the CB Landfill is currently at design grades and closure would be initiated following approval of this closure plan by UDEQ.
- Closure of the western portion of the CB Landfill would commence following conversion to gas and cessation of ash disposal, which is anticipated to be July 1, 2025.
- Seeding of the final cover system was fixed to only occur in the late fall to improve vegetation establishment.

Based on the schedule developed, closure activities for the CB Landfill are anticipated to be completed by November 13, 2026.

7.0 REFERENCES

IGES, 2014. Geotechnical Laboratory Testing Results – IPSC CCR Unit Closures, Delta, UT.

Stantec, 2016. Coal Combustion Residual (CCR) Units Initial Closure Plan. Intermountain Generating Facility. Delta, Utah. October 13, 2016.

Stantec, 2020. June 2020 Semi-Annual Progress Report. Intermountain Generating Facility. Delta, Utah. June 25, 2020.

UDEQ, 2016. R315. Environmental Quality, Waste Management and Radiation Control, Waste Management. R315-319. Coal Combustion Residual Requirements., Issued September 2016.

Appendix A

IPSC CCR CB Landfill Closure Design

PRELIMINARY DESIGN PHASE - 10/16/2020

NOT FOR CONSTRUCTION
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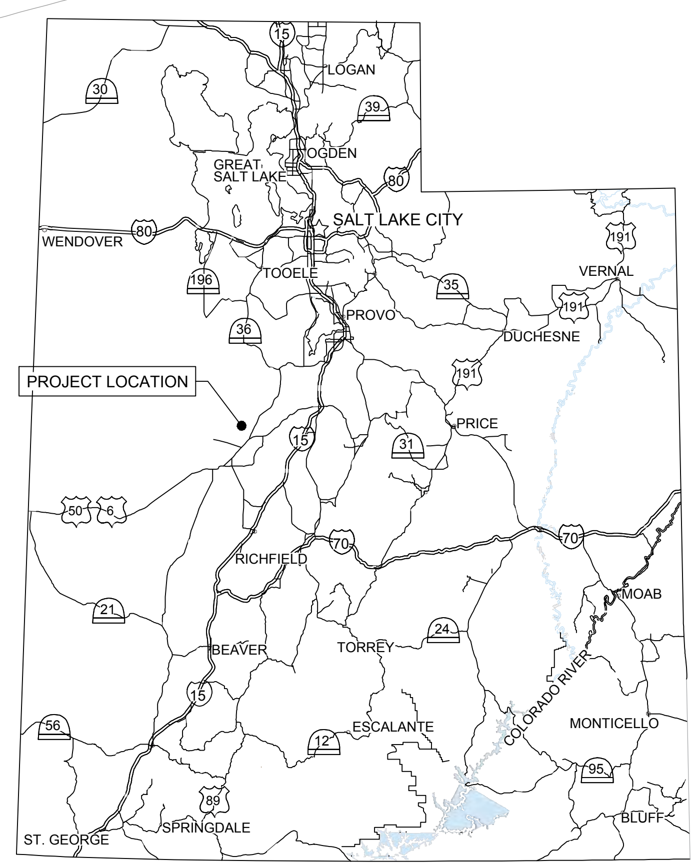
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR CB LANDFILL

CLOSURE DESIGN SUBMITTAL - OCTOBER 2020

INTERMOUNTAIN POWER SERVICE CORP

Stantec



AREA MAP
NTS

INDEX OF DRAWINGS

DRAWING NO	DRAWING NAME
G-001	COVER SHEET AND DRAWING INDEX
G-002	GENERAL NOTES
G-003	EXISTING SITE LAYOUT
C-200	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - EXISTING CONDITIONS
C-210	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - EASTERN PORTION FINAL COVER DESIGN
C-211	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - EASTERN PORTION SECTIONS
C-220	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - WESTERN PORTION FINAL COVER DESIGN
C-221	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - WESTERN PORTION SECTIONS
C-240	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - BORROW SOURCE 3 - PHASE 2 EXCAVATION PLAN - SHEET 1
C-241	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - BORROW SOURCE 3 - PHASE 2 EXCAVATION PLAN - SHEET 2
C-242	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - BORROW SOURCE 3 - PHASE 2 EXCAVATION SECTIONS - SHEET 1
C-243	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - BORROW SOURCE 3 - PHASE 2 EXCAVATION SECTIONS - SHEET 2
C-244	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - BORROW SOURCE 3 - PHASE 2 STAGE STORAGE CURVE - SHEET 1
C-245	COMBUSTION BY-PRODUCTS LANDFILL CLOSURE - BORROW SOURCE 3 - PHASE 2 STAGE STORAGE CURVE - SHEET 2

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40956\G-001.dwg

CIVIL GENERAL NOTES

GENERAL

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.

THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL DEBRIS FROM DEMOLITION AT CONTRACTORS EXPENSE.

CONTRACTOR SHALL RESTORE ALL SURVEY MONUMENTS THAT ARE DAMAGED OR DESTROYED DURING CONSTRUCTION.

UTILITIES

PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES IN AND AROUND THE AREAS OF NEW CONSTRUCTION.

THE CONTRACTOR SHALL PROTECT ALL REMAINING EXISTING UTILITIES.

LOCATIONS OF UNDERGROUND AND ABOVE GROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM AVAILABLE RECORDS. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS AND ELEVATIONS AND SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT UTILITY LINES WHETHER SHOWN OR NOT SHOWN.

PRIOR TO ANY EXCAVATION IN THE VICINITY OF ANY EXISTING UNDERGROUND FACILITIES, INCLUDING ALL WATER, SEWER, STORM DRAIN, GAS, PETROLIUM PRODUCTS, OR OTHER PIPELINES; ALL BURIED ELECTRIC POWER, COMMUNICATIONS, OR TELEVISION CABLES; ALL TRAFFIC SIGNAL AND STREET LIGHTING FACILITIES; AND ALL ROADWAY, STATE HIGHWAY, AND RAILROAD RIGHTS-OF-WAY, THE CONTRACTOR SHALL NOTIFY THE RESPECTIVE AUTHORITIES REPRESENTING THE OWNERS OR AGENCIES RESPONSIBLE FOR SUCH FACILITIES NOT LESS THAN 3 DAYS NOR MORE THAN 7 DAYS PRIOR TO EXCAVATION SO THAT A REPRESENTATIVE OF SAID OWNERS OR AGENCIES CAN BE PRESENT DURING SUCH WORK IF THEY SO DESIRE. IN THE CASE OF THE UNDERGROUND UTILITY SERVICE ALERT CENTER, THIS NOTICE WILL GIVE THEM TIME TO MARK THE LOCATION OF THE UTILITIES. THE CONTRACTOR SHALL ALSO NOTIFY THE REGIONAL OR LOCAL UNDERGROUND SERVICE ALERT COMPANY AT LEAST 3 DAYS, BUT NO MORE THAN 7 DAYS, PRIOR TO SUCH EXCAVATION.

EROSION CONTROL

THE CONTRACTOR SHALL SUBMIT AN EROSION CONTROL PLAN FOR WORK DURING THE CONSTRUCTION, SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER PRIOR TO THE START OF CONSTRUCTION.

ALL SLOPES SHALL BE PROTECTED FROM EROSION DURING ROUGH GRADING OPERATIONS AND THEREAFTER, UNTIL INSTALLATION OF FINAL GROUNDCOVER.

ALL SLOPE PROTECTION SWALES SHALL BE CONSTRUCTED AT THE SAME TIME AS BANKS ARE GRADED.

THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF EROSION CONTROL MEASURES CONTAINED WITHIN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL ALSO PROVIDE ANY ADDITIONAL EROSION CONTROL MEASURES (E.G. HYDROSEEDING, MULCHING OF STRAW, SAND BAGGING, DIVERSION DITCHES, ETC.) DICTATED BY FIELD CONDITIONS TO PREVENT EROSION OR THE INTRODUCTION OF DIRT, MUD, OR DEBRIS INTO EXISTING WATERWAYS, OR ONTO ADJACENT PROPERTIES DURING ANY PHASE OF CONSTRUCTION OPERATIONS.

CIVIL GENERAL NOTES - CONTINUED

SURVEY AND CONTROL

1. TOPOGRAPHY AND AERIAL IMAGERY BASED ON A NOVEMBER 2019 OLYMPUS AERIAL SURVEYS INC. SURVEY.
2. SURVEY IN LOCAL PLANT COORDINATE SYSTEM AND LOCAL DATUM IN INTERNATIONAL FEET.

PERMITTING

OWNER WILL BE RESPONSIBLE FOR OBTAINING PERMITS FROM THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY.

GENERAL CIVIL SYMBOLS

Symbol	Description
4600	MAJOR CONTOURS
	MINOR CONTOURS
4600	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
P/L	PROPERTY LINE
R/W	RIGHT-OF-WAY LINE
	EASEMENT LINE
TEMP ESMT	TEMPORARY EASEMENT LINE
	TRAIL OR DIRT ROAD
	FLOW LINE
	RAILROAD
	GUARDRAIL (PERMANENT)
	GUARDRAIL (REMOVABLE)
	VEGETATION
	WELL
	NEW
	EXISTING
	CENTERLINE
3:1	BERM SLOPE (HORZ TO VERT)

CONTROL SYMBOLS

Symbol	Description
BM-XX	BENCH MARK
###	SITE COORDINATE NUMBER
N XXXXXXX E XXXXXXX	SITE COORDINATES
EL XXXX.XX	MONUMENT
	HORZ AND VERT CONTROL POINT
XXX.XX	FINISHED ELEVATION
(XXX.XX)	EXISTING ELEVATION

GEOTECHNICAL SYMBOLS

Symbol	Description
B-X	SOIL BORING LOCATION
	TEST PIT LOCATION
XX	OBSERVATION HOLE
MW	MONITORING WELL

STRUCTURES

Symbol	Description
	SITE OR RETAINING WALL
x	FENCE (CHAINLINK)
	FENCE (WOOD)
	STRUCTURE
	STRUCTURE (BELOW GRADE)
	CONVEYOR SYSTEM

REV 050215

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: NTS

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR CB LANDFILL
GENERAL
GENERAL NOTES
SYMBOLS

SHEET G-002

Job# 233001396

DWG FILE: C:\pwwrk\dms40956\G-002.dwg   PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM   BY: WOOLSEY, ROGER

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40956\G-003.dwg

KEY PLAN

LEGEND

- EXISTING CONTOURS
- EXISTING RAILWAY
- CONVEYOR SYSTEM
- FENCE
- POWER POLE
- EXISTING WATER LEVEL

REV	DATE	BY	DESCRIPTION
B	11/18/2020	RNW	ISSUED FOR CLIENT REVIEW
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: 1" = 1000'

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DRAWN C FOWLER
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 11/18/2020

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR CB LANDFILL
GENERAL
COMBUSTION BYPRODUCT LANDFILL CLOSURE
EXISTING SITE LAYOUT

SHEET G-003

Job# 233001396

KEY PLAN

CURRENT DRAWING

LEGEND

4600	EXISTING CONTOURS
	CONVEYOR SYSTEM
	STORMWATER DRAINAGE
	DELINEATION LINE BETWEEN WESTERN AND EASTERN LANDFILL AREAS
	POWER POLE
	MONITORING WELL

GENERAL SHEET NOTES

1. TOPOGRAPHY BASED ON NOVEMBER 2019 AERIAL SURVEY AND REPRESENTS FINAL ASH GRADES ON EASTERN PORTION OF CB LANDFILL.
2. EAST PORTION OF COMBUSTION BYPRODUCT LANDFILL HAS BEEN GRADED TO THE REQUIRED SUBGRADE SLOPE AND WILL BE CLOSED PRIOR TO WESTERN PORTION.
3. SOIL FOR CLOSURE SHALL BE OBTAINED FROM BORROW SOURCE 3. REFER TO C-240 FOR BORROW EXCAVATION PLAN.

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40956\C-200.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: 1" = 200'

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CHECKED C. TOMLINSON

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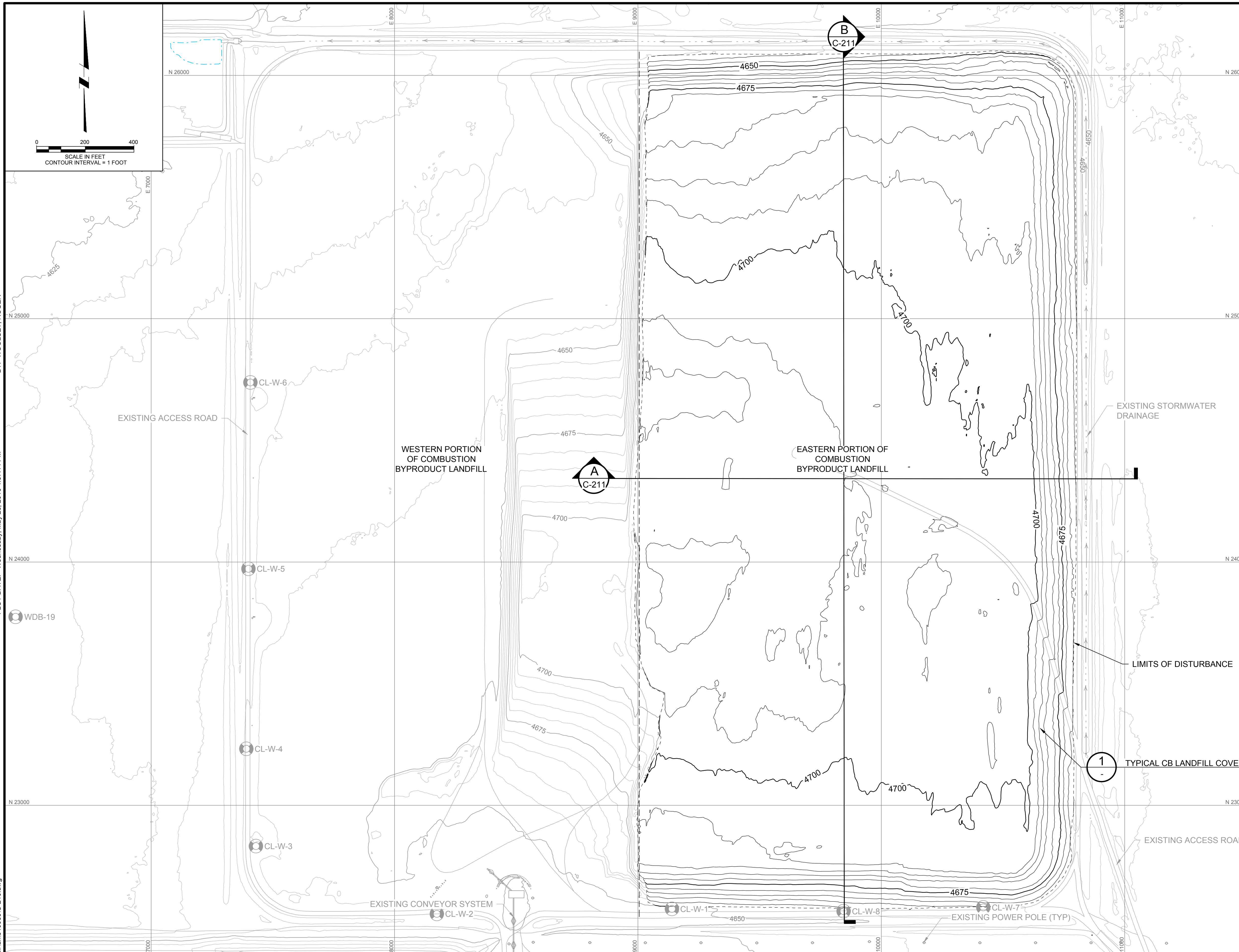
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR CB LANDFILL
CIVIL
COMBUSTION BYPRODUCT LANDFILL CLOSURE
EXISTING CONDITIONS

SHEET C-200

Job# 233001396



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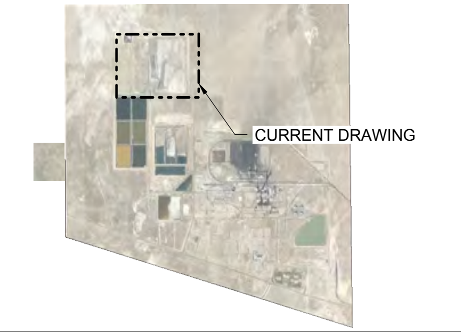


LEGEND

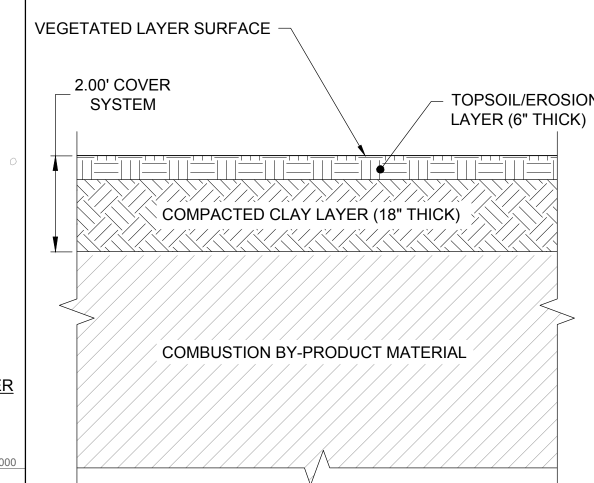
- 4600 — EXISTING CONTOURS
- 4600 — TOP OF CAP CONTOURS
- EXISTING CONVEYOR SYSTEM
- EXISTING STORMWATER DRAINAGE
- LIMITS OF DISTURBANCE
- EXISTING POWER POLE
- EXISTING WELL

GENERAL SHEET NOTES

1. CB LANDFILL CLOSURE COVER SHALL BE PLACED DIRECTLY ON SUBGRADE PREPARED BY OWNER.
2. PRIOR TO INSTALLATION OF FINAL COVER, EXISTING CB LANDFILL SURFACE SHALL BE GRADED TO ENSURE POSITIVE DRAINAGE.

QUANTITY TABLE

DESCRIPTION	COMPACTED CLAY (CY)	TOPSOIL (CY)
EASTERN PORTION	341,860	114,525



1 TYPICAL CB LANDFILL COVER

0 2 4 SCALE IN FEET

BY: WOOLSEY, ROGER PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM DWG FILE: C:\pwwrkdir\dms40956\C-210.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: 1" = 200'

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DRAWN C. FOWLER
CHECKED C. TOMLINSON

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INTERMOUNTAIN POWER SERVICE CORP

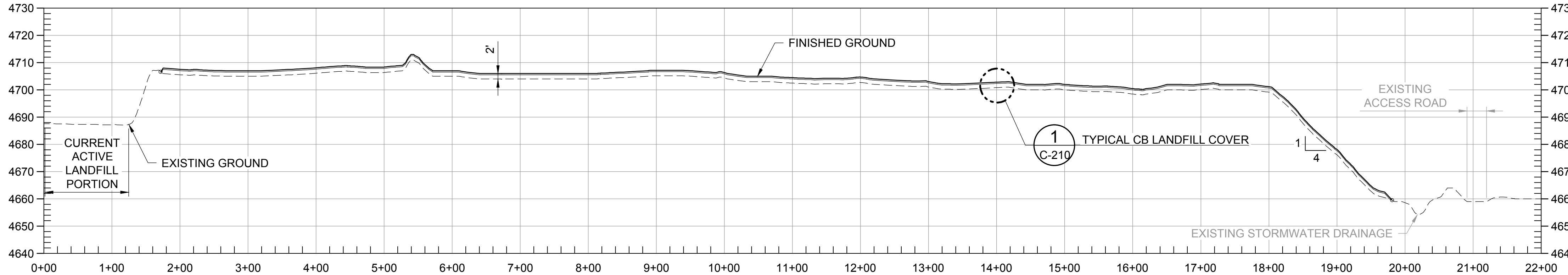
IPSC CCR CB LANDFILL
CIVIL
COMBUSTION BYPRODUCT LANDFILL CLOSURE
EASTERN PORTION FINAL COVER DESIGN

SHEET C-210

Job# 233001396

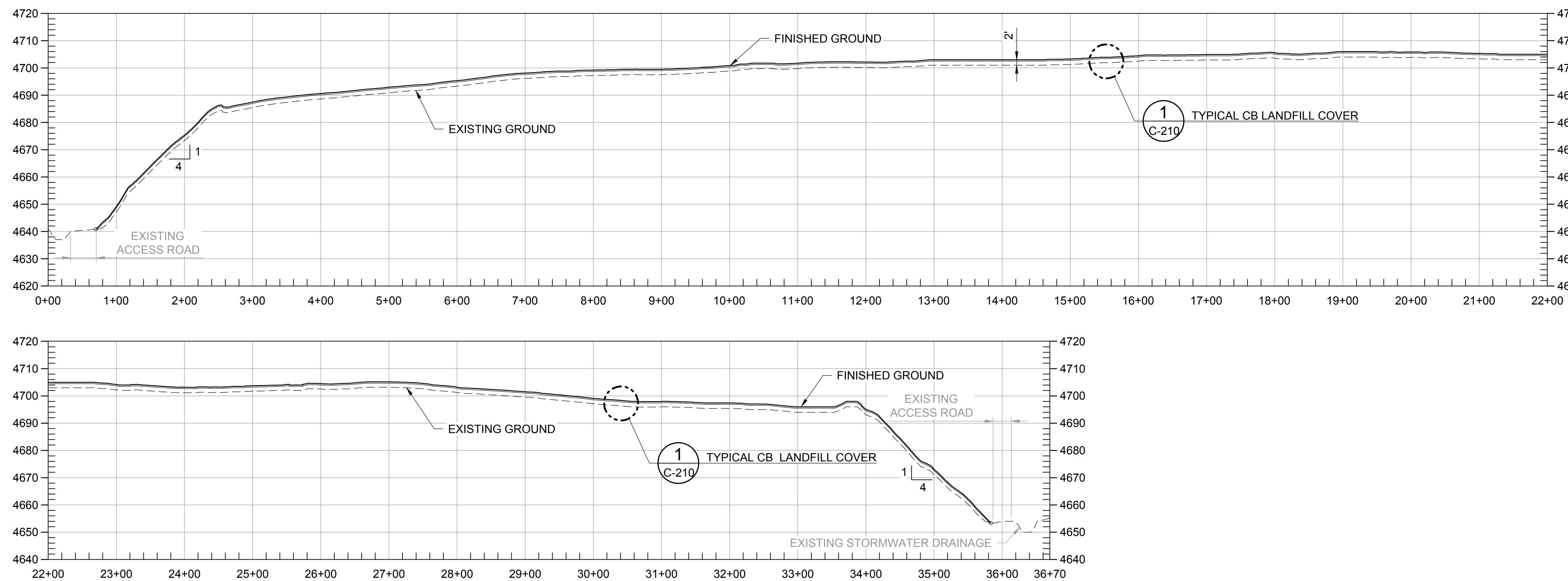
GENERAL SHEET NOTES

1. PRIOR TO INSTALLATION OF FINAL COVER, EXISTING CB LANDFILL SURFACE SHALL BE GRADED TO ENSURE POSITIVE DRAINAGE.



A C-210 SECTION A

HORZ 0 100 200
VERT 0 25 50
SCALE IN FEET



B C-210 SECTION B

HORZ 0 100 200
VERT 0 25 50
SCALE IN FEET

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40956\C-211.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR REVIEW

SCALE: AS SHOWN

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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DRAWN C. FOWLER
CHECKED C. TOMLINSON

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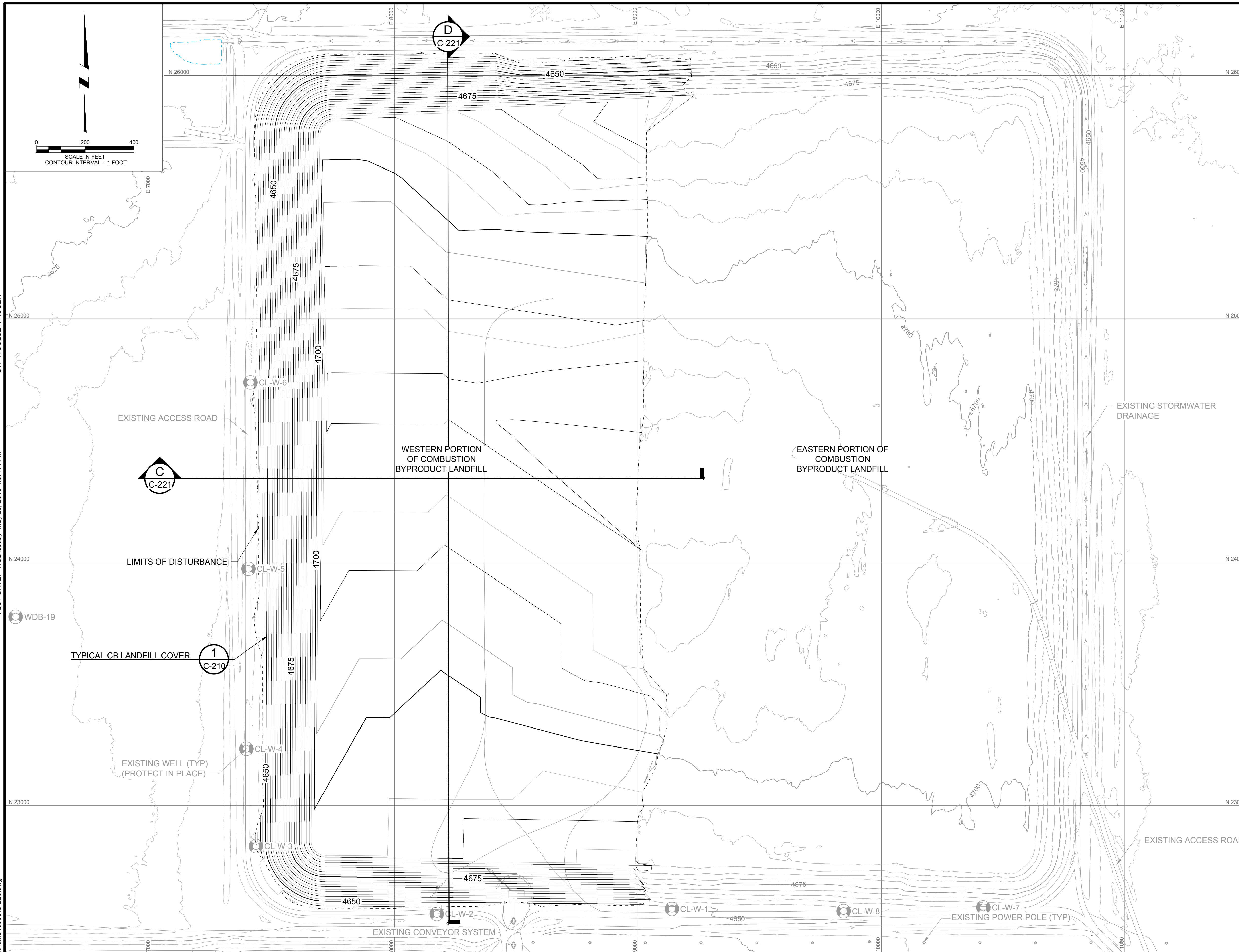
INTERMOUNTAIN POWER SERVICE CORP

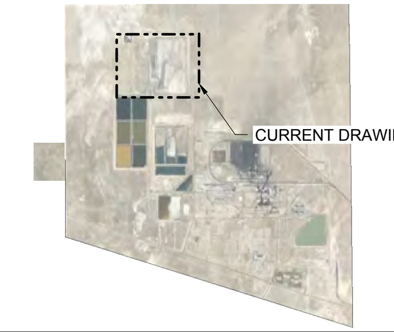
IPSC CCR CB LANDFILL
CIVIL
COMBUSTION BYPRODUCT LANDFILL CLOSURE
EASTERN PORTION SECTIONS

SHEET C-211

Job# 233001396



KEY PLAN



LEGEND

- 4600 — EXISTING CONTOURS
- 4600 — TOP OF CAP CONTOURS
- EXISTING CONVEYOR SYSTEM
- EXISTING STORMWATER DRAINAGE
- LIMITS OF DISTURBANCE
- EXISTING POWER POLE
- EXISTING WELL

GENERAL SHEET NOTES

1. CB LANDFILL CLOSURE COVER SHALL BE PLACED DIRECTLY ON SUBGRADE PREPARED BY OWNER.
2. PRIOR TO INSTALLATION OF FINAL COVER, EXISTING CB LANDFILL SURFACE SHALL BE GRADED TO ENSURE POSITIVE DRAINAGE.

QUANTITY TABLE

DESCRIPTION	COMPACTED CLAY (CY)	TOPSOIL (CY)
WESTERN PORTION	303,025	103,995

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40956\C-220.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

SCALE: 1" = 200'

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CHECKED C. TOMLINSON

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Stantec

INTERMOUNTAIN POWER SERVICE CORP

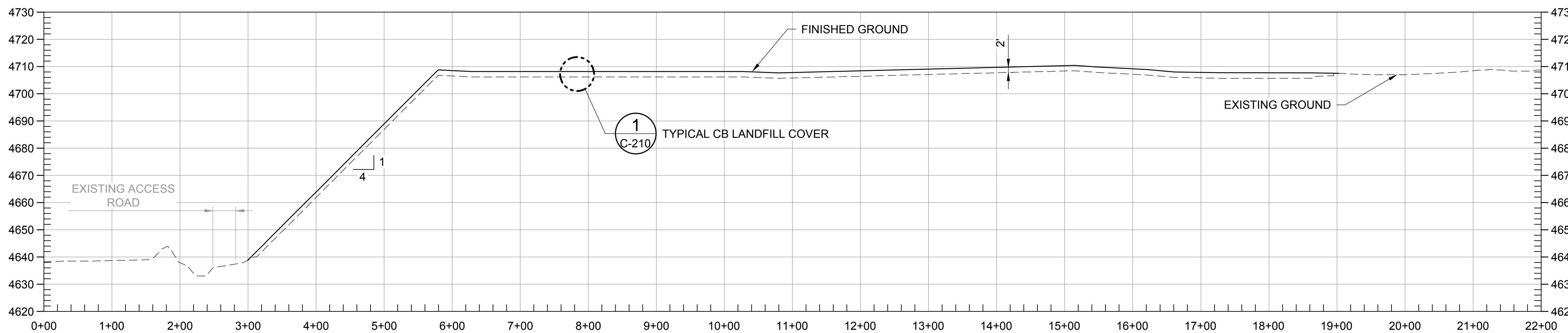
IPSC CCR CB LANDFILL
CIVIL
COMBUSTION BYPRODUCT LANDFILL CLOSURE
WESTERN PORTION FINAL COVER DESIGN

SHEET C-220

Job# 233001396

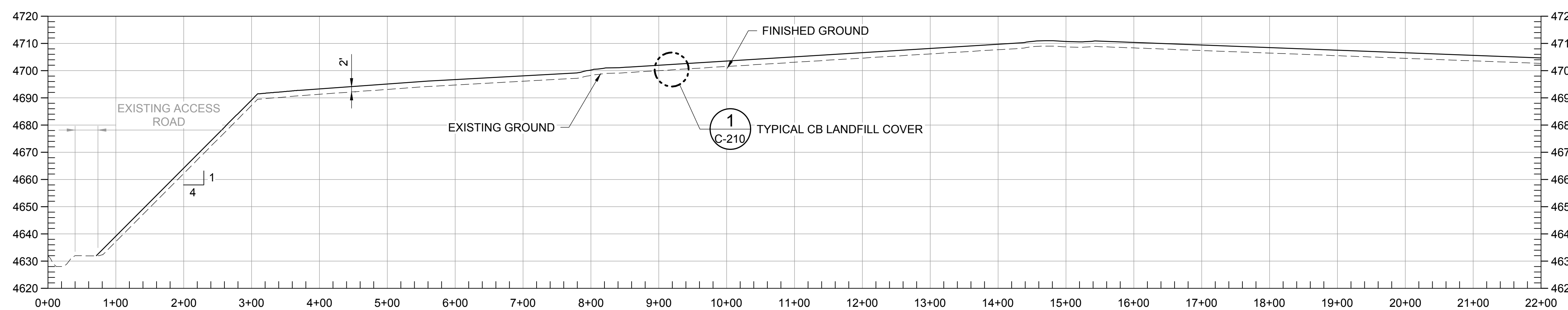
GENERAL SHEET NOTES

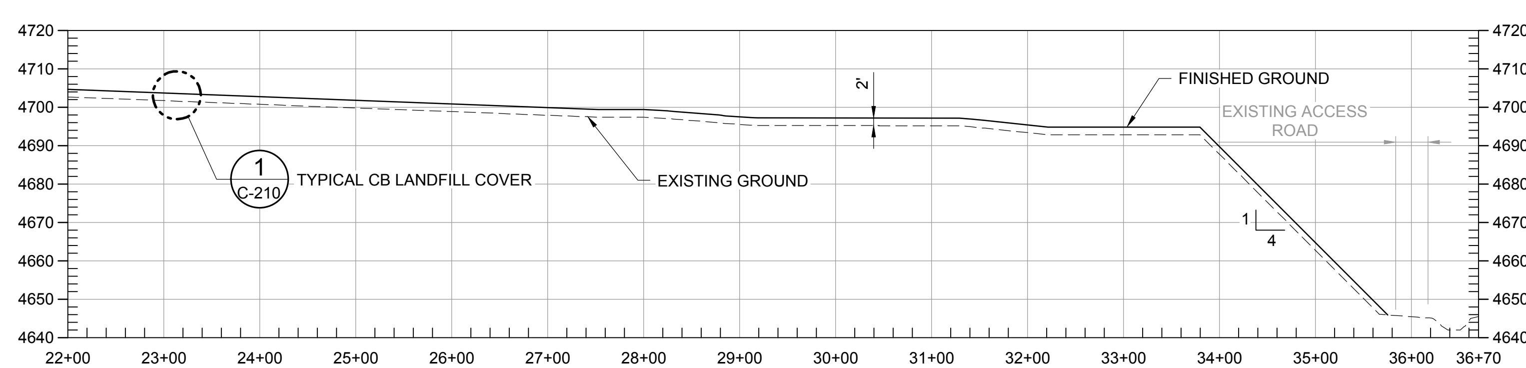
1. PRIOR TO INSTALLATION OF FINAL COVER, EXISTING CB LANDFILL SURFACE SHALL BE GRADED TO ENSURE POSITIVE DRAINAGE.



C SECTION C
C-220

HORZ 0 100 200
VERT 0 25 50
SCALE IN FEET





D SECTION D
C-220

HORZ 0 100 200
VERT 0 25 50
SCALE IN FEET

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40956\C-221.dwg

REV	DATE	BY	DESCRIPTION
A	10/16/2020	RNW	ISSUED FOR CLIENT REVIEW

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DESIGNED P. BERNHARD
DRAWN C. FOWLER
CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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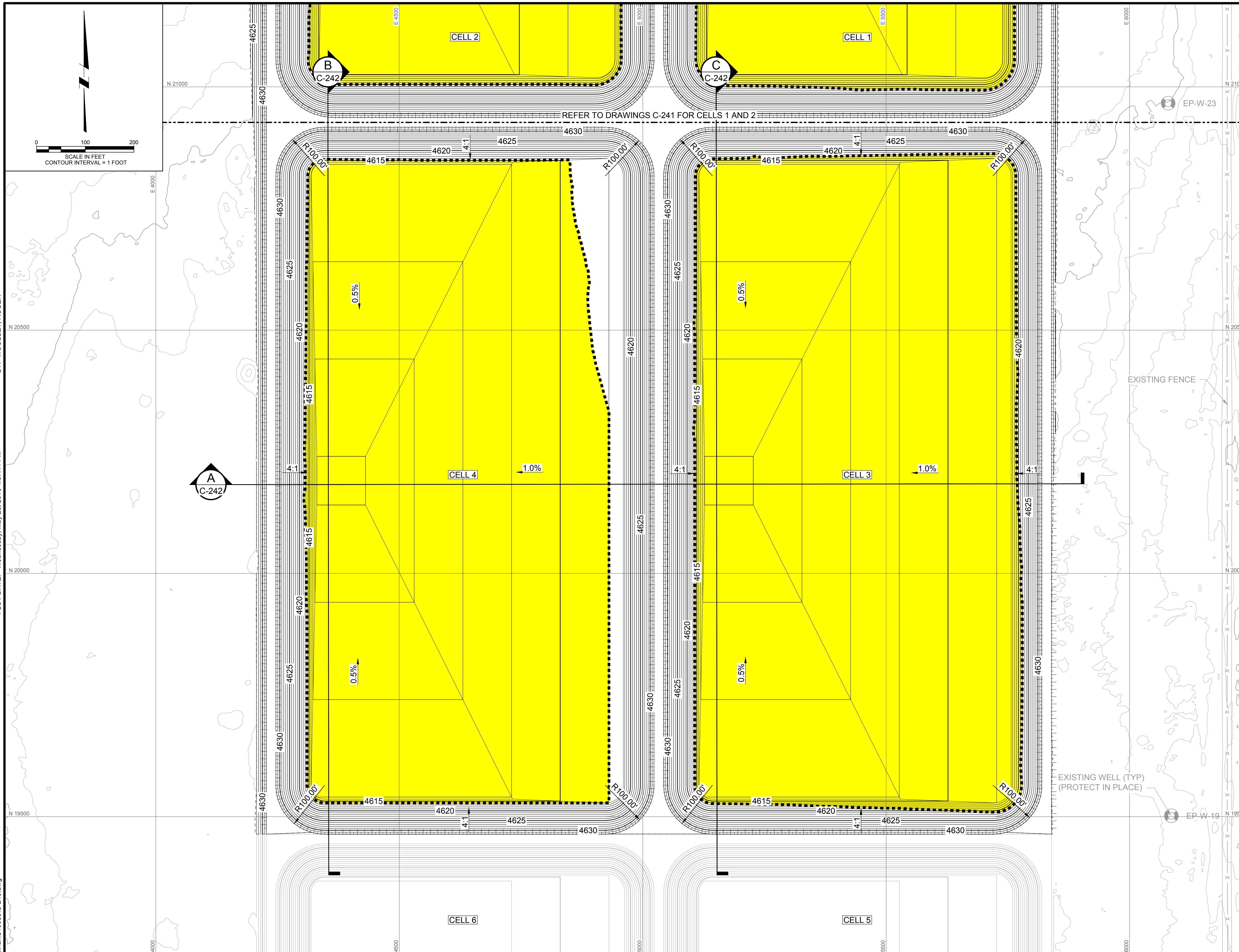
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR CB LANDFILL
CIVIL
COMBUSTION BYPRODUCT LANDFILL CLOSURE
WESTERN PORTION SECTIONS

SHEET
C-221
Job# 233001396

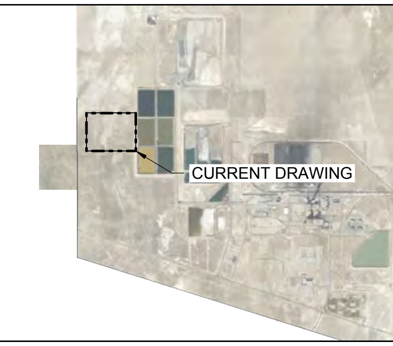


BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40956\C-240.dwg

KEY PLAN



LEGEND

- 4600 EXISTING CONTOURS
- 4600 DESIGN CONTOURS
- LIMITS OF DISTURBANCE
- EXISTING FENCE
- EXSTING TEST PIT
- CLAY EXCAVATION
- EXISTING WELL

GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.
2. REFER TO WASTEWATER BASIN CLOSURE (C-470) FOR CELLS 5 AND 6.

QUANTITY TABLE

DESCRIPTION	6" STRIP (CY)	GEN FILL (CY)	CLAY (CY)
EXCAVATION	38,220	667,592	198,860

QUANTITY TABLE

DESCRIPTION	FILL (CY)
EMBANKMENT FILL	37,830

REV	DATE	BY	DESCRIPTION
A	10/16/2020	CF	ISSUED FOR CLIENT REVIEW

SCALE 1" = 100'

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DESIGNED P. BERNHARD
DRAWN R. WOOLSEY
CHECKED C. TOMLINSON

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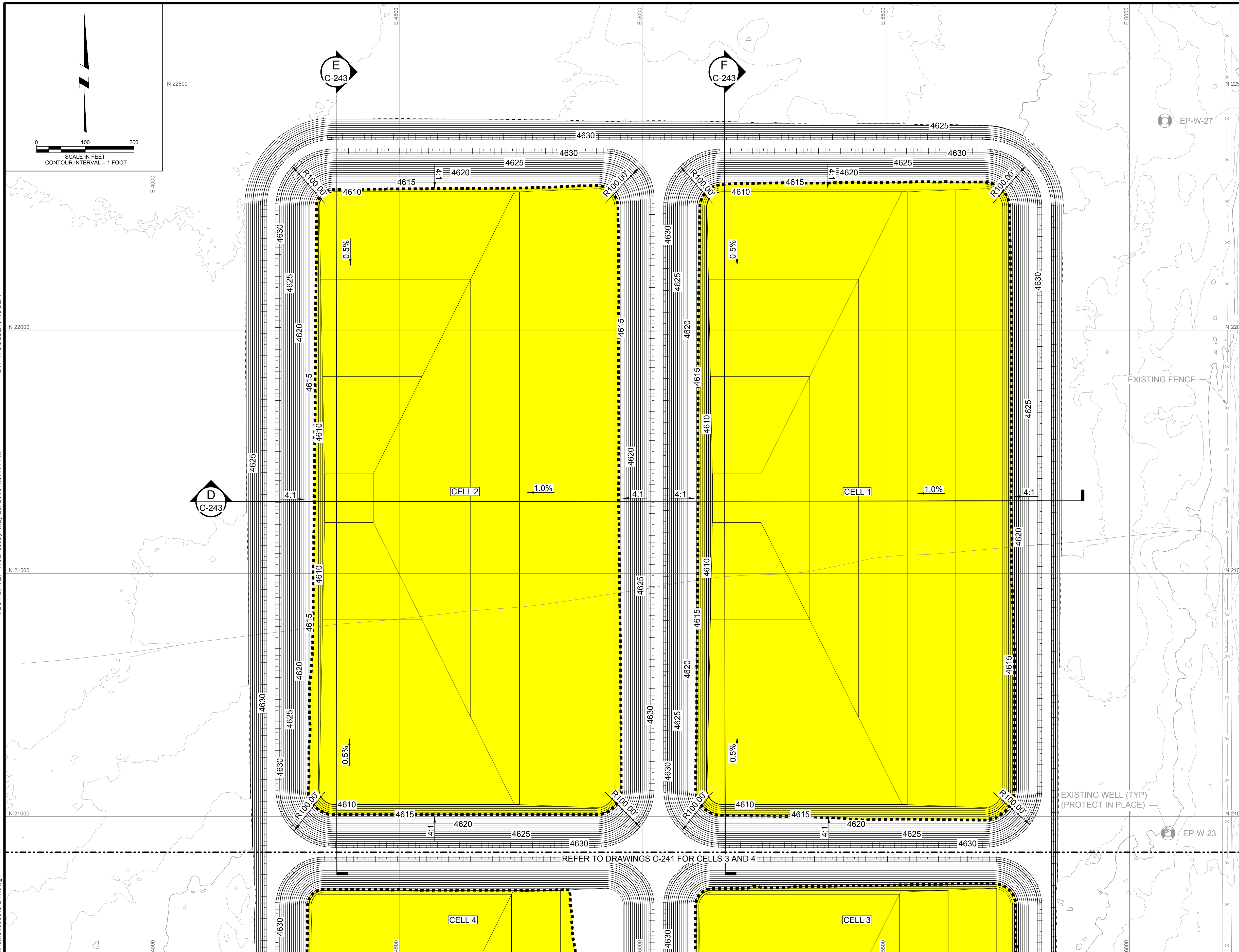
INTERMOUNTAIN POWER SERVICE CORP

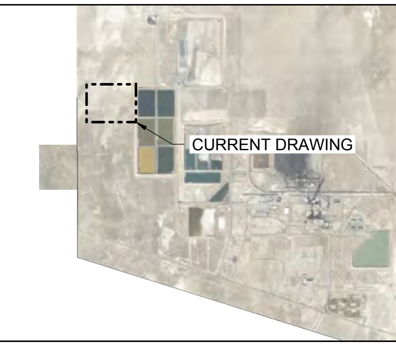
IPSC CCR BOTTOM ASH BASIN
CIVIL
COMBUSTION BYPRODCUT LANDFILL CLOSURE
BORROW SOURCE 3
PHASE 2 EXCAVATION PLAN - SHEET 1

SHEET C-240

Job# 233001396



KEY PLAN



LEGEND

Symbol	Description
4600 (light line)	EXISTING CONTOURS
4600 (heavy line)	DESIGN CONTOURS
dashed line	LIMITS OF DISTURBANCE
x line	EXISTING FENCE
	EXSTING TEST PIT
	CLAY EXCAVATION
	EXISTING WELL

GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.
2. REFER TO WASTEWATER BASIN CLOSURE (C-470) FOR CELLS 5 AND 6.

QUANTITY TABLE

DESCRIPTION	6" STRIP (CY)	GEN FILL (CY)	CLAY (CY)
EXCAVATION	36,145	631,390	294,400

QUANTITY TABLE

DESCRIPTION	FILL (CY)
EMBANKMENT FILL	45,450

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SCALE: 1" = 100'

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DESIGNED: P. BERNHARD
DRAWN: R. WOOLSEY
CHECKED: C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR BOTTOM ASH BASIN
CIVIL
COMBUSTION BYPRODCUT LANDFILL CLOSURE
BORROW SOURCE 3
PHASE 2 EXCAVATION PLAN - SHEET 2

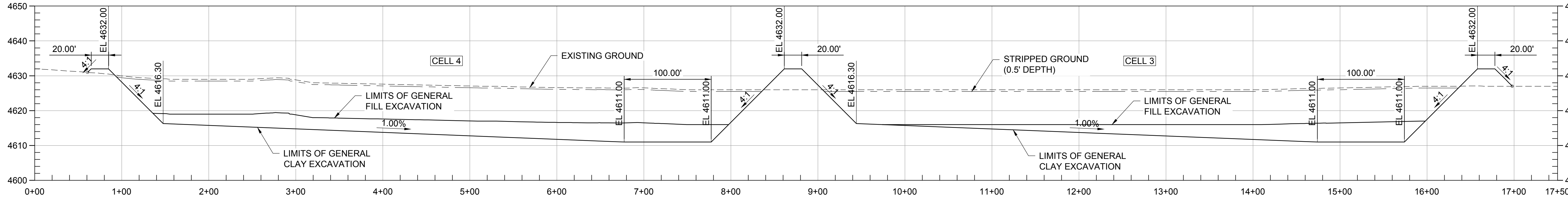
SHEET C-241

Job# 233001396

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40956\C-241.dwg

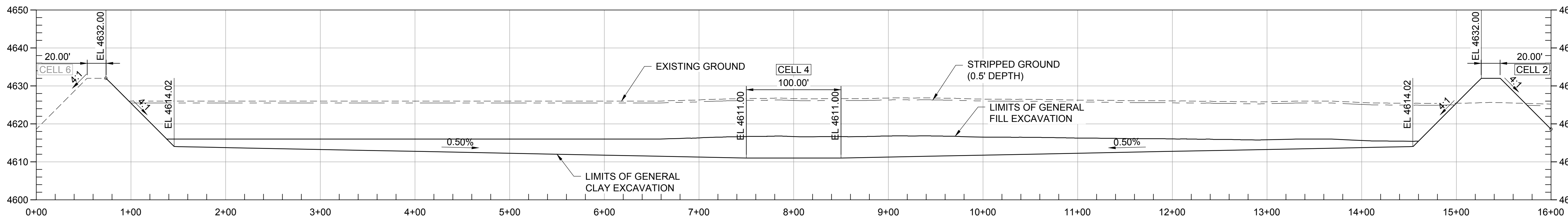
GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.



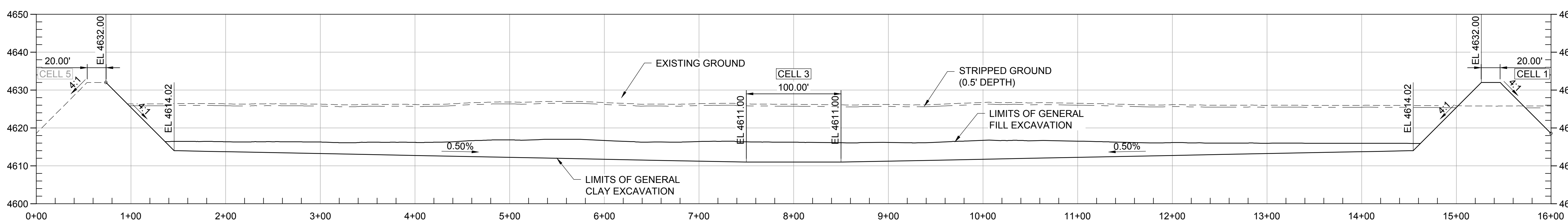
A SECTION A
C-240

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET



B SECTION B
C-240

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET



C SECTION C
C-240

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET

BY: WOOLSEY, ROGER

PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM

DWG FILE: C:\pwwrk\dms40956\C-242.dwg

REV	DATE	BY	DESCRIPTION
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INTERMOUNTAIN POWER SERVICE CORP

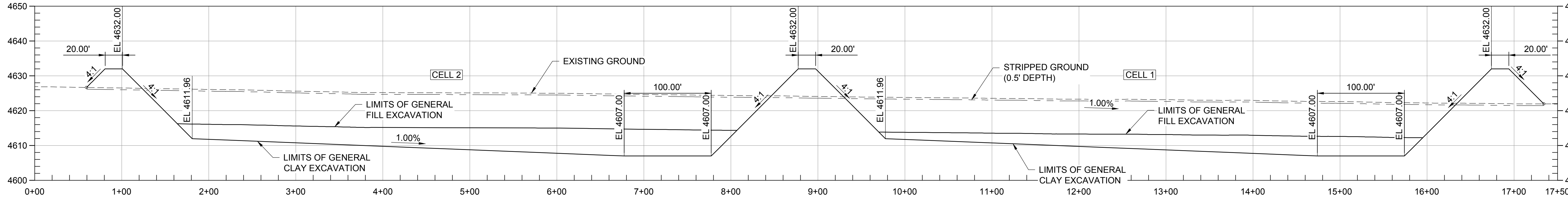
IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
BORROW SOURCE 3
PHASE 2 EXCAVATION SECTIONS - SHEET 1

SHEET C-242

Job# 233001396

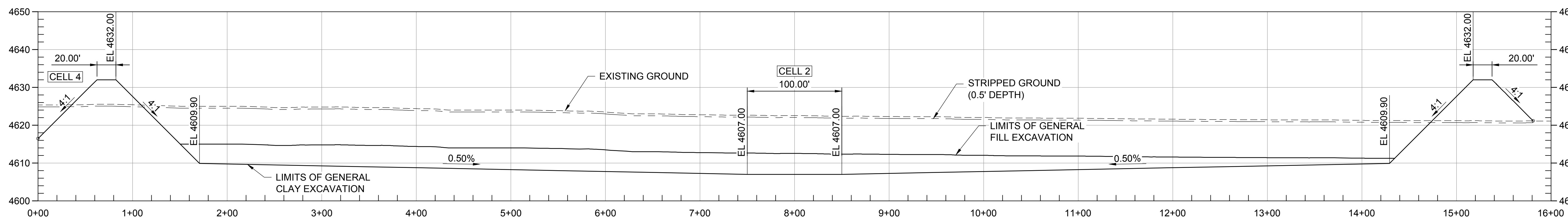
GENERAL SHEET NOTES

1. REFER TO CLOSURE PLAN FOR DESCRIPTION OF BORROW AREA SOILS.



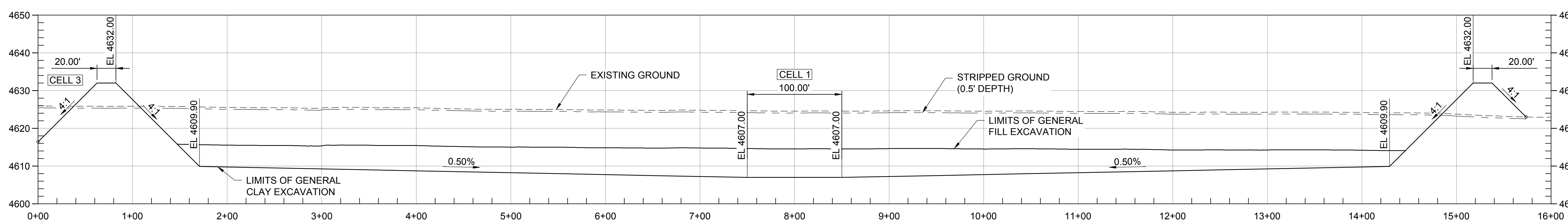
A SECTION A
C-241

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET



B SECTION B
C-241

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET



C SECTION C
C-241

HORZ 0 60 120
VERT 0 15 30
SCALE IN FEET

BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40956\C-243.dwg

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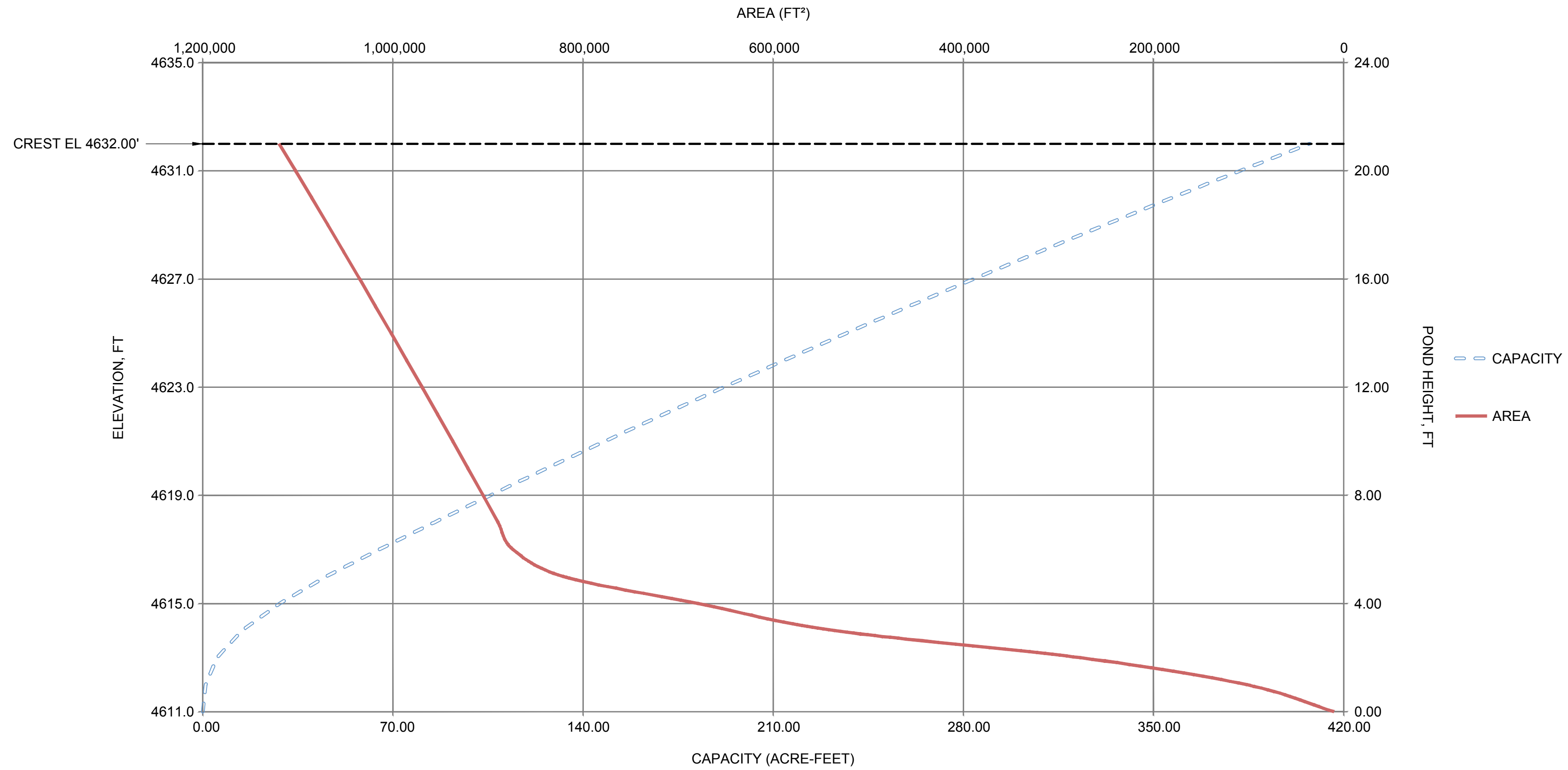
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
BORROW SOURCE 3
PHASE 2 EXCAVATION SECTIONS - SHEET 2

SHEET C-243

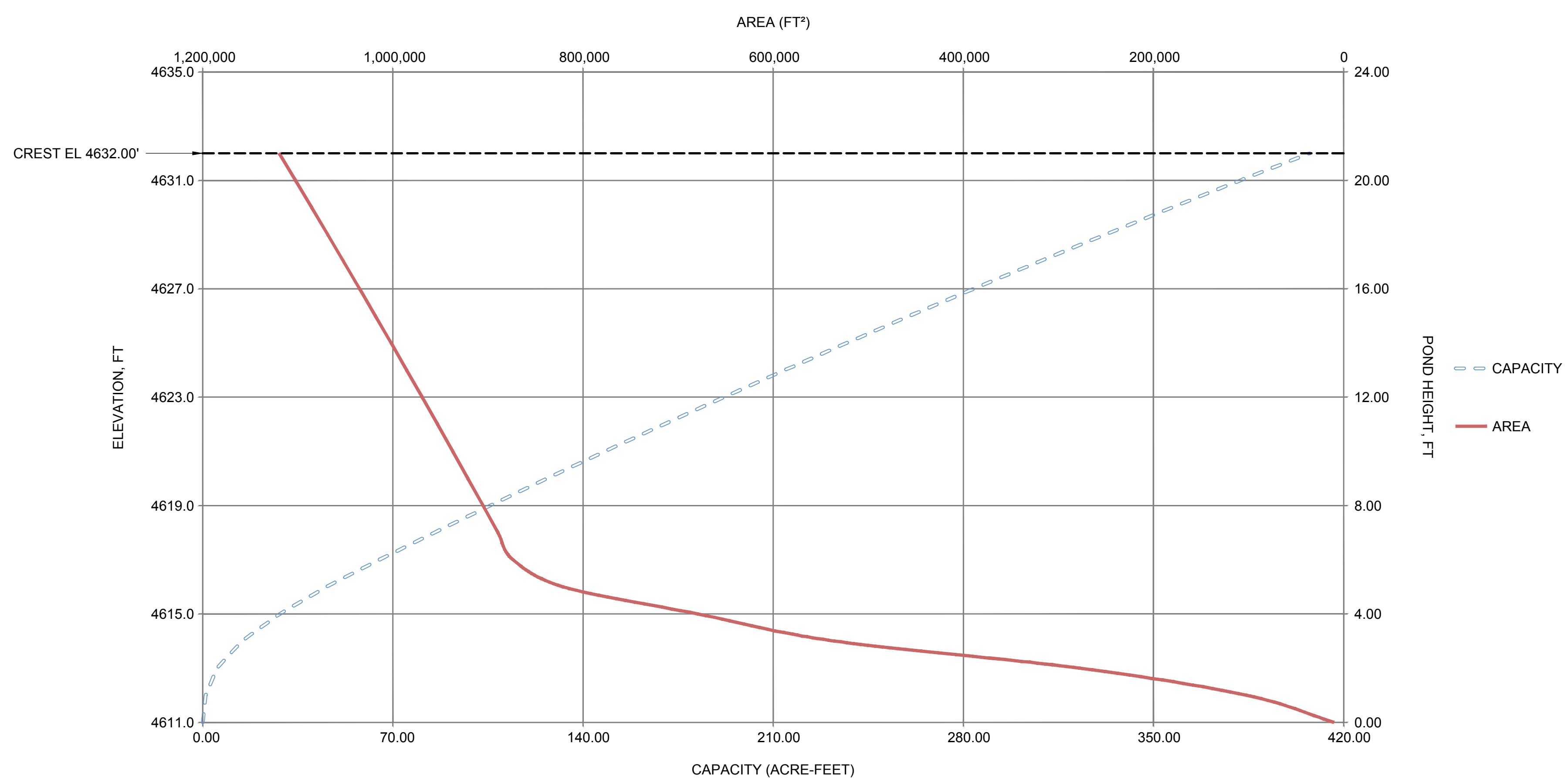
Job# 233001396



AREA CAPACITY CURVE - EVAP POND 3

AREA CAPACITY TABLE - EVAP POND 3		
ELEVATION (FT)	AREA (FT²)	CAPACITY (ACRE-FT)
4611.00	10,000.00	0.00
4612.00	102,000.00	1.10
4613.00	277,200.00	5.29
4614.00	535,416.14	14.46
4615.00	678,982.01	28.36
4616.00	820,758.87	45.55
4617.00	873,625.86	65.00
4618.00	889,315.00	85.23
4619.00	905,104.51	105.83
4620.00	920,994.37	126.79
4621.00	936,984.59	148.12
4622.00	953,075.17	169.81
4623.00	969,266.11	191.88
4624.00	985,557.40	214.31
4625.00	1,001,949.05	237.13
4626.00	1,018,441.06	260.32
4627.00	1,035,033.43	283.89
4628.00	1,051,726.16	307.84
4629.00	1,068,519.24	332.18
4630.00	1,085,412.68	356.90
4631.00	1,102,406.48	382.01
4632.00	1,119,500.64	407.52

CREST EL 4632.00' →



AREA CAPACITY CURVE - EVAP POND 4

AREA CAPACITY TABLE - EVAP POND 4		
ELEVATION (FT)	AREA (FT²)	CAPACITY (ACRE-FT)
4611.00	10,000.00	0.00
4612.00	102,000.00	1.10
4613.00	277,200.00	5.29
4614.00	535,416.14	14.46
4615.00	678,982.01	28.36
4616.00	820,758.87	45.55
4617.00	873,625.86	65.00
4618.00	889,315.00	85.23
4619.00	905,104.51	105.83
4620.00	920,994.37	126.79
4621.00	936,984.59	148.12
4622.00	953,075.17	169.81
4623.00	969,266.11	191.88
4624.00	985,557.40	214.31
4625.00	1,001,949.05	237.13
4626.00	1,018,441.06	260.32
4627.00	1,035,033.43	283.89
4628.00	1,051,726.16	307.84
4629.00	1,068,519.24	332.18
4630.00	1,085,412.68	356.90
4631.00	1,102,406.48	382.01
4632.00	1,119,500.64	407.52

CREST EL 4632.00' →

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Stantec

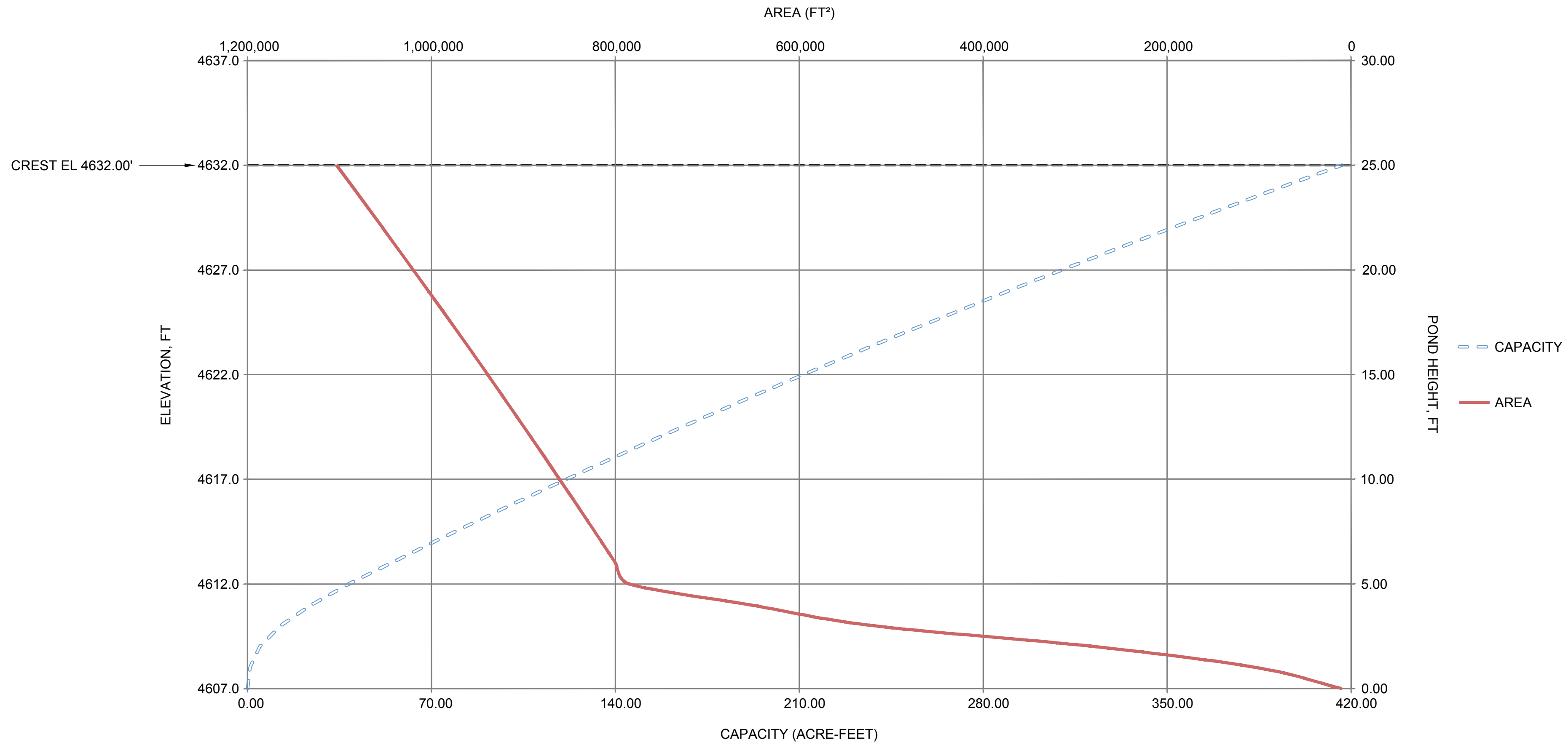
INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
BORROW SOURCE 3
PHASE 2 STAGE STORAGE CURVE - SHEET 1

SHEET C-244

Job# 233001396

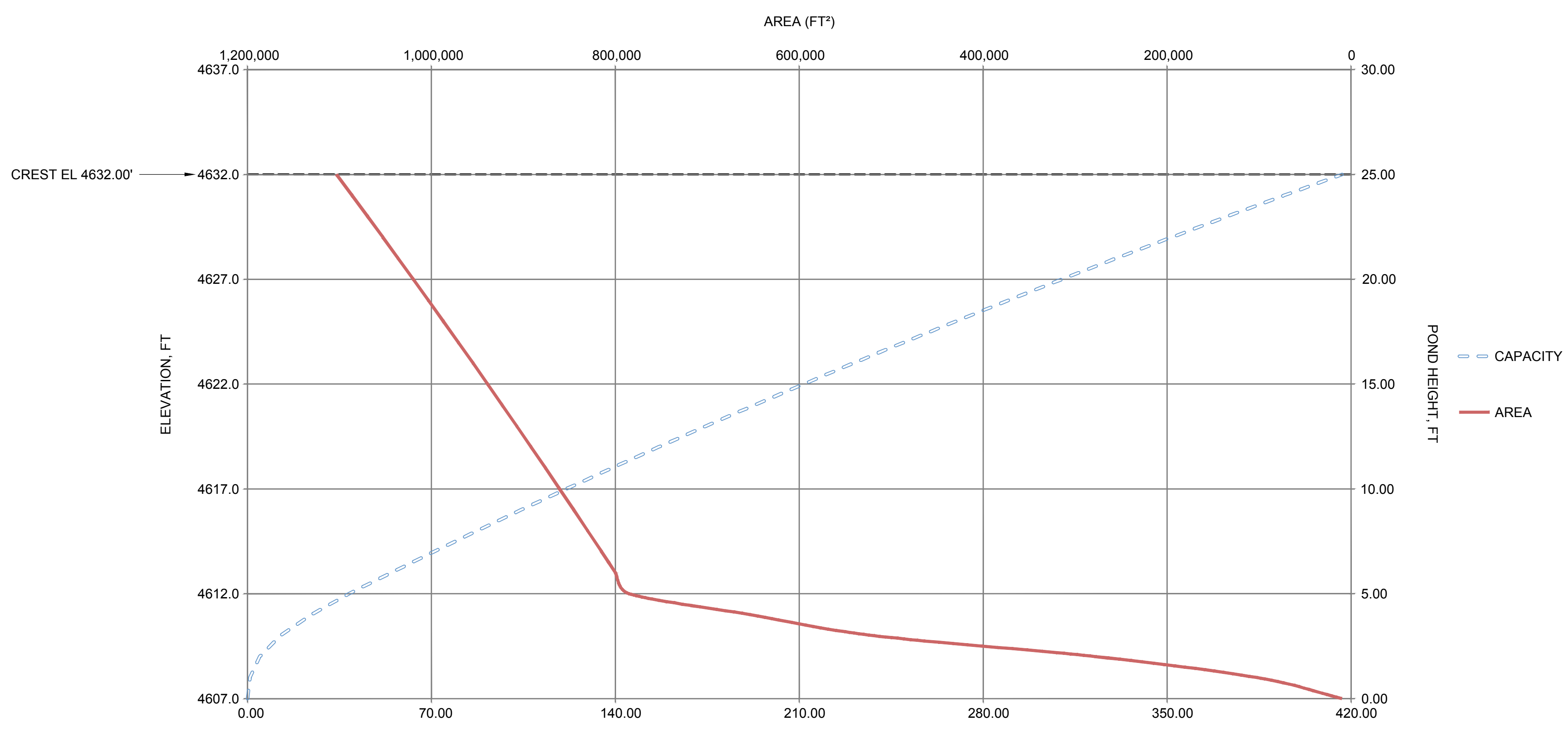
BY: WOOLSEY, ROGER
PLOT DATE: Wednesday, May 25, 2016 1:37:44 PM
DWG FILE: C:\pwwrk\dms40956\C-244.dwg



AREA CAPACITY CURVE - EVAP POND 1

AREA CAPACITY TABLE - EVAP POND 1		
ELEVATION (FT)	AREA (FT²)	CAPACITY (ACRE-FT)
4607.00	10,000.00	0.00
4608.00	102,000.00	1.10
4609.00	277,200.00	5.29
4610.00	518,390.38	14.28
4611.00	653,369.39	27.70
4612.00	784,924.27	44.19
4613.00	799,849.32	62.38
4614.00	714,878.14	80.91
4615.00	830,010.74	99.79
4616.00	845,247.12	119.02
4617.00	860,587.28	138.60
4618.00	876,031.22	158.53
4619.00	891,578.93	178.82
4620.00	907,230.42	199.47
4621.00	922,985.69	220.48
4622.00	938,844.74	241.85
4623.00	954,807.56	263.58
4624.00	970,874.16	285.69
4625.00	987,044.54	308.16
4626.00	1,003,318.70	331.01
4627.00	1,019,696.63	354.23
4628.00	1,036,178.34	377.83
4629.00	1,052,763.83	401.80
4630.00	1,069,453.10	426.16
4631.00	1,086,246.15	450.91
4632.00	1,103,142.97	476.04

CREST EL 4632.00'



AREA CAPACITY CURVE - EVAP POND 2

AREA CAPACITY TABLE - EVAP POND 2		
ELEVATION (FT)	AREA (FT²)	CAPACITY (ACRE-FT)
4607.00	10,000.00	0.00
4608.00	102,000.00	1.10
4609.00	277,200.00	5.29
4610.00	518,390.38	14.28
4611.00	653,369.39	27.70
4612.00	784,924.27	44.19
4613.00	799,849.32	62.38
4614.00	714,878.14	80.91
4615.00	830,010.74	99.79
4616.00	845,247.12	119.02
4617.00	860,587.28	138.60
4618.00	876,031.22	158.53
4619.00	891,578.93	178.82
4620.00	907,230.42	199.47
4621.00	922,985.69	220.48
4622.00	938,844.74	241.85
4623.00	954,807.56	263.58
4624.00	970,874.16	285.69
4625.00	987,044.54	308.16
4626.00	1,003,318.70	331.01
4627.00	1,019,696.63	354.23
4628.00	1,036,178.34	377.83
4629.00	1,052,763.83	401.80
4630.00	1,069,453.10	426.16
4631.00	1,086,246.15	450.91
4632.00	1,103,142.97	476.04

CREST EL 4632.00'

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CHECKED C. TOMLINSON

PRELIMINARY DESIGN PHASE - 10/16/2020

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INTERMOUNTAIN POWER SERVICE CORP

IPSC CCR WASTEWATER BASIN
CIVIL
WASTEWATER BASIN CLOSURE
BORROW SOURCE 3
PHASE 2 STAGE STORAGE CURVE - SHEET 2

SHEET C-245

Job# 233001396

Appendix B

Construction Specifications

IPP CCR CLOSURE TECHNICAL SPECIFICATIONS

DIVISION 02 - SITEWORK

SECTION 02222 – EARTHWORK AND GRADING

PART 1 -- GENERAL

1.1 SUMMARY

A. The Contractor shall be responsible for all activities required to ensure that the designated areas are free from objectionable materials, in accordance with the Contract Documents.

B. Contractor shall be responsible for the excavation and grading of the site to configuration in accordance with the details and to the lines and grades indicated by the project drawings.

C. Contractor shall be responsible for construction of the soil covers to the grades and specifications presented herein.

D. The Contractor shall be responsible for development of borrow areas.

1.2 RELATED SPECIFICATION

A. The following specifications contain requirements that relate to this specification:

- 02272 – Geomembranes

1.3 DEFINITIONS

A. Company: Intermountain Power Service Corp.

B. Engineer: Stantec

C. Contractor: The party to whom the Contract for the work described herein has been awarded and any of its authorized representatives.

1.4 CONTRACTOR SUBMITTALS

A. The Contractor shall submit the following documents for Engineer approval and acceptance prior to mobilization:

1. Samples:

   a. The Contractor shall submit samples of materials proposed for the Work.

   b. Sample sizes shall be determined by the testing laboratory.

PART 2 -- EQUIPMENT AND MATERIALS

2.1 EQUIPMENT

A. Conventional earth-moving equipment shall be used for the material acquisition. All equipment shall be decontaminated prior to arrival at the site, in good working condition, and suitable for its intended use.

2.2 MATERIALS

A. The following materials shall be furnished by the Contractor from designated soil borrow areas or supplied by the Company as specified below.

1. General Fill: General fill material shall be obtained from the identified borrow areas located on the drawings and shall conform to the gradation limits given in Table 1 below, when tested in accordance with ASTM D 422:

Table 1: General Fill Gradation Requirements

U.S. Standard Sieve Size	% Passing	
	Coarse Range	Fine Range
1.5-inch	100	100
¾-inch	90	100
No.4	65	100
No. 40	30	80
No. 200	10	50

2. Compacted Clay Layer, Clay Trench, and Clay Dividing Berm: Compacted Clay Layer, Clay Trench and Clay Dividing Berm material shall be obtained from the identified borrow areas located on the drawings and shall conform to the gradation limits given in Table 2 below, when tested in accordance with ASTM D 422:

Table 2: Compacted Clay Layer, Clay Trench and Clay Dividing Berm Gradation Requirements

U.S. Standard Sieve Size	% Passing	
	Coarse Range	Fine Range
1-inch	100	100
¾-inch	95	100
No.4	90	100
No. 40	80	100
No. 200	60	100

Note that clay clay material can be used for gernal fill if necessary.

3. Topsoil / Erosion Layer: Topsoil / Erosion Layer material shall be 1.5-inch minus material, shall be a blend of 50% clay material and 50% slty sand to promote soil moisture storage and reduce the potential for soil erosion. The Topsoil / Erosion Layer shall conform to the gradation limits given in Table 3 below, when tested in accordance with ASTM D 422.

Table 3: Topsoil / Erosion Layer Material Gradation Requirements

`	% Passing	
	Coarse Range	**Fine Range**
1.5-inch	100	100
¾-inch	90	100
No. 4	65	100
No. 40	50	95
No. 200	30	75

PART 3 -- EXECUTION

3.1 EXCAVATION

A. General

1. Excavation is unclassified and includes excavation to required grade, or subgrade elevations, regardless of the character of materials or obstruction encountered.

2. Tolerances for all excavated surfaces shall be within ±0.1 foot of the elevation as specified in the design drawings.

3. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable state safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

4. The Contractor shall provide quantity surveys where so required to verify quantities for Unit Price Contracts.

5. Survey shall be performed prior to beginning Work and upon completion by a surveyor licensed in the State of Utah.

6. If stockpiles will be used, the material shall be transported and stockpiled in an approved stockpiling area.

B. Disposal Of Excess Excavated Material

1. The Contractor shall be responsible for the removal and stockpiling of any excess excavated material according to Section 01552 – Staging and Stockpile Areas.

2. Material shall be disposed of at an approved on-Site disposal area.

3.2 FILL PLACEMENT AND COMPACTION

A. Material Placement

1. Material shall be placed and spread evenly in approximately horizontal layers.

2. Lift thicknesses are specified by material types in the following sections.

3. Unless otherwise approved by the Engineer, loose lift thickness shall not exceed 6 inches, prior to compaction by hand operated compactors.

B. General Fill:

1. General Fill shall be spread in 18-inch loose lifts using equipment meeting the ground pressure requirements described in Section 02272 – Geomembrane to prevent damage to the geomembrane. The equipment shall have GPS elevation grade control capability.

2. Following placement and grading of each lift, the surface shall be compacted with a number of passes by equipment that is capale of achieving the required degree of compaction stated in Table 4.

3. Following placement and grading of the general fill for the liner protection layer, the surface shall be compacted with a number of passes (tracked) by the low-groud-pressure (LGP) dozer. The Contractor shall determine the appropriate number of passes to achieve the required degree of compaction stated in Table 4.

4. Moisture contents of the general fill during placement shall comply with Table 4.

C. Compacted Clay Layer, Clay Trench and Clay Divider Berm:

1. Compacted Clay Layer shall be spread in 8-inch loose lifts. The equipment used to spread lifts shall have GPS elevation grade control capability.

2. Clay Trench and Clay Divider Berm shall be spread in 12-inch loose lifts. The equipment used to spread lifts shall have GPS elevation grade control capability.

3. Following placement and grading of each lift, the surface shall be compacted with a number of passes by equipment that is capale of achieving the required degree of compaction stated in Table 4. The Contractor shall determine the appropriate number of passes.

4. Moisture contents of the Compacted Clay Layer, Clay Trench and Clay Divider Berm during placement shall comply with Table 4.

5. Where clay is to be used as General Fill the contractor shall place, spread, and compact the layer in accordance with Section 3.2.B

D. Topsoil / Erosion Layer:

1. Topsoil Layer shall be spread in one loose lift using equipment meeting the ground pressure requirements described in Section 02272 – Geomembrane to prevent damage to the geomembrane, graded to achieve final design grades, and compacted to meet the requirements of Table 4, by tracking to achieve the final thickness.

2. The surface of the layer shall be tracked into place to maintain the surface of the material, in the event of heavy rain, prior to vegetation.

E. Compaction Requirements:

1. Compaction equipment shall be of the appropriate type and weight for the fill materials being placed in order to achieve the compaction requirements of this Specification and meet the ground pressure requirements described in Section 02272 – Geomembrane where applicable.

2. The Contractor shall submit compaction procedures to the Engineer as part of the Construction Plan submitted. Procedures shall include details of the equipment proposed for use and the number of passes required. The Contractor shall state in the procedures, the steps that will be taken to control moisture content of the fill materials. Approval of the compaction procedures shall be given by the Engineer prior to Contractor undertaking any compaction work.

3. Coverages of Compaction Equipment: Coverages of the compaction equipment shall be carried out so that the compactive effort is uniformly distributed in a systematic manner over the entire lift. Compaction of individual lanes of a lift shall be completed before beginning compaction of adjacent portions of the lift. Individual lanes shall be overlapped by at least 1 ft.

4. In locations where compaction by normal mechanical equipment is not possible and compaction can only be completed by hand tamping, fill shall be moistened, placed and compacted with the aid of pneumatic or hand tampers. Pneumatic and hand tampers shall provide a minimum of 9 psi compactive force.

5. Compaction shall meet the requirements given in Table 4 below in accordance with:

   ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (400 ft-lbf/ft^3) where the material is graded such that 10 percent or more passes a No. 4 sieve.

Table 4: Compaction Requirements for Fill Materials

Location or Use of Fill or Backfill	Percentage of Maximum Dry Density	Percentage of Optimum Moisture
General Fill	90% (±3% of MDD)	±2%
General Fill (Liner Protective Layer)	90% (±3% of MDD)	±2%
Compacted Clay Layer (CB Landfill)	95% (minimum)	±2%
Clay Trench (Wastewater Basin)	90% (±3% of MDD)	NA
Clay Divider Berm (Wastewater Basin)	90% (minimum)	±2%
Erosion Protection Layer (topsoil)	85% (+5%)	±2%

F. Moisture Content

1. For General Fill, Compacted Clay Layer, Clay Divider Berm and Topsoil, the moisture contents of materials to be placed and compacted or scarified and compacted shall be within +2.0 and -2.0 percent of the Optimum Moisture Content (OMC) as

determined by ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3).

2. The moisture content of materials shall be uniform throughout each layer of material placed prior to and during compaction.

3. Perform wetting and drying operations as necessary in order to achieve the required moisture contents prior to compaction.

4. Materials too dry for compaction shall be pre-wetted in the borrow areas. Supplemental water, if required, shall be added to the material at the placement area prior to compaction; by uniform sprinkling, followed by uniform mixing, prior to compaction.

5. Materials too wet for compaction shall be dried to the proper moisture content before compaction. Mixing of wet materials with drier materials may also be performed to achieve the appropriate moisture content, as approved by the Engineer.

6. If the moisture content of fill material placed into the work falls outside the required limits, the Contractor shall condition the material to bring it to within the required limits. If the material cannot be brought readily to the specified moisture content, the Contractor shall remove the material from the work.

3.3 MATERIALS TESTING

A. Samples:

1. Soils testing of samples submitted by the Contractor will be performed by a testing laboratory of the Contractor's choice and at the Contractor's expense.

2. The Engineer may direct the Contractor to supply samples for testing of any material used in the Work.

3. Particle-size analyses of soils and aggregates will be performed using ASTM D 422 - Standard Test Method for Particle-size Analysis of Soils.

4. References in this Section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D 2487.

5. The Contractor shall be bound by applicable provisions of ASTM D 2487 in the interpretation of soil classifications.

B. Field and Laboratory Testing:

1. Field soils testing will be performed by a testing laboratory of the Contractor's choice at the Contractor's expense at the frequency given in Table 5 below.

Table 5: Minimum Required QC Field and Laboratory Testing Methods and Frequencies

Material	Test Name	Testing Method	Minimum QC Testing Frequency
General Fill / Liner Protective Layer	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 10,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 20,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Compacted Clay Layer (CB Landfill)	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 5,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per10,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Clay Ternch / Clay Dividing Berm	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 5,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 10,000 CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test
Topsoil/Erosion Layer	In-Place Moisture and Density – Nuclear Moisture Density Gauge	ASTM D6938	1 per 2,000 CY and per each material source or processing method
	Standard Proctor	ASTM D698	1 per 5,000CY and per each material source or processing method
	Atterberg Limits	ASTM D4318	1 per Proctor test
	Classification of Soils	ASTM D2487	1 per Proctor test
	Grain-size Distribution	ASTM D6913	1 per Proctor test

Notes:
1. The Engineer may revise the listed frequencies and test methods during the work.
2. Standard Proctor testing shall be performed at the frequencies listed in the table and as needed to obtain Proctor values representative of the placed material.

C. Contractor's Responsibilities:

1. Re-working to Attain Specified Limits: When the test results indicate that compaction, water content, or relative compaction is not in conformance with specified limits, the Contractor shall make immediate adjustments in procedures as necessary to conform to the specified limits. Re-working to attain the specified limits may include removal, rehandling reconditioning, re-rolling, or combinations of these procedures. The Contractor shall perform all re-work required to achieve the specified compaction water content and relative compaction at no cost to the Company.

2. Confirmation of In-Situ Material Properties: The Contractor shall independently confirm the geotechnical properties of the proposed Cover Soil material and determine the appropriate moisture conditioning and compaction methods to ensure that cover material meets the project specifications and are constructed to the design lines and grades as provided in the design drawings. Claims arising from material shrinkage and/or swelling will not be entertained.

- END OF SECTION -

SECTION 02272 –GEOMEMBRANES

PART 1 -- GENERAL

1.1 SUMMARY

A. The CONTRACTOR shall supply all labor, equipment, materials, and appurtenances for the complete installation of geomembranes as per contract documents.

B. Sufficient geomembrane material shall be furnished to cover all lined areas, including seam overlaps and anchor trenches. One percent shall be added to the length of each panel to allow for shrink and wrinkles. The geomembrane shall be installed in a relaxed condition and shall be free of tension or stress upon completion of the installation.

1.2 SUBMITTALS

A. Prior to installation of geomembrane material, the CONTRACTOR shall submit the following for the ENGINEER's approval:

1. Resin Data, including a certification stating that the resin meets the specification requirements (see Paragraph 2.3.C).

2. Statement certifying that geomembrane materials have been tested and inspected in accordance with Paragraph 1.5.

3. Statement certifying no recycled polymer and no more than 10% rework of the same type of material is added to the resin (product run may be recycled).

4. Specification sheet stating that the geomembrane meets the specification requirements (see Paragraph 2.3.E)

5. Installation layout drawings showing the proposed panel layout to cover the lined area shown, with proposed size, number, position, and sequence of placing all sheets and indicating the location and direction of all field joints and penetrations. Installation layout drawings shall also show complete details and/or methods for anchoring, field joints, seals at existing structures, etc.

6. Four 8-inch x 10-inch samples of the material proposed for the lining

7. A Statement of Qualifications for the geomembrane manufacturer and installation contractor with sufficient detail to satisfy the experience requirements of Paragraph 1.3.

8. Installation Contractor's Quality Control Plan.

B. Placement of geomembrane material shall not commence until the submittals required in Paragraph 1.2 A have been approved by the ENGINEER.

C. Upon completion of geomembrane installation, the CONTRACTOR shall submit the following:

1. Certificate stating the geomembrane has been installed in accordance with the Contract Documents.

2. Material and installation warranties

3. As-built drawings showing actual geomembrane placement and seams including complete details.

1.3 QUALIFICATIONS

A. **Qualifications of Manufacturer:** The manufacturer shall have at least five years continuous experience in manufacturing polyethylene geomembrane and/or experience totaling not less than 5 million square feet of manufactured polyethylene geomembrane.

   1. The following manufacturers are approved by the COMPANY:

      a. Agru America

      b. Solmax

B. **Qualifications of Installation Contractor:** The installation contractor shall be the manufacturer, or shall be trained to install the manufacturer's material, and shall have experience of not less than 3 projects and not less than 1,000,000 square feet of successfully installed polyethylene geomembrane.

   1. Field Installation Supervisor: Installation shall be performed under the constant direction of a Field Installation Supervisor who shall remain on site and be responsible, throughout the geomembrane installation, for layout, seaming, testing, repairs, and all other activities by the Installer. The Field Installation Supervisor shall have installed or supervised the installation of not less than 1,000,000 square feet of polyethylene geomembrane.

   2. Master Seamer: Seaming shall be performed under the direction of a Master Seamer (who may also be the Field Installation Supervisor) who has seamed not less than 1,000,000 square feet of polyethylene geomembrane, using the same type of seaming apparatus specified for this project. The Field Installation Supervisor and/or Master Seamer shall be present whenever seaming is performed.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

ASTM D792	Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1004	Test Method for Initial Tear Resistance of Plastic Film and Sheeting
ASTM D1238	Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1505	Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1603	Test Method for Carbon Black in Olefin Plastics
ASTM D3895	Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D4218	Standard Test Method for Determination of Carbon Black in Polyethylene Compounds
ASTM D4833	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

ASTM D5199	Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
ASTM D5397	Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D5994	Standard Test Method for Measuring Core Thickness of Textured Geomembranes
ASTM D6392	Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
ASTM D6693	Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
ASTM D7240	Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique (Conductive Geomembrane Spark Test)
GRI GM 13	Test Methods, Test Properties, and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
GRI GM 14	Standard Guide for Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes
GRI GM 17	Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

1.5 QUALITY CONTROL

A. All WORK shall be constructed, monitored and tested in accordance with the requirements of the Installation Contractor's Quality Control Plan (CQP), which shall be submitted in accordance with Paragraph 1.2 A.

B. The CONTRACTOR shall be aware of all activities outlines in the CQP, and the CONTRACTOR shall account for these activities in the construction schedule. No additional costs to the COMPANY shall be allowed by the CONTRACTOR as a result of the performance of the CQP activities.

1.6 QUALITY ASSURANCE

A. The COMPANY shall conduct quality assurance monitoring and testing of the geomembrane installation under the direction of the ENGINEER. This testing is defined in Part 3 of the Specification and include, but are not limited to, trial welds (Section 3.2.F.5) and seam testing (Section 3.3).

1.7 WARRANTY

A. The CONTRACTOR shall procure and provide copies of the manufacturer's warranty for the geomembrane system and all appurtenances. The warranty shall cover materials for a period of 5 years prorated and workmanship for a period of 1 year from the date of the COMPANY's acceptance of the project. The warranty shall not be prorated for workmanship, but shall be a full replacement value warranty. Should defects or premature loss of use within the scope of the above warranty occur, repair and/or replacement of damaged material shall be performed by the CONTRACTOR at no cost to the COMPANY.

PART 2 -- PRODUCTS

2.1 SCHEDULE OF GEOMEMBRANES

TABLE 1 – SCHEDULE OF GEOMEMBRANES

Application	Geomembrane
Bottom Ash Basin Cover Geomembrane	60-mil HDPE, Textured (Single Side)
Wastewater Basin Cover Geomembrane	60-mil LLDPE, Textured (Single Side)

2.2 APPROVED GEOMEMBRANE PRODUCTS

A. 60-mil HDPE, Textured (Single Side)

1. Solmax HDPE Single Textured

2. Agru America HDPE MicroSpike Single Sided

B. 60-mil LLDPE, Textured (Single Side)

1. Solmax LLDPE Single Textured

2. Agru America LLDPE MicroSpike Single Sided

2.3 "OR EQUAL" PRODUCTS

A. CONTRACTOR shall provide the COMPANY approved geomembrane products listed in Paragraph 2.2, or provide "or equal" products that meet the requirement indicated below.

B. **Materials:** The material shall be black, coextruded high-density polyethylene (HDPE) geomembrane or black, coextruded linear low-density polyethylene (LLDPE) geomembrane as listed below and as shown on the Contract Drawings.

C. The geomembrane shall be manufactured from new, first quality resin produced in the United States and shall be compounded and manufactured specifically for producing geomembrane. Natural resin (without carbon black) shall meet requirements listed in Table 2:

TABLE 2 – RESIN PROPERTIES

Property	Test Method	HDPE Value	LLDPE Value
Density (g/cm3)	ASTM D 792 / ASTM D 1505	$\geq$0.932	$\leq$0.926
Melt Flow Index (g/10 min)	ASTM D 1238 (190/2.16)	$\leq$1.0	$\leq$1.0

Reprocessed materials shall not be acceptable. No post-consumer resin of any type shall be added to the formulation.

D. **Fabrication:** The geomembrane shall have a minimum 20-foot seamless width. The geomembrane shall be supplied in rolls with labels identifying the thickness of material, the length and width of the roll, the lot and roll numbers, and the name of the manufacturer.

E. Properties:

1. The geomembrane shall not exceed a combined maximum total of 1 percent by weight of additives other than carbon black.

2. The geomembrane shall be free of holes, pinholes, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

3. The finished product shall be uniform in color, thickness, and surface texture and shall meet the **minimum** average specifications listed in Table 3 and as stipulated in GRI Test Method GM13 and GM17 for HDPE and LLDPE liners, respectively.

F. Manufacturer Quality Control

1. All resins and additives used in the fabrication of the geomembrane shall be sampled, tested, and approved by the MANUFACTURER before being eligible for use. Sampling and testing of the resins and additives shall be performed in accordance with the Manufacturer's Quality Control program.

2. All roll goods shall be inspected for defects and impurities. Geomembrane thickness shall be measured for each roll.

3. All geomembrane sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements listed in Paragraph 2.3.E and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be corrected during installation.

4. The geomembrane shall be tested by the MANUFACTURER for the listed properties provided in the tables in Part 2. A log shall be maintained showing the testing date, time and results. Any rolls not meeting the visual inspection or requirements of the specification shall be rejected.

5. Certification that the material has been inspected, tested, and meets all requirements shall be submitted to the ENGINEER. Test results shall be made available to the ENGINEER upon request.

TABLE 3 – GEOMEMBRANE PROPERTIES

Tested Property	Test Method	Frequency	Textured HDPE	Textured LLDPE
Thickness, (minimum average) mil; Lowest individual reading (-10%);	ASTM D 5199 (Sm.) / ASTM D 5994 (Tx.)	every roll	60 54	60 54
Density, g/cm^3	ASTM D 792 / ASTM D 1505	200,000 lb	0.94	0.94
Tensile Properties (each direction) Strength at Yield, lb/in-width Strength at Break, lb/in-width Elongation at Yield, % Elongation at Break, %	ASTM D 6693, Type IV Dumbell, 2 ipm G.L. 1.3 in (33 mm) G.L. 2.0 in (51 mm)	20,000 lb	126 90 12 100	N/A 120 N/A 250
Tear Resistance, lb	ASTM D 1004	45,000 lb	42	33
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	90	66
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lb	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note(1)	Note(1)
Asperity Height, mil	ASTM D 7466	second roll	18	18
Notched Constant Tensile Load(2), hr	ASTM D 5397, Appendix	200,000 lb	300	N/A
Oxidative Induction Time, min	ASTM D 3895, 200° C; O_2, 1 atm	200,000 lb	≥100	≥100

NOTES:
(1)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3. *Modified

PART 3 -- EXECUTION

3.1 STORAGE

A. After delivery, all roll goods shall be stored so as to be protected from puncture, dirt, grease, moisture and excessive heat which may result in damage or degradation of the material. Damaged material shall be stored separately for repair or replacement. The rolls shall be stored on a prepared smooth surface and should not be stacked more than two rolls high.

3.2 INSTALLATION

A. **General:** The geomembrane shall be installed in accordance with the following specifications and approved procedures submitted with the shop drawings.

B. Subgrade Preparation and Inspection:

1. Surfaces to be lined shall be smooth and free of all rocks, stones, sticks, roots, sharp objects, or debris of any kind. The surface shall provide a firm, unyielding foundation for the membrane with no sudden, sharp, or abrupt changes or break in grade.

2. The CONTRACTOR shall, on a daily basis, approve the surface on which the geomembrane shall be installed. The surface shall be smooth, clean and free of foreign material, sharp objects, frost, standing water or excessive moisture. Installation shall proceed only if the surface conditions are found satisfactory.

C. Equipment:

1. Welding equipment and accessories shall meet the following requirements:

a. Gauges showing temperatures in apparatus such as extrusion welder or fusion welder shall be present.

b. An adequate number of welding apparati shall be available to avoid delaying work.

c. Power source must be capable of providing constant voltage under combined line load.

D. Deployment:

1. Each panel shall be assigned a simple and logical identifying code.

2. The coding system shall be subject to approval by the ENGINEER and shall be determined at the job site.

3. The CONTRACTOR shall visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.

4. Deployment of geomembrane panels shall be performed in a manner that shall comply with the following guidelines:

a. Geomembranes shall be installed according to site-specific specifications and MANUFACTURER recommendations.

b. The geomembrane shall be placed in such a manner as to assure minimum handling.

c. Only those sheets of material which can be anchored and sealed together that same day shall be unpackaged and placed in position.

d. Deployment of the geomembrane shall proceed with ambient temperatures greater than 32° F. Placement can proceed below 32° F only after it has been verified by the ENGINEER that the material can be seamed in accordance with GRI GM9 (Cold weather seaming of geomembranes).. Placement shall not be done during any precipitation, in the presence of excessive moisture (fog, rain, dew) that deposits a residue on the liner that is detectable for sight or touch and could adversely impact the performance of the seam welding process.

e. Placement shall not be done in the presence of excessive winds which could adversely impact the ability to complete the seam welding process. In areas where wind is prevalent, installation should be started at the upwind side of the project and proceed downwind. The leading edge of the geomembrane shall be secured at all times with sandbags or other means sufficient to hold it down during high winds.

f. Geomembrane shall be unrolled using methods that shall not damage geomembrane and shall protect underlying surface from damage (spreader bar, protected equipment bucket).

g. Ballast (commonly sandbags) which shall not damage geomembrane shall be placed on geomembrane to prevent wind uplift.

h. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage it. Smoking shall not be permitted on the geomembrane.

i. No vehicle traffic shall travel on the geomembrane other than an approved low ground pressure vehicle.

j. Geomembrane shall be protected in areas of heavy traffic by placing protective cover over the geomembrane. Protective cover is material as approved by the ENGINEER that is placed over the geomembrane to reduce the ground pressure of heavy traffic to less than 8 psi on the liner.

5. Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

E. Lining sheets shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Lining to concrete seals shall be made with a mechanical anchor or as approved by the ENGINEER. All piping, structures, and other projections through the lining shall be sealed with approved sealing methods.

F. Field Seams:

1. Seams shall meet the following requirements:

    a. To the maximum extent possible, seams shall be oriented parallel to line of slope, i.e., down and not across slope.

    b. The number of field seams in corners, odd-shaped geometric locations and outside corners shall be minimized.

    c. Slope seams (panels) shall extend a minimum of five-feet beyond the grade break into the flat area.

    d. Be designated using a sequential seam numbering system compatible with panel numbering system, and that is agreeable to the ENGINEER.

    e. Seam overlaps shall be aligned to be consistent with the requirements of the welding equipment being used.

2. During welding operations provide at least one Master Seamer who shall provide direct supervision over other welders as necessary.

3. Extrusion Welding

    a. Hot-air tack adjacent pieces together using procedures that do not damage the geomembrane.

    b. Clean geomembrane surfaces by disc grinder or equivalent.

    c. Purge welding apparatus of heat-degraded extrudate before welding.

4. Hot Wedge Welding

    a. Welding apparatus shall be a self-propelled device equipped with an electronic controller which displays applicable temperatures.

    b. Clean seam area of dust, mud, moisture and debris immediately ahead of hot wedge welder.

    c. Protect against moisture build-up between sheets.

5. Trial Welds

    a. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.

    b. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.

    c. Minimum of two trial welds per day, per welding apparatus, one made prior to the start of work and one completed at mid shift.

    d. Cut four, one-inch wide by six-inch long test strips from the trial weld.

    e. Quantitatively test specimens for peel adhesion, and then for shear strength.

f. Trial weld specimens shall pass when the results shown in the Table 4 are achieved in both peel and shear test:

TABLE 4 – SEAM PROPERTIES

Property	Test Method	Minimum Values	
		60-mil HDPE	**60-mil LLDPE**
Peel Strength (fusion) ppi (1), (2)	ASTM D6392	91	75
Peel Strength (extrusion) ppi (1), (2)	ASTM D6392	78	66
Shear Strength (fusion and ext.) ppi	ASTM D6392	120	90

Notes:
1) The break, when peel testing, occurs in the geomembrane material itself, not through peel separation (FTB).
2) The break is ductile.

g. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.

h. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed trial weld.

i. Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the geomembrane installation. CONTRACTOR shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds.

j. Defects and Repairs

1) Examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.

2) Repair and non-destructively test each suspect location in both seam and non-seam areas. Do not cover geomembrane at locations that have been repaired until test results with passing values are available.

G. **Anchor Trench:** The geomembrane shall be placed and secured in an earth anchor trench as indicated in the Contract Drawings. The installer shall coordinate with the earthwork contractor regarding excavation and backfilling of the anchor trench. Care shall be taken when backfilling the trenches to prevent any damage to the geomembrane. If damage occurs, it shall be repaired prior to backfilling.

3.3 SEAM TESTING

A. Field Destructive Testing

1. Destructive seam tests shall be performed to evaluate bonded seam strength. The frequency of sample removal shall be one sample per 500 linear feet of seam. Location of the destructive samples shall be selected by the ENGINEER. Field testing shall take place as soon as possible after completion of the seam.

    a. At the sole discretion of the ENGINEER, destructive seam tests may be reduced in frequency by following the procedures of Geosynthetic Research Institute (GRI) Standard Guide GM 14.

2. Sample labeling shall be the responsibility of the ENGINEER and shall include test number, seam number, seaming machine number, job number, date welded, and welding tech number.

3. The samples shall be approximately 12 inches x 25 inches. The samples shall then be cut into two samples approximately 12 inches x 12 inches: one for field testing and one for archiving or independent testing.

4. The sample for field testing shall have ten coupons cut and be tested with a tensiometer adjusted to a pull rate as shown below. The strength of four out of five specimens shall meet or exceed the values below, and the fifth value must meet or exceed 80% of the value below.

    a. Seam must exhibit film tear bond (FTB). Welds shall have less than 25% incursion into the weld.

    b. Peel and shear values shall meet or exceed the values in Table 4 (at 2 inches/minute)

5. All destructive weld test data shall be logged by the ENGINEER.

6. If a test fails, additional samples shall be cut, approximately ten feet on each side of the failed test, and retested. This procedure shall be repeated until a sample passes. Then the area of the failed seam between the two tests that pass shall be capped or reconstructed.

B. Non-Destructive Testing

1. The CONTRACTOR shall non-destructively test all seams their full length for continuity using an air pressure or vacuum test.

2. Air Pressure Testing

    a. Air pressure testing shall be performed on all seams welded with a double seam fusion welder.

    b. The equipment used for air pressure testing shall consist of an air tank or pump capable of producing a minimum of 35 psi and a sharp needle with a pressure gauge attached to insert into the air chamber.

    c. Both ends of the seam to be tested shall be heated and squeezed together.

d. The needle with gauge shall be inserted into the air channel and the channel shall be pressurized to 30 psig.

e. If the pressure in the air channel drops by more than 4 psig over a period of five minutes, then the seam has failed.

f. If the seam fails the air pressure test, the leak shall be located and the area cut away. Air pressure testing shall be performed on the remaining portions of the seam until all portions of the seam pass the test.

g. The area cut away shall be repaired with a patch. The patch shall be tested according to the procedures outlined below for vacuum testing.

3. Vacuum Testing

a. Vacuum testing shall be performed on all seams welded with an extrusion welder.

b. The equipment used for vacuum testing shall consist of a vacuum pumping device, a vacuum box, and a foaming agent in solution.

c. The section of seam to be tested shall be wetted with a foaming agent and the vacuum box shall be placed over the wetted area. Air shall be evacuated from the vacuum box until a seal between the box and the geomembrane has been formed.

d. The minimum vacuum shall be equivalent to 5 psig (10 inches of mercury).

e. If fusion welded seams are being tested, the overlap flap must be cut off prior to testing.

f. The seam shall be observed through the viewing window for bubbles emitting from the seam.

g. If no bubbles are observed, the box shall be moved on to the next area for testing. If bubbles are observed, the area of the leak shall be marked for repair.

h. After completion of repairs, the repair seam shall be retested according to the requirements of paragraph 3.3B.

3.4 INSPECTION AND REPAIR

A. **Field Inspection:** All seals to penetrations as well as all seams and non-seam areas of the geomembrane shall be inspected for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection. Each suspect location shall be non-destructively tested as appropriate and repaired accordingly.

B. Repair Procedures:

1. Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.

2. Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.

3. CONTRACTOR shall be responsible for repair of defective areas.

4. Agreement upon the appropriate repair method shall be decided between ENGINEER and CONTRACTOR by using one of the following repair methods:

   a. Patching- Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.

   b. Abrading and Re-welding- Used to repair short section of a seam.

   c. Spot Welding- Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.

   d. Capping- Used to repair long lengths of failed seams.

   e. Flap Welding- Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.

   f. Remove the unacceptable seam and replace with new material.

5. The following procedures shall be observed when a repair method is used:

   a. All geomembrane surfaces shall be clean and dry at the time of repair.

   b. Surfaces of the polyethylene which are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.

   c. Extend patches or caps at least 6 inches for extrusion welds and 4 inches for wedge welds beyond the edge of the defect, and around all corners of patch material.

6. Repair Verification

   a. Number and log each patch repair (performed by ENGINEER).

   b. Non-destructively test each repair using methods specified in this Specification.

7. The CONTRACTOR shall also keep detailed record drawings showing the location, size, type, and frequency of all repairs made during the installation of the geomembrane. These record drawings shall be updated by the CONTRACTOR on a daily basis and submitted to the COMPANY upon completion of the project. Inspection of these record drawings shall be made available to the ENGINEER or the COMPANY for verification and review at any time during the construction period.

3.5 ACCEPTANCE

A. The CONTRACTOR shall retain all ownership and responsibility for the geomembrane system until acceptance by the ENGINEER. Final acceptance shall occur when the following conditions are met:

   1. Installation is finished.

2. Verification of the adequacy of all field seams and repairs is complete.

3. Submittals required in Paragraph 1.2 D have been accepted by the ENGINEER.

- END OF SECTION –

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SECTION 02930 - SEEDING

PART 1 -- GENERAL

1.1 SUMMARY

A. The Contractor shall apply reclamation seed mix to the completed cover, complete and in place, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Federal Specifications:

FS O-F-241D	Fertilizer, Mixed, Commercial.

B. Commercial Standards:

ANSI/ASTM D 422	Method for Particle-size Analysis of Soils.

1.3 CONTRACTOR SUBMITTALS

A. Furnish submittals for approval.

B. Materials List: A list of all materials to be used in the seeding operations together with the source of those materials. The list shall include mulches, soil amendments, seed mixtures, and erosion control blanketing. Manufacturer's literature showing physical characteristics, applications, and installation instrumentation shall be included.

C. Schedules: The following work plans, before work is started.

1. Delivery schedule at least 10 days prior to the intended date of the first delivery.

2. Seeding Operation: A list of seeding and mulching equipment to be used.

D. Reports

1. Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

2. Reports for the following materials shall be included.

   a. Fertilizer: For chemical analysis and composition percent.

   b. Seed: For mixture, percent pure live seed, minimum percent germination and hard seed, maximum percent weed content, date tested and state certification.

E. Certificates: Certificates of compliance that materials meet the indicated requirements prior to the delivery of materials.

F. Records:

1. Plant Establishment Period

2. Maintenance Report

3. Maintenance Instructions

1.4 CLEANUP

A. Upon completion of all seeding operations, the portion of the Site used for a work or storage area by the Contractor shall be cleaned of all debris, superfluous materials, equipment, and garbage.

1.5 MAINTENANCE OF LANDSCAPING PLANTING PRIOR TO ACCEPTANCE OF PROJECT

A. General: The Contractor shall be responsible for protecting seeded areas until final acceptance of the Work.

B. Upon completion of seeding, the entire planted area shall be soaked to saturation by a fine spray. Care shall be taken to avoid excessive washing, or puddling on the surface, and any such damage caused thereby shall be repaired by the Contractor.

C. Protection: The Contractor shall provide adequate protection to all newly seeded areas including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until the end of the one-year warranty period.

1.6 FINAL INSPECTION AND GUARANTEE

A. Inspection of seeded areas will be made at final acceptance

B. Written notice requesting inspection shall be submitted to the Engineer at least 10 days prior to the anticipated inspection date.

C. Any delay in completing the Work of this Section beyond a single season will be cause for extending the correction of defects period an equal time.

D. The Contractor shall, without additional expense to the Company, replace seeding which develops defects or dies during the correction period.

PART 2 -- PRODUCTS

2.1 GENERAL

A. Cover soil shall be obtained from onsite borrow sources.

2.2 TOPSOIL

A. General fill and clay to be blended to generate the topsoil shall be obtained from the pre-established borrow source at a location directed by the Company and placed in accordance with Section 02222 – Earthwork and Grading.

2.3 FERTILIZER AND ADDITIVES

A. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.

B. Fertilizers shall be uniform in composition, dry, and free flowing.

C. Chemical fertilizers shall be a mixed uncommercial fertilizer with nitrogen (N), phosphorous (P), and potassium (K) at the following application rates. Nitrogen shall be applied at 70 lbs /acre in the form of ammonium nitrate (33-0-0). This is an equivalent of 23 lbs of total N/acre (70 x 33%). Phosphorous shall be applied at 150 lbs/acre in the form of triple super phosphate (0-44-0). This form of phosphorous contains 20% total P, so the application of total P will be 30 lbs/acre. Potassium shall be applied at 60 lbs/acre in the form of potassium chloride (0-0-60). This form of potassium contains 50% total K, so the application of total K will be 30 lbs/acre. Fertilizer recommendations may be modified as to the forms or blends of fertilizer used as formulations vary by region. The total nutrient application rate for each of the nutrients shall be matched within ±10% of what is recommended. Fertilizers shall be uniform in composition, dry, and free flowing.

2.4 MULCH

A. Wood Cellulose Fiber: shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to aid visual monitoring during application. Composition will include at least 70 percent specially prepared virgin cellulose fiber and shall contain the following properties: recycled cellulose fiber (30 percent minimum), ash content (0.8 to 1.1 percent maximum), water holding capacity (10 to 1 ratio of water to fiber), and pH range from 4.5 to 5.5.

B. Weed free straw mulch, or native hay, for a soil/seed stabilizer shall be clean hay or straw applied at a rate of 2 tons per acre. Mulch shall be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6-inches minimum and 9-inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3 inches.

2.5 SEED MIXTURES

A. All seed shall conform to applicable County, State of Utah, and Federal regulations. Seed shall be mixed by the seed supplier. The Contractor shall furnish the seed supplier's guaranteed germination of each variety listed in the seed mixture. Grass seed shall not be delivered to the Site until samples have been approved by the Engineer. Approval of samples, however, shall not affect the right of the Engineer to reject seed upon or after delivery. Seed which has become wet, moldy, or otherwise damaged prior to use will not be accepted.

B. Seed shall be delivered in strong, clearly marked bags not exceeding 50 pounds each.

C. Seed shall be fresh, clean, and new-crop seed composed of the following varieties mixed in the proportions by weight as indicated. Seed shall be tested for compliance with the minimum percentage of purity and germination requirements. All rates specified shall be pure live seed (PLS).

D. The seed mixture shall not contain more than 5 percent weeds or other species that are not required.

E. Any deviation of the indicated seed mixture composition shall be approved by the Engineer prior to delivery.

SEED MIXTURE	
Common Names	**Drill Seeding Rate (lbs pf Pure Live Seed/Acre)**
Tall Wheatgrass	2.0
Hercules Tall Wheatgrass	2.0
AC Saltlander Green Wheatgrass	4.0
Garrison Creeping Foxtail	2.5
Intermediate Wheatgrass	2.5
FSG423ST Salt Tolerant Alfalfa	1.5
Strawberry Clover	1.5
Total	16.0

PART 3 -- EXECUTION

3.1 GENERAL

A. Delivery of seed and fertilizer may begin only after samples and tests have been approved by the Engineer. Seed and fertilizer furnished shall not be different from the approved sample.

B. Seeding shall not be performed at any time when it may be impaired by climatic conditions.

3.2 SOIL PREPARATION

A. The seeding shall not begin until the Contractor has repaired all areas of settlement, erosion, rutting, etc. and the soils have been placed, compacted, and contoured to finish grade. The Engineer shall be notified of areas that prevent the planting work from being executed.

B. After removal of waste materials in the planting areas, such as weeds, roots, rocks 6 inches and larger, construction materials, etc., the seeding subgrade shall be tilled to a depth of 6 inches and all surface irregularities removed.

C. Areas requiring grading by the Contractor including adjacent transition areas shall be uniformly level or sloping between finish elevations to within 0.10-ft above or below required finish elevations.

D. Any unusual subsoil condition that will require special treatment shall be reported to the Engineer.

E. Topsoil: Topsoil shall be placed in accordance with Section 02222 – Earthworks and Grading. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, excessively compacted or in a condition detrimental to the proposed planting or grading.

F. Fertilizer: Fertilizer shall be applied at the following rates:

1. Nitrogen shall be applied at 70 lbs /acre in the form of ammonium nitrate (33-0-0). This is an equivalent of 23 lbs of total N/acre (70 x 33%).

2. Phosphorous shall be applied at 150 lbs/acre in the form of triple super phosphate (0-44-0). This form of phosphorous contains 20% total P, so the application of total P will be 30 lbs/acre.

3. Potassium shall be applied at 60 lbs/acre in the form of potassium chloride (0-0-60). This form of potassium contains 50% total K, so the application of total K will be 30 lbs/acre.

G. Fertilizer shall be incorporated into the soil to a minimum depth of 6 inches and may be incorporated as part of the tillage operation.

H. Tillage

1. Preparation. Seed areas shall be filled as needed or have surplus soil removed to attain the finished grade. Drainage patterns shall be maintained as indicated on drawings. Seed areas compacted by construction operations shall be completely pulverized by tillage.

2. Protection. Finished graded areas shall be protected from damage by vehicular or pedestrian traffic and erosion.

3. Finish Grading. Finished grade shall be 1-inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing. Make minor adjustments of finish grades as directed by the Engineer.

I. No seeding shall be done when wind velocity exceeds 4 mph, within 4 hours after rain, or if the surface has been compacted without first loosening the ground.

3.3 HYDROSEEDING

A. **Equipment:** Mixing shall be performed in a tank. The tank shall have a built-in continuous agitation and circulation system, of sufficient operating capacity to produce a homogenous slurry of mulch, stabilizer, seed, fertilizer and water in the designated unit proportions for a minimum coverage of one-half acre. The tank shall have a discharge system which will permit attachment of at least 500-feet of hose extensions, a change of elevation of 150-feet in height from tank to discharge nozzle, and still retain enough pressure to apply the slurry to the areas at a continuous and uniform rate.

B. **Proportions:** Proportions of mulch, seed, stabilizer and water per acre shall be as indicated in the approved Revegetation Plan, or as otherwise approved by the ENGINEER.

C. Application

1. With agitation system operating at part speed, water shall be added to the tank and good recirculation shall be established. Materials shall be added in such a manner that they are uniformly blended into the mixture.

2. Slurry distribution shall begin immediately. Application of slurry shall be done only when rain is not anticipated for at least three days after slurry application.

3. The entire tank of each batch of slurry shall be emptied and the slurry evenly applied to areas to be hydroseeded within a 2 hour period following the mixing of each slurry batch. Slurry batches not applied during this time will be rejected.

3.4 DRILL SEEDING

A. **Equipment:** Seeding drill shall be a mechanical grass drill with depth bands and have multiple seed boxes to appropriate to the size and weight of the specified seeds.

B. All seed shall be drilled to one-quarter (1/4) inch to one half (1/2) inch into the soil at the specified seed rate.

C. CONTRACTOR shall drill on-half (1/2) of the required seed in one direction, and then drill the remaining half of the required seed in a direction 90° to the first half.

3.5 SEEDING COMPLETION

A. Mulching: Immediately after seeding, the entire area shall be mulched with one of the two following methods:

1. Weed free straw or native hay at a rate of 2 tons per acre. Weed free straw mulch or native hay for a soil/seed stabilizer shall be clean hay or straw. Mulch shall be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6-inches minimum and 9-inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3-inches.

2. Hydromulching with wood fiber mulch can be used as an alternative to straw or hay and applied at a rate of 1.5 tons/acre along with a tackifier to bind the mulch to the soil.

3.4 INSPECTION

A. At the completion of the work, the Contractor shall request a preliminary inspection by the Engineer to determine the condition of seeding.

B. A final inspection shall be requested 48 hours following seed germination. The Contractor and Engineer will be present for the inspection. Seeded areas considered for final inspection shall show uniform smooth ground surface without eroded ruts or gullies and evidence of uniform seed germination.

3.5 ACCEPTANCE

A. If the installation is found satisfactory, the Company will approve the work in writing.

B. If the installation is found unsatisfactory, the Engineer will submit a punch list of conditions to correct at the Contractor's expense. The Contractor shall be responsible for requesting additional inspections after the conditions of the punch list have been corrected.

C. The final acceptance criteria for seeding will be an average of one seedling (from seeded species) per square foot after the first growing season. Therefore, for seeding performed in late fall, the evaluation of final acceptance will be determined in the fall of next year.

D. Any areas not achieving the acceptance criteria presented above will be re-seeded at the expense of the Contractor.

3.6 REPAIRS

A. Seed shall be re-applied in any area, including washout gullies and/or slopes, where growth has not initiated during the first rainy season, November through April, following initial application. Washout gullies will require the placement of additional topsoil to fill washouts in accordance with Section 02222 – Earthwork and Grading, prior to re-seeding.

- END OF SECTION -

Appendix C

Borrow Area 1 & 3 Test Pit Logs

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures **Project Number** 233001396

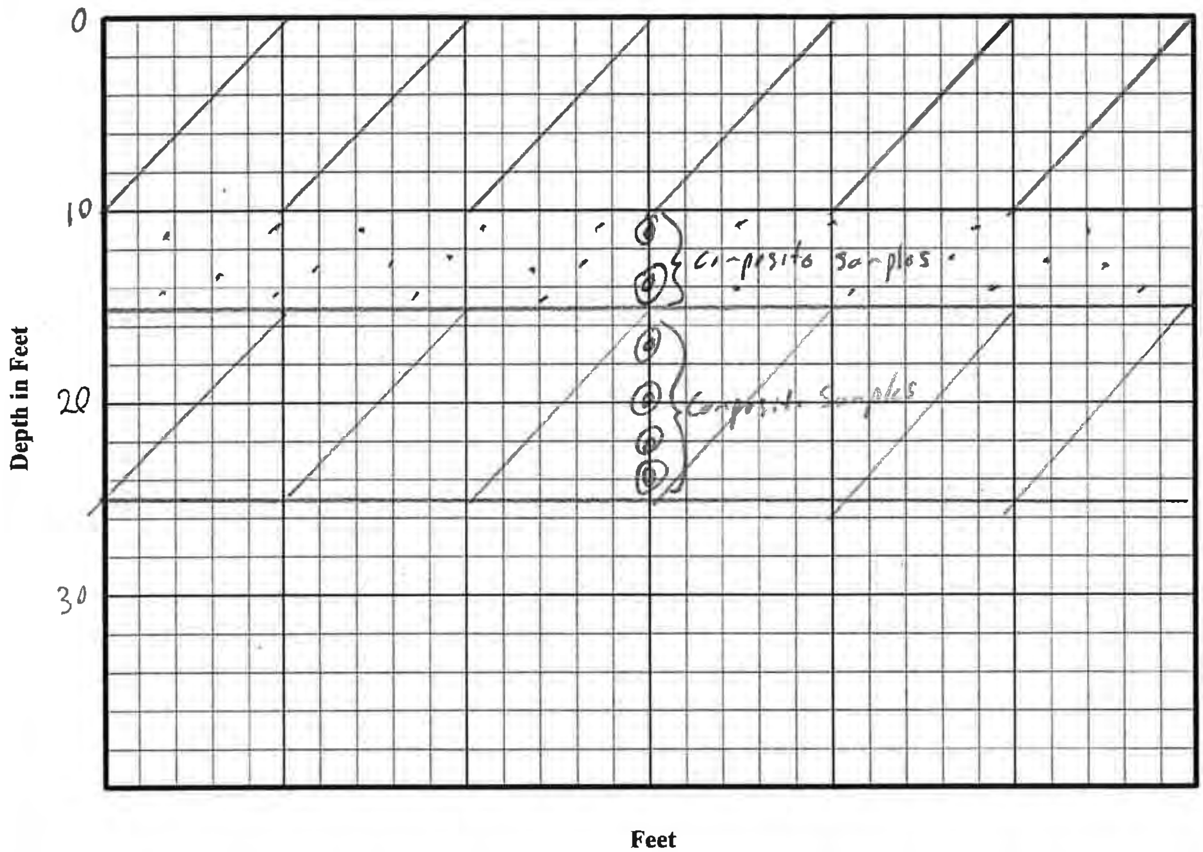
Sample Location Borrow Area 1 **Trench Number** B1TP-1 **Date** 10/29/20

Coordinates: Inside Stake ______ **Outside Stake** ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' – Sand and gravel. No samples collected

10-15' – Light brown, silty sand, no plasticity

15-25' – Light brown, transitions to sandy clay, moderate plasticity

Begin Trench 12:45 **Finish Trench** 1200 **Trenching Contractor** IPSC

Total Depth 20' **Total Length** 10'

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures **Project Number** 233001396

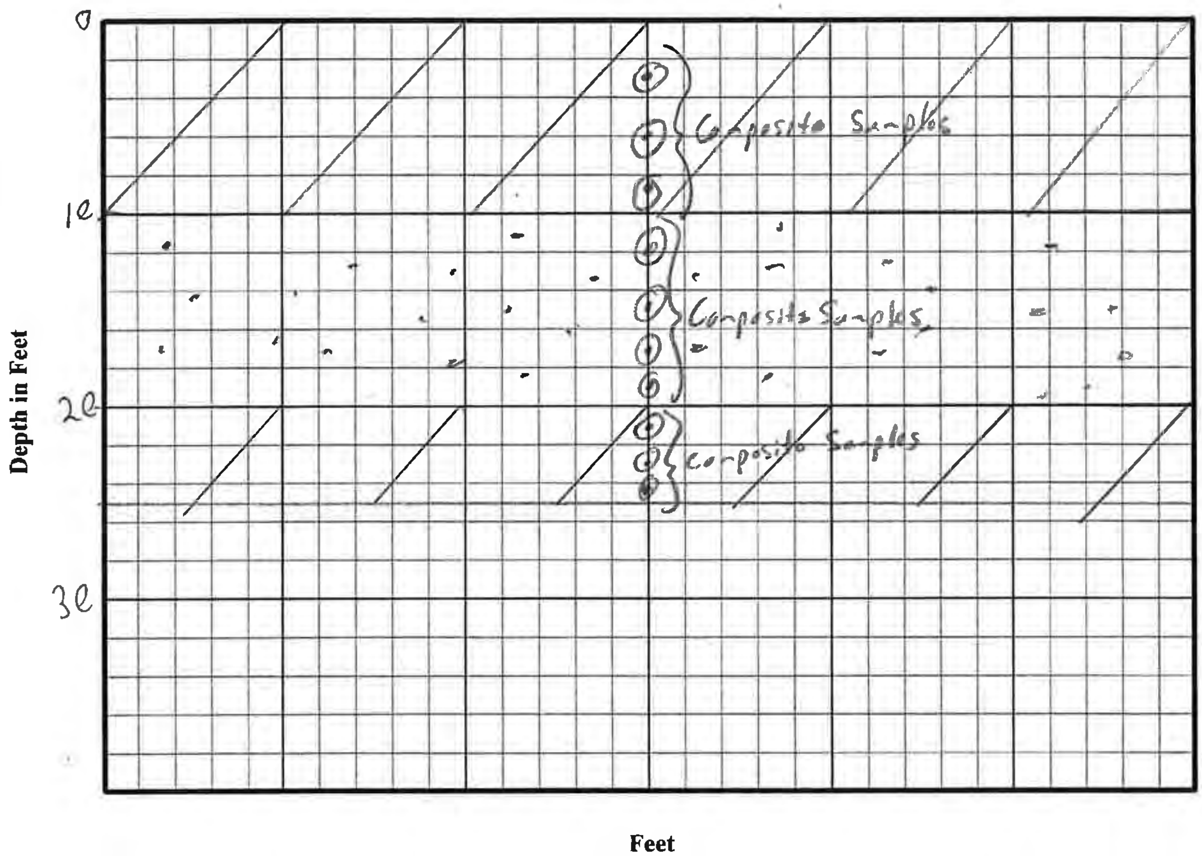
Sample Location Borrow Area 1 **Trench Number** B1TP-2 **Date** 10/29/20

Coordinates: Inside Stake See map **Outside Stake**

Native/Fill Stake

Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' - Light brown, silty sand (SM), no plasticity
10-20' - Same as above transitioning to sandy clay
20-25' - Light brown, sandy clay (CL), moderate plasticity

Begin Trench 1:10 **Finish Trench** 1:25 **Trenching Contractor** IPSC

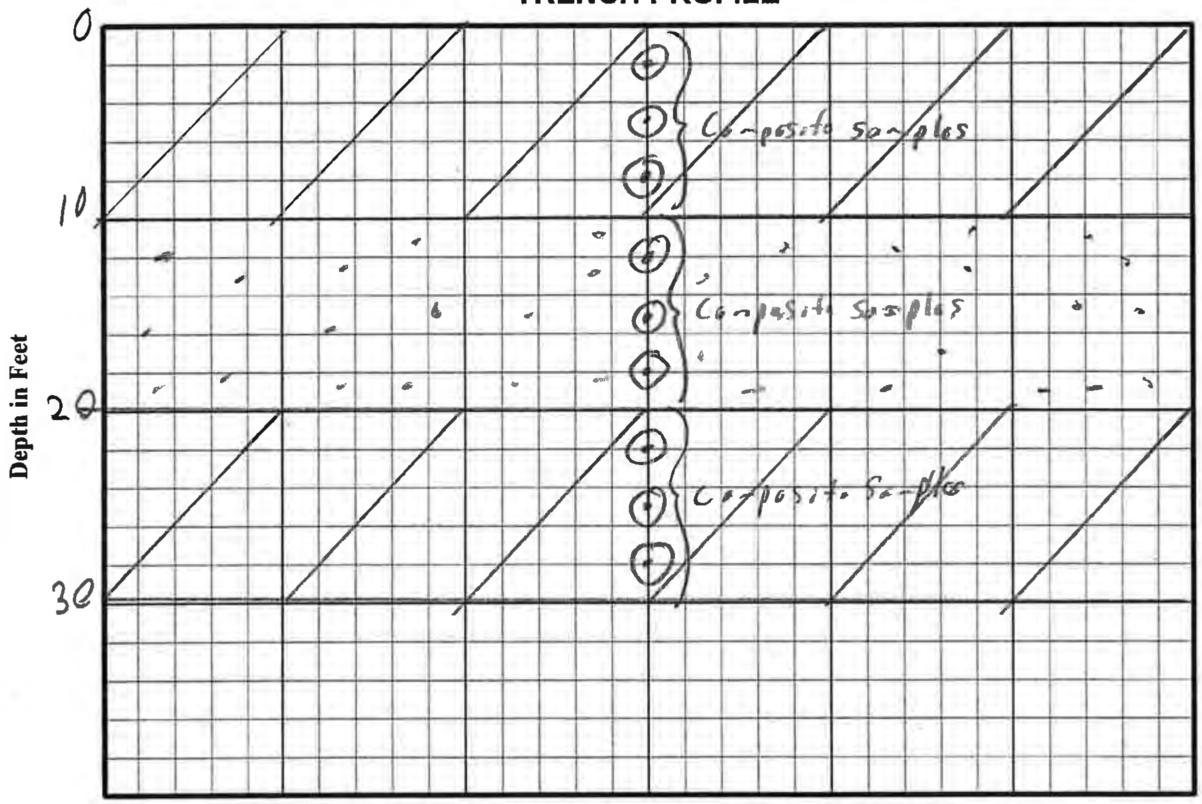
Total Depth 25 **Total Length** 10

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures
Project Number 233001396
Sample Location Borrow Area 1
Trench Number B1 TP-3
Date 10/29/20
Coordinates: Inside Stake See map
Outside Stake
Native/Fill Stake
Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' – Light brown, sandy silt (ML), low to no plasticity beginning to transition to clay at bottom of composite interval.
10'-20' – Light brown, clay moderately dense, high plasticity
20'-30' – Same as above

Begin Trench 1:35
Finish Trench 1:50
Trenching Contractor IPSC
Total Depth 30
Total Length 10

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures **Project Number** 233001376

Sample Location Borrow Area 3 **Trench Number** B3TP-1 **Date** 10/29/20

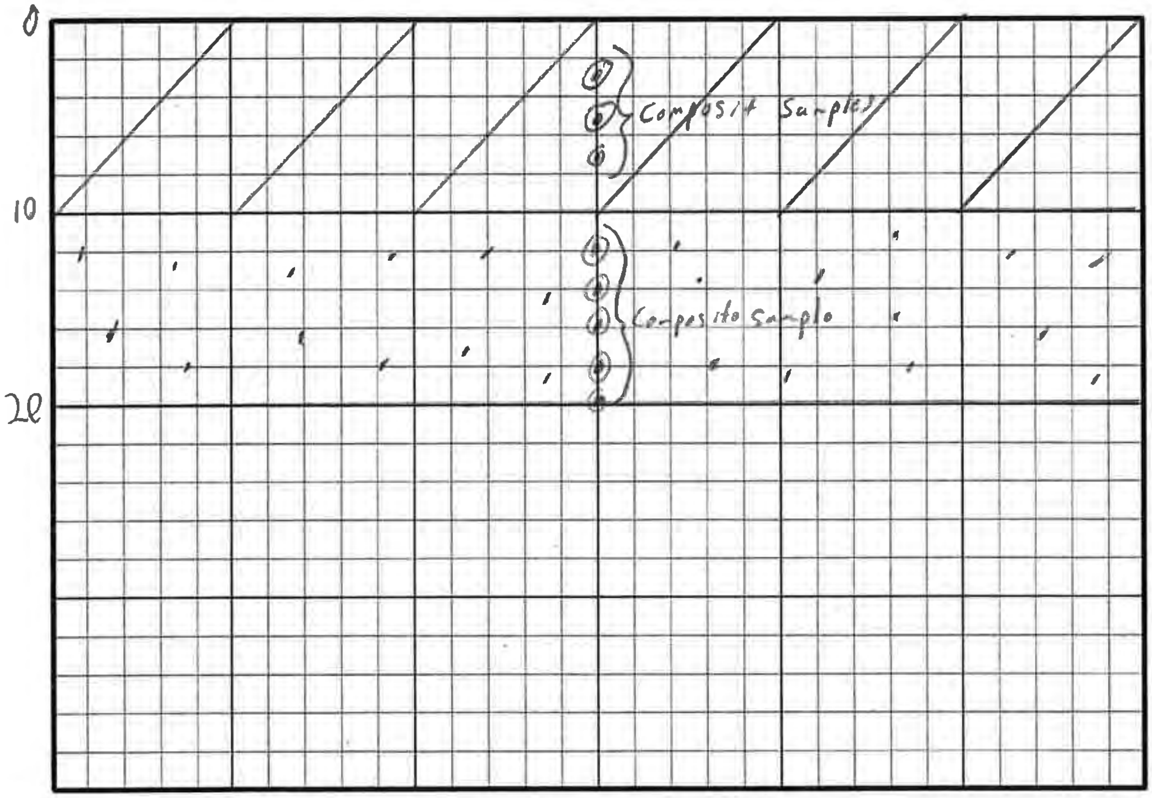
Coordinates: Inside Stake ______ **Outside Stake** ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE

Depth in Feet



Feet

Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-10' - Light brown in color, clayey sand (SC), low plasticity

10-20' - Light brown in color, transitioning to clay with sand (CL), moderat plasticity

Begin Trench 10:20 **Finish Trench** 10:35 **Trenching Contractor** IPSC

Total Depth 20' **Total Length** 10'

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closure **Project Number** 233001396

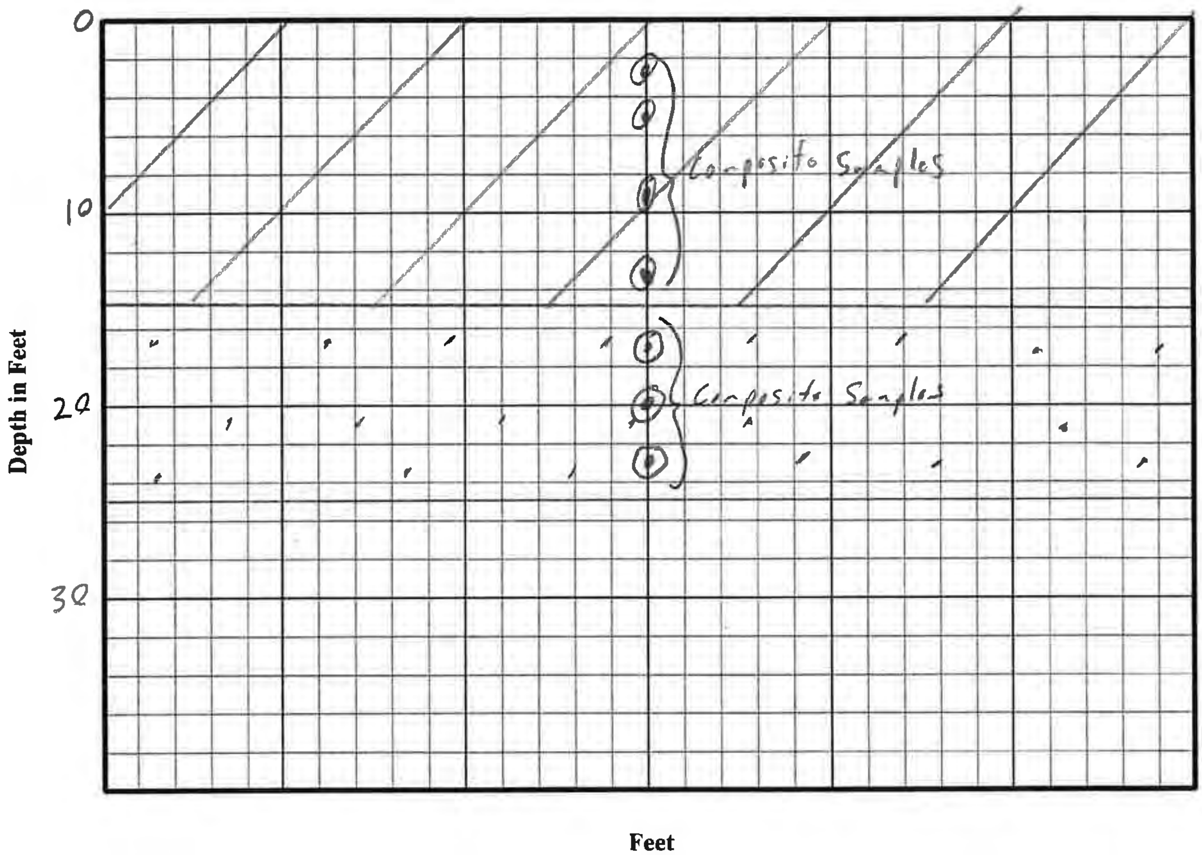
Sample Location Borrow Area 3 **Trench Number** B3TP-2 **Date** 10/29/19

Coordinates: Inside Stake ______ **Outside Stake** ______

Native/Fill Stake ______

Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-15' - light brown, sandy clay, moderate plasticity

15-25' - Same as above.

Begin Trench 10:40 **Finish Trench** 10:50 **Trenching Contractor** IPSC

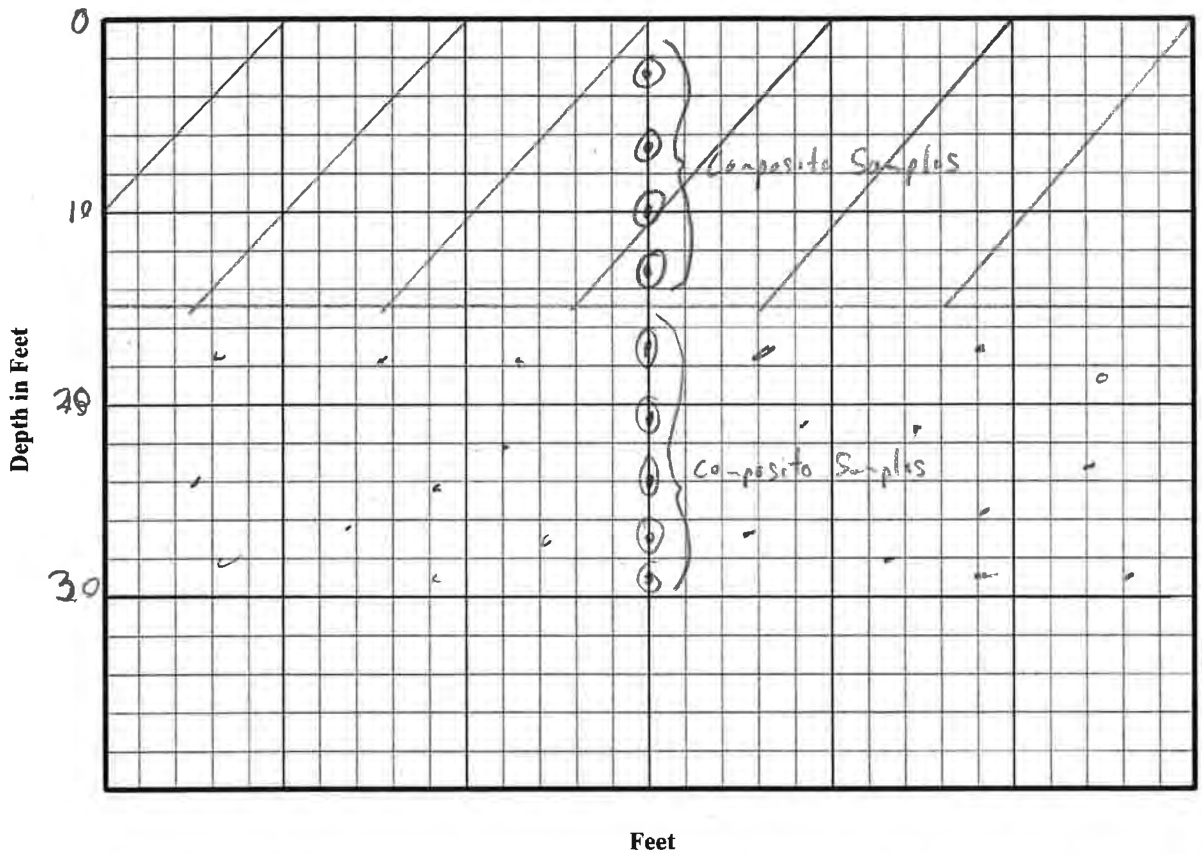
Total Depth 25' **Total Length** 10'

TRENCH TEST PIT LOG FORM

Page 1 of 1

Project IPSC CCR Closures
Project Number 233001396
Sample Location Borrow Area 3
Trench Number B3TP-3
Date 10/29/20
Coordinates: Inside Stake ________ Outside Stake ________
Native/Fill Stake ________
Logged By Chad Tomlinson

TRENCH PROFILE



Subsurface description and filed USCS Classifications
(USCS name, color, size and angularity or plasticity, density, moisture content, additional facts and debris encountered)

0-15' - Light brown, silty sand, low to no plasticity
15-30' - Light brown, transition from silty sand to clay with sand, moderate plasticity

Begin Trench 10:55 Finish Trench 11:15 Trenching Contractor IPSC
Total Depth 30' Total Length 10'

Appendix D

Borrow Area 1 & 3 Laboratory Test Results

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/2/2020
By: LJ

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Description: SILT, light brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 1"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

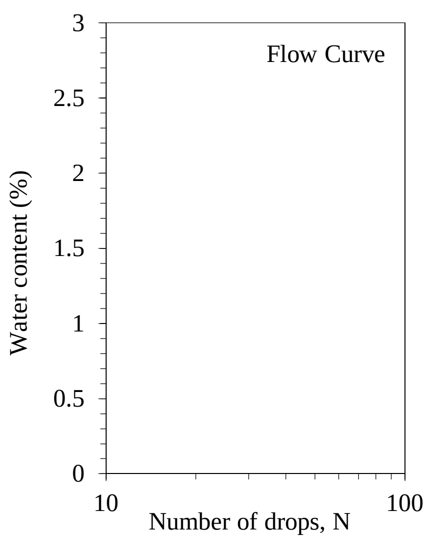
Plastic Limit

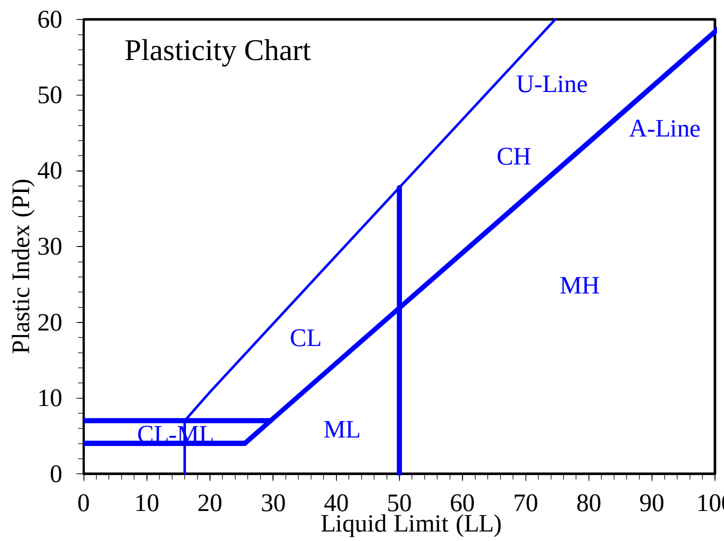
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





Entered by:____________
Reviewed:____________

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: LJ

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/4"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

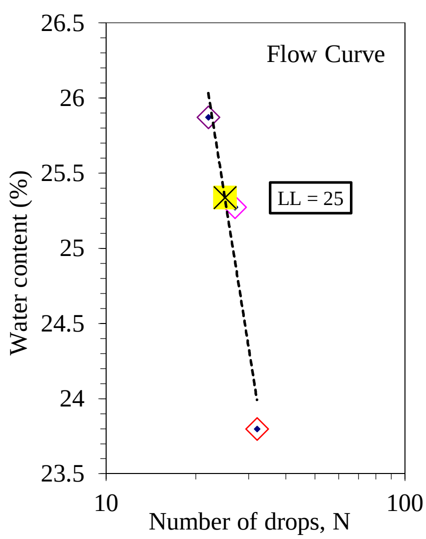
Plastic Limit

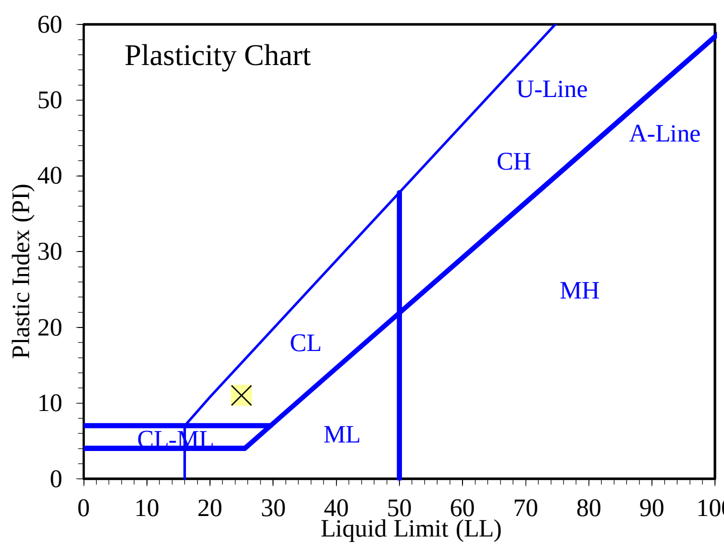
Determination No	1	2				
Wet Soil + Tare (g)	18.55	15.58				
Dry Soil + Tare (g)	17.17	14.58				
Water Loss (g)	1.38	1.00				
Tare (g)	7.55	7.54				
Dry Soil (g)	9.62	7.04				
Water Content, w (%)	14.35	14.20				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	32	27	22			
Wet Soil + Tare (g)	16.29	16.29	17.49			
Dry Soil + Tare (g)	14.56	14.43	15.41			
Water Loss (g)	1.73	1.86	2.08			
Tare (g)	7.29	7.07	7.37			
Dry Soil (g)	7.27	7.36	8.04			
Water Content, w (%)	23.80	25.27	25.87			
One-Point LL (%)		26	25			

Liquid Limit, LL (%)	**25**
Plastic Limit, PL (%)	**14**
Plasticity Index, PI (%)	**11**





Entered by:____________
Reviewed:____________

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/2/2020
By: LJ
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.:
Sample: B1TP-2
Depth: 0-10'
Description: SILT, light brown

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

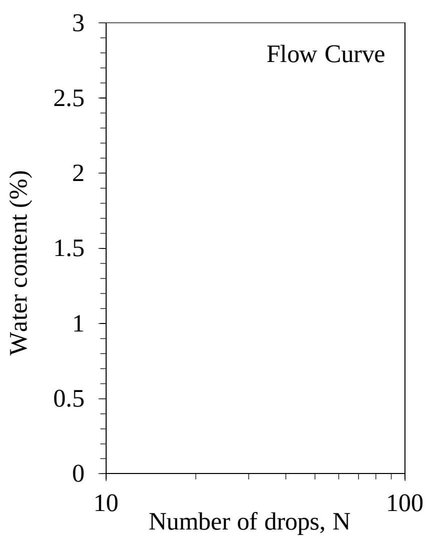
Plastic Limit

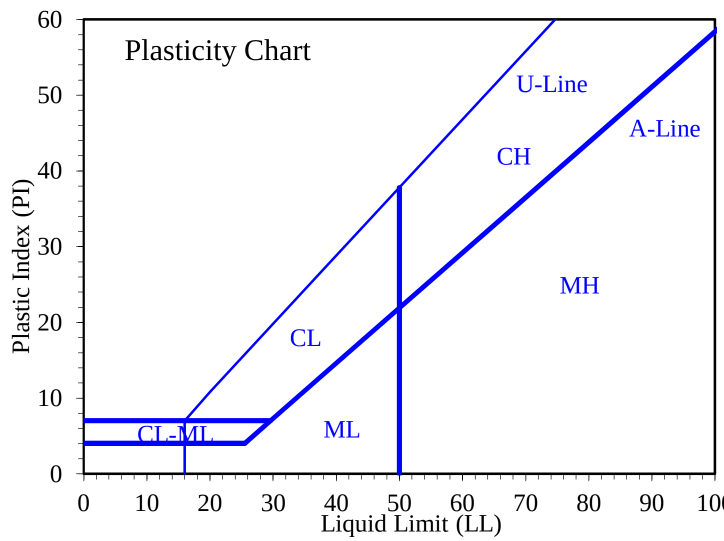
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/6/2020
By: LJ

Boring No.:
Sample: B1TP-2
Depth: 10-20'
Description: SILT, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

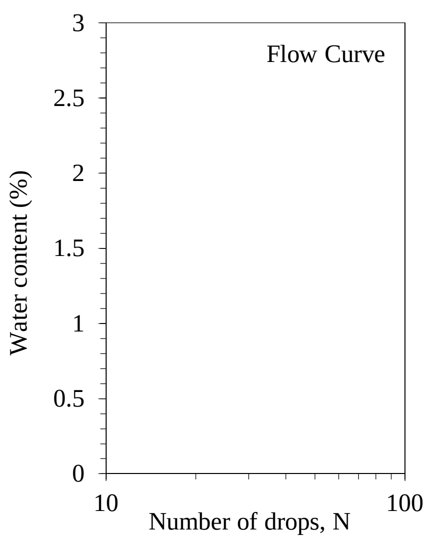
Plastic Limit

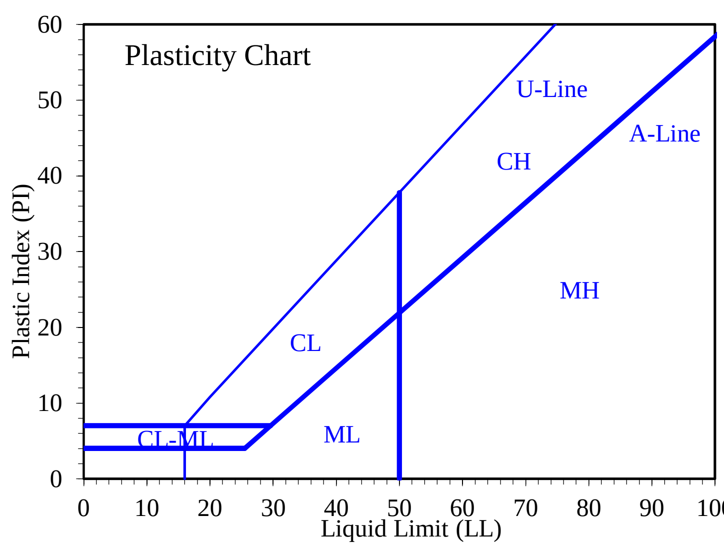
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/7/2020
By: LJ

Boring No.:
Sample: B1TP-2
Depth: 20-25'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

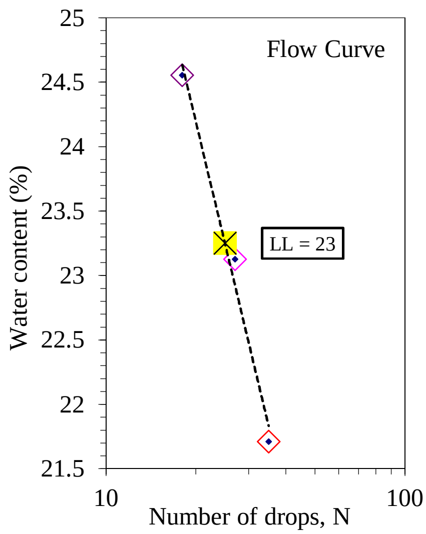
Plastic Limit

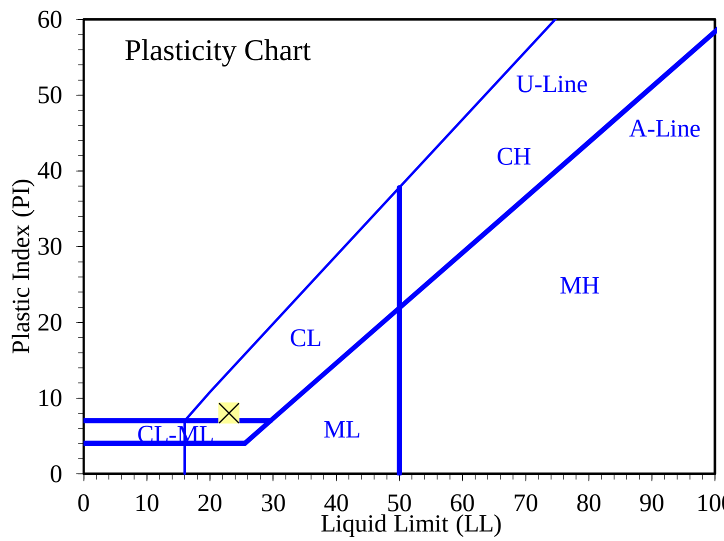
Determination No	1	2				
Wet Soil + Tare (g)	16.24	15.62				
Dry Soil + Tare (g)	15.04	14.50				
Water Loss (g)	1.20	1.12				
Tare (g)	7.34	7.08				
Dry Soil (g)	7.70	7.42				
Water Content, w (%)	15.58	15.09				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	27	18			
Wet Soil + Tare (g)	17.85	16.80	16.48			
Dry Soil + Tare (g)	15.92	14.98	14.69			
Water Loss (g)	1.93	1.82	1.79			
Tare (g)	7.03	7.11	7.40			
Dry Soil (g)	8.89	7.87	7.29			
Water Content, w (%)	21.71	23.13	24.55			
One-Point LL (%)		23				

Liquid Limit, LL (%)	**23**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**8**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils
(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/6/2020
By: LJ

Boring No.:
Sample: B1TP-3
Depth: 0-10'
Description: SILT, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.4
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

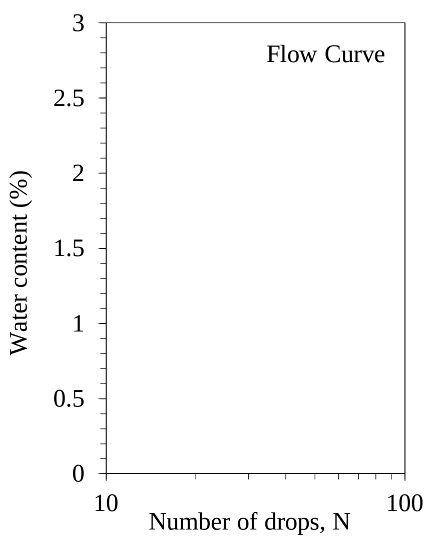
Plastic Limit

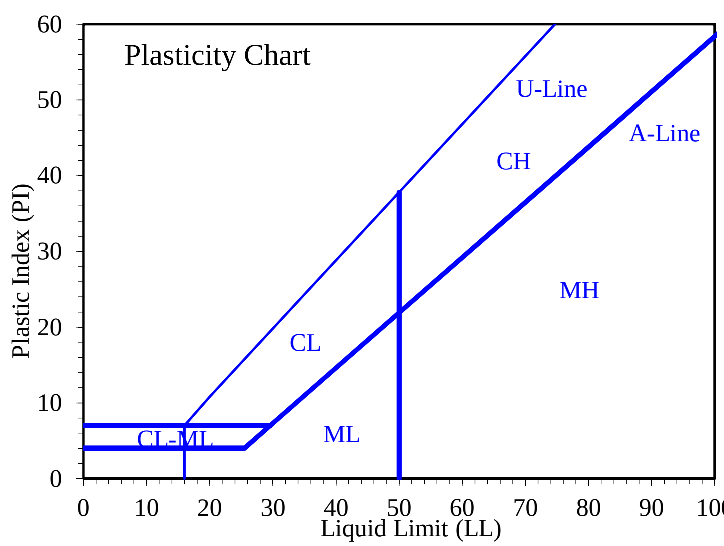
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils
(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/6/2020
By: LJ

Boring No.:
Sample: B1TP-3
Depth: 10-20'
Description: Lean CLAY, grey

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

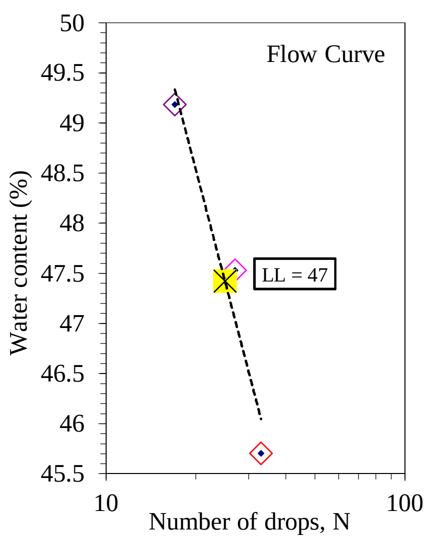
Plastic Limit

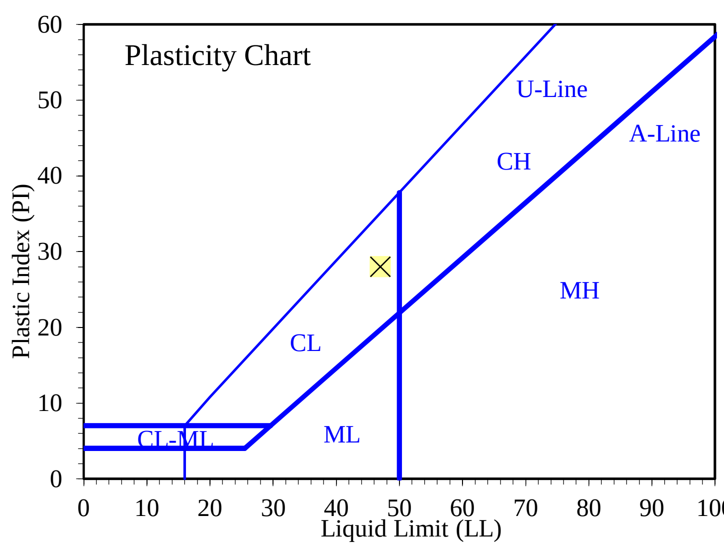
Determination No	1	2				
Wet Soil + Tare (g)	15.19	15.69				
Dry Soil + Tare (g)	13.87	14.39				
Water Loss (g)	1.32	1.30				
Tare (g)	7.05	7.55				
Dry Soil (g)	6.82	6.84				
Water Content, w (%)	19.35	19.01				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	33	27	17			
Wet Soil + Tare (g)	15.78	14.57	14.66			
Dry Soil + Tare (g)	13.28	12.26	12.25			
Water Loss (g)	2.50	2.31	2.41			
Tare (g)	7.81	7.40	7.35			
Dry Soil (g)	5.47	4.86	4.90			
Water Content, w (%)	45.70	47.53	49.18			
One-Point LL (%)		48				

Liquid Limit, LL (%)	**47**
Plastic Limit, PL (%)	**19**
Plasticity Index, PI (%)	**28**





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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928
Split:	Yes
First Split sieve:	3/8"
Second split:	No

	Moist	Dry
Total sample wt. (g):	9633.7	8765.6
+3/8" Coarse fraction (g):	566.59	556.78
-3/8" Split fraction (g):	206.76	187.19
Hydrometer fraction (g):	64.70	58.97
First Split fraction:	0.936	

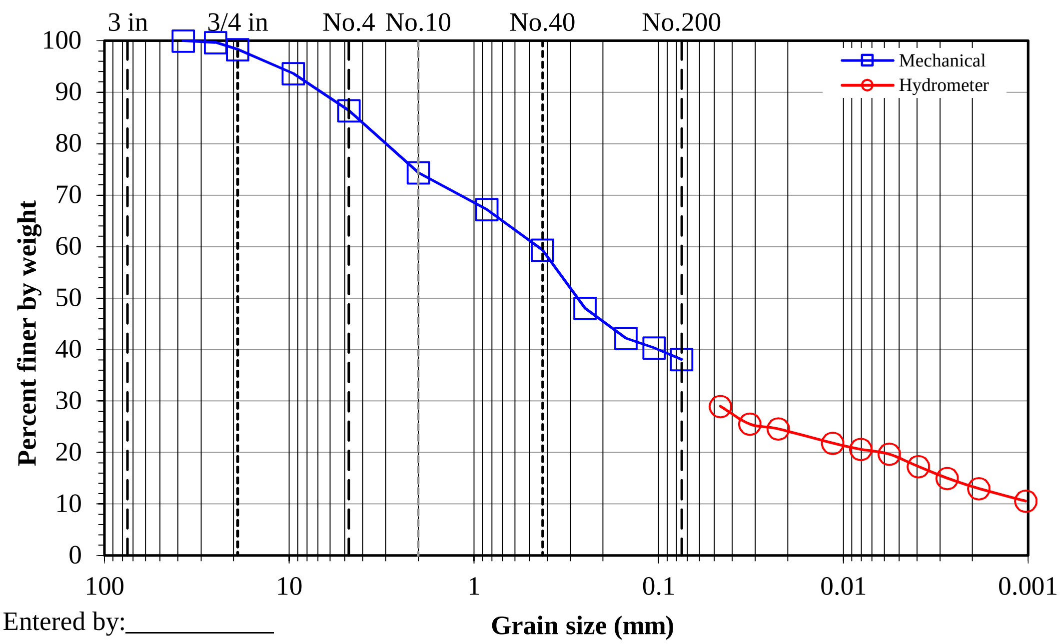
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	695.22	329.16	26.95
Dry soil + tare (g):	685.34	309.59	25.23
Tare (g):	124.76	122.40	7.54
Water content (%):	1.76	10.45	9.72

Hydrometer data

Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	74.37
Cylinder ID:	T6	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer		Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
6"		150	-		1	21.4	28.25	0.0463	28.96
4"		100	-		2	21.4	25.5	0.0321	25.53
3"		75	-		4	21.4	24.75	0.0226	24.60
1.5"		37.5	100.0		15	21.5	22.5	0.0115	21.84
1"	32.12	25	99.6		30	21.6	21.5	0.0080	20.63
3/4"	148.62	19	98.3		60	21.6	20.75	0.0057	19.70
3/8"	556.78	9.5	93.6		120	21.8	18.75	0.0039	17.29
No.4	14.43	4.75	86.4		240	21.6	17	0.0027	15.02
No.10	38.53	2	74.4		511	22	15.25	0.0019	13.02
No.20	52.79	0.85	67.2	<=1st Split	1590	22.1	13.25	0.0010	10.57
No.40	68.53	0.425	59.4						
No.60	91.12	0.25	48.1	<=Split hyd.					
No.100	102.86	0.15	42.2						
No.140	106.57	0.106	40.3						
No.200	111.05	0.075	38.1						

Gravel (%): 13.6
Sand (%): 48.3
Fines (%): 38.1



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JP/EH

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9630.7	8851.1
+3/8" Coarse fraction (g):	294.56	288.18
-3/8" Split fraction (g):	298.58	273.85
Hydrometer fraction (g):	64.69	59.43
First Split fraction:	0.967	

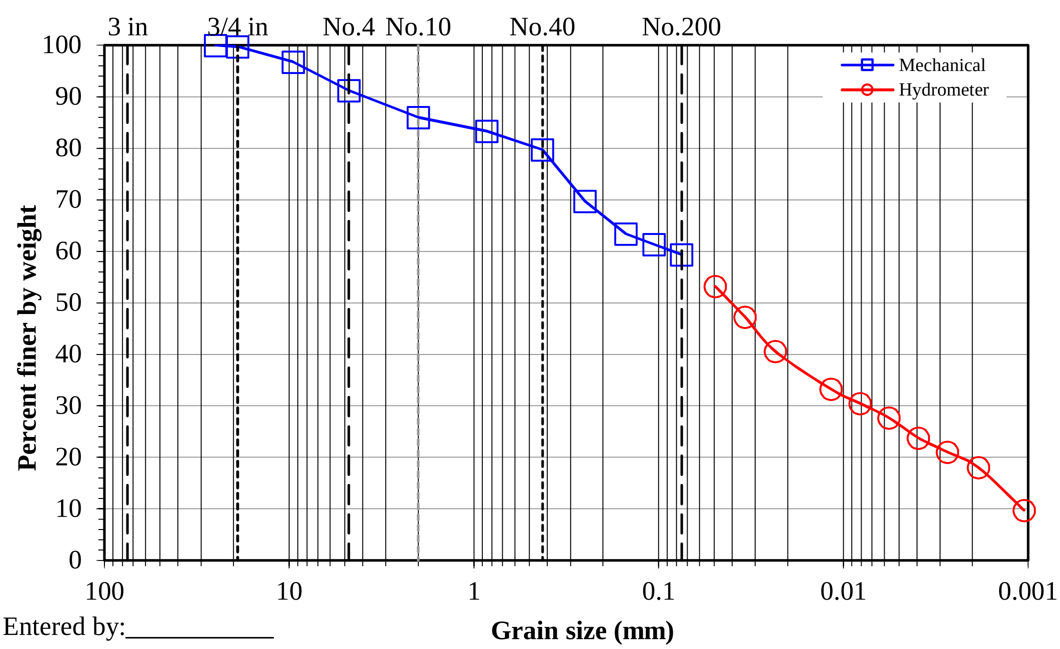
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	485.54	478.29	18.00
Dry soil + tare (g):	478.75	453.56	17.11
Tare (g):	172.19	179.71	7.06
Water content (%):	2.21	9.03	8.86

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.8	Assumed	
Bulb No.	6	Hyd. fraction:	85.98
Cylinder ID:	T3	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	100.0	
3/4"	25.41	19	99.7	
3/8"	288.18	9.5	96.7	<=1st Split
No.4	15.72	4.75	91.2	
No.10	30.47	2	86.0	<=Split hyd.
No.20	37.93	0.85	83.3	
No.40	48.24	0.425	79.7	
No.60	76.41	0.25	69.8	
No.100	94.41	0.15	63.4	
No.140	100.31	0.106	61.3	
No.200	105.83	0.075	59.4	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.4	43	0.0494	53.21
2	21.4	38.75	0.0341	47.25
4	21.4	34	0.0234	40.60
15	21.4	28.75	0.0117	33.24
30	21.5	26.75	0.0081	30.49
60	21.5	24.75	0.0057	27.69
120	21.4	22	0.0039	23.78
240	21.5	20	0.0027	21.03
500	21.8	17.75	0.0019	18.03
1414	21.3	12	0.0011	9.72

Gravel (%): 8.8
Sand (%): 31.8
Fines (%): 59.4



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-2
Depth: 0-10'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	No	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	221.32	209.67
Hydrometer fraction (g):	59.42	56.44

Water content data		S.F.	Hyd.(-No.10)
Moist soil + tare (g):	-	372.46	17.86
Dry soil + tare (g):	-	360.81	17.32
Tare (g):	-	151.14	7.10
Water content (%):		5.56	5.28

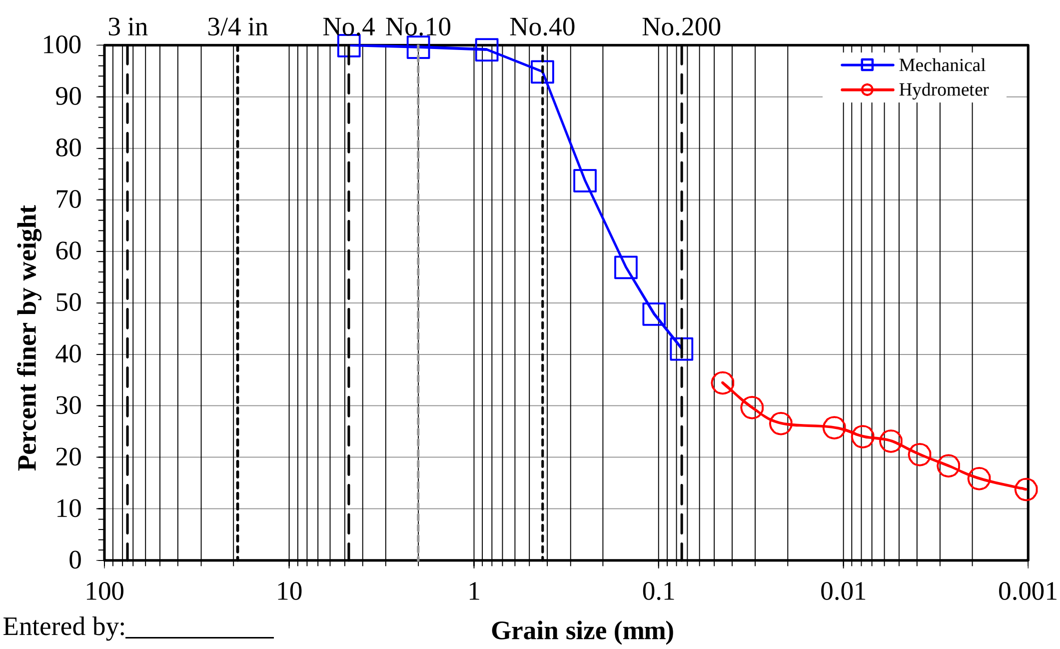
Hydrometer data				
Hyd. split:	No.10			
Gs:	2.7	Assumed		
Bulb No.	6		Hyd. fraction:	99.64
Cylinder ID:	N30		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	-
No.4		4.75	100.0
No.10	0.76	2	99.6
No.20	1.80	0.85	99.1
No.40	10.74	0.425	94.9
No.60	55.07	0.25	73.7
No.100	90.26	0.15	57.0
No.140	109.33	0.106	47.9
No.200	123.47	0.075	41.1

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.5	24.75	0.0451	34.49
2	21.5	22	0.0312	29.69
4	21.5	20.25	0.0218	26.64
15	21.6	19.75	0.0112	25.83
30	21.6	18.75	0.0079	24.08
60	21.6	18.25	0.0055	23.21
120	21.6	16.75	0.0039	20.59
240	21.6	15.5	0.0027	18.41
506	21.8	14	0.0018	15.91
1590	21.9	12.75	0.0010	13.79

Gravel (%): 0.0
Sand (%): 58.9
Fines (%): 41.1



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-2
Depth: 10-20'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	No.10	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	221.70	214.45
No.10 Coarse fraction (g):	0.57	0.56
-No.10 Split fraction (g):	62.94	60.88
Hydrometer fraction (g):	62.94	60.88
First Split fraction:	0.997	

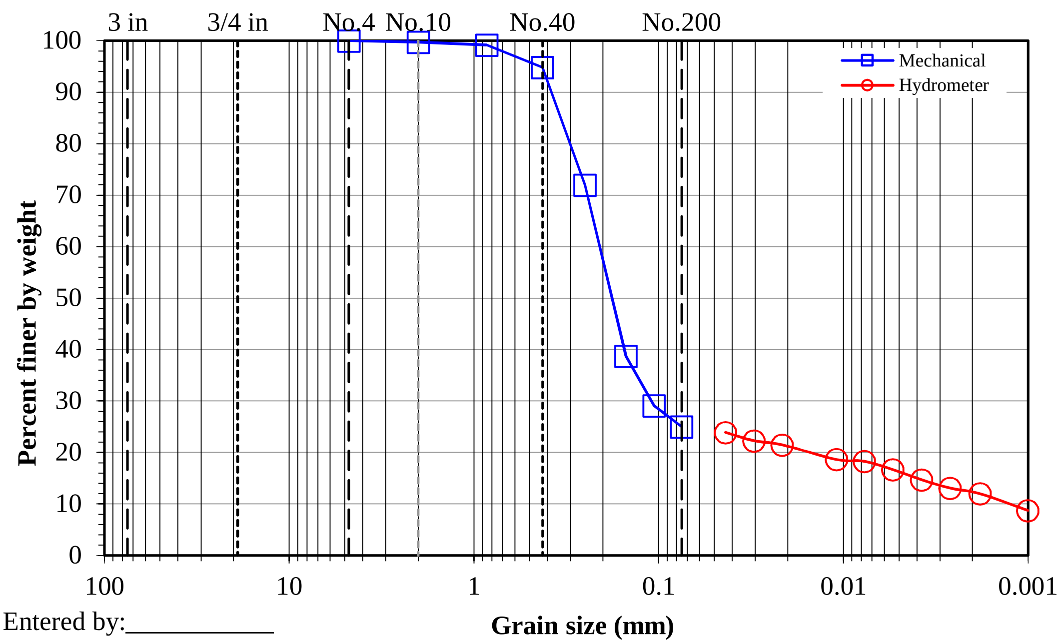
Water content data	C.F.1(+No.10)	S.F.1(-No.10)	Hyd.(-No.10)
Moist soil + tare (g):	344.36	19.84	19.84
Dry soil + tare (g):	339.29	19.42	19.42
Tare (g):	122.66	7.01	7.01
Water content (%):	2.34	3.38	3.38

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	99.74
Cylinder ID:	T5	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	-	
3/8"		9.5	-	
No.4		4.75	100.0	
No.10	0.56	2	99.7	<=1st Split
No.20	0.35	0.85	99.2	
No.40	3.00	0.425	94.8	
No.60	16.95	0.25	72.0	
No.100	37.23	0.15	38.7	
No.140	43.12	0.106	29.1	
No.200	45.61	0.075	25.0	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.5	19.75	0.0434	23.91
2	21.5	18.75	0.0305	22.29
4	21.5	18.25	0.0215	21.48
15	21.5	16.5	0.0109	18.64
30	21.6	16.25	0.0077	18.30
60	21.6	15.25	0.0054	16.68
120	21.7	14	0.0038	14.71
240	21.7	13	0.0026	13.09
501	21.9	12.25	0.0018	11.99
1590	21.9	10.25	0.0010	8.75

Gravel (%): 0.0
Sand (%): 75.0
Fines (%): 25.0



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BSS/EH

Boring No.:
Sample: B1TP-2
Depth: 20-25'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	No	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	305.97	279.27
Hydrometer fraction (g):	64.95	59.57

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	459.30	17.55
Dry soil + tare (g):	432.60	16.68
Tare (g):	153.33	7.05
Water content (%):	9.56	9.03

Hydrometer data

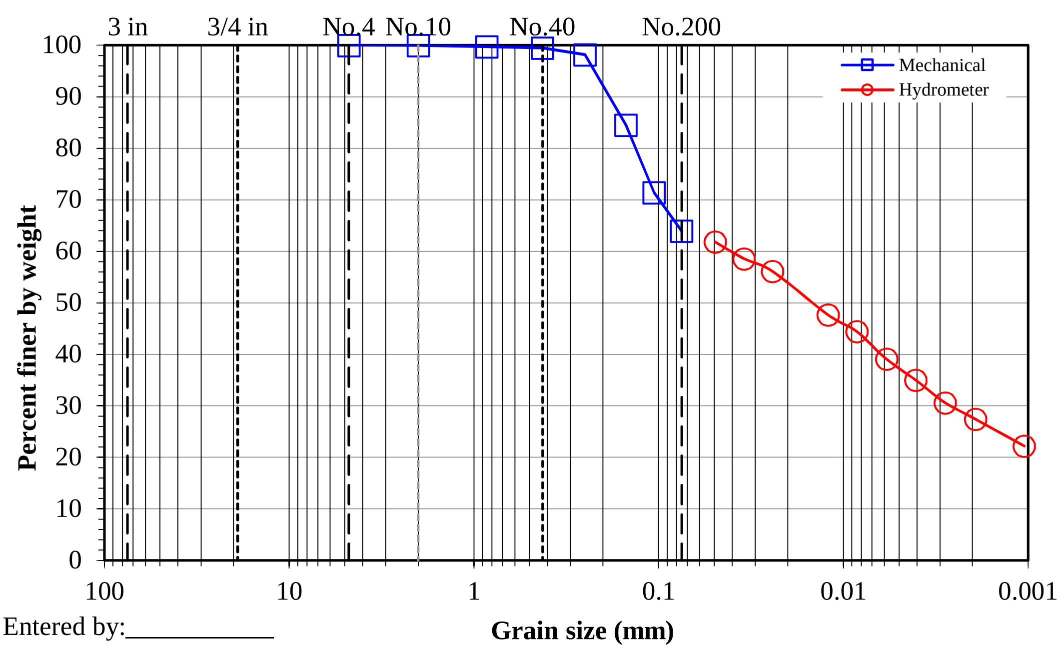
Hyd. split:	No.10			
Gs:	2.8	Assumed		
Bulb No.	6		Hyd. fraction:	99.95
Cylinder ID:	11		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	-
No.4		4.75	100.0
No.10	0.14	2	99.9
No.20	0.73	0.85	99.7
No.40	1.41	0.425	99.5
No.60	5.06	0.25	98.2
No.100	43.21	0.15	84.5
No.140	79.89	0.106	71.4
No.200	100.67	0.075	64.0

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.6	43	0.0494	61.82
2	21.6	41	0.0346	58.57
4	21.6	39.5	0.0242	56.13
15	21.7	34.25	0.0121	47.66
30	21.7	32.25	0.0084	44.41
60	21.6	29	0.0058	39.07
120	21.6	26.5	0.0041	35.01
240	21.7	23.75	0.0028	30.60
498	21.8	21.75	0.0019	27.41
1587	21.9	18.5	0.0010	22.18

Gravel (%): 0.0
Sand (%): 36.0
Fines (%): 64.0



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BF/EH

Boring No.:
Sample: B1TP-3
Depth: 0-10'
Description: Sandy SILT, brown

ASTM Standard(s): ASTM D6913 and ASTM D7928
Split: No
Second split: No

	Moist	Dry
Total sample wt. (g):	184.65	166.57
Hydrometer fraction (g):	66.04	59.92

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	306.54	20.61
Dry soil + tare (g):	288.46	19.35
Tare (g):	121.89	7.02
Water content (%):	10.85	10.22

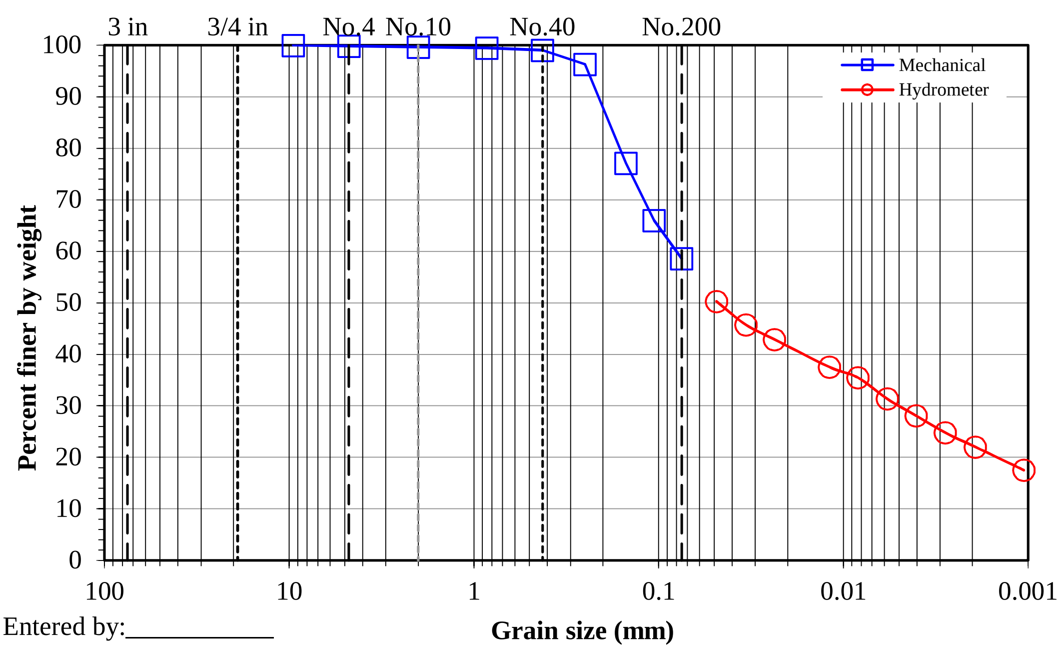
Hydrometer data
Hyd. split: No.10
Gs: 2.7 Assumed
Bulb No.: 6
Hyd. fraction: 99.63
Cylinder ID: N18
Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	100.0
No.4	0.27	4.75	99.8
No.10	0.61	2	99.6
No.20	0.87	0.85	99.5
No.40	1.61	0.425	99.0
No.60	6.18	0.25	96.3
No.100	38.13	0.15	77.1
No.140	56.65	0.106	66.0
No.200	69.00	0.075	58.6

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.7	35.5	0.0486	50.28
2	21.7	32.75	0.0338	45.76
4	21.7	31	0.0236	42.88
15	21.7	27.75	0.0119	37.54
30	21.7	26.5	0.0083	35.48
60	21.7	24	0.0058	31.37
120	21.7	22	0.0040	28.08
240	21.7	20	0.0028	24.80
493	21.9	18.25	0.0019	22.04
1583	21.9	15.5	0.0011	17.51

Gravel (%): 0.2
Sand (%): 41.3
Fines (%): 58.6



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BSS/EH

Boring No.:
Sample: B1TP-3
Depth: 10-20'
Description: Lean CLAY, brownish grey

ASTM Standard(s): ASTM D6913 and ASTM D7928
Split: No
Second split: No

	Moist	Dry
Total sample wt. (g):	379.51	350.56
Hydrometer fraction (g):	63.43	58.92

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	501.99	25.48
Dry soil + tare (g):	473.04	24.20
Tare (g):	122.48	7.46
Water content (%):	8.26	7.65

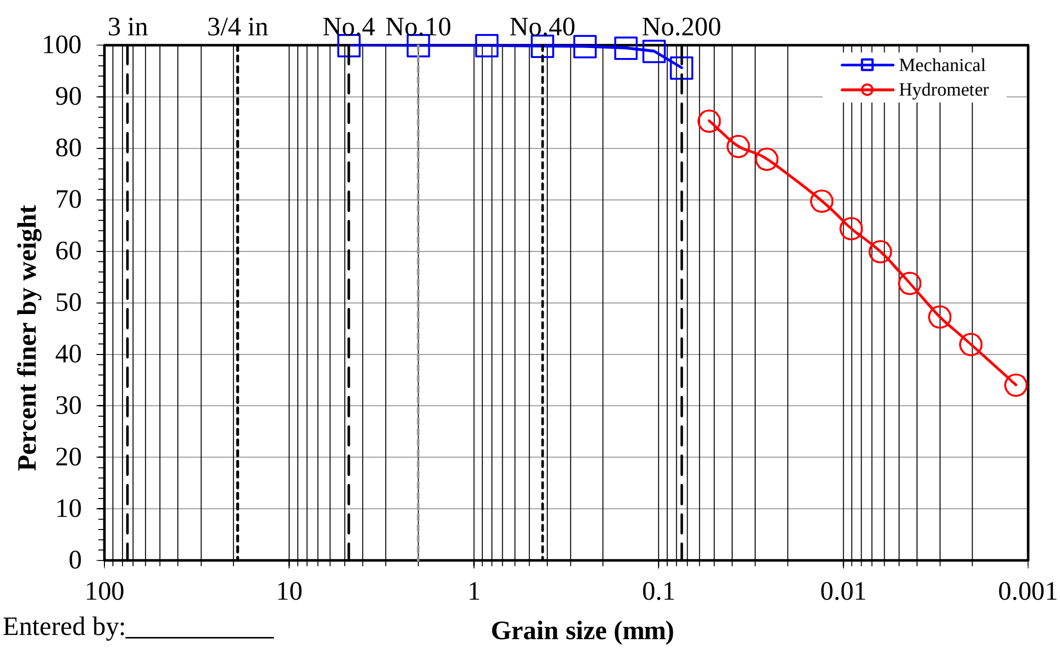
Hydrometer data
Hyd. split: No.10
Gs: 2.8 Assumed
Bulb No. 6
Hyd. fraction: 99.97
Cylinder ID: N33
Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	-
No.4		4.75	100.0
No.10	0.09	2	100.0
No.20	0.16	0.85	100.0
No.40	0.42	0.425	99.9
No.60	0.84	0.25	99.8
No.100	1.87	0.15	99.5
No.140	4.01	0.106	98.9
No.200	15.34	0.075	95.6

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.3	57	0.0533	85.34
2	21.3	54	0.0371	80.41
4	21.3	52.5	0.0260	77.95
15	21.4	47.5	0.0131	69.79
30	21.4	44.25	0.0091	64.45
60	21.5	41.5	0.0063	59.99
120	21.5	37.75	0.0044	53.83
240	21.6	33.75	0.0030	47.31
500	21.6	30.5	0.0020	41.97
1440	21.4	25.75	0.0012	34.05

Gravel (%): 0.0
Sand (%): 4.4
Fines (%): 95.6



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BSS/EH

Boring No.:
Sample: B1TP-3
Depth: 20-30'
Description: Lean CLAY, brownish grey

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	No	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	454.10	418.96
Hydrometer fraction (g):	62.92	58.55

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	593.85	23.73
Dry soil + tare (g):	558.71	22.59
Tare (g):	139.75	7.31
Water content (%):	8.39	7.46

Hydrometer data

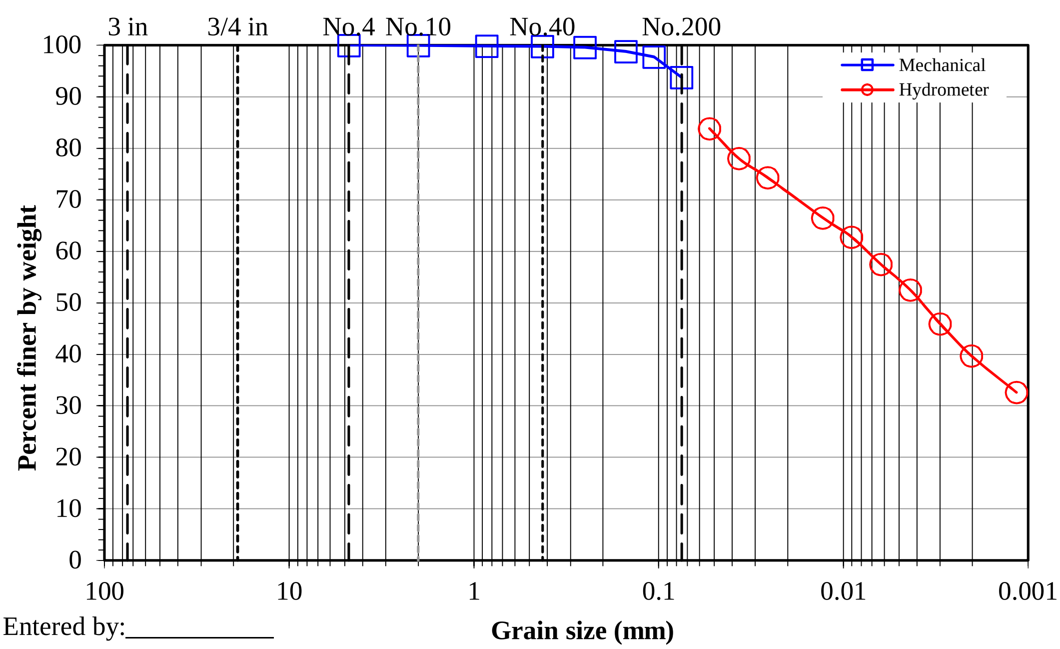
Hyd. split:	No.10			
Gs:	2.8	Assumed		
Bulb No.	6		Hyd. fraction:	99.98
Cylinder ID:	N10		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"	-	37.5	-
1"	-	25	-
3/4"	-	19	-
3/8"	-	9.5	-
No.4	-	4.75	100.0
No.10	0.09	2	100.0
No.20	0.52	0.85	99.9
No.40	0.87	0.425	99.8
No.60	1.67	0.25	99.6
No.100	4.93	0.15	98.8
No.140	9.44	0.106	97.7
No.200	26.20	0.075	93.7

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.3	55.75	0.0530	83.82
2	21.3	52.25	0.0368	78.04
4	21.3	50	0.0257	74.31
15	21.4	45.25	0.0129	66.52
30	21.4	43	0.0090	62.80
60	21.5	39.75	0.0063	57.48
120	21.5	36.75	0.0043	52.52
240	21.6	32.75	0.0030	45.96
500	21.5	29	0.0020	39.70
1442	21.4	24.75	0.0012	32.62

Gravel (%): 0.0
Sand (%): 6.3
Fines (%): 93.7



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Classification of Soils for Engineering Purposes

(*ASTM D2487*)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/7/2020
By: BRR

Sample Info. Boring No.								
Sample:	B1TP-1	B1TP-1	B1TP-2	B1TP-2	B1TP-2	B1TP-3	B1TP-3	B1TP-3
Depth:	10-15'	15-25'	0-10'	10-20'	20-25'	0-10'	10-20'	20-30'
Liquid Limit (%):	NP	25	NP	NP	23	NP	47	39
Plastic Limit (%):	NP	14	NP	NP	15	NP	19	18
Plastic Index (%):	NP	11	NP	NP	8	NP	28	21
Gravel (%):	13.6	8.8	0	0	0	0.2	0	0
Sand (%):	48.3	31.8	58.9	75	36	41.3	4.4	6.3
Fines (%):	38.1	59.4	41.1	25	64	58.6	95.6	93.7
D_{60} (mm):								
D_{30} (mm):								
D_{10} (mm):								
Cu:								
Cc:								
Group Symbol:	**SM**	**CL**	**SM**	**SM**	**CL**	**ML**	**CL**	**CL**
Group Name:	**Silty SAND**	**Sandy lean CLAY**	**Silty SAND**	**Silty SAND**	**Sandy lean CLAY**	**Sandy SILT**	**Lean CLAY**	**Lean CLAY**

Entered by:___________

Reviewed:___________

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Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

(ASTM D2974)

Project: **Stantec**
No: **M00287-022**
Location: IPSC CCR Unit Closures; Delta, UT
Date: 12/31/2019
By: BF/BSS/JAB

Sample Info.	Boring No.								
	Sample:	B1TP-1	B1TP-2	B1TP-3	B2TP-1	B2TP-2	B2TP-3	B3TP-1	
	Depth:	10-15'	10-20'	0-10'	20-25'	0-15'	12-15'	10-20'	
	Test Method:	C	C	C	C	C	C	C	
	Furnace temp. (°C)	440	440	440	440	440	440	440	
Moisture	Wet soil + tare (g)	680.76	630.70	611.32	614.17	599.84	552.15	569.66	
	Dry soil + tare (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Tare (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Ash / Organic Info	Mass of crucible and oven-dried sample (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Mass of crucible and ash (g)	648.81	622.08	584.01	572.54	578.24	521.82	530.70	
	Mass of crucible (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Moisture Content, w (%) [a]		**10.2**	**2.6**	**12.1**	**17.7**	**9.4**	**18.0**	**16.7**	
Ash Content (%)		**98.5**	**99.2**	**99.2**	**96.9**	**98.9**	**97.2**	**96.8**	
Organic Matter (%)		**1.5**	**0.8**	**0.8**	**3.1**	**1.1**	**2.8**	**3.2**	

[a] Moisture contents are by proportion of oven-dried mass (geotechnical convention).

Entered by:___________

Reviewed:___________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Sample Description: Silty SAND, brown
Engineering Classification: SM
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	144.85	
Dry soil + tare (g)	144.43	
Tare (g)	128.38	
Water content, w (%)	2.6	

Initial water temperature: 19.0 °C
Date test started: 12/27/2019
Time at beginning of test: 10:05

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	19.0	1	18.4	1	18.5
2	1	19.0	1	18.4	1	18.5

Dispersive classification: Grade 1-Nondispersive

Entered: ________
Reviewed: ________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-2
Depth: 10-20'
Sample Description: Silty SAND, brown
Engineering Classification: SM
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	162.75	
Dry soil + tare (g)	162.17	
Tare (g)	127.70	
Water content, w (%)	1.7	

Initial water temperature: 19.0 °C
Date test started: 12/27/2019
Time at beginning of test: 10:07

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	2	19.0	2	18.4	2	18.0
2	2	18.9	3	18.4	3	18.0

Dispersive classification: Grade 3-Dispersive

Entered: ________
Reviewed: ________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

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Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-3
Depth: 0-10'
Sample Description: Sandy SILT, brown
Engineering Classification: ML
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs: 2.65 Assumed
Curing Time: 0 minutes

Water used: Distilled
Water content: Air-dried

Wet soil + tare (g)	156.54
Dry soil + tare (g)	155.93
Tare (g)	123.07
Water content, w (%)	1.9

Initial water temperature: 19.0 °C
Date test started: 12/27/2019
Time at beginning of test: 10:10

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	2	19.0	2	18.4	2	18.0
2	2	19.0	2	18.4	2	18.0

Dispersive classification: Grade 2-Intermediate

Entered: ________
Reviewed: ________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B1TP-3
Depth: 20-30'
Sample Description: Lean CLAY, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	593.85	
Dry soil + tare (g)	558.71	
Tare (g)	139.75	
Water content, w (%)	8.4	

Initial water temperature: 18.9 °C
Date test started: 12/27/2019
Time at beginning of test: 10:13

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	18.9	1	18.4	1	18.1
2	1	18.9	1	18.4	1	18.1

Dispersive classification: Grade 1-Nondispersive

Entered: ________
Reviewed: ________

Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 12/26/2019
By: BF

Sample: B1TP-1 & B1TP-2 & B1TP-3
Depth: 0-20'
Sample Description: Silty SAND, brown
Engineering Classification: SM
As-received water content (%): Not requested

Method: ASTM D698 B
Mold Id. Inc 3
Mold volume (ft^3): 0.0332

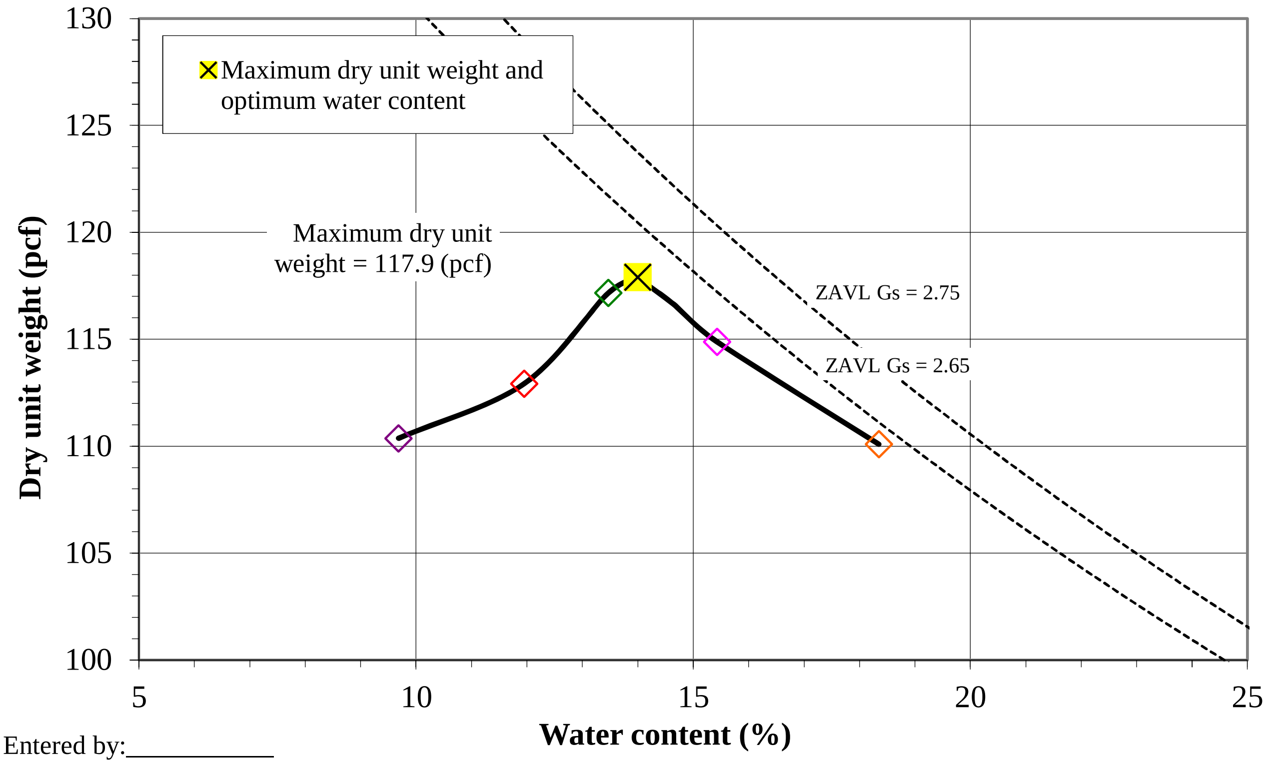
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Optimum water content (%): 14
Maximum dry unit weight (pcf): 117.9

Point Number	+2%	+4%	+6%	+8%	+10%			
Wt. Sample + Mold (g)	6046.3	6127.2	6225.5	6220.5	6185.5			
Wt. of Mold (g)	4220.9	4220.9	4220.9	4220.9	4220.9			
Wet Unit Wt., γ_m (pcf)	121.1	126.4	132.9	132.6	130.3			
Wet Soil + Tare (g)	1271.79	1030.93	1316.46	1342.64	1453.85			
Dry Soil + Tare (g)	1183.63	938.82	1180.06	1185.36	1261.84			
Tare (g)	273.28	168.10	167.11	165.99	215.39			
Water Content, w (%)	**9.7**	**12.0**	**13.5**	**15.4**	**18.3**			
Dry Unit Wt., γ_d (pcf)	**110.4**	**112.9**	**117.2**	**114.9**	**110.1**			

Comments:

Test specimen consisted of material from B1TP-1 @ 10-15', B1TP-2 @ 0-10', B1-TP2 @ 10-20', and B1TP-3 @ 0-10'.



Entered by:___________

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Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BSS

Sample: B1TP-2 & B1TP-3
Depth: 10-30'
Sample Description: Lean CLAY, brown
Engineering Classification: CL
As-received water content (%): Not requested

Method: ASTM D698 B
Mold Id. Inc 1
Mold volume (ft^3): 0.0333

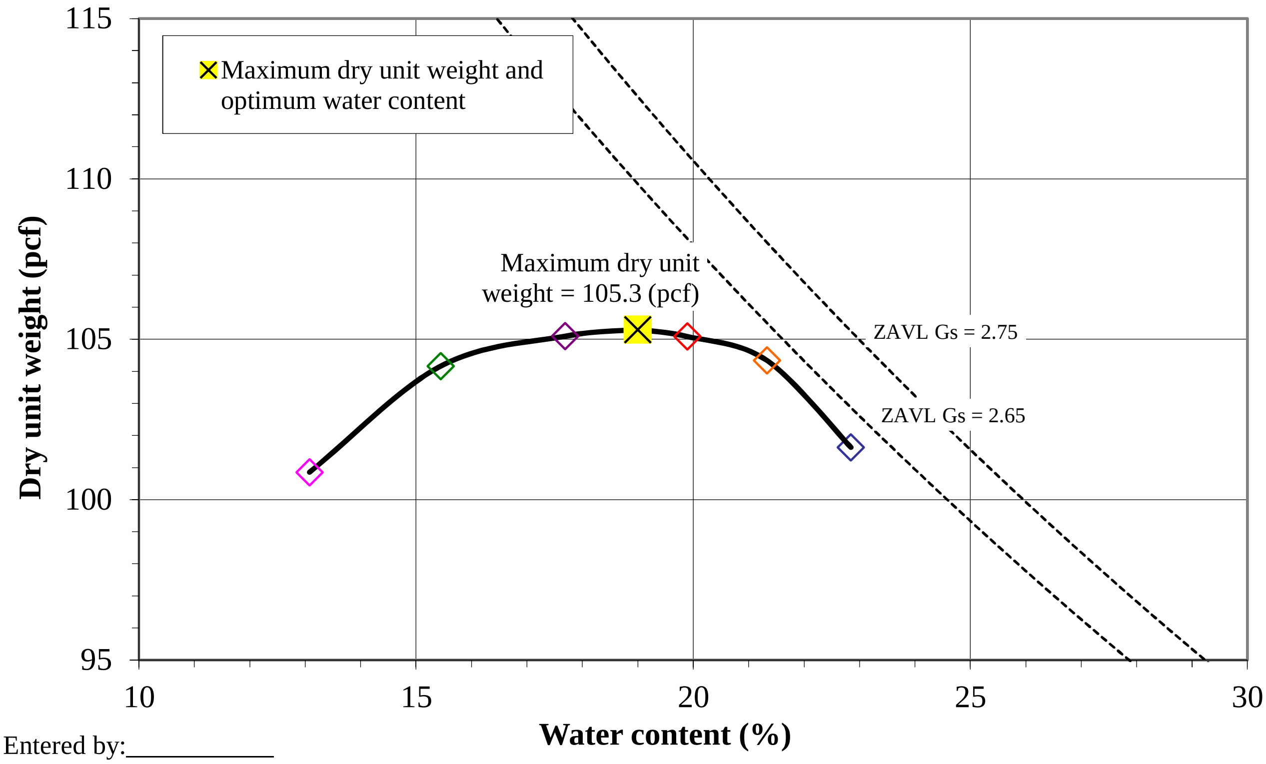
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Optimum water content (%): 19
Maximum dry unit weight (pcf): 105.3

Point Number	+8%	+10%	+6%	+4%	+12%	14%		
Wt. Sample + Mold (g)	6097.0	6131.8	6045.0	5951.4	6140.9	6114.5		
Wt. of Mold (g)	4229.7	4229.7	4229.7	4229.7	4229.7	4229.7		
Wet Unit Wt., γ_m (pcf)	123.7	126.0	120.2	114.0	126.6	124.8		
Wet Soil + Tare (g)	1224.49	1390.14	1141.17	1063.87	1248.59	1113.37		
Dry Soil + Tare (g)	1089.49	1211.00	1032.53	976.63	1083.68	947.60		
Tare (g)	326.42	310.61	328.95	309.51	310.52	221.97		
Water Content, w (%)	**17.7**	**19.9**	**15.4**	**13.1**	**21.3**	**22.8**		
Dry Unit Wt., γ_d (pcf)	**105.1**	**105.1**	**104.2**	**100.9**	**104.3**	**101.6**		

Comments:

Test specimen consisted of material from B1TP-2 @ 20-25', B1TP-3 @ 10-20', and B1TP-3 @ 20-30'. Due to insufficient sample quantity, points +6% and +14% contained previously compacted material.



Entered by:___________

Reviewed:___________

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

IGES

Project:	Stantec	Boring No.:	
No:	M00287-022	Sample:	B1TP-1
Location:	IPSC CCR Unit Clousres; Delta, UT	Depth:	10-15'
Date:	1/15/2020	Sample Description:	Silty SAND, brown
By:	EH	Sample Type:	Laboratory Compacted

Compaction Specifications: 90 (%) Dry unit weight at 14 (%) w

	Initial (o)	Final (f)
Sample Height, H (in)	2.995	2.972
Sample Diameter, D (in)	2.412	2.364
Sample Length, L (cm)	7.607	7.548
Sample Area, A (cm^2)	29.479	28.318
Sample Volume, V (cm^3)	224.26	213.73
Wt. Rings + Wet Soil (g)	435.15	458.15
Wt. Rings (g)	0	0
Wet Unit Wt., γ_m (pcf)	121.1	133.8
Wet Soil + Tare (g)	129.41	572.28
Dry Soil + Tare (g)	118.28	498.07
Tare (g)	37.61	123.49
Weight of solids, Ws (g)	382.39	382.39
Water Content, w (%)	13.80	19.81
Dry Unit Wt, γ_d (pcf)	106.4	111.7
Void ratio, e, for assumed Gs	0.58	0.53
Saturation (%), for assumed Gs	63.8	100 [a]
Average K[b] (cm/sec)	**3.6E-04**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Optimum water content (%)	14	
Maximum dry unit weight (pcf)	117.9	
Gs	2.7	Assumed
Cell No.	2	
Station No.	3	
Permeant liquid used	De-aired tap water	
Total backpressure (psi)	35	
Effective horiz. consolidation stress (psi)	15	
Effective vert. consolidation stress (psi)	15	

	Initial (o)	Final (f)
B value	0.60	0.98
External Burette (cm^3)	8.20	26.60
Cell Pressure (psi)	0.0	50.0

Backpressure bottom (psi)	35.0
Backpressure top (psi)	35.0
System volume coefficient (cm^3/psi)	0.158
System volume change (cm^3)	7.88
Net sample volume change (cm^3)	-10.52
Bottom burette ground length, l_b (cm)	82.25
Top burette ground length, l_t (cm)	81.95
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.076

Start Date and Time: 1/13/20 15:16

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_T	K[b] (cm/sec)
15.0	3.80 4.04	6.16 5.92	12.28	9.84	3.9E-04	23.5 23.5	0.92	3.6E-04
15.0	4.04 4.23	5.92 5.72	9.84	7.86	3.9E-04	23.5 23.5	0.92	3.6E-04
15.0	4.23 4.39	5.72 5.56	7.86	6.24	4.0E-04	23.5 23.5	0.92	3.7E-04
15.0	4.39 4.52	5.56 5.44	6.24	4.97	4.0E-04	23.5 23.5	0.92	3.7E-04
25.0	4.52 4.67	5.44 5.28	4.97	3.40	4.0E-04	23.5 23.5	0.92	3.7E-04

Comments:
Test specimen was remolded (using only material from B1TP-1 at 10-15') to 90% of ASTM D698 B (which inlcuded combined material from B1TP-1 @ 10-15', B1TP-2 @ 0-10', B1-TP2 @ 10-20', and B1TP-3 @ 0-10') at optimum water content.

Entered by:___________
Reviewed:___________

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

IGES

Project: **Stantec**
No: **M00287-022**
Location: IPSC CCR Unit Clousres; Delta, UT
Date: 1/15/2020
By: EH

Boring No.:
Sample: **B1TP-2**
Depth: **10-20'**
Sample Description: Silty SAND, brown
Sample Type: Laboratory Compacted
Compaction Specifications: 95 (%) Dry unit weight at 14 (%) w

	Initial (o)	Final (f)
Sample Height, H (in)	2.995	2.979
Sample Diameter, D (in)	2.412	2.380
Sample Length, L (cm)	7.607	7.567
Sample Area, A (cm^2)	29.479	28.696
Sample Volume, V (cm^3)	224.26	217.15
Wt. Rings + Wet Soil (g)	459.11	476.24
Wt. Rings (g)	0	0
Wet Unit Wt., γ_m (pcf)	127.8	136.9
Wet Soil + Tare (g)	238.49	601.83
Dry Soil + Tare (g)	223.93	529.21
Tare (g)	118.62	127.39
Weight of solids, Ws (g)	403.34	403.34
Water Content, w (%)	13.83	18.07
Dry Unit Wt, γ_d (pcf)	112.3	116.0
Void ratio, e, for assumed Gs	0.50	0.49
Saturation (%), for assumed Gs	74.5	100 [a]
Average K[b] (cm/sec)		**2.1E-04**

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Optimum water content (%)	14	
Maximum dry unit weight (pcf)	117.9	
Gs	2.7	Assumed
Cell No.	1	
Station No.	6	
Permeant liquid used	De-aired tap water	
Total backpressure (psi)	35	
Effective horiz. consolidation stress (psi)	3	
Effective vert. consolidation stress (psi)	3	

	Initial (o)	Final (f)
B value	0.40	0.96
External Burette (cm^3)	12.70	25.50
Cell Pressure (psi)	0.0	38.0
Backpressure bottom (psi)	35.0	
Backpressure top (psi)	35.0	
System volume coefficient (cm^3/psi)	0.150	
System volume change (cm^3)	5.69	
Net sample volume change (cm^3)	-7.11	
Bottom burette ground length, l_b (cm)	82.05	
Top burette ground length, l_t (cm)	82	
Burette area, a (cm^2)	0.197	
Conversion, reading to cm head (cm/rd)	5.076	

Start Date and Time: 1/13/20 11:45

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_T	K[b] (cm/sec)
30.0	3.92 4.19	6.11 5.85	11.17	8.48	2.4E-04	23.5 23.5	0.92	2.2E-04
30.0	4.19 4.39	5.85 5.66	8.48	6.52	2.3E-04	23.5 23.5	0.92	2.1E-04
30.0	4.39 4.54	5.66 5.52	6.52	5.02	2.3E-04	23.5 23.5	0.92	2.1E-04
30.0	4.54 4.66	5.52 5.42	5.02	3.91	2.2E-04	23.5 23.5	0.92	2.0E-04

Comments:
Test specimen was remolded (using only material from B1TP-2 at 10-20') to 95% of ASTM D698 B (which inlcuded combined material from B1TP-1 @ 10-15', B1TP-2 @ 0-10', B1-TP2 @ 10-20', and B1TP-3 @ 0-10') at optimum water content.

Entered by:___________
Reviewed:___________

Determination of the Soil Water Characteristic Curve for Desorption

Using Pressure Extractor

(In general accordance with ASTM D6836)

Project: Stantec
No: M00287-022
Location: IPSCC CCR Unit Closures; Delta, UT
Date: 3/5/2020
By: DNB/JDF

Specific gravity, Gs: 2.650 Assumed

Boring No.:
Sample: B1TP-1
Depth: 10-15'
Description: Silty SAND, brown
Sample type: Laboratory compacted
Dry unit weight 103.8 pcf
at 16 (%) w
Compaction specifications: 90% of ASTM D698B

		Test No.	1	2	3	4	5	6	7*	8*
		Tension (psi)	0.5	1.0	2.0	6.0	18.0	72.0	2915.26	22991.38
Sample A	Initial Condition	Sample height, H (in)	0.5010	0.5010	0.5010	0.5010	0.5010	0.5010	0.1873	0.1877
Sample A	Initial Condition	Sample diameter, D (in)	1.880	1.880	1.880	1.880	1.880	1.880	1.4722	1.4715
Sample A	Initial Condition	Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001	0.0002	0.0002
Sample A	Initial Condition	Wt. rings/cup + wet soil (g)	64.05	64.05	64.05	64.05	64.05	64.05	34.127	33.817
Sample A	Initial Condition	Wt. rings/cup (g)	20.69	20.69	20.69	20.69	20.69	20.69	24.594	24.575
Sample A	Initial Condition	Moist soil, Ws (g)	43.36	43.36	43.36	43.36	43.36	43.36	9.533	9.242
Sample A	Initial Condition	Dry soil (g)	37.93	37.93	37.93	37.93	37.93	37.93	8.731	8.668
Sample A	Initial Condition	Moist unit wt., γ_m (pcf)	118.79	118.79	118.79	118.79	118.79	118.79	113.91	110.32
Sample A	Initial Condition	Wet soil + tare (g)	107.89	107.89	107.89	107.89	107.89	107.89	34.127	33.817
Sample A	Initial Condition	Dry soil + tare (g)	99.06	99.06	99.06	99.06	99.06	99.06	33.325	33.243
Sample A	Initial Condition	Tare (g)	37.40	37.40	37.40	37.40	37.40	37.40	24.594	24.575
Sample A	Initial Condition	Moisture Content, w (%)	14.3	14.3	14.3	14.3	14.3	14.3	9.19	6.62
Sample A	Initial Condition	Dry Unit Wt., γ_d (pcf)	103.91	103.91	103.91	103.91	103.91	103.91	104.32	103.47
Sample A	Final Condition	Wet soil + ring/cup (g)	64.76	64.35	64.07	63.80	63.62	61.14	33.828	33.424
Sample A	Final Condition	Dry soil + ring/cup (g)	58.62	58.62	58.62	58.62	58.62	58.62	33.325	33.243
Sample A	Final Condition	Ring/cup (g)	20.69	20.69	20.69	20.69	20.69	20.69	24.594	24.575
Sample A	Final Condition	Dry soil (g)	37.93	37.93	37.93	37.93	37.93	37.93	8.731	8.668
Sample A	Final Condition	Moisture Content, w (%)	16.18	15.10	14.38	13.65	13.19	6.64	5.76	2.09
Sample A	Final Condition	Volumetric Water Content, θ	0.269	0.251	0.239	0.227	0.220	0.111	0.096	0.035
Sample B	Initial Condition	Sample height, H (in)	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000		
Sample B	Initial Condition	Sample diameter, D (in)	1.887	1.887	1.887	1.887	1.887	1.887		
Sample B	Initial Condition	Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001		
Sample B	Initial Condition	Wt. rings/cup + wet soil (g)	64.08	64.08	64.08	64.08	64.08	64.08		
Sample B	Initial Condition	Wt. rings/cup (g)	20.48	20.48	20.48	20.48	20.48	20.48		
Sample B	Initial Condition	Moist unit wt., γ_m (pcf)	118.80	118.80	118.80	118.80	118.80	118.80		
Sample B	Initial Condition	Wet soil + tare (g)	107.89	107.89	107.89	107.89	107.89	107.89		
Sample B	Initial Condition	Dry soil + tare (g)	99.06	99.06	99.06	99.06	99.06	99.06		
Sample B	Initial Condition	Tare (g)	37.40	37.40	37.40	37.40	37.40	37.40		
Sample B	Initial Condition	Moisture Content, w (%)	14.3	14.3	14.3	14.3	14.3	14.3		
Sample B	Initial Condition	Dry Unit Wt., γ_d (pcf)	103.92	103.92	103.92	103.92	103.92	103.92		
Sample B	Final Condition	Wet soil + ring/cup (g)	64.82	64.43	64.18	63.90	63.62	63.25		
Sample B	Final Condition	Dry soil + ring/cup (g)	58.62	58.62	58.62	58.62	58.62	58.62		
Sample B	Final Condition	Ring/cup (g)	20.48	20.48	20.48	20.48	20.48	20.48		
Sample B	Final Condition	Dry soil (g)	38.14	38.14	38.14	38.14	38.14	38.14		
Sample B	Final Condition	Moisture Content, w (%)	16.26	15.24	14.59	13.85	13.11	12.14		
Sample B	Final Condition	Volumetric Water Content, θ	0.271	0.254	0.243	0.231	0.218	0.202		
		Average Volumetric Moisture:	**0.270**	**0.253**	**0.241**	**0.229**	**0.219**	**0.156**	**0.096**	**0.035**

Comments:
*Points 7 and 8 were performed on a Chilled Mirror Hygrometer

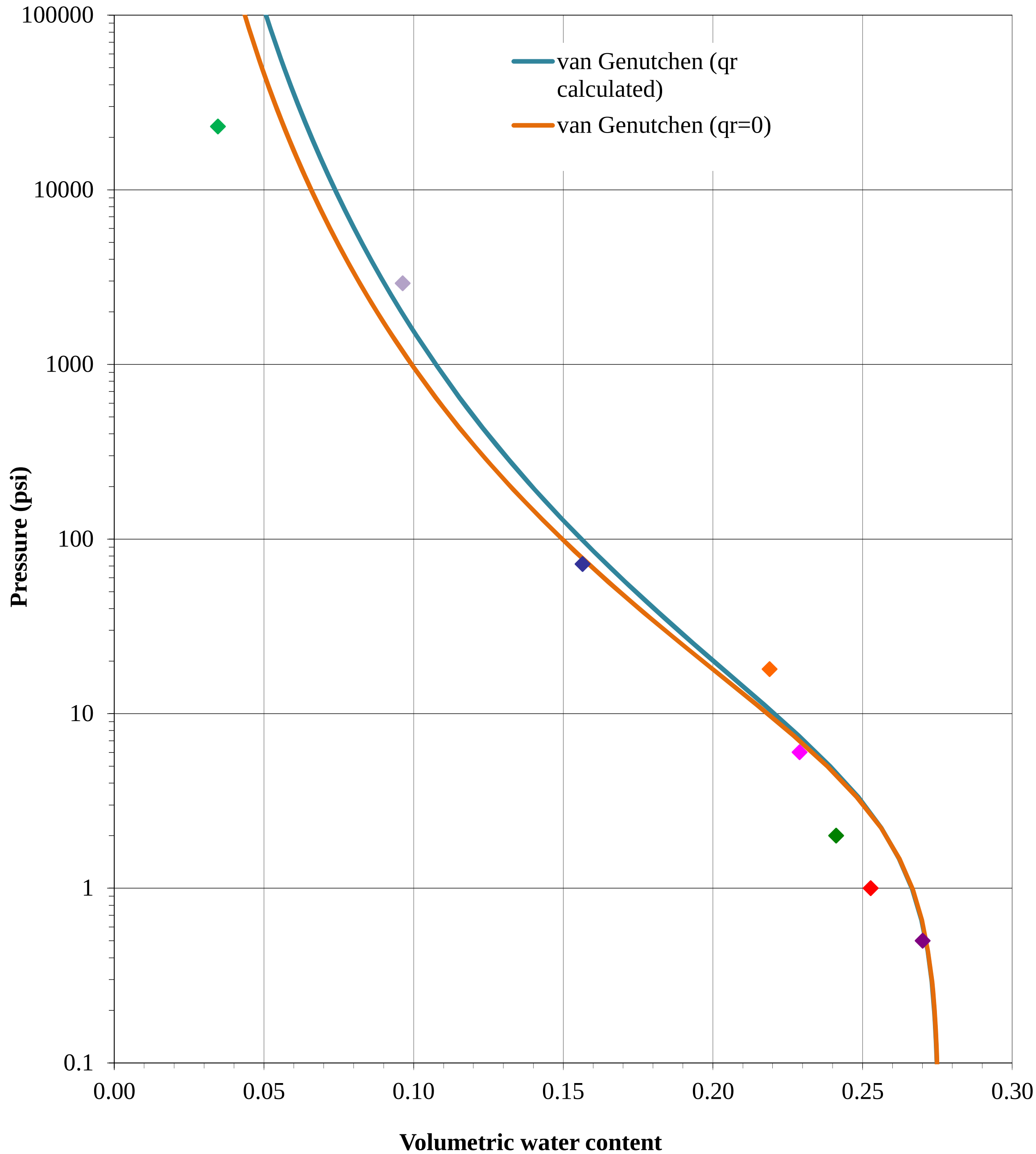
Entered by:___________
Reviewed:___________

Determination of the Soil Water Characteristic Curve for Desorption

Using Pressure Extractor

(In general accordance with ASTM D6836)

Project:	**Stantec**	**Boring No.:**	
No:	**M00287-022**	**Sample:**	**B1TP-1**
Location:	IPSCC CCR Unit Closures; Delta, UT	**Depth:**	**10-15'**
Date:	3/5/2020	Description:	Silty SAND, brown



van Genuchten (1980) fitting parameters (using SWRC fit, Seki, K. (2007)); h in *psi:*

θ_r calculated		Setting $\theta_r = 0$	
θ_s	0.2755	θ_s	0.2755
θ_r	9.938E-06	θ_r	0
α	0.3215	α	0.2987
n	1.1632	n	1.1790
m	0.1403	m	0.1518
R^2	0.9648	R^2	0.9686

$$S_e = \left[\frac{1}{1+(\alpha h)^n}\right]^m$$

$$(m = 1 - 1/n)$$

$$\theta = \theta_r + (\theta_s - \theta_r)S_e$$

Determination of the Soil Water Characteristic Curve for Desorption

Using Pressure Extractor

(In general accordance with ASTM D6836)

Project: Stantec
No: M00287-022
Location: IPSCC CCR Unit Closures; Delta, UT
Date: 3/4/2020
By: DNB/JDF

Specific gravity, Gs: 2.650 Assumed

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Sandy lean CLAY, brown
Sample type: Laboratory compacted
Dry unit weight 93.1 pcf
at 19 (%) w
Compaction specifications: 90% of ASTM D698B

		Test No.	1	2	3	4	5	6	7*	8*
		Tension (psi)	0.5	1.0	2.0	6.0	18.0	72.0	3354.72	22508.41
Sample A	Initial Condition	Sample height, H (in)	0.5010	0.5010	0.5010	0.5010	0.5010	0.5010	0.1890	0.1882
		Sample diameter, D (in)	1.882	1.882	1.882	1.882	1.882	1.882	1.4718	1.4722
		Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001	0.0002	0.0002
		Wt. rings/cup + wet soil (g)	61.18	61.18	61.18	61.18	61.18	61.18	33.709	33.004
		Wt. rings/cup (g)	20.56	20.56	20.56	20.56	20.56	20.56	24.764	24.367
		Moist soil, Ws (g)	40.62	40.62	40.62	40.62	40.62	40.62	8.945	8.637
		Dry soil (g)	34.06	34.06	34.06	34.06	34.06	34.06	7.900	7.842
		Moist unit wt., γ_m (pcf)	111.03	111.03	111.03	111.03	111.03	111.03	105.98	102.71
		Wet soil + tare (g)	146.19	146.19	146.19	146.19	146.19	146.19	33.709	33.004
		Dry soil + tare (g)	128.62	128.62	128.62	128.62	128.62	128.62	32.664	32.209
		Tare (g)	37.42	37.42	37.42	37.42	37.42	37.42	24.764	24.367
		Moisture Content, w (%)	19.3	19.3	19.3	19.3	19.3	19.3	13.23	10.14
		Dry Unit Wt., γ_d (pcf)	93.10	93.10	93.10	93.10	93.10	93.10	93.60	93.25
	Final Condition	Wet soil + ring/cup (g)	63.05	62.69	62.29	61.66	61.13	60.37	33.266	32.394
		Dry soil + ring/cup (g)	54.62	54.62	54.62	54.62	54.62	54.62	32.664	32.209
		Ring/cup (g)	20.56	20.56	20.56	20.56	20.56	20.56	24.764	24.367
		Dry soil (g)	34.06	34.06	34.06	34.06	34.06	34.06	7.900	7.842
		Moisture Content, w (%)	24.74	23.68	22.51	20.66	19.12	16.89	7.62	2.36
		Volumetric Water Content, θ	0.369	0.353	0.336	0.308	0.285	0.252	0.114	0.035
Sample B	Initial Condition	Sample height, H (in)	0.4980	0.4980	0.4980	0.4980	0.4980	0.4980		
		Sample diameter, D (in)	1.881	1.881	1.881	1.881	1.881	1.881		
		Sample Volume (ft^3)	0.001	0.001	0.001	0.001	0.001	0.001		
		Wt. rings/cup + wet soil (g)	61.05	61.05	61.05	61.05	61.05	61.05		
		Wt. rings/cup (g)	20.54	20.54	20.54	20.54	20.54	20.54		
		Moist unit wt., γ_m (pcf)	111.52	111.52	111.52	111.52	111.52	111.52		
		Wet soil + tare (g)	146.19	146.19	146.19	146.19	146.19	146.19		
		Dry soil + tare (g)	128.62	128.62	128.62	128.62	128.62	128.62		
		Tare (g)	37.42	37.42	37.42	37.42	37.42	37.42		
		Moisture Content, w (%)	19.3	19.3	19.3	19.3	19.3	19.3		
		Dry Unit Wt., γ_d (pcf)	93.51	93.51	93.51	93.51	93.51	93.51		
	Final Condition	Wet soil + ring/cup (g)	62.74	62.41	62.02	61.45	61.17	60.44		
		Dry soil + ring/cup (g)	54.51	54.51	54.51	54.51	54.51	54.51		
		Ring/cup (g)	20.54	20.54	20.54	20.54	20.54	20.54		
		Dry soil (g)	33.97	33.97	33.97	33.97	33.97	33.97		
		Moisture Content, w (%)	24.24	23.26	22.11	20.43	19.60	17.47		
		Volumetric Water Content, θ	0.363	0.349	0.331	0.306	0.294	0.262		
		Average Volumetric Moisture:	**0.366**	**0.351**	**0.334**	**0.307**	**0.290**	**0.257**	**0.114**	**0.035**

Comments:
*Points 7 and 8 were performed on a Chilled Mirror Hygrometer

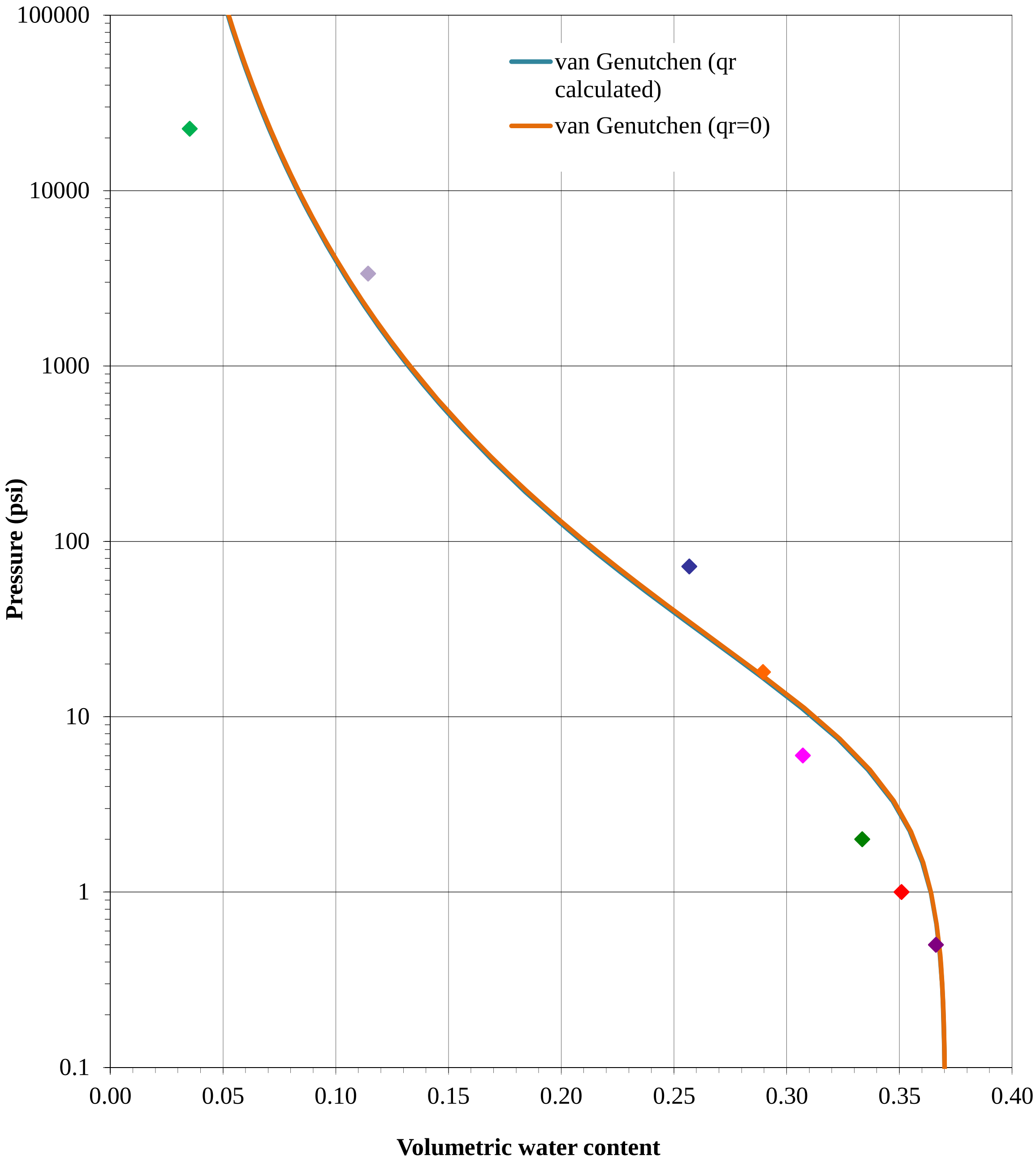
Entered by:___________
Reviewed:___________

Determination of the Soil Water Characteristic Curve for Desorption Using Pressure Extractor

(In general accordance with ASTM D6836)

Project: Stantec
No: M00287-022
Location: IPSCC CCR Unit Closures; Delta, UT
Date: 3/4/2020

Boring No.:
Sample: B1TP-1
Depth: 15-25'
Description: Sandy lean CLAY, brown



van Genuchten (1980) fitting parameters (using SWRC fit, Seki, K. (2007)); h in *psi:*

θ_r calculated		Setting θ_r = 0	
θ_s	0.3705	θ_s	0.3705
θ_r	4.115E-06	θ_r	0
α	0.1639	α	0.1598
n	1.2021	n	1.2020
m	0.1681	m	0.1681
R^2	0.9627	R^2	0.9627

$$S_e = \left[\frac{1}{1+(\alpha h)^n}\right]^m$$

$$(m = 1 - 1/n)$$

$$\theta = \theta_r + (\theta_s - \theta_r)S_e$$

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-1
Depth: 0-10'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/4"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

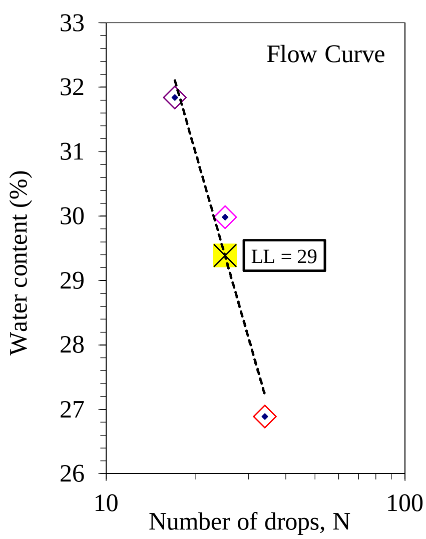
Plastic Limit

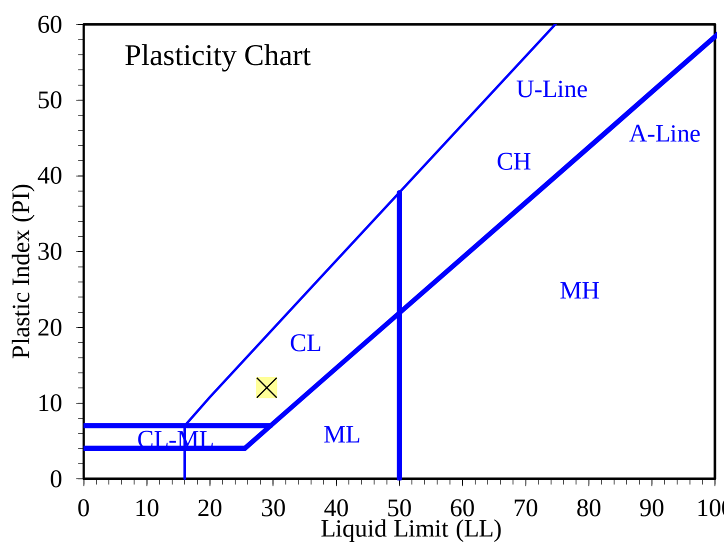
Determination No	1	2				
Wet Soil + Tare (g)	14.37	14.62				
Dry Soil + Tare (g)	13.28	13.51				
Water Loss (g)	1.09	1.11				
Tare (g)	7.08	7.11				
Dry Soil (g)	6.20	6.40				
Water Content, w (%)	17.58	17.34				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	34	25	17			
Wet Soil + Tare (g)	14.56	15.45	16.23			
Dry Soil + Tare (g)	13.03	13.66	14.10			
Water Loss (g)	1.53	1.79	2.13			
Tare (g)	7.34	7.69	7.41			
Dry Soil (g)	5.69	5.97	6.69			
Water Content, w (%)	26.89	29.98	31.84			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**29**
Plastic Limit, PL (%)	**17**
Plasticity Index, PI (%)	**12**





Entered by:____________
Reviewed:____________

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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

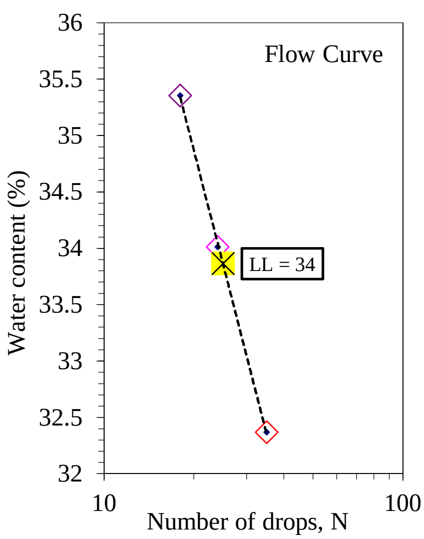
Plastic Limit

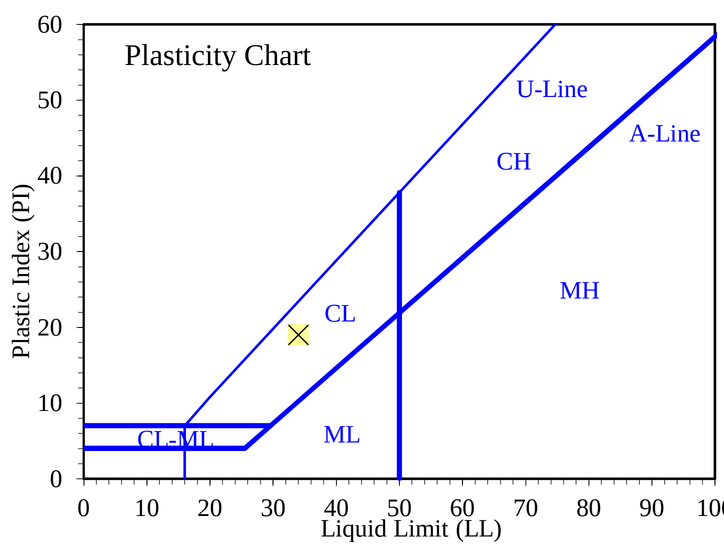
Determination No	1	2				
Wet Soil + Tare (g)	14.56	14.71				
Dry Soil + Tare (g)	13.56	13.73				
Water Loss (g)	1.00	0.98				
Tare (g)	7.03	7.11				
Dry Soil (g)	6.53	6.62				
Water Content, w (%)	15.31	14.80				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	24	18			
Wet Soil + Tare (g)	15.70	16.50	15.24			
Dry Soil + Tare (g)	13.69	14.33	13.20			
Water Loss (g)	2.01	2.17	2.04			
Tare (g)	7.48	7.95	7.43			
Dry Soil (g)	6.21	6.38	5.77			
Water Content, w (%)	32.37	34.01	35.36			
One-Point LL (%)		34				

Liquid Limit, LL (%)	**34**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**19**





Entered by:____________
Reviewed:____________

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR
Boring No.:
Sample: B3TP-2
Depth: 0-15'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand
Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

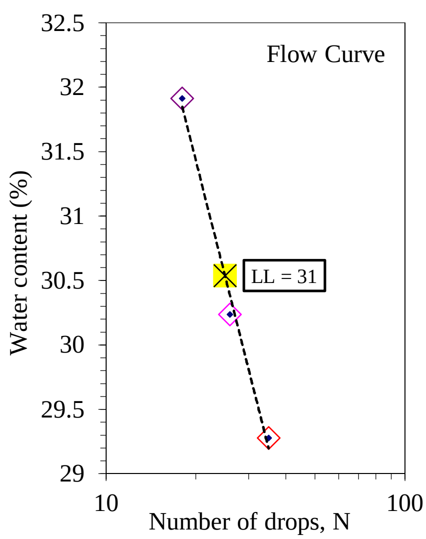
Plastic Limit

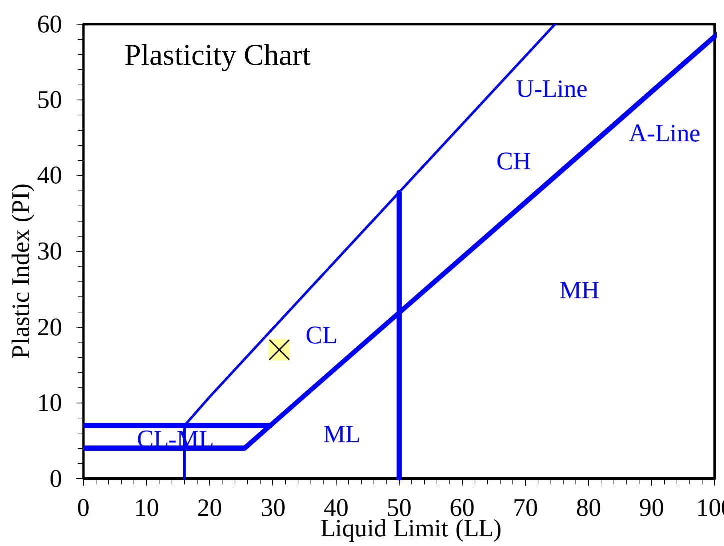
Determination No	1	2				
Wet Soil + Tare (g)	13.77	13.08				
Dry Soil + Tare (g)	12.94	12.34				
Water Loss (g)	0.83	0.74				
Tare (g)	7.05	7.03				
Dry Soil (g)	5.89	5.31				
Water Content, w (%)	14.09	13.94				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	26	18			
Wet Soil + Tare (g)	15.47	14.82	16.03			
Dry Soil + Tare (g)	13.57	13.03	13.86			
Water Loss (g)	1.90	1.79	2.17			
Tare (g)	7.08	7.11	7.06			
Dry Soil (g)	6.49	5.92	6.80			
Water Content, w (%)	29.28	30.24	31.91			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**31**
Plastic Limit, PL (%)	**14**
Plasticity Index, PI (%)	**17**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: BRR
Boring No.:
Sample: B3TP-2
Depth: 15-25'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand
Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

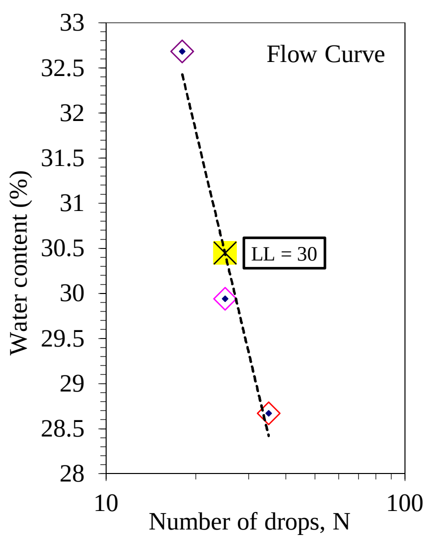
Plastic Limit

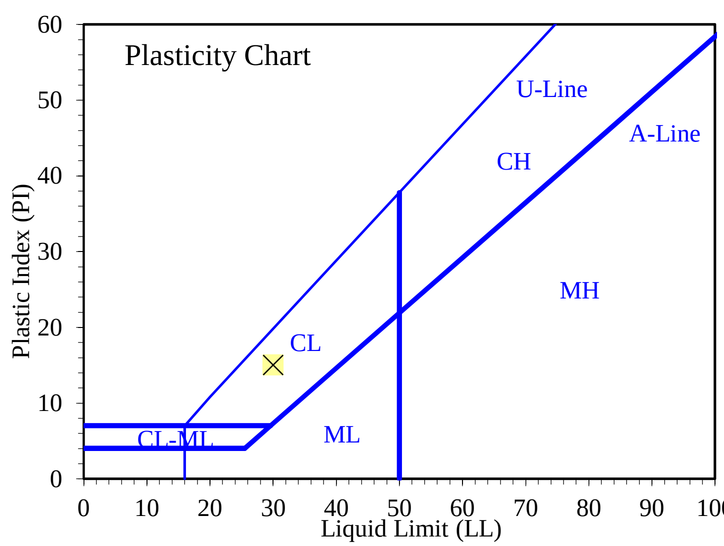
Determination No	1	2				
Wet Soil + Tare (g)	13.81	14.54				
Dry Soil + Tare (g)	12.93	13.56				
Water Loss (g)	0.88	0.98				
Tare (g)	7.03	7.13				
Dry Soil (g)	5.90	6.43				
Water Content, w (%)	14.92	15.24				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	25	18			
Wet Soil + Tare (g)	14.98	16.02	14.94			
Dry Soil + Tare (g)	13.30	14.02	13.10			
Water Loss (g)	1.68	2.00	1.84			
Tare (g)	7.44	7.34	7.47			
Dry Soil (g)	5.86	6.68	5.63			
Water Content, w (%)	28.67	29.94	32.68			
One-Point LL (%)		30				

Liquid Limit, LL (%)	**30**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**15**





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.:
Sample: B3TP-3
Depth: 0-15'
Description: SILT, brown

Preparation method: Wet
Liquid Limit: Could not be determined (N.P.)
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: 3/8"
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

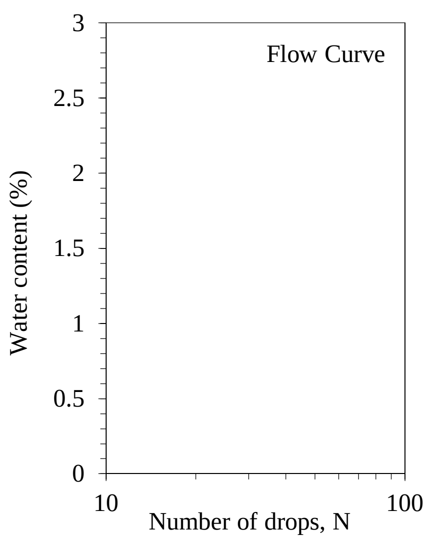
Plastic Limit

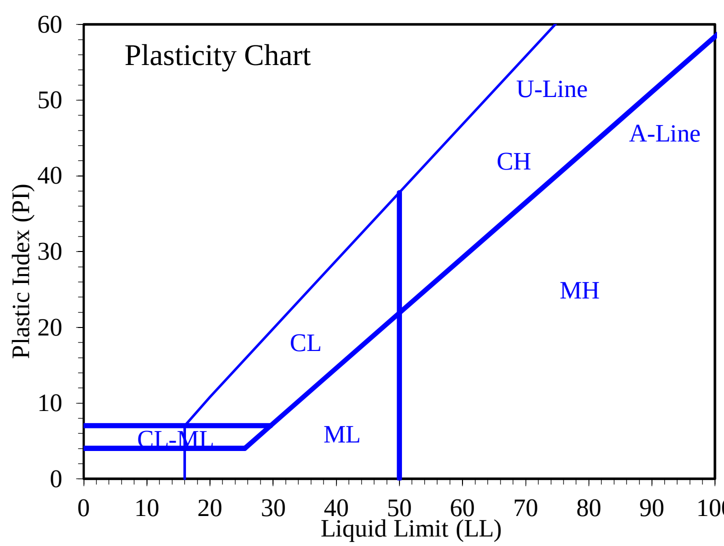
Determination No						
Wet Soil + Tare (g)						
Dry Soil + Tare (g)		Difficult to thread.				
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						

Liquid Limit: Could not be determined (N.P.)

Determination No						
Number of Drops, N						
Wet Soil + Tare (g)	Unable to obtain an adequate blow count.					
Dry Soil + Tare (g)						
Water Loss (g)						
Tare (g)						
Dry Soil (g)						
Water Content, w (%)						
One-Point LL (%)						

Liquid Limit, LL (%)	**Nonplastic (N.P.)**
Plastic Limit, PL (%)	
Plasticity Index, PI (%)	





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Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR

Boring No.:
Sample: B3TP-3
Depth: 15-30'
Description: Lean CLAY, brown

Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.4
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): Not requested

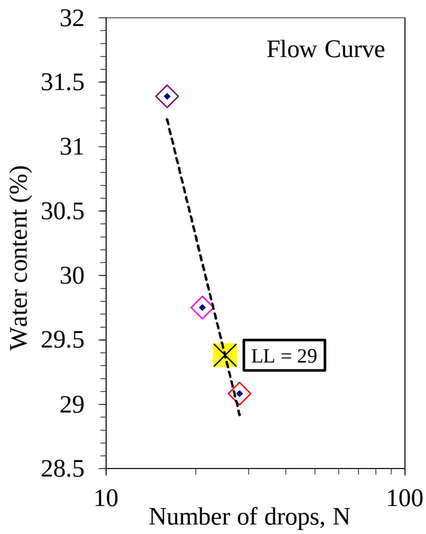
Plastic Limit

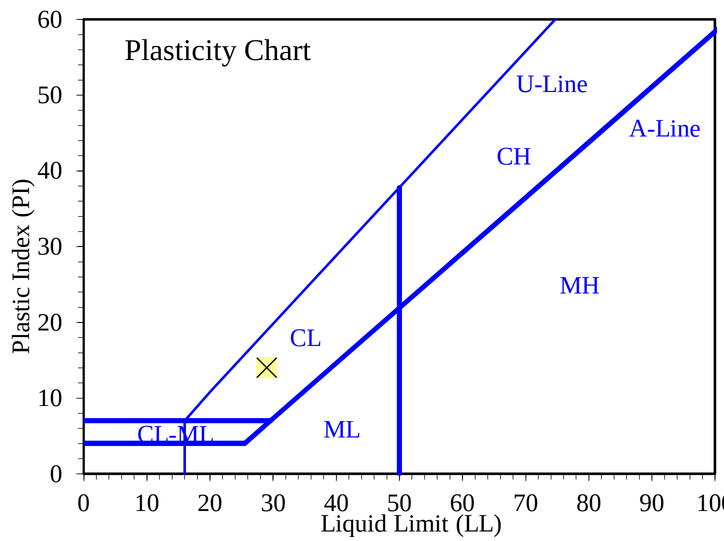
Determination No	1	2				
Wet Soil + Tare (g)	13.22	13.61				
Dry Soil + Tare (g)	12.41	12.75				
Water Loss (g)	0.81	0.86				
Tare (g)	7.12	7.07				
Dry Soil (g)	5.29	5.68				
Water Content, w (%)	15.31	15.14				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	28	21	16			
Wet Soil + Tare (g)	13.54	13.77	17.19			
Dry Soil + Tare (g)	12.08	12.22	14.93			
Water Loss (g)	1.46	1.55	2.26			
Tare (g)	7.06	7.01	7.73			
Dry Soil (g)	5.02	5.21	7.20			
Water Content, w (%)	29.08	29.75	31.39			
One-Point LL (%)	29	29				

Liquid Limit, LL (%)	**29**
Plastic Limit, PL (%)	**15**
Plasticity Index, PI (%)	**14**





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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-1
Depth: 0-10'
Description: Clayey SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9915.5	9258.2
+3/8" Coarse fraction (g):	139.95	137.45
-3/8" Split fraction (g):	368.30	343.63
Hydrometer fraction (g):	65.30	58.84
First Split fraction:	0.985	

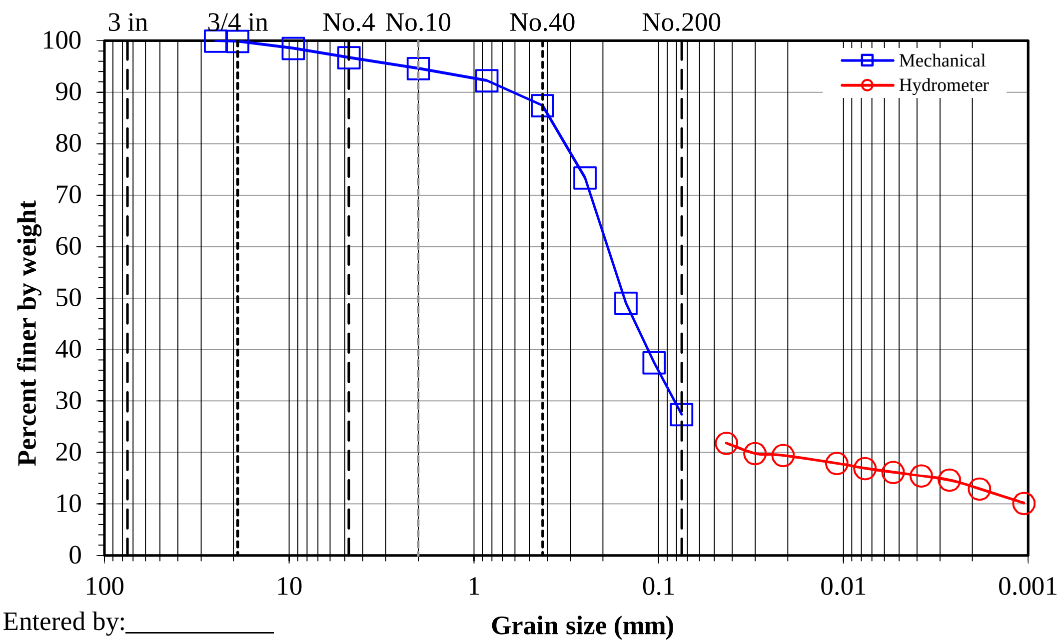
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	264.47	497.11	30.00
Dry soil + tare (g):	261.94	472.44	27.73
Tare (g):	123.06	128.81	7.06
Water content (%):	1.82	7.18	10.98

Hydrometer data
Hyd. split: No.10
Gs: 2.7 Assumed
Bulb No. 6 — Hyd. fraction: 94.65
Cylinder ID: T5 — Dispersion device: Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	100.0	
3/4"	5.88	19	99.9	
3/8"	137.45	9.5	98.5	<=1st Split
No.4	6.25	4.75	96.7	
No.10	13.50	2	94.6	<=Split hyd.
No.20	21.74	0.85	92.3	
No.40	38.63	0.425	87.4	
No.60	87.59	0.25	73.4	
No.100	172.67	0.15	49.0	
No.140	212.92	0.106	37.5	
No.200	247.98	0.075	27.4	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.1	18.5	0.0430	21.83
2	22.1	17.25	0.0301	19.84
4	22.1	17	0.0212	19.44
15	22.2	16	0.0109	17.91
30	21.9	15.5	0.0077	16.94
60	22	15	0.0054	16.20
120	22.1	14.5	0.0038	15.47
240	22.1	14	0.0027	14.67
500	21.9	13	0.0018	12.97
1465	21.9	11.25	0.0011	10.18

Gravel (%): 3.3
Sand (%): 69.3
Fines (%): 27.4



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Description: Lean CLAY with sand, brown

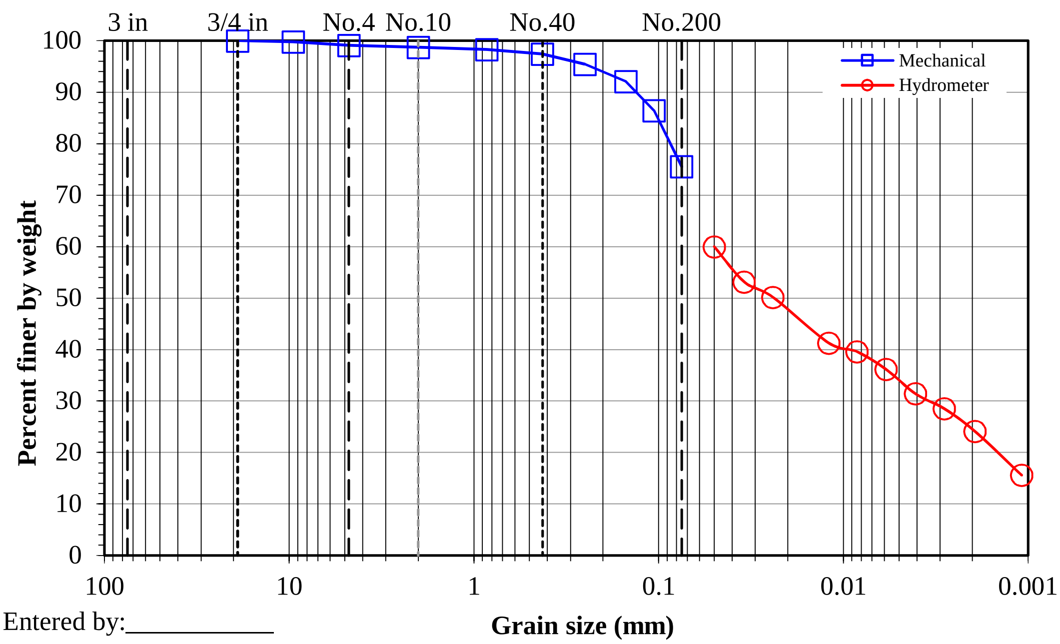
ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9285.1	7989.9
+3/8" Coarse fraction (g):	18.33	17.92
-3/8" Split fraction (g):	308.83	265.68
Hydrometer fraction (g):	65.18	57.28
First Split fraction:	0.998	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	147.79	435.66	25.99
Dry soil + tare (g):	147.33	392.51	23.75
Tare (g):	127.04	126.83	7.50
Water content (%):	2.27	16.24	13.78

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	98.76
Cylinder ID:	N3	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	17.92	9.5	99.8	<=1st Split
No.4	1.82	4.75	99.1	
No.10	2.71	2	98.8	<=Split hyd.
No.20	3.99	0.85	98.3	
No.40	6.25	0.425	97.4	
No.60	11.55	0.25	95.4	
No.100	20.49	0.15	92.1	
No.140	35.48	0.106	86.5	
No.200	64.53	0.075	75.5	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	40	0.0500	59.99
2	22	36	0.0345	53.17
4	22	34.25	0.0241	50.18
15	22.1	29	0.0120	41.30
30	22.1	28	0.0084	39.59
60	22.1	26	0.0059	36.18
120	22	23.25	0.0041	31.43
240	22.1	21.5	0.0028	28.51
494	21.9	19	0.0019	24.12
1458	21.9	14	0.0011	15.60



Gravel (%): 0.9
Sand (%): 23.6
Fines (%): 75.5

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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-2
Depth: 0-15'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	8606.1	7443.4
+3/8" Coarse fraction (g):	4.08	3.99
-3/8" Split fraction (g):	245.05	211.93
Hydrometer fraction (g):	65.51	57.75
First Split fraction:	0.999	

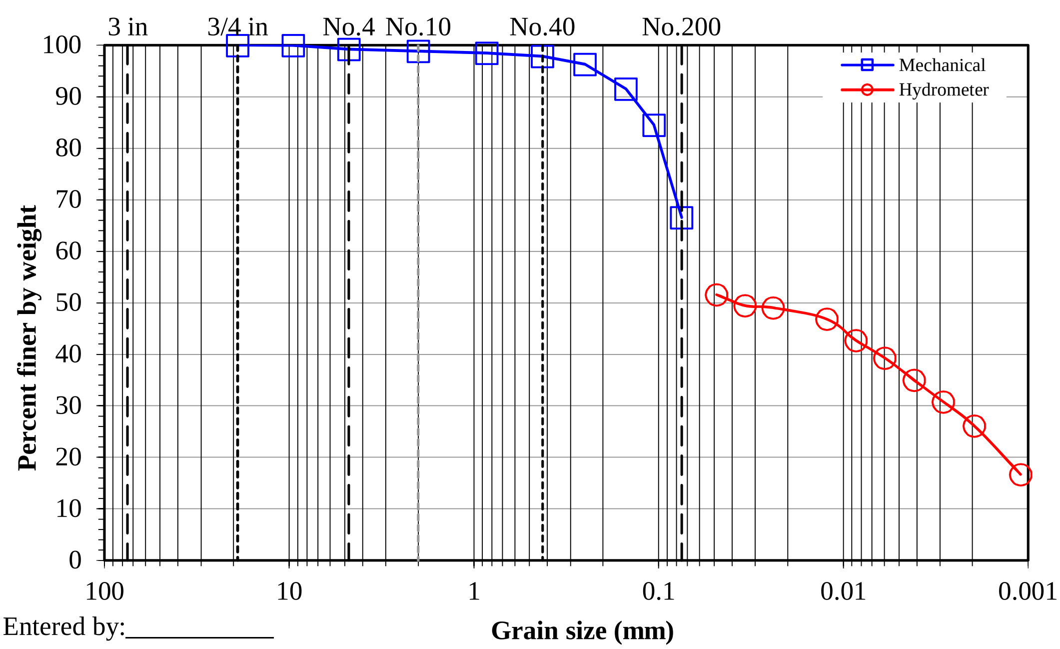
Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	132.04	373.55	35.45
Dry soil + tare (g):	131.95	340.43	32.09
Tare (g):	127.91	128.50	7.10
Water content (%):	2.23	15.63	13.45

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	6	Hyd. fraction:	98.84
Cylinder ID:	N10	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	3.99	9.5	99.9	<=1st Split
No.4	1.58	4.75	99.2	
No.10	2.34	2	98.8	<=Split hyd.
No.20	3.08	0.85	98.5	
No.40	4.48	0.425	97.8	
No.60	7.69	0.25	96.3	
No.100	17.86	0.15	91.5	
No.140	32.70	0.106	84.5	
No.200	70.82	0.075	66.5	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.1	35.25	0.0486	51.58
2	22.1	34	0.0341	49.46
4	22.1	33.75	0.0240	49.04
15	22	32.5	0.0123	46.86
30	22.1	30	0.0086	42.69
60	22.1	28	0.0060	39.31
120	22	25.5	0.0041	35.02
240	22	23	0.0029	30.78
497	22	20.25	0.0020	26.13
1450	21.1	15	0.0011	16.70

Gravel (%): 0.8
Sand (%): 32.7
Fines (%): 66.5



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/9/2020
By: JAB/EH/BRR

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Description: Sandy lean CLAY, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928
Split:	Yes
First Split sieve:	3/8"
Second split:	No

	Moist	Dry
Total sample wt. (g):	8940.3	7903.2
+3/8" Coarse fraction (g):	56.99	54.10
-3/8" Split fraction (g):	261.81	231.33
Hydrometer fraction (g):	61.80	55.36
First Split fraction:	0.993	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	192.03	389.49	28.99
Dry soil + tare (g):	188.63	359.01	26.74
Tare (g):	125.02	127.68	7.41
Water content (%):	5.35	13.18	11.64

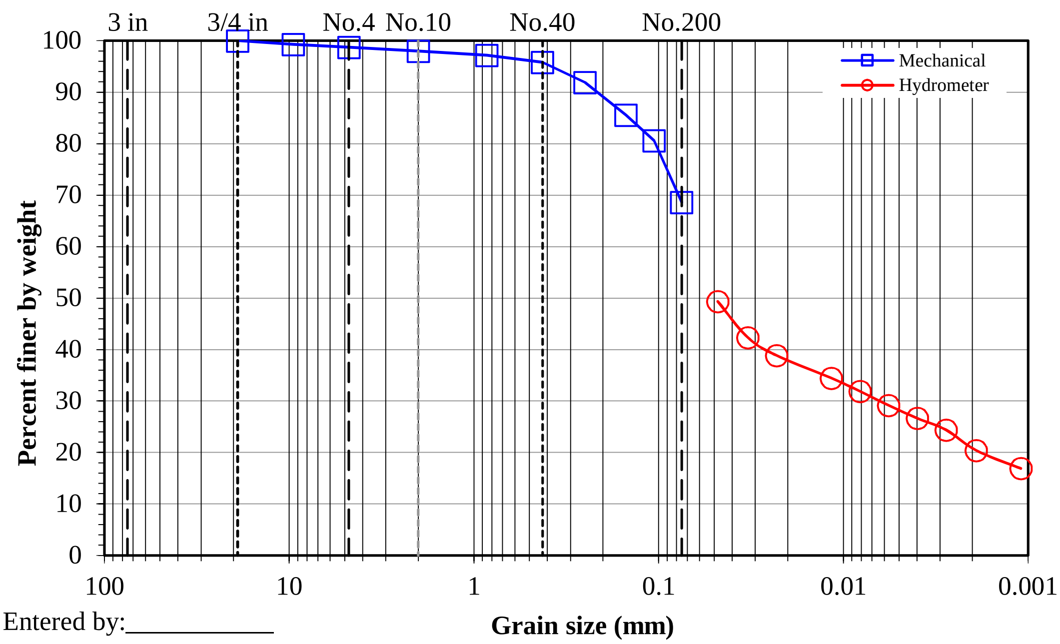
Hydrometer data

Hyd. split:	No.10			
Gs:	2.7	Assumed		
Bulb No.	6		Hyd. fraction:	98.00
Cylinder ID:	T3		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	54.10	9.5	99.3	<=1st Split
No.4	1.37	4.75	98.7	
No.10	3.07	2	98.0	<=Split hyd.
No.20	4.94	0.85	97.2	
No.40	8.21	0.425	95.8	
No.60	17.25	0.25	91.9	
No.100	32.03	0.15	85.6	
No.140	43.64	0.106	80.6	
No.200	71.52	0.075	68.6	

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22	33	0.0478	49.34
2	22	29	0.0329	42.34
4	22	27	0.0229	38.84
15	22	24.5	0.0116	34.46
30	22.1	23	0.0081	31.90
60	21.9	21.5	0.0057	29.15
120	22.1	20	0.0040	26.65
240	22	18.75	0.0028	24.40
492	21.9	16.5	0.0019	20.40
1443	21.9	14.5	0.0011	16.90

Gravel (%): 1.3
Sand (%): 30.1
Fines (%): 68.6



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Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JAB/BRR/EH

Boring No.:
Sample: B3TP-3
Depth: 0-15'
Description: Silty SAND, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	3/8"	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	9290.9	8833.5
+3/8" Coarse fraction (g):	47.94	46.11
-3/8" Split fraction (g):	212.21	201.75
Hydrometer fraction (g):	83.68	80.77
First Split fraction:	0.995	

Water content data	C.F.1(+3/8")	S.F.1(-3/8")	Hyd.(-No.10)
Moist soil + tare (g):	171.32	339.33	49.45
Dry soil + tare (g):	169.45	328.87	48.17
Tare (g):	122.41	127.12	12.64
Water content (%):	3.98	5.18	3.60

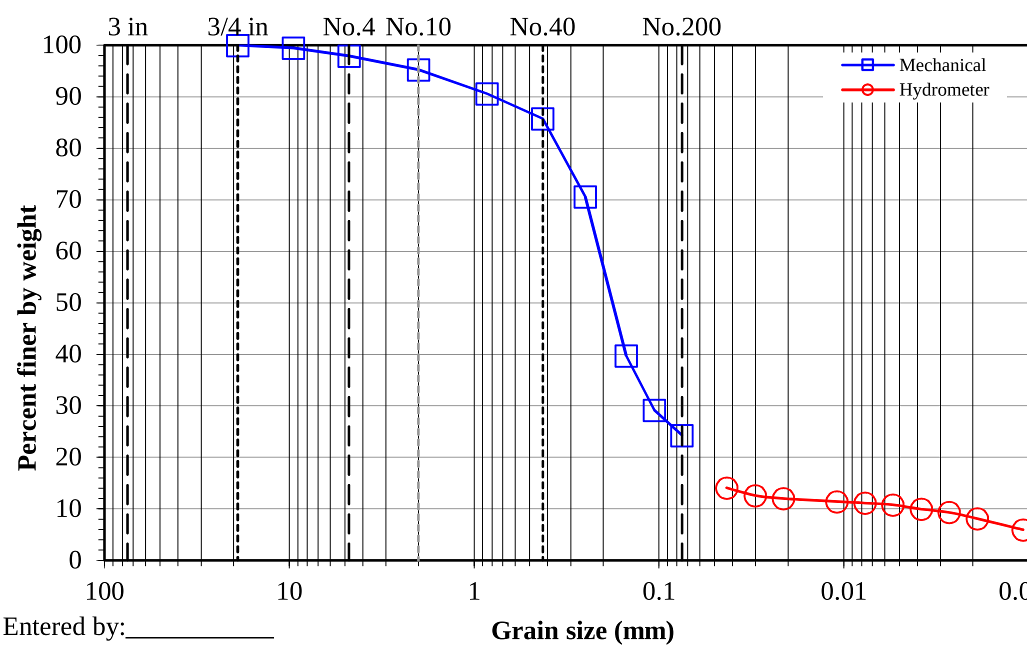
Hydrometer data

Hyd. split:	No.10		
Gs:	2.65	Assumed	
Bulb No.	6	Hyd. fraction:	95.26
Cylinder ID:	N16	Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer		Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
6"		150	-		1	22	16.75	0.0430	14.08
4"		100	-		2	22	15.5	0.0301	12.60
3"		75	-		4	22	15	0.0212	12.01
1.5"		37.5	-		15	22	14.5	0.0109	11.42
1"		25	-		30	22	14.25	0.0077	11.13
3/4"		19	100.0		60	21.9	14	0.0054	10.79
3/8"	46.11	9.5	99.5	<=1st Split	120	22	13.25	0.0038	9.95
No.4	3.18	4.75	97.9		239	21.9	12.75	0.0027	9.32
No.10	8.56	2	95.3	<=Split hyd.	474	21.8	11.75	0.0019	8.10
No.20	18.00	0.85	90.6		1430	21.6	10	0.0011	5.95
No.40	27.85	0.425	85.7						
No.60	58.55	0.25	70.6						
No.100	121.17	0.15	39.7						
No.140	142.63	0.106	29.2						
No.200	152.51	0.075	24.3						

Note: in the printed sheet the hydrometer rows are positioned alongside sieve rows 6" through 3/8"; "<=1st Split" is printed beside the 3/8" row and "<=Split hyd." beside the No.10 row.

Gravel (%): 2.1
Sand (%): 73.6
Fines (%): 24.3



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Reviewed:___________

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP/JAB/EH/BRR

Boring No.:
Sample: B3TP-3
Depth: 15-30'
Description: Lean CLAY with sand, brown

ASTM Standard(s)	ASTM D6913 and ASTM D7928		
Split:	No		
Second split:	No		
	Moist	Dry	
Total sample wt. (g):	260.92	217.49	
Hydrometer fraction (g):	65.96	56.18	

Water content data	S.F.	Hyd.(-No.10)
Moist soil + tare (g):	384.53	47.86
Dry soil + tare (g):	341.10	42.64
Tare (g):	123.61	12.66
Water content (%):	19.97	17.41

Hydrometer data

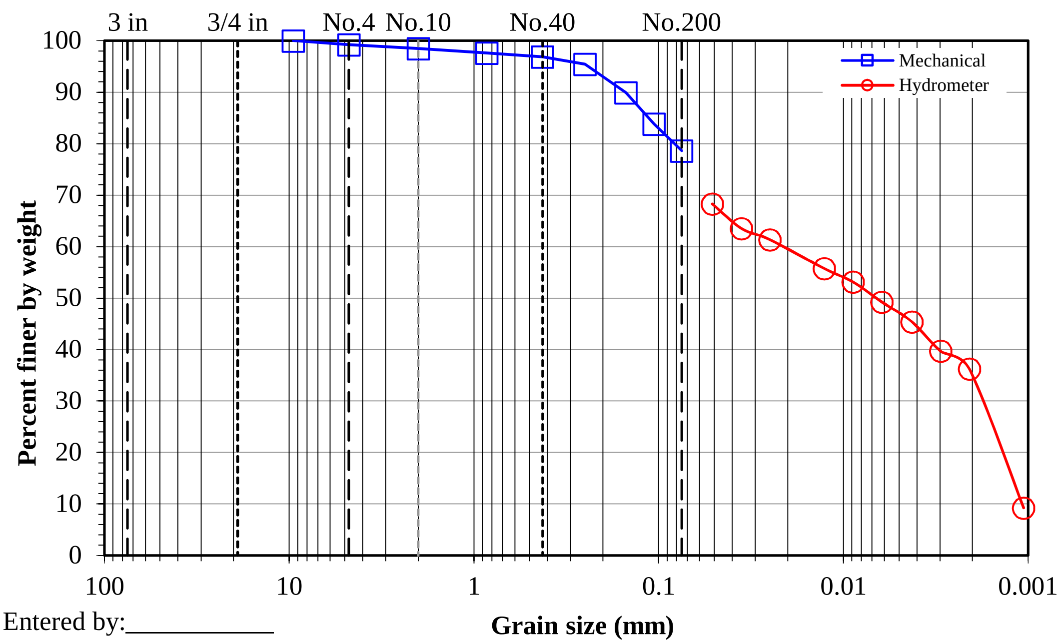
Hyd. split:	No.10			
Gs:	2.7	Assumed		
Bulb No.	6		Hyd. fraction:	98.48
Cylinder ID:	N18		Dispersion device:	Air-jet

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer
6"		150	-
4"		100	-
3"		75	-
1.5"		37.5	-
1"		25	-
3/4"		19	-
3/8"		9.5	100.0
No.4	1.74	4.75	99.2
No.10	3.31	2	98.5
No.20	5.15	0.85	97.6
No.40	6.80	0.425	96.9
No.60	9.89	0.25	95.5
No.100	21.91	0.15	89.9
No.140	35.12	0.106	83.9
No.200	46.50	0.075	78.6

<=Split hyd.

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	21.9	44.25	0.0512	68.30
2	21.9	41.5	0.0357	63.53
4	21.9	40.25	0.0250	61.36
15	21.9	37	0.0127	55.73
30	21.9	35.5	0.0089	53.13
60	21.9	33.25	0.0062	49.23
123	22	31	0.0043	45.39
240	21.9	27.75	0.0030	39.70
478	21.9	25.75	0.0021	36.23
1434	21.7	10.25	0.0011	9.24

Gravel (%): 0.8
Sand (%): 20.6
Fines (%): 78.6



Entered by:___________
Reviewed:___________

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Classification of Soils for Engineering Purposes

(*ASTM D2487*)

IGES

Project: **Stantec**
No: **M00287-022**
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BRR

Sample Info.	Boring No.								
	Sample:	B3TP-1	B3TP-1	B3TP-2	B3TP-2	B3TP-3	B3TP-3		
	Depth:	0-10'	10-20'	0-15'	15-25'	0-15'	15-30'		
Liquid Limit (%):		29	34	31	30	NP	29		
Plastic Limit (%):		17	15	14	15	NP	15		
Plastic Index (%):		12	19	17	15	NP	14		
Gravel (%):		3.3	0.9	0.8	1.3	2.1	0.8		
Sand (%):		69.3	23.6	32.7	30.1	73.6	20.6		
Fines (%):		27.4	75.5	66.5	68.6	24.3	78.6		
D_{60} (mm):									
D_{30} (mm):									
D_{10} (mm):									
Cu:									
Cc:									
Group Symbol:		**SC**	**CL**	**CL**	**CL**	**SM**	**CL**		
Group Name:		**Clayey SAND**	**Lean CLAY with sand**	**Sandy lean CLAY**	**Sandy lean CLAY**	**Silty SAND**	**Lean CLAY with sand**		

Entered by:___________

Reviewed:___________

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Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

(ASTM D2974)

Project: **Stantec**
No: **M00287-022**
Location: IPSC CCR Unit Closures; Delta, UT
Date: 12/31/2019
By: BF/BSS/JAB

Sample Info.	Boring No.								
	Sample:	B1TP-1	B1TP-2	B1TP-3	B2TP-1	B2TP-2	B2TP-3	B3TP-1	
	Depth:	10-15'	10-20'	0-10'	20-25'	0-15'	12-15'	10-20'	
	Test Method:	C	C	C	C	C	C	C	
	Furnace temp. (°C)	440	440	440	440	440	440	440	
Moisture	Wet soil + tare (g)	680.76	630.70	611.32	614.17	599.84	552.15	569.66	
	Dry soil + tare (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Tare (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Ash / Organic Info	Mass of crucible and oven-dried sample (g)	653.03	624.18	585.74	578.80	580.49	525.90	536.95	
	Mass of crucible and ash (g)	648.81	622.08	584.01	572.54	578.24	521.82	530.70	
	Mass of crucible (g)	380.50	375.01	374.87	378.48	374.28	380.26	341.22	
Moisture Content, w (%) [a]		**10.2**	**2.6**	**12.1**	**17.7**	**9.4**	**18.0**	**16.7**	
Ash Content (%)		**98.5**	**99.2**	**99.2**	**96.9**	**98.9**	**97.2**	**96.8**	
Organic Matter (%)		**1.5**	**0.8**	**0.8**	**3.1**	**1.1**	**2.8**	**3.2**	

[a] Moisture contents are by proportion of oven-dried mass (geotechnical convention).

Entered by:___________

Reviewed:___________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B3TP-1
Depth: 10-20'
Sample Description: Lean CLAY with sand, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	142.03	
Dry soil + tare (g)	139.46	
Tare (g)	123.63	
Water content, w (%)	16.2	

Initial water temperature: 19.0 °C
Date test started: 12/27/2019
Time at beginning of test: 10:22

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	19.0	1	18.4	1	18.0
2	1	19.0	1	18.4	1	18.0

Dispersive classification: Grade 1-Nondispersive

Entered: ________
Reviewed: ________

DETERMINING DISPERSIVE CHARACTERISTICS OF CLAYEY SOILS BY THE CRUMB TEST

IGES

(ASTM D6572)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: JP

Boring No.:
Sample: B3TP-2
Depth: 15-25'
Sample Description: Sandy lean CLAY, brown
Engineering Classification: CL
Specimen Type: Natural irregularly shaped crumb

Specific Gravity, Gs:	2.65	Assumed
Curing Time:	0	minutes
Water used:	Distilled	
Water content:	Air-dried	
Wet soil + tare (g)	178.14	
Dry soil + tare (g)	169.56	
Tare (g)	114.72	
Water content, w (%)	15.6	

Initial water temperature: 18.9 °C
Date test started: 12/27/2019
Time at beginning of test: 10:24

Specimen Number	2 minutes		1 hour		6 hours	
	Grade	Temp. (°C)	Grade	Temp. (°C)	Grade	Temp. (°C)
1	1	18.9	1	18.3	1	18.0
2	1	18.9	1	18.3	1	18.0

Dispersive classification: Grade 1-Nondispersive

Entered: ________
Reviewed: ________

Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

IGES

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Closures; Delta, UT
Date: 1/10/2020
By: BSS

Sample: B3TP-1 & B3TP-2 & B3TP-3
Depth: 10-30'
Sample Description: Sandy lean CLAY, brown
Engineering Classification: CL
As-received water content (%): Not requested

Method: ASTM D698 B
Mold Id. Inc 3
Mold volume (ft^3): 0.0332

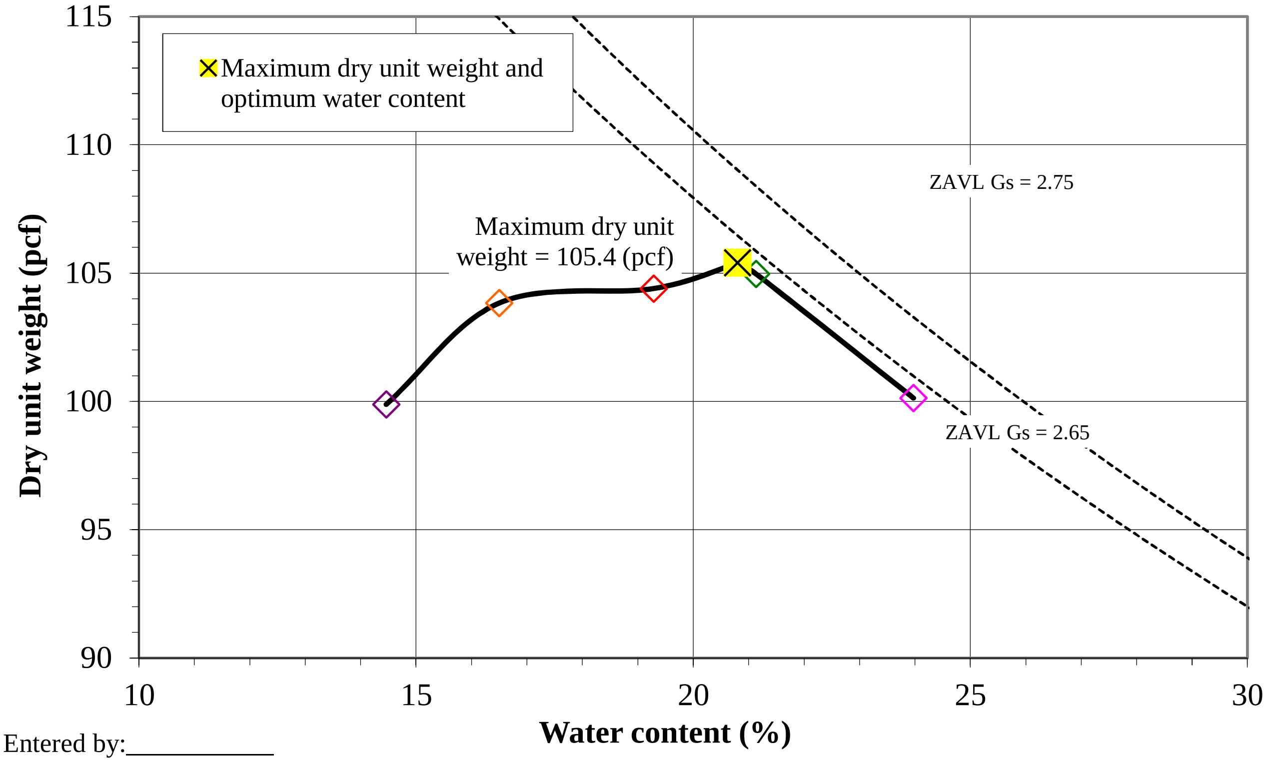
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Optimum water content (%): 20.8
Maximum dry unit weight (pcf): 105.4

Point Number	-2%	+2%	+4%	+6%	As Is			
Wt. Sample + Mold (g)	5945.2	6099.0	6138.5	6093.1	6045.3			
Wt. of Mold (g)	4221.2	4221.2	4221.2	4221.2	4221.2			
Wet Unit Wt., γ_m (pcf)	114.3	124.5	127.2	124.1	121.0			
Wet Soil + Tare (g)	971.48	1138.75	1103.65	1005.38	941.90			
Dry Soil + Tare (g)	890.21	990.52	948.61	852.61	840.16			
Tare (g)	328.25	221.93	215.02	215.35	223.51			
Water Content, w (%)	**14.5**	**19.3**	**21.1**	**24.0**	**16.5**			
Dry Unit Wt., γ_d (pcf)	**99.9**	**104.4**	**105.0**	**100.1**	**103.8**			

Comments:

Test specimen consisted of material from B3TP-1 @ 10-20', B3TP-2 @ 15-25', and B3TP-3 @ 15-30'. Due to insufficient sample quantity, points +4%, +6%, and As Is contained previously compacted material .



Entered by:___________

Reviewed:___________

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Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

Project: Stantec
No: M00287-022
Location: IPSC CCR Unit Clousres; Delta, UT
Date: 1/15/2020
By: EH

Boring No.:
Sample: B3TP-1, B3-TP-2, & B3TP-3
Depth: 10-30'
Sample Description: Sandy lean CLAY, brown
Sample Type: Laboratory Compacted
Compaction Specifications: 95 (%) Dry unit weight at 20.8 (%) w

	Initial (o)	Final (f)
Sample Height, H (in)	2.994	2.988
Sample Diameter, D (in)	2.413	2.400
Sample Length, L (cm)	7.605	7.589
Sample Area, A (cm^2)	29.503	29.195
Sample Volume, V (cm^3)	224.37	221.55
Wt. Rings + Wet Soil (g)	435.45	452.38
Wt. Rings (g)	0	0
Wet Unit Wt., γ_m (pcf)	121.2	127.5
Wet Soil + Tare (g)	292.31	578.61
Dry Soil + Tare (g)	263.64	486.29
Tare (g)	127.12	127.15
Weight of solids, Ws (g)	359.87	359.87
Water Content, w (%)	21.00	25.71
Dry Unit Wt, γ_d (pcf)	100.1	101.4
Void ratio, e, for assumed Gs	0.68	0.69
Saturation (%), for assumed Gs	83.0	100 [a]
Average K[b] (cm/sec)	**1.5E-05**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Optimum water content (%)	20.8
Maximum dry unit weight (pcf)	105.4
Gs	2.7 Assumed
Cell No.	2
Station No.	3
Permeant liquid used	De-aired tap water
Total backpressure (psi)	35
Effective horiz. consolidation stress (psi)	3
Effective vert. consolidation stress (psi)	3

	Initial (o)	Final (f)
B value	0.58	0.96
External Burette (cm^3)	14.90	23.70
Cell Pressure (psi)	0.0	38.0

Backpressure bottom (psi)	35.0
Backpressure top (psi)	35.0
System volume coefficient (cm^3/psi)	0.158
System volume change (cm^3)	5.99
Net sample volume change (cm^3)	-2.81
Bottom burette ground length, l_b (cm)	82.25
Top burette ground length, l_t (cm)	81.95
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.076

Start Date and Time: 1/14/20 16:34

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_T	K[b] (cm/sec)
30.0	1.21 1.27	8.66 8.59	38.14	37.46	1.5E-05	23.5 23.5	0.92	1.4E-05
30.0	1.27 1.34	8.59 8.52	37.46	36.75	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.34 1.41	8.52 8.45	36.75	36.06	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.41 1.47	8.45 8.38	36.06	35.38	1.6E-05	23.5 23.5	0.92	1.5E-05
30.0	1.47 1.55	8.38 8.31	35.38	34.61	1.9E-05	23.5 23.5	0.92	1.7E-05

Comments:
Test specimen was remolded to 95% of ASTM D698 B (which inlcuded combined material from B3TP-1 @ 10-20', B3TP-2 @ 15-25', and B3TP-3 @ 15-30') at optimum water content. Test specimen comprised of combined material.

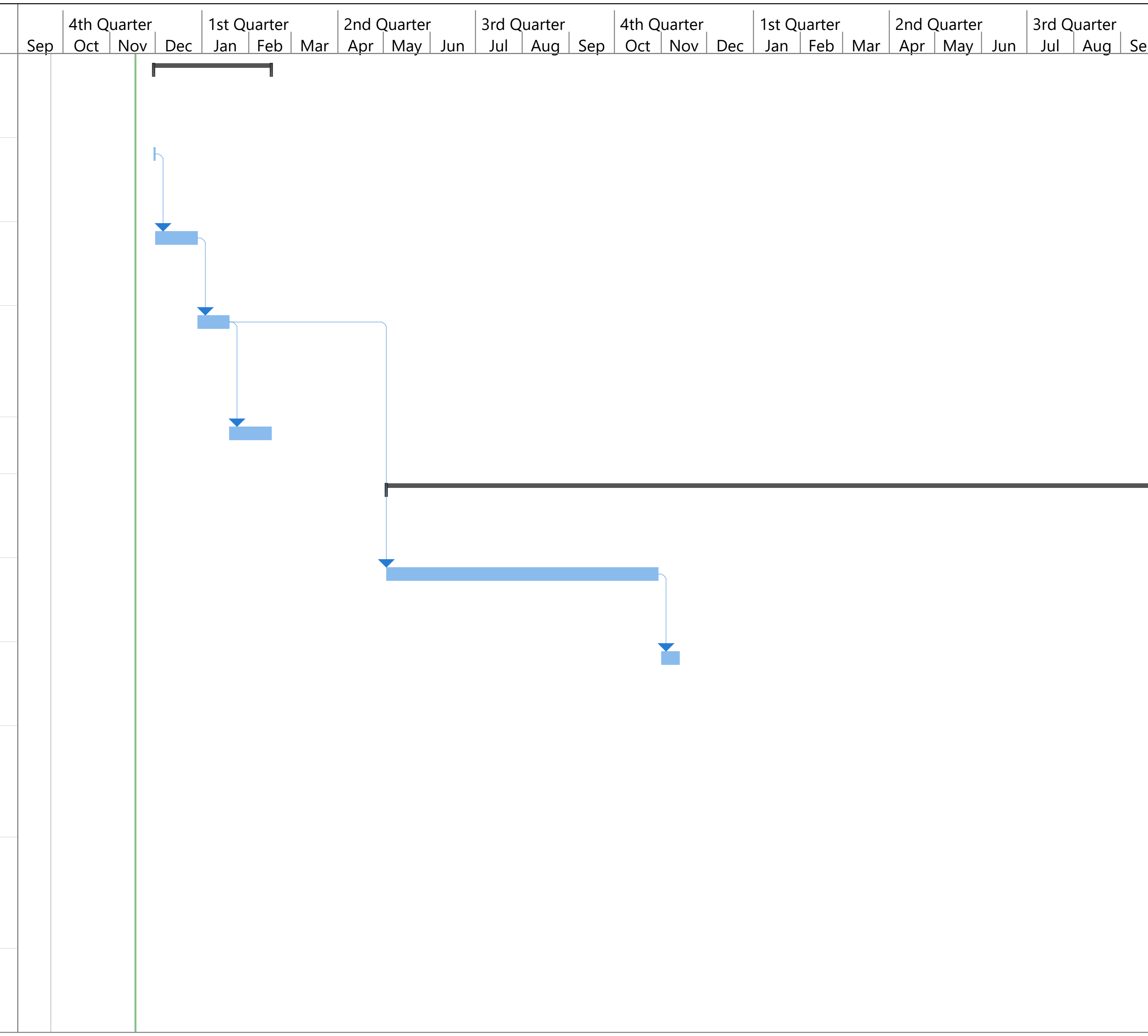
Entered by:___________
Reviewed:___________

Appendix E

Closure Schedule

CB Landfill Closure Schedule

ID		Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1			**Closure Plan**	**56 days?**	**Mon 11/30/20**	**Mon 2/15/21**		
2			Submit CB Landfill Closure Plan to UDEQ	1 day?	Mon 11/30/20	Mon 11/30/20		
3			UDEQ Review	20 days	Tue 12/1/20	Mon 12/28/20	2	
4			Revise and Submit CB Landfill Closure Plan per UDEQ Review	15 days	Tue 12/29/20	Mon 1/18/21	3	
5			UDEQ Approval of Closure Plan	20 days	Tue 1/19/21	Mon 2/15/21	4	
6			**CB Landfill Closure**	**1445 days**	**Mon 5/3/21**	**Fri 11/13/26**		
7			Cover Installation on Eastern Portion of Landfill	130 days	Mon 5/3/21	Fri 10/29/21	4	
8			Seeding of Eastern Portion of Landfill Cover	10 days	Mon 11/1/21	Fri 11/12/21	7	
9			Cover Installation on Western Portion of Landfill (first season)	88 days	Tue 7/1/25	Thu 10/30/25		
10			Cover Installation on Western Portion of Landfill (second season)	30 days	Mon 5/4/26	Fri 6/12/26	9	
11			Seeding of Western Portion of Landfill Cover	10 days	Mon 11/2/26	Fri 11/13/26	9	



Project: CB Landfill Closure Sch
Date: Wed 11/18/20

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

CB Landfill Closure Schedule

Project: CB Landfill Closure Sch
Date: Wed 11/18/20

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	