
To: Intermountain Power Service Corporation
Delta, Utah

From: John Russell
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File:

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Reference: Establishment of Assessment Monitoring

This memo establishes an Assessment Monitoring Program for each of the three (3) Coal Combustion Residual (CCR) units at the Intermountain Power Plant, specifically including:

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

As part of the CCR Rule, CCR unit operators were required to install ground water monitoring networks to assess potential impacts to ground water quality downgradient of CCR units. Ground water quality data collected from the network were to be assessed statistically to: 1) Determine background concentrations, 2) Detection Monitoring - identify statistically significant increases (SSIs) over background for Appendix III analytes and, if any exceedance, then 3) Assessment Monitoring – sample Appendix IV analytes and identify if any SSIs, as well as establish ground water protection standards (GWPS).

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 CCR-regulated units, as detailed in IPSC's November 2015 CCR Unit Monitoring Well Design and Installation Summary Report. During late-October 2015, IPSC initiated its CCR Unit-specific, monitoring, sampling, and analysis program for background and down-gradient, monitoring wells, as outlined in IPSC's November 2015 Ground Water Sampling and Analysis Plan. IPSC completed eight (8) independent sampling events from each background and downgradient monitoring wells by October 17, 2017.

Statistical analyses for the first eight sampling events were conducted consistent with Code of Federal Regulations (CFR) Rule 257.90-257.94 using the United States Environmental Protection Agency's (USEPA) ProUCL software version 5.1.00 and spreadsheet tools where appropriate.

Statistical analyses associated with each of the three separate CCR Units consisted of:

- Laboratory analytical data organization and reduction
- Preparation of plots of constituent concentrations versus time from each monitoring well within the network;
- Testing statistical assumptions of normality, seasonality, and presence of outliers; and
- Statistical analysis of each of the constituents to determine 'upper limits' (Upper Prediction Limits for Appendix III constituents).

Upper Prediction Limits (UPLs) are statistics calculated using historical background data from up-gradient wells (e.g. data from the initial eight rounds of sampling). UPLs represent a statistical tool to identify potential SSIs in downgradient wells. During the Detection Monitoring phase, constituent concentrations in downgradient wells are compared to the UPL; an exceedance is potential evidence of an SSI.

Conclusions based on the following analyses should be made with caution; the eight rounds of sampling were conducted for the purpose of establishing background conditions only. The results of the preliminary statistical analyses from each area are presented below.

Combustion By-Product Landfill Area

The monitoring well network representing the Combustion By-Product Landfill area consists of two up-gradient monitoring wells (CLU-1 and CLU-2) and eight down-gradient monitoring wells (CLW-1, CLW-2, CLW-3, CLW-4, CLW-5, CLW-6, CLW-7 and CLW-8).

Based on preliminary statistical analyses of eight rounds of ground water monitoring:

- Down-gradient wells exhibited concentrations that exceeded the associated UPL for two Appendix III constituents: Fluoride (wells CLW-3, 4, and 5) and pH (wells CLW-1, 3, 4, 5, 6, and 7).

Bottom Ash Basin Area

The monitoring well network representing the Bottom Ash Basin Area consists of two up-gradient monitoring wells (BAU-1 and BAU-2), and seven down-gradient monitoring wells (BAC-1, BAC-2, BAC-3, BAC-4, BAC-5, BAC-6 and BAC-7).

Based on preliminary statistical analyses of eight rounds of ground water monitoring:

- Down-gradient wells exhibited concentrations that exceeded the associated UPL for six Appendix III constituents: Boron (wells BAC-1, 2, 3, 6, and 7), Calcium (well BAC-3), Chloride (BAC-1, 2, and 3), Fluoride (wells BAC-2, 3, 4, 5, and 7), Sulfate (wells BAC-1 through 7), and TDS (wells BAC-1, 2, 3, and 7).

Wastewater Holding Basin Area

The monitoring well network representing the Wastewater Holding Basin Area consists of two up-gradient monitoring wells (WWU-1 and WWU-2), and five down-gradient monitoring wells (WWC-1, WWC-2, WWC-3, WWC-4 and WWC-5). Ground water monitoring data collected from up-gradient, monitoring well SIU-1 was not used for statistical analysis based on results of statistical tests that indicated significant differences in characteristics of SIU-1 and the other up-gradient wells.

Based on preliminary statistical analyses of eight rounds of groundwater monitoring:

- Down-gradient wells exhibited concentrations that exceeded the associated UPL for seven Appendix III constituents: Boron, Calcium, and Sulfate (wells WWC-1 and 5), Chloride (well WWC-1), Fluoride (wells WWC-2 and 3), pH (wells WWC-2, 3, and 4), and TDS (well WWC-1).

In summary, preliminary statistical analyses indicate potential SSI exceedances of certain Appendix III constituents associated with each of the three CCR Units. Therefore, IPSC has established an Assessment Monitoring Program at each of the three CCR Units in accordance with §257.94(e)(1) and IPSC's November 2015 Ground Water Sampling and Analysis Plan. All purging, sampling, and QA/QC protocol will be administered as specified by §257.95.

During Assessment Monitoring, IPSC will establish Ground Water Protection Standards (GWPSs) for Appendix IV constituents. UTLs represent a statistical tool to establish site-specific, ground water protection standards for each Appendix IV constituent. The GWPS is the greater of the USEPA Maximum Contaminant Level (MCL) or background concentration, represented by the UTL. If no MCL is published for a given constituent, the GWPS is set at the UTL.