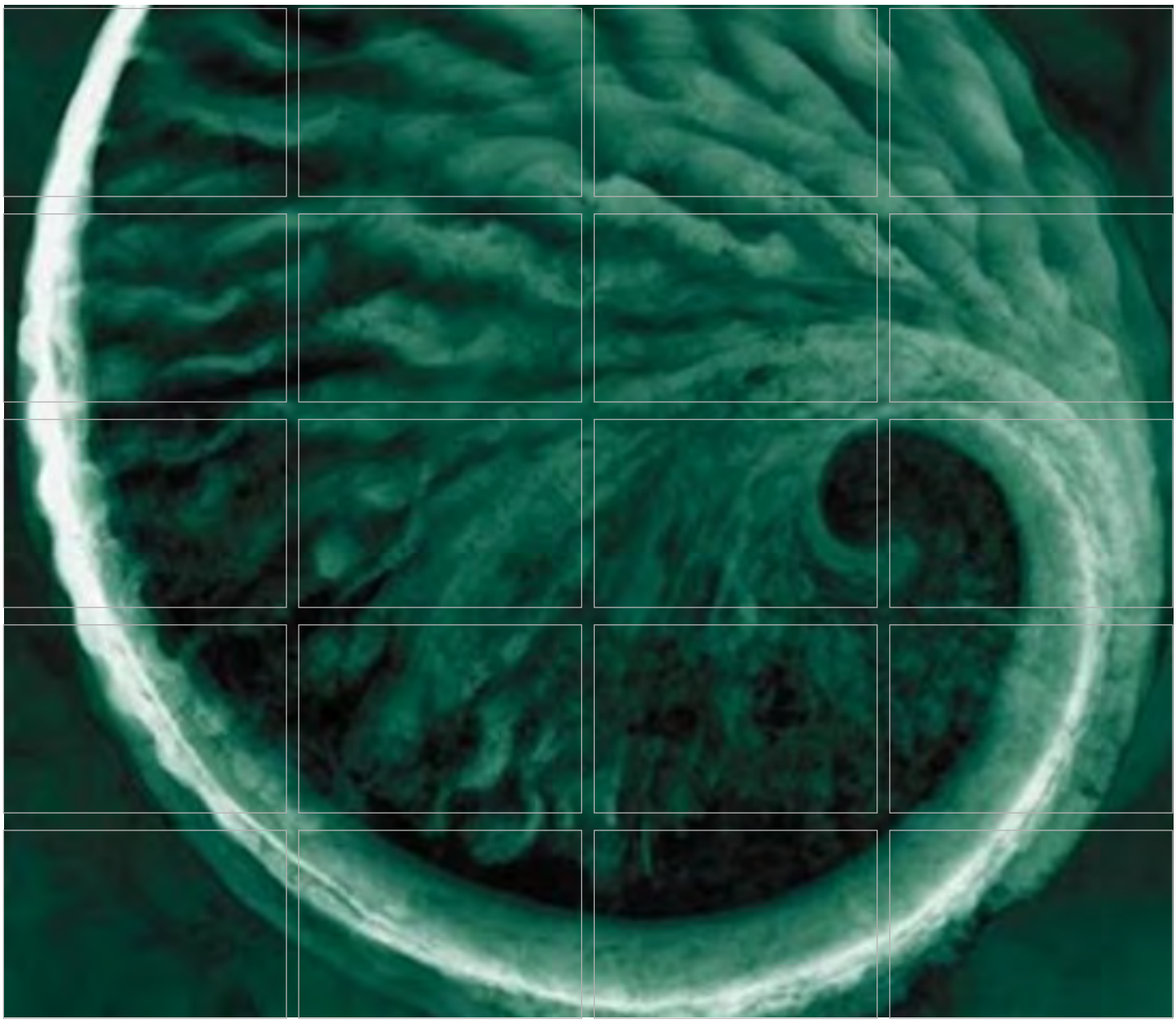

Annual Groundwater Monitoring and Corrective Action Report

CPS Energy
Calaveras Power Station – Fly Ash Landfill
San Antonio, Texas

January 2020

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Calaveras Power Station – Fly Ash Landfill

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January 2020

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1. INTRODUCTION

CPS Energy owns and operates the Calaveras Power Station which consists of two power plants (J.T Deely and J.K. Spruce) that are subject to regulation under Title 40, Code of Federal Regulations, Part 257 (40 CFR §257) (a.k.a. the CCR Rule). The Power Station is located in unincorporated Bexar County, Texas, approximately 13 miles southeast of San Antonio. Currently, CPS Energy operates three CCR units at the Power Station: Evaporation Pond, Fly Ash Landfill, and the Sludge Recycle Holding (SRH) Pond. This *Annual Groundwater Monitoring and Corrective Action Report* (Report) only addresses the Fly Ash Landfill.

This Report was produced by Environmental Resource Management (ERM), on behalf of CPS Energy, and summarizes the groundwater monitoring activities for the Fly Ash Landfill and provides a statistical summary of the findings for samples collected during the 2019 semi-annual monitoring events. Consistent with the requirements of the CCR Rule, this Report will be posted to the facility's operating record and notification will be made to the State of Texas. Additionally, this Report will be placed on the CPS Energy publically accessible internet site. Unless otherwise mentioned, the analyses in this Report follow the *Groundwater Sampling and Analysis Program* (SAP) (ERM, 2017) posted on the internet site. The table below cross references the reporting requirements under the CCR Rule with the contents of this Report.

Regulatory Requirement Cross-Reference

Regulatory Citation	Requirement (paraphrased)	Where Addressed in this Report
§257.90(e)	Status of the groundwater monitoring and corrective action program	Section 2
§257.90(e)	Summarize key actions completed	Section 2
§257.90(e)	Describe any problems encountered and actions to resolve problems	Section 2
§257.90(e)	Key activities for upcoming year	Section 4
§257.90(e)(1)	Map or aerial image of CCR unit and monitoring wells	Figure 1
§257.90(e)(2)	Identification of new monitoring wells installed or decommissioned during the preceding year	Section 2
§257.90(e)(3)	Summary of groundwater data, monitoring wells and dates sampled, and whether sample was required under detection or assessment monitoring	Sections 2 and 3, Tables 1 through 3, and Figure 2
§257.90(e)(4)	Narrative discussion of any transition between monitoring programs	Section 4

The Fly Ash Landfill is located northeast of the Power Station generating units and is north of the Evaporation Pond. The Fly Ash Landfill currently receives fly ash, bottom ash, economizer ash, scrubber sludge from flue gas desulphurization ponds, and flue gas desulphurization gypsum. The Fly Ash Landfill was constructed in 1992. The CCR unit location is shown on Figure 1.

2. PROGRAM STATUS

From December 2016 to October 2017, groundwater samples were collected as part of background sampling. After October 2017, groundwater samples were collected as part of detection monitoring. The samples were collected from the groundwater monitoring well network certified for use in determining compliance with the CCR Rule.

The groundwater monitoring well network consists of two upgradient monitoring wells (JKS-45 and JKS-57) and four downgradient monitoring wells (JKS-31, JKS-33, JKS-46, and JKS-60). All monitoring wells are screened within the uppermost groundwater bearing unit (GWBU). The uppermost GWBU is approximately 5 to over 25 feet thick and is comprised of clayey/silty sand to well-sorted sand. The uppermost GWBU is located below unconsolidated material (i.e., sands, silts, and low to medium plasticity clays), and above a high plasticity clay (lower confining unit).

The monitoring well locations are shown in Figure 1. No problems were encountered in the data collection or in well performance, and no action was required to resolve any issues. No new monitoring wells were installed or decommissioned after the certification of the well network.

2.1. GROUNDWATER FLOW RATE AND DIRECTION

Depth to groundwater surface measurements were made at each monitoring well prior to sampling. Groundwater elevations were calculated by subtracting the depth to groundwater measurement from the surveyed reference elevation for each well.

Groundwater elevations collected during the monitoring events are summarized in Table 1. Groundwater elevations and the potentiometric surface for the most recent monitoring event (October 2019) are shown on Figure 2. Groundwater in the vicinity of the Fly Ash Landfill appears to flow towards Lake Calaveras (east to northeast). The horizontal gradient is approximately 0.008 feet/foot.

2.2. SAMPLING SUMMARY

A summary of the total number of samples collected from each monitoring well is provided in Table 2. Groundwater analytical results from the monitoring events are summarized in Table 3. Laboratory data packages are provided in Appendix A.

The Fly Ash Landfill monitoring wells were sampled by CPS Energy using low flow sampling techniques during the monitoring events. No data gaps were identified during the 2019 semi-annual groundwater monitoring events.

2.3. DATA QUALITY

ERM reviewed field and laboratory documentation to assess the validity, reliability and usability of the analytical results. Samples were sent to Xenco Laboratories, located in San Antonio, Texas for analysis. Data quality information reviewed for these results included field sampling forms, chain-of-custody documentation, holding times, lab methods, cooler temperatures, laboratory method blanks, laboratory control sample recoveries, field duplicate samples, matrix spikes/matrix spike duplicates, quantitation limits, and equipment blanks. A summary of the data qualifiers are included in Table 3. The data quality review found the

results to be valid, reliable, and useable for decision making purposes with the listed qualifiers. No analytical results were rejected.

3. STATISTICAL ANALYSIS AND RESULTS

Consistent with the CCR Rule and the SAP, a prediction limit approach [40 CFR §257.93(f)] was used to identify potential impacts to groundwater. Tables and figures generated as part of the statistical analysis are provided in Appendix B. The steps outlined in the decision framework in the SAP include:

- Interwell versus intrawell comparisons;
- Establishment of upgradient dataset;
- Calculation of prediction limits; and
- Conclusions.

The remaining sections of this Report are focused on evaluation of the October 2019 sampling results. Note the April 2019 sampling results were evaluated as discussed in the *April 2019 Groundwater Sampling Event – Calaveras Power Station CCR Units* (ERM, 2019) provided in Appendix C.

3.1. INTERWELL VERSUS INTRAWELL COMPARISONS

When multiple upgradient wells were available within the same unit, concentrations were compared among these wells to determine if they could be pooled to create a single, interwell, upgradient dataset. For each analyte, Boxplots (Appendix B, Figure 1) and Kruskal-Wallis test results (Appendix B, Table 1) are provided for upgradient wells. The statistical test shows that:

- One Appendix III analyte [chloride] will follow interwell analysis, with no significant differences present in upgradient data; and
- The remaining six Appendix III analytes [boron, calcium, fluoride, pH, sulfate, and total dissolved solids (TDS)] will follow intrawell analysis, with significant differences present in upgradient data.

Interwell analytes will use a pooled upgradient dataset for subsequent report sections. Conversely, intrawell analytes will have each individual upgradient dataset used for subsequent report sections.

3.2. ESTABLISHMENT OF UPGRADIENT DATASET

When evaluating the concentrations of analytes in groundwater, USEPA Unified Guidance (2009) recommends performing a careful quality check of the data to identify any anomalies. In addition to the data validation that was performed, descriptive statistics, outlier testing, and temporal stationarity checks were completed to finalize the upgradient dataset.

3.2.1. Descriptive Statistics

Descriptive statistics were calculated for the upgradient wells and analytes at the Fly Ash Landfill (Appendix B, Table 2). The descriptive statistics highlight a number of relevant characteristics about the upgradient datasets including:

- There are a total of 13 well-analyte combinations for the upgradient dataset;
- 13 well-analyte combinations have detection rates greater than or equal to 50 percent;
- 11 well-analyte combinations have 100 percent detects;
- Six well-analyte combinations follow a normal distribution (using Shapiro-Wilks Normality Test);
- One well-analyte combination follows a log-normal distribution; and
- Six well-analyte combinations have no discernible distribution.

3.2.2. Outlier Determination

Both statistical and visual outlier tests were performed on the upgradient datasets. Data points identified as both a statistical and visual outliers (Appendix B, Table 3 and Appendix B, Figure 2) were reviewed before they were excluded from the dataset. A total of five potential outliers were initially flagged in the upgradient datasets. After review, it was determined that four of the five values were consistent with seasonal fluctuations and concentrations detected in other upgradient wells or in historical groundwater sampling results. No analytical or sampling issues were identified for four potential outliers during data review; therefore, the four values were considered valid and were retained for upper prediction limit (UPL) calculations.

3.2.3. Check for Temporal Stability

A trend test was performed for all values in the upgradient wells that had at least eight detected data points and at least 50 percent detection rate. Time series figures of upgradient wells are provided in Appendix B, Figure 3. Additionally, the Mann Kendall trend test results are provided in Appendix B, Table 4. The following summarize the results of the trend analysis:

- There are a total of 13 well-analyte combinations in the upgradient dataset;
- 13 well-analyte combinations meet the data requirements of the trend test of which:
    - Four well-analyte combinations had a significant increasing trend;
    - No well-analyte combinations had a significant decreasing trend; and
    - Nine well-analyte combinations had no significant trend (i.e., concentrations were stable over time).

3.3. CALCULATION OF PREDICTION LIMITS

A multi-part assessment of the monitoring wells was performed to determine what type of UPL to calculate as a compliance point. A decision framework was applied for each upgradient well based on inter/intrawell analysis, data availability, and presence of temporal trends.

Upgradient wells that had fewer than eight detected values had a UPL based on the maximum concentration of the upgradient dataset. The single well-analyte combination that did not meet the minimum data requirements for a calculated UPL was fluoride in well JKS-45.

A total of four well-analyte combinations were found to have either increasing or decreasing trends. For these well-analyte combinations, a bootstrapped UPL calculated around a Theil Sen trend was used to derive a more accurate UPL. The remaining nine well-analyte combinations were found to have no significant trend. Sanitas was used to calculate static UPLs using an annual site-wide false positive rate of 0.1 with a 1-of-2 re-testing approach.

A final UPL was selected for each analyte and compared to the October 2019 sampling results in the downgradient wells. A final lower prediction limit (LPL) was also selected for pH. For the one analyte following interwell analysis, the upgradient dataset was pooled prior to UPL calculations, resulting in a single UPL value per analyte. For the six analytes following intrawell analysis, a UPL value was calculated for each of the upgradient wells. For these wells and analytes, the maximum UPL was selected as the representative UPL for each analyte. A similar approach was used to determine the LPL for pH; however, the minimum LPL was selected in the case of intrawell analysis. All final UPL and LPL values are shown in the table below. Full upgradient well calculations are provided in Appendix B, Table 5.

Final UPL and LPL Values

Analysis Type	Analyte	LPL	UPL	Unit
Intrawell	Boron	--	4.29	mg/L
Intrawell	Calcium	--	583	mg/L
Interwell	Chloride	--	841	mg/L
Intrawell	Fluoride	--	4.86	mg/L
Intrawell	pH	3.98	6.73	SU
Intrawell	Sulfate	--	7,630	mg/L
Intrawell	TDS	--	11,900	mg/L

3.4. CONCLUSIONS

The downgradient samples collected during the October 2019 monitoring event were used for compliance comparisons. All downgradient wells were below the UPLs and above the LPLs with the following exceptions shown in the table below. Full downgradient results are provided in Appendix B, Table 6.

Downgradient Results Exceedances

Analyte	Well	LPL	UPL	Sample Date	Value	Unit
pH	JKS-31	3.98	6.73	2019-10-22	2.62	SU
pH	JKS-46	3.98	6.73	2019-10-23	2.62	SU

All initial exceedances of the LPL may be confirmed with re-testing of the downgradient wells per the 1-of-2 re-testing scheme. If the initial exceedance is confirmed with re-testing results from the same well, the well-analyte combination will be declared a statistically significant increase (SSI) above background. Any wells with re-testing results at or above the LPL, will be considered in compliance and will not require further action. Any resampling results will be reported in the subsequent *Written Demonstration*.

All downgradient wells with initial exceedances were examined for trends to assess the stability of concentrations. A summary of these trend test results are provided in Appendix B, Figure 4. Both of the downgradient wells with potential SSIs have decreasing trends (pH).

4. RECOMMENDATIONS

Currently, there are no plans to transition from detection monitoring to assessment monitoring. Consistent with the 1-of-2 re-testing approach described in the Unified Guidance and the SAP, initial exceedances may be re-tested within 90 days. Based on these re-testing results, if an SSI is found, a notification or *Written Demonstration* will be prepared within 90 days. Based on the findings of the *Written Demonstration*, detection monitoring or assessment monitoring will be initiated as appropriate under §257.94 and §257.95.

5. REFERENCES

ERM, 2017. *Groundwater Sampling and Analysis Program.*

USEPA, 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities.* Unified Guidance. USEPA/530/R/09/007. Office of Resource Conservation and Recovery. Washington, D.C.

Tables

TABLE 1
Groundwater Elevations Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

		JKS-45 Upgradient		JKS-57 Upgradient		JKS-58 Water Level Only		JKS-59 Water Level Only	
		TOC Elevation	531.46	TOC Elevation	506.91	TOC Elevation	504.45	TOC Elevation	496.45
Sampling Event	Sampling Event Dates	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)
1	12/6/16 to 12/8/16	46.83	484.63	19.89	487.02	18.85	485.60	15.67	480.78
2	2/21/17 to 2/23/17	46.64	484.82	18.95	487.96	15.95	488.50	14.12	482.33
3	3/28/17 to 3/30/17	46.52	484.94	18.20	488.71	15.10	489.35	14.12	482.33
4	5/2/17 to 5/4/17	46.35	485.11	18.80	488.11	16.50	487.95	14.94	481.51
5	6/20/17 to 6/21/17	46.64	484.82	20.23	486.68	18.38	486.07	16.46	479.99
6	7/25/17 to 7/26/17	46.38	485.08	21.16	485.75	15.63	488.82	17.80	478.65
7	8/29/17 to 8/30/17	46.73	484.73	19.44	487.47	19.90	484.55	17.77	478.68
8	10/10/17 to 10/11/17	46.50	484.96	21.67	485.24	20.67	483.78	18.00	478.45
9	4/4/18 to 4/5/18	46.59	484.87	23.22	483.69	21.86	482.59	17.36	479.09
10	10/30/18 to 10/31/18	46.55	484.91	24.65	482.26	21.63	482.82	19.00	477.45
11	4/9/19 to 4/10/19	46.21	485.25	21.09	485.82	17.79	486.66	17.08	479.37
12	10/22/19 to 10/23/19	46.63	484.83	22.61	484.30	20.90	483.55	19.55	476.90

		JKS-31 Downgradient		JKS-33 Downgradient		JKS-46 Downgradient		JKS-60 Downgradient	
		TOC Elevation	507.45	TOC Elevation	498.71	TOC Elevation	499.08	TOC Elevation	495.70
Sampling Event	Sampling Event Dates	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)
1	12/6/16 to 12/8/16	27.01	480.44	18.03	480.68	17.61	481.47	17.15	478.55
2	2/21/17 to 2/23/17	26.50	480.95	17.32	481.39	16.30	482.78	16.34	479.36
3	3/28/17 to 3/30/17	25.98	481.47	16.99	481.72	16.10	482.98	15.93	479.77
4	5/2/17 to 5/4/17	26.60	480.85	17.27	481.44	16.70	482.38	15.96	479.74
5	6/20/17 to 6/21/17	26.70	480.75	18.08	480.63	17.98	481.10	16.43	479.27
6	7/25/17 to 7/26/17	26.77	480.68	18.50	480.21	18.80	480.28	17.00	478.70
7	8/29/17 to 8/30/17	26.58	480.87	18.23	480.48	18.91	480.17	17.52	478.18
8	10/10/17 to 10/11/17	26.73	480.72	18.10	480.61	19.37	479.71	17.20	478.50
9	4/4/18 to 4/5/18	26.86	480.59	17.28	481.43	19.65	479.43	16.95	478.75
10	10/30/18 to 10/31/18	26.70	480.75	18.25	480.46	20.54	478.54	17.75	477.95
11	4/9/19 to 4/10/19	25.10	482.35	17.10	481.61	18.90	480.18	16.53	479.17
12	10/22/19 to 10/23/19	27.04	480.41	18.80	479.91	20.45	478.63	18.03	477.67

NOTES:
btoc = below top of casing
msl = mean sea level

TABLE 2
Groundwater Sampling Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

CCR Unit	Well ID	Well Function	Number of Samples Collected in 2016 - 2019	2016 - 2019 Sample Dates												Monitoring Program
				12/6/16 to 12/8/16	2/21/17 to 2/23/17	3/28/17 to 3/30/17	5/2/17 to 5/4/17	6/20/17 to 6/21/17	7/25/17 to 7/26/17	8/29/17 to 8/30/17	10/10/17 to 10/11/17	4/4/18 to 4/5/18	10/30/18 to 10/31/18	4/9/19 to 4/10/19	10/22/19 to 10/23/19	
Fly Ash Landfill	JKS-31	Downgradient Monitoring	12	X	X	X	X	X	X	X	X	X	X	X	X	Detection
	JKS-33	Downgradient Monitoring	12	X	X	X	X	X	X	X	X	X	X	X	X	Detection
	JKS-45	Upgradient Monitoring	12	X	X	X	X	X	X	X	X	X	X	X	X	Detection
	JKS-46	Downgradient Monitoring	12	X	X	X	X	X	X	X	X	X	X	X	X	Detection
	JKS-57	Upgradient Monitoring	12	X	X	X	X	X	X	X	X	X	X	X	X	Detection
	JKS-60	Downgradient Monitoring	12	X	X	X	X	X	X	X	X	X	X	X	X	Detection

NOTES:
X = Indicates that a sample was collected.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

		JKS-45 Upgradient											
Sample Date		**12/6/16**	**2/23/17**	**3/28/17**	**5/3/17**	**6/20/17**	**7/25/17**	**8/29/17**	**10/10/17**	**4/4/18**	**10/30/18**	**4/10/19**	**10/23/19**
Task		**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**	**Event 9 Apr 2018**	**Event 10 Oct 2018**	**Event 11 Apr 2019**	**Event 12 Oct 2019**
Constituents	**Unit**												
Appendix III - Detection Monitoring													
Boron	mg/L	1.65	1.51	2.27	1.11	2.03	1.91	2.02	2.21	2.28	3.24	2.78	2.98
Calcium	mg/L	144	122	184	105	101	103	120	130	128	161 D	195	161 D
Chloride	mg/L	196	187	181 J	160	152	0.803	345 JHD	24.8	118	137	167	144
Fluoride	mg/L	0.0360 U	0.207	0.334	0.337 JH	0.174 J	0.274 JH	0.0960 U	0.131 JH	0.0360 U	0.0360 U	0.0621 UJ	0.101 J
Sulfate	mg/L	623 D	639 D	661	613 X	602 D	2.95 JH	770 JHD	120	662 D	707	874	698
pH - Field Collected	SU	5.41	5.17	3.98	5.62	5.13	5.66	5.82	5.60	5.59	5.70	5.03	5.59
Total dissolved solids	mg/L	1270	1300	1330	1350	1270	1250	1680 JH	1100	1190	741	1350	1320
Appendix IV - Assessment Monitoring													
Antimony	mg/L	0.000240 U	0.000310 J	0.000400 J	0.00120 U	0.00120 U	0.000240 U	0.000348 J	0.000490 J	NR	NR	NR	NR
Arsenic	mg/L	0.000534 J	0.00216	0.00595	0.00123 U	0.00123 U	0.000346 J	0.00283	0.000618 J	NR	NR	NR	NR
Barium	mg/L	0.0185	0.0436	0.103	0.0128 J	0.0176 J	0.0114	0.0480	0.0142	NR	NR	NR	NR
Beryllium	mg/L	0.00261 U	0.000383 J	0.000921 J	0.000654 U	0.000654 U	0.000149 J	0.000408 J	0.000229 J	NR	NR	NR	NR
Cadmium	mg/L	0.000147 U	0.000147 U	0.000189 J	0.000734 U	0.000734 U	0.000147 U	0.000147 U	0.000147 U	NR	NR	NR	NR
Chromium	mg/L	0.00743	0.0152	0.0320	0.00403 J	0.00262 U	0.00313 J	0.0135	0.00272 J	NR	NR	NR	NR
Cobalt	mg/L	0.00506	0.00465	0.00828	0.00346 J	0.00351 J	0.00277	0.00376	0.00358	NR	NR	NR	NR
Fluoride	mg/L	0.0360 U	0.207	0.334	0.337 JH	0.174 J	0.274 JH	0.0960 U	0.131 JH	NR	NR	NR	NR
Lead	mg/L	0.000571 J	0.00419	0.0117	0.000758 U	0.000758 U	0.000479 J	0.00482	0.000968 J	NR	NR	NR	NR
Lithium	mg/L	0.0329	0.0601	0.00238 U	0.0600	0.0639	0.0694	0.0935	0.0781	NR	NR	NR	NR
Mercury	mg/L	0.0000263 U	0.0000320 JX	0.0000263 U	0.0000263 U	0.0000300 J	0.0000263 U	0.0000263 U	0.0000263 U	NR	NR	NR	NR
Molybdenum	mg/L	0.00105 J	0.00245	0.00372	0.00128 U	0.00128 U	0.000255 U	0.00115 J	0.000271 J	NR	NR	NR	NR
Selenium	mg/L	0.0147	0.0144	0.0174	0.0121	0.0123	0.00990	0.0136	0.0118	NR	NR	NR	NR
Thallium	mg/L	0.000332 U	0.000332 U	0.000460 J	0.00166 U	0.00166 U	0.000332 U	0.000332 U	0.000332 U	NR	NR	NR	NR
Radium-226	pCi/L	4.78 ± 0.890	4.29 ± 0.612	7.63 ± 0.795	3.29 ± 0.485	4.24 ± 0.671	4.34 ± 0.607	3.65 ± 0.553	5.07 ± 0.718	NR	NR	NR	NR
Radium-228	pCi/L	1.92 ± 1.19	4.59 ± 1.34	2.27 ± 1.19	1.42 ± 0.908	2.84 ± 1.15	1.83 ± 0.868	1.86 ± 0.827	1.66 ± 0.847	NR	NR	NR	NR

NOTES:

mg/L: Milligrams per Liter.
SU: Standard Units.
pCi/L: Picocuries per Liter.
-- : Laboratory did not analyze sample for indicated constituent.
D: Sample diluted due to targets detected over highest point of calibration curve or due to matrix interference.
F: Relative percent difference exceeded laboratory control limits.
H: Bias in sample result likely to be high.
J: Analyte detected above method (sample) detection limit but below method quantitation limit.
K: Sample analyzed outside of recommended hold time.
L: Bias in sample result likely to be low.
NR: Analysis of this constituent not required for detection monitoring.
U: Analyte not detected at laboratory reporting limit (Sample Detection Limit).
X: Matrix Spike/Matrix Spike Duplicate recoveries were found to be outside of the laboratory control limits.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

		JKS-57 Upgradient											
Sample Date		**12/7/16**	**2/22/17**	**3/28/17**	**5/2/17**	**6/20/17**	**7/25/17**	**8/29/17**	**10/10/17**	**4/4/18**	**10/30/18**	**4/10/19**	**10/23/19**
Task		**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**	**Event 9 Apr 2018**	**Event 10 Oct 2018**	**Event 11 Apr 2019**	**Event 12 Oct 2019**
Constituents	**Unit**												
Appendix III - Detection Monitoring													
Boron	mg/L	3.19	3.24	3.17	2.67	3.09	3.08	2.98	3.48	4.49	2.81	3.23	4.14
Calcium	mg/L	349	362	413	--	290	327	337	393	409	401 D	477 D	479 D
Chloride	mg/L	70.6	76.2	89.6	130	158	311 D	12.5 JH	185	534 D	3770	119	841
Fluoride	mg/L	3.62	3.32	2.84	2.27	3.42	3.43	0.0960 U	3.28	4.29	2.31	3.03	2.72
Sulfate	mg/L	2780 D	1980 DX	2090	2470 D	3080	3410 D	450 JH	3610	4260 D	5000	3570	4240
pH - Field Collected	SU	6.73	6.08	5.13	6.63	6.37	6.72	6.60	6.70	6.63	6.35	6.20	6.19
Total dissolved solids	mg/L	4770	3780	3320	4060	5800	5920	850 JH	5850	7390	9750	6000	6700
Appendix IV - Assessment Monitoring													
Antimony	mg/L	0.00120 U	0.000240 U	0.000240 U	0.000240 U	0.00120 U	0.000240 U	0.000240 U	0.000240 U	NR	NR	NR	NR
Arsenic	mg/L	0.00138 J	0.000630 J	0.000654 J	0.000561 J	0.00123 U	0.000480 J	0.000519 J	0.000486 J	NR	NR	NR	NR
Barium	mg/L	0.0311	0.0211	0.0208	0.0174	0.0164 J	0.0149	0.0128	0.0145	NR	NR	NR	NR
Beryllium	mg/L	0.000654 U	0.000131 U	0.000161 J	0.000131 U	0.000654 U	0.000131 U	0.000131 U	0.000131 U	NR	NR	NR	NR
Cadmium	mg/L	0.000734 U	0.000147 U	0.000147 U	0.000147 U	0.000734 U	0.000147 U	0.000147 U	0.000147 U	NR	NR	NR	NR
Chromium	mg/L	0.00262 U	0.000687 J	0.000525 U	0.000525 U	0.00262 U	0.000739 J	0.000816 J	0.00104 J	NR	NR	NR	NR
Cobalt	mg/L	0.000520 J	0.00232	0.000297 J	0.000449 J	0.000407 J	0.000748 J	0.000195 J	0.000322 J	NR	NR	NR	NR
Fluoride	mg/L	3.62	3.32	2.84	2.27	3.42	3.43	0.0960 U	3.28	NR	NR	NR	NR
Lead	mg/L	0.000758 U	0.000152 U	0.000152 U	0.000152 U	0.000758 U	0.000152 U	0.000256 J	0.000152 U	NR	NR	NR	NR
Lithium	mg/L	0.545	0.287 X	0.00238 U	--	0.533	0.649	0.671	0.733	NR	NR	NR	NR
Mercury	mg/L	0.0000263 U	0.0000300 J	0.0000263 U	0.0000580 J	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	NR	NR	NR	NR
Molybdenum	mg/L	0.00128 U	0.000385 J	0.000278 J	0.000255 U	0.00128 U	0.000329 J	0.000283 J	0.000255 U	NR	NR	NR	NR
Selenium	mg/L	0.00237 J	0.000664 J	0.000594 J	0.000561 J	0.00227 U	0.000612 J	0.000858 J	0.000697 J	NR	NR	NR	NR
Thallium	mg/L	0.00166 U	0.000332 U	0.000332 U	0.000332 U	0.00166 U	0.000332 U	0.000332 U	0.000332 U	NR	NR	NR	NR
Radium-226	pCi/L	0.592 ± 0.325	0.322 ± 0.157	0.519 ± 0.219	0.356 ± 0.176	0.273 ± 0.273	0.338 ± 0.221	0.255 ± 0.176	0.0986 ± 0.153	NR	NR	NR	NR
Radium-228	pCi/L	1.15 ± 0.895	2.31 ± 1.03	0.794 ± 0.818	2.86 ± 1.27	0.903 ± 0.843	0.786 ± 0.900	1.9 ± 0.894	1.73 ± 1.00	NR	NR	NR	NR

NOTES:

mg/L: Milligrams per Liter.
SU: Standard Units.
pCi/L: Picocuries per Liter.
-- : Laboratory did not analyze sample for indicated constituent.
D: Sample diluted due to targets detected over highest point of calibration curve or due to matrix interference.
F: Relative percent difference exceeded laboratory control limits.
H: Bias in sample result likely to be high.
J: Analyte detected above method (sample) detection limit but below method quantitation limit.
K: Sample analyzed outside of recommended hold time.
L: Bias in sample result likely to be low.
NR: Analysis of this constituent not required for detection monitoring.
U: Analyte not detected at laboratory reporting limit (Sample Detection Limit).
X: Matrix Spike/Matrix Spike Duplicate recoveries were found to be outside of the laboratory control limits.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

		JKS-31 Downgradient											
Sample Date		**12/8/16**	**2/21/17**	**3/29/17**	**5/2/17**	**6/20/17**	**7/25/17**	**8/29/17**	**10/10/17**	**4/4/18**	**10/30/18**	**4/10/19**	**10/22/19**
Task		**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**	**Event 9 Apr 2018**	**Event 10 Oct 2018**	**Event 11 Apr 2019**	**Event 12 Oct 2019**
Constituents	**Unit**												
Appendix III - Detection Monitoring													
Boron	mg/L	0.446	0.580	0.642	0.499	0.573	0.510	0.494	0.553	0.485	0.514	0.557	0.483
Calcium	mg/L	188	384 X	317	--	216	171	230	228	187	208 D	295 D	200 D
Chloride	mg/L	223 D	477 D	303 D	317	285 D	0.280 UDXF	0.347 U	288	253 D	256	322	267
Fluoride	mg/L	0.801	0.186 J	0.548	0.865	0.661	0.979 JHXF	0.0960 U	0.735 JH	0.839	0.694	0.791 U	0.784
Sulfate	mg/L	697 D	1130 D	768 D	875	782 D	1.17 JHDXF	0.160 JH	803	771 D	774	852	819
pH - Field Collected	SU	3.94	4.04	6.34	4.29	3.84	5.14	3.99	3.98	3.74	3.07	3.56	2.62
Total dissolved solids	mg/L	1470	2290	2430	1850	1730	1500	25.0 U	1890	1420	1390	1660	1620
Appendix IV - Assessment Monitoring													
Antimony	mg/L	0.00120 U	0.000240 U	0.000295 J	0.000301 J	0.00120 U	0.000527 J	0.000240 U	0.000559 J	NR	NR	NR	NR
Arsenic	mg/L	0.00151 J	0.0110	0.00834	0.00501	0.00363 J	0.00134 J	0.00556	0.00279	NR	NR	NR	NR
Barium	mg/L	0.0167 J	0.0141	0.0198	0.0136	0.0127 J	0.0229	0.0129	0.0122	NR	NR	NR	NR
Beryllium	mg/L	0.00793 J	0.00851	0.00885	0.00814	0.00865 J	0.00593	0.00827	0.00857	NR	NR	NR	NR
Cadmium	mg/L	0.000734 U	0.000147 U	0.000147 U	0.000147 U	0.000734 U	0.000147 U	0.000147 U	0.000147 U	NR	NR	NR	NR
Chromium	mg/L	0.0200 J	0.000663 J	0.000596 J	0.000525 U	0.00262 U	0.000890 J	0.000849 J	0.000760 J	NR	NR	NR	NR
Cobalt	mg/L	0.000440 J	0.0399	0.0623	0.0227	0.0173	0.0113	0.0302	0.0192	NR	NR	NR	NR
Fluoride	mg/L	0.801	0.186 J	0.548	0.865	0.661	0.979 JHXF	0.0960 U	0.735 JH	NR	NR	NR	NR
Lead	mg/L	0.000758 U	0.000415 J	0.000223 J	0.000344 J	0.000758 U	0.000348 J	0.00233	0.000580 J	NR	NR	NR	NR
Lithium	mg/L	0.533	0.510	0.00238 U	--	0.572	0.484	0.615	0.590	NR	NR	NR	NR
Mercury	mg/L	0.0000263 U	0.0000263 U	0.0000263 U	0.0000360 J	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	NR	NR	NR	NR
Molybdenum	mg/L	0.00128 U	0.000255 U	0.000255 U	0.000255 U	0.00128 U	0.000255 U	0.000255 U	0.000255 U	NR	NR	NR	NR
Selenium	mg/L	0.00227 U	0.00163 J	0.00175 J	0.00125 J	0.00227 U	0.00162 J	0.00177 J	0.00155 J	NR	NR	NR	NR
Thallium	mg/L	0.00166 U	0.000332 U	0.000332 U	0.000332 U	0.00166 U	0.000332 U	0.000332 U	0.000332 U	NR	NR	NR	NR
Radium-226	pCi/L	2.46 ± 0.574	2.60 ± 0.473	1.44 ± 0.425	1.40 ± 0.338	1.40 ± 0.403	1.28 ± 0.341	1.36 ± 0.399	1.01 ± 0.323	NR	NR	NR	NR
Radium-228	pCi/L	7.35 ± 1.59	8.16 ± 2.15	5.33 ± 1.47	5.85 ± 1.79	4.63 ± 1.23	4.44 ± 1.37	3.58 ± 1.22	4.96 ± 1.43	NR	NR	NR	NR

NOTES:

mg/L: Milligrams per Liter.
SU: Standard Units.
pCi/L: Picocuries per Liter.
-- : Laboratory did not analyze sample for indicated constituent.
D: Sample diluted due to targets detected over highest point of calibration curve or due to matrix interference.
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H: Bias in sample result likely to be high.
J: Analyte detected above method (sample) detection limit but below method quantitation limit.
K: Sample analyzed outside of recommended hold time.
L: Bias in sample result likely to be low.
NR: Analysis of this constituent not required for detection monitoring.
U: Analyte not detected at laboratory reporting limit (Sample Detection Limit).
X: Matrix Spike/Matrix Spike Duplicate recoveries were found to be outside of the laboratory control limits.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

		JKS-33 Downgradient											
Sample Date		**12/7/16**	**2/22/17**	**3/28/17**	**5/2/17**	**6/20/17**	**7/26/17**	**8/29/17**	**10/10/17**	**4/5/18**	**10/30/18**	**4/10/19**	**10/22/19**
Task		**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**	**Event 9 Apr 2018**	**Event 10 Oct 2018**	**Event 11 Apr 2019**	**Event 12 Oct 2019**
Constituents	**Unit**												
Appendix III - Detection Monitoring													
Boron	mg/L	0.940	1.02	1.05	0.987	1.09	1.01	1.03	1.11	0.990	0.791	1.13	1.18
Calcium	mg/L	564	600	553	--	563	558	567	531	552	385 D	631	553 D
Chloride	mg/L	735 D	679 D	731 D	690	692 D	693 D	125 JH	666	786	758	806	773 JLKD
Fluoride	mg/L	1.86	1.08	1.77	1.36	1.81	1.34	0.480 U	1.69	1.85	1.21	1.23	1.24 JLK
Sulfate	mg/L	1850 D	1670 D	1780 D	1710	1690 D	1710 D	3170 D	1640	1810	1740	1640	1690 JLKD
pH - Field Collected	SU	6.51	5.90	4.91	6.52	6.15	5.71	6.49	6.49	6.33	6.26	5.98	5.18
Total dissolved solids	mg/L	4000	3990	4310	4410	3750	4070	3580	4320	3970	3320	2650 JLK	4040 JLK
Appendix IV - Assessment Monitoring													
Antimony	mg/L	0.00120 U	0.000240 U	0.00120 U	0.000240 U	0.00120 U	0.000240 U	0.000240 U	0.000240 U	NR	NR	NR	NR
Arsenic	mg/L	0.00123 U	0.000246 U	0.00123 U	0.000257 J	0.00123 U	0.000279 J	0.000316 J	0.000246 U	NR	NR	NR	NR
Barium	mg/L	0.0326	0.0318	0.0297	0.0268	0.0279	0.0274	0.0263	0.0264	NR	NR	NR	NR
Beryllium	mg/L	0.000654 U	0.000131 U	0.000709 J	0.000131 U	0.000654 U	0.000131 U	0.000131 U	0.000131 U	NR	NR	NR	NR
Cadmium	mg/L	0.000734 U	0.000147 U	0.000734 U	0.000147 U	0.000734 U	0.000147 U	0.000147 U	0.000147 U	NR	NR	NR	NR
Chromium	mg/L	0.00262 U	0.000611 J	0.00262 U	0.000525 U	0.00262 U	0.000525 U	0.00113 J	0.00108 J	NR	NR	NR	NR
Cobalt	mg/L	0.000690 J	0.000433 J	0.000487 J	0.000435 J	0.000512 J	0.000731 J	0.000902 J	0.000554 J	NR	NR	NR	NR
Fluoride	mg/L	1.86	1.08	1.77	1.36	1.81	1.34	0.480 U	1.69	NR	NR	NR	NR
Lead	mg/L	0.000758 U	0.000152 U	0.000758 U	0.000152 U	0.000758 U	0.000152 U	0.000157 J	0.000152 U	NR	NR	NR	NR
Lithium	mg/L	0.000476 U	0.000476 U	0.00238 U	--	0.194	0.181	0.255	0.176	NR	NR	NR	NR
Mercury	mg/L	0.0000263 U	0.0000263 U	0.0000263 U	0.0000720 J	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	NR	NR	NR	NR
Molybdenum	mg/L	0.00128 U	0.000255 U	0.00128 U	0.000255 U	0.00128 U	0.000255 U	0.000255 U	0.000255 U	NR	NR	NR	NR
Selenium	mg/L	0.0314	0.0356	0.0389	0.0368	0.0451	0.0495	0.0546	0.0342	NR	NR	NR	NR
Thallium	mg/L	0.00166 U	0.000332 U	0.00166 U	0.000332 U	0.00166 U	0.000332 U	0.000332 U	0.000332 U	NR	NR	NR	NR
Radium-226	pCi/L	2.04 ± 0.439	1.14 ± 0.328	2.36 ± 0.522	1.81 ± 0.365	1.73 ± 0.428	1.55 ± 0.422	1.37 ± 0.394	2.23 ± 0.491	NR	NR	NR	NR
Radium-228	pCi/L	2.95 ± 1.16	3.52 ± 1.07	4.69 ± 1.33	3.24 ± 1.26	1.73 ± 0.902	4.11 ± 1.19	1.98 ± 1.01	2.99 ± 1.26	NR	NR	NR	NR

NOTES:

mg/L: Milligrams per Liter.
SU: Standard Units.
pCi/L: Picocuries per Liter.
-- : Laboratory did not analyze sample for indicated constituent.
D: Sample diluted due to targets detected over highest point of calibration curve or due to matrix interference.
F: Relative percent difference exceeded laboratory control limits.
H: Bias in sample result likely to be high.
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K: Sample analyzed outside of recommended hold time.
L: Bias in sample result likely to be low.
NR: Analysis of this constituent not required for detection monitoring.
U: Analyte not detected at laboratory reporting limit (Sample Detection Limit).
X: Matrix Spike/Matrix Spike Duplicate recoveries were found to be outside of the laboratory control limits.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

		JKS-46 Downgradient											
Sample Date		**12/6/16**	**2/22/17**	**3/28/17**	**5/3/17**	**6/20/17**	**7/25/17**	**8/29/17**	**10/10/17**	**4/4/18**	**10/30/18**	**4/10/19**	**10/23/19**
Task		**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**	**Event 9 Apr 2018**	**Event 10 Oct 2018**	**Event 11 Apr 2019**	**Event 12 Oct 2019**
Constituents	**Unit**												
Appendix III - Detection Monitoring													
Boron	mg/L	0.902	0.837	0.645	0.799	0.920	0.801	0.788	1.01	0.828	0.702	0.997	1.01
Calcium	mg/L	120	132	145	115	126	117	137	145	140	126 D	212 D	172 D
Chloride	mg/L	11.6	11.8	12.2	10.5	12.6	11.8	327 JHD	11.7	11.6	11.6	13.2	13.0
Fluoride	mg/L	1.51	1.38	1.03	1.59	2.25	2.34	0.460 JH	1.83	2.16	1.68	2.52	2.22
Sulfate	mg/L	700 D	692 D	608 D	677	0.0460 U	780 D	288 JHD	800	864 D	855	1030	1020
pH - Field Collected	SU	3.60	3.55	2.10	3.57	2.96	3.54	3.21	3.20	3.15	3.00	2.85	2.62
Total dissolved solids	mg/L	1160	1040	926	1030	1270	1180	1170 JH	1390	1300	1220	1550	1500
Appendix IV - Assessment Monitoring													
Antimony	mg/L	0.000240 U	0.000240 U	0.000240 U	0.00120 U	0.00120 U	0.000240 U	0.000240 U	0.000240 U	NR	NR	NR	NR
Arsenic	mg/L	0.00190 J	0.00227	0.00144 J	0.00196 J	0.00277 J	0.00253	0.00295	0.00290	NR	NR	NR	NR
Barium	mg/L	0.0429	0.0356	0.0308	0.0307	0.0364	0.0317	0.0323	0.0331	NR	NR	NR	NR
Beryllium	mg/L	0.00381 J	0.00362	0.00340	0.00399 J	0.00459 J	0.00415	0.00462	0.00479	NR	NR	NR	NR
Cadmium	mg/L	0.00110 J	0.000988 J	0.00121 J	0.00120 J	0.00101 J	0.00133 J	0.00141 J	0.00136 J	NR	NR	NR	NR
Chromium	mg/L	0.000942 J	0.00140 J	0.00104 J	0.00262 U	0.00262 U	0.00156 J	0.00191 J	0.00202 J	NR	NR	NR	NR
Cobalt	mg/L	0.0303	0.0324	0.0329	0.0367	0.0387	0.0383	0.0412	0.0414	NR	NR	NR	NR
Fluoride	mg/L	1.51	1.38	1.03	1.59	2.25	2.34	0.460 JH	1.83	NR	NR	NR	NR
Lead	mg/L	0.0162	0.0134	0.0109	0.0144	0.0192	0.0201	0.0236	0.0257	NR	NR	NR	NR
Lithium	mg/L	0.0646	0.000476 U	0.00238 U	0.0673	0.0749	0.0799	0.107	0.0863	NR	NR	NR	NR
Mercury	mg/L	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	NR	NR	NR	NR
Molybdenum	mg/L	0.000255 U	0.000255 U	0.000255 U	0.00128 U	0.00128 U	0.000255 U	0.000255 U	0.000255 U	NR	NR	NR	NR
Selenium	mg/L	0.0255	0.0266	0.0205	0.0247	0.0296	0.0257	0.0298	0.0283	NR	NR	NR	NR
Thallium	mg/L	0.00293	0.00292	0.00235	0.00263 J	0.00314 J	0.00300	0.00335	0.00345	NR	NR	NR	NR
Radium-226	pCi/L	3.16 ± 0.701	1.69 ± 0.387	1.80 ± 0.448	1.2 0± 0.315	1.82 ± 0.420	1.40 ± 0.353	1.52 ± 0.375	1.99 ± 0.459	NR	NR	NR	NR
Radium-228	pCi/L	4.98 ± 1.41	2.17 ± 1.48	2.96 ± 1.24	1.98 ± 0.957	4.39 ± 1.13	2.80 ± 1.05	2.28 ± 1.13	3.82 ± 1.15	NR	NR	NR	NR

NOTES:

mg/L: Milligrams per Liter.
SU: Standard Units.
pCi/L: Picocuries per Liter.
-- : Laboratory did not analyze sample for indicated constituent.
D: Sample diluted due to targets detected over highest point of calibration curve or due to matrix interference.
F: Relative percent difference exceeded laboratory control limits.
H: Bias in sample result likely to be high.
J: Analyte detected above method (sample) detection limit but below method quantitation limit.
K: Sample analyzed outside of recommended hold time.
L: Bias in sample result likely to be low.
NR: Analysis of this constituent not required for detection monitoring.
U: Analyte not detected at laboratory reporting limit (Sample Detection Limit).
X: Matrix Spike/Matrix Spike Duplicate recoveries were found to be outside of the laboratory control limits.

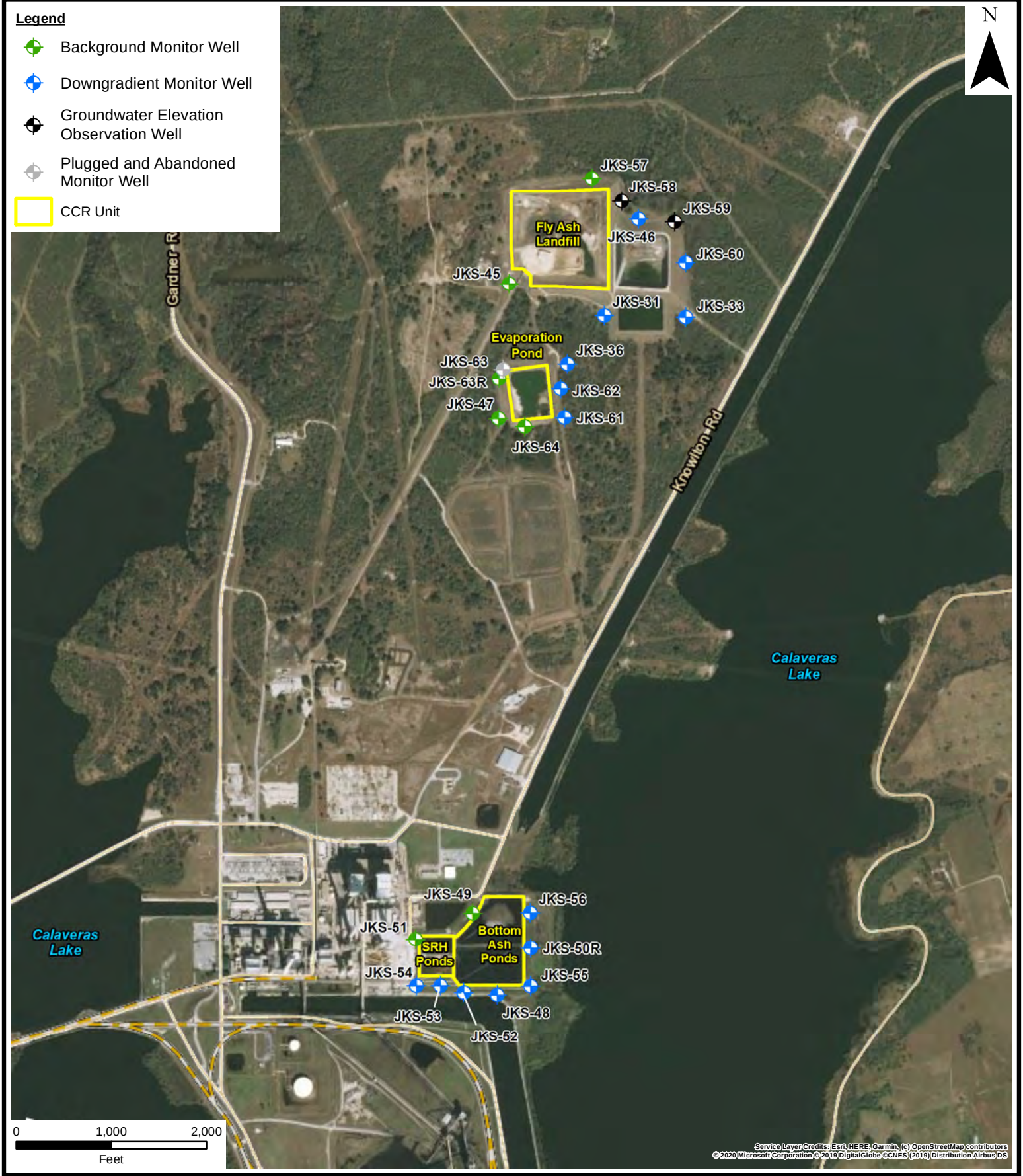
TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Fly Ash Landfill

		JKS-60 Downgradient											
Sample Date		**12/7/16**	**2/22/17**	**3/28/17**	**5/2/17**	**6/20/17**	**7/25/17**	**8/29/17**	**10/10/17**	**4/4/18**	**10/30/18**	**4/10/19**	**10/23/19**
Task		**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**	**Event 9 Apr 2018**	**Event 10 Oct 2018**	**Event 11 Apr 2019**	**Event 12 Oct 2019**
Constituents	**Unit**												
Appendix III - Detection Monitoring													
Boron	mg/L	0.655	0.504	0.449	0.456	0.442	0.394	0.436	0.479	0.399	0.334	0.405	0.377
Calcium	mg/L	433	375	290	--	379	336	350	383	363	382 D	501 D	524 D
Chloride	mg/L	411 D	311 D	311 D	285	300 D	319 D	287 JHD	352	366 D	202	149 X	183
Fluoride	mg/L	0.0360 U	0.319	0.324	0.421	0.306	0.338 JH	0.0960 U	0.284 JH	0.22 J	0.239 J	0.187 UJ	0.231 J
Sulfate	mg/L	1480 D	999 D	1010 D	976 X	1020 D	818 D	760 JHDX	759	801 D	906	968	1320
pH - Field Collected	SU	5.82	5.38	4.21	5.75	6.07	6.44	5.93	5.97	6.09	6.42	5.93	6.23
Total dissolved solids	mg/L	2790	2340	2020	2110	2510	2120	1450 JH	2300	1860	1910	2010	2820
Appendix IV - Assessment Monitoring													
Antimony	mg/L	0.00120 U	0.000240 U	0.000240 U	0.000240 U	0.00120 U	0.000240 U	0.000240 U	0.000240 U	NR	NR	NR	NR
Arsenic	mg/L	0.00123 U	0.000861 J	0.000592 J	0.000366 J	0.00123 U	0.000367 J	0.000381 J	0.000266 J	NR	NR	NR	NR
Barium	mg/L	0.0702	0.0491	0.0465	0.0450	0.0469	0.0454	0.0490	0.0503	NR	NR	NR	NR
Beryllium	mg/L	0.000654 U	0.000131 U	0.000131 U	0.000131 U	0.000654 U	0.000131 U	0.000131 U	0.000131 U	NR	NR	NR	NR
Cadmium	mg/L	0.000774 J	0.000778 J	0.000786 J	0.000695 J	0.000734 U	0.000359 J	0.000608 J	0.000699 J	NR	NR	NR	NR
Chromium	mg/L	0.00262 U	0.000743 J	0.000525 U	0.000525 U	0.00262 U	0.000690 J	0.00204 J	0.00100 J	NR	NR	NR	NR
Cobalt	mg/L	0.115	0.0542	0.0423	0.0389	0.0210	0.00896	0.0166	0.0183	NR	NR	NR	NR
Fluoride	mg/L	0.0360 U	0.319	0.324	0.421	0.306	0.338 JH	0.0960 U	0.284 JH	NR	NR	NR	NR
Lead	mg/L	0.000758 U	0.000152 U	0.000152 U	0.000152 U	0.000758 U	0.000152 U	0.000152 U	0.000216 J	NR	NR	NR	NR
Lithium	mg/L	0.000476 U	0.000476 U	0.00238 U	--	0.0305	0.0179 J	0.0635	0.0314	NR	NR	NR	NR
Mercury	mg/L	0.0000263 U	0.0000263 U	0.0000263 U	0.0000370 J	0.0000263 U	0.0000263 U	0.0000263 U	0.0000263 U	NR	NR	NR	NR
Molybdenum	mg/L	0.00128 U	0.000726 J	0.000622 J	0.000715 J	0.00148 J	0.00162 J	0.00124 J	0.00103 J	NR	NR	NR	NR
Selenium	mg/L	0.00227 U	0.00168 J	0.00132 J	0.00981	0.0390	0.0244	0.00761	0.00745	NR	NR	NR	NR
Thallium	mg/L	0.00166 U	0.000425 J	0.000412 J	0.000403 J	0.00166 U	0.000332 U	0.000372 J	0.000387 J	NR	NR	NR	NR
Radium-226	pCi/L	3.01 ± 0.578	2.29 ± 0.421	2.74 ± 0.572	1.71 ± 0.378	0.914 ± 0.341	1.57 ± 0.381	1.34 ± 0.378	4.61 ± 0.650	NR	NR	NR	NR
Radium-228	pCi/L	2.57 ± 1.15	2.62 ± 1.04	0.838 ± 0.826	0.269 ± 0.713	2.24 ± 1.02	0.701 ± 0.850	1.72 ± 0.940	2.48 ± 1.60	NR	NR	NR	NR

NOTES:

mg/L: Milligrams per Liter.
SU: Standard Units.
pCi/L: Picocuries per Liter.
-- : Laboratory did not analyze sample for indicated constituent.
D: Sample diluted due to targets detected over highest point of calibration curve or due to matrix interference.
F: Relative percent difference exceeded laboratory control limits.
H: Bias in sample result likely to be high.
J: Analyte detected above method (sample) detection limit but below method quantitation limit.
K: Sample analyzed outside of recommended hold time.
L: Bias in sample result likely to be low.
NR: Analysis of this constituent not required for detection monitoring.
U: Analyte not detected at laboratory reporting limit (Sample Detection Limit).
X: Matrix Spike/Matrix Spike Duplicate recoveries were found to be outside of the laboratory control limits.

Figures



Environmental Resources Management

DESIGN:	WZ	DRAWN:	EFC	CHKD.:	WZ
DATE:	1/17/2020	SCALE:	AS SHOWN	REVISION:	0

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FIGURE 1
CCR WELL NETWORK LOCATION MAP
CPS Energy - Calaveras Power Station
San Antonio, Texas

ERM

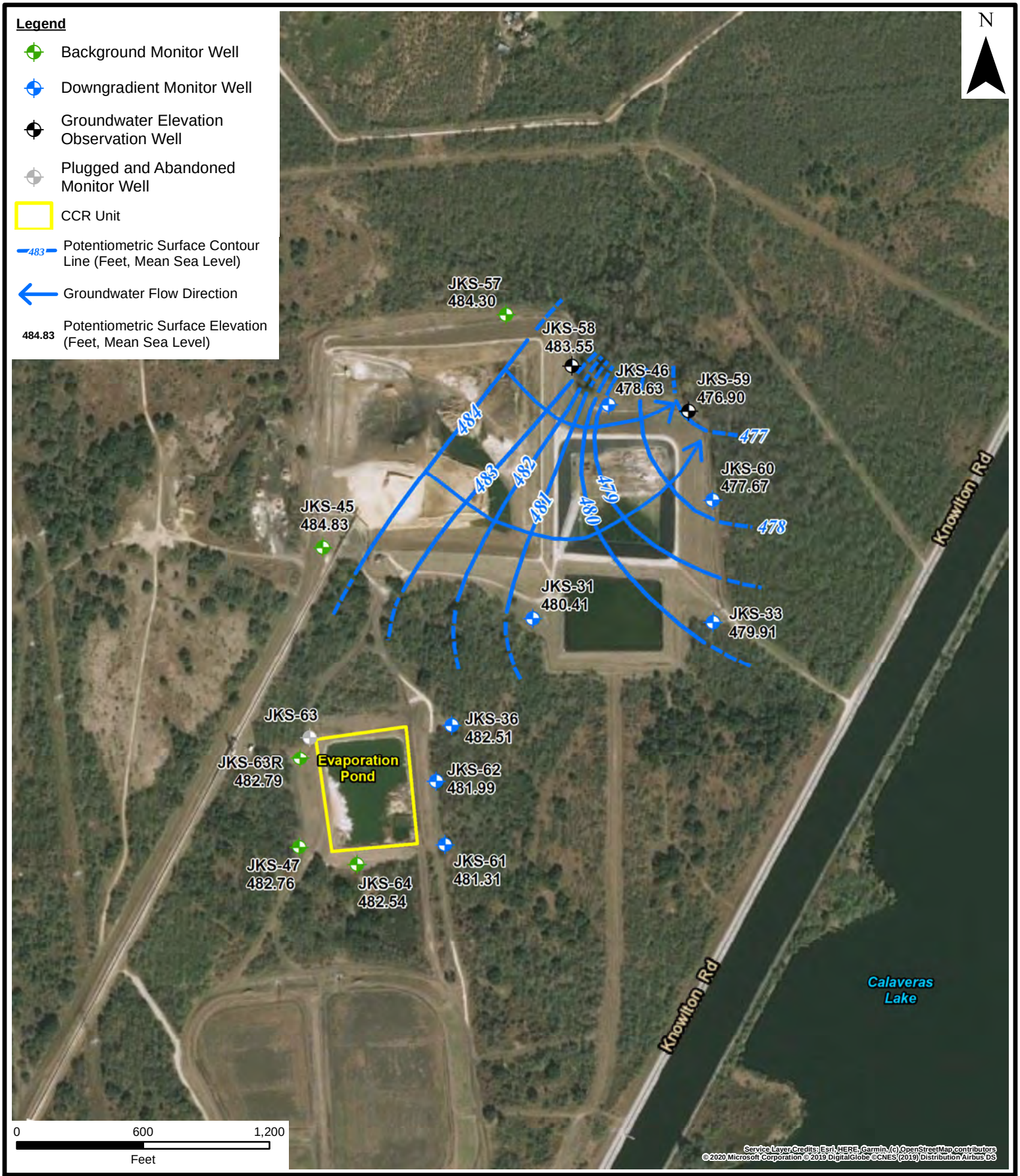

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FIGURE 2
POTENTIOMETRIC SURFACE MAP - OCTOBER 2019
Fly Ash Landfill CCR Unit
CPS Energy - Calaveras Power Station
San Antonio, Texas

ERM

Laboratory Data Packages

Appendix A

(*Data Packages Available Upon Request*)

Statistical Analysis Tables and Figures

Appendix B

APPENDIX B - TABLE 1
Kruskal-Wallis Test Comparisons of Upgradient Wells
Calaveras Power Station
Fly Ash Landfill

Analyte	N	Num Detects	Percent Detect	DF	KW Statistic	p-value	Conclusion	UPL Type
Boron	24	24	100%	1	12	<0.001	Significant Difference	Intrawell
Calcium	23	23	100%	1	16.5	<0.001	Significant Difference	Intrawell
Chloride	24	24	100%	1	0.03	0.862	No Significant Difference	Interwell
Fluoride	24	19	79%	1	13.5	<0.001	Significant Difference	Intrawell
pH	24	24	100%	1	13	<0.001	Significant Difference	Intrawell
Sulfate	24	24	100%	1	12.8	<0.001	Significant Difference	Intrawell
Total dissolved solids	24	24	100%	1	12.4	<0.001	Significant Difference	Intrawell

NOTES:

Non-detects were substituted with a value of half the detection limit for calculations
N: number of data points
DF: degrees of freedom
statistic: Kruskal Wallis test statistic

p-value: P-values below 0.05 indicate that the median concentrations in the upgradient wells are significantly different from each other and the upgradient wells should not be pooled.

p-value: P-values equal or above 0.05 indicate that the median concentrations in the upgradient wells are not significantly different from each other and the upgradient wells can be pooled.

APPENDIX B - TABLE 2
Descriptive Statistics for Upgradient Wells
Calaveras Power Station
Fly Ash Landfill

Analyte	Well	Units	N	Num Detects	Percent Detect	Min ND	Max ND	Min Detect	Median	Mean	Max Detect	SD	CV	Distribution
Boron	JKS-45	mg/L	12	12	100%			1.11	2.12	2.17	3.24	0.613	0.28311521	Normal
Boron	JKS-57	mg/L	12	12	100%			2.67	3.18	3.3	4.49	0.524	0.1589895	Lognormal
Calcium	JKS-45	mg/L	12	12	100%			101	129	138	195	31.5	0.2282322	Normal
Calcium	JKS-57	mg/L	11	11	100%			290	393	385	479	59.6	0.15467992	Normal
Chloride	Pooled	mg/L	24	24	100%			0.803	155	338	3770	753	2.2272759	NDD
Fluoride	JKS-45	mg/L	12	8	67%	0.018	0.048	0.0621	0.116	0.144	0.337	0.121	0.84219724	Normal
Fluoride	JKS-57	mg/L	12	11	92%	0.048	0.048	2.27	3.16	2.88	4.29	1.06	0.36623373	NDD
pH	JKS-45	SU	12	12	100%			3.98	5.59	5.36	5.82	0.5	0.09336292	NDD
pH	JKS-57	SU	12	12	100%			5.13	6.48	6.36	6.73	0.45	0.07080881	NDD
Sulfate	JKS-45	mg/L	12	12	100%			2.95	650	581	874	255	0.43953831	NDD
Sulfate	JKS-57	mg/L	12	12	100%			450	3240	3080	5000	1230	0.39934431	Normal
Total dissolved solids	JKS-45	mg/L	12	12	100%			741	1280	1260	1680	214	0.16932965	NDD
Total dissolved solids	JKS-57	mg/L	12	12	100%			850	5820	5350	9750	2240	0.41946444	Normal

NOTES:

Non-detects were substituted with a value of half the detection limit for calculations
Well = Pooled, indicates that the summary statistics were produced for the pooled upgradient wells based on the Kruskal-Wallis test (Table 1).
SU: Standard units
N: number of data points
ND: Non-detect
SD: Standard Deviation
CV: Coefficient of Variation (standard deviation divided by the mean)
NDD: No Discernible Distribution

APPENDIX B - TABLE 3
Potential Outliers in Upgradient Wells
Calaveras Power Station
Fly Ash Landfill

Well	Sample	Date	Analyte	Units	Detect	Concentration	UPL type	Distribution	Statistical Outlier	Visual Outlier	Normal Outlier	Log Statistical Outlier	Log Visual Outlier	Lognormal Outlier	Statistical and Visual Outlier
JKS-45	JKS-45003	10/23/2019	Boron	mg/L	TRUE	2.98	Intrawell	Normal		X					
JKS-57	JKS 57565194-013	10/10/2017	Boron	mg/L	TRUE	3.48	Intrawell	Lognormal		X			X		
JKS-57	JKS 57581381-013	4/4/2018	Boron	mg/L	TRUE	4.49	Intrawell	Lognormal	X	X	X		X		
JKS-57	JKS-57005	10/23/2019	Boron	mg/L	TRUE	4.14	Intrawell	Lognormal	X	X	X		X		
JKS-45	JKS-45561478-015	8/29/2017	Chloride	mg/L	TRUE	345	Interwell	NDD		X			X		
JKS-57	JKS 57558406-015	7/25/2017	Chloride	mg/L	TRUE	311	Interwell	NDD		X			X		
JKS-57	JKS 57581381-013	4/4/2018	Chloride	mg/L	TRUE	534	Interwell	NDD		X			X		
JKS-57	JKS 57603951-015	10/30/2018	Chloride	mg/L	TRUE	3770	Interwell	NDD	X	X	X	X	X	X	X
JKS-57	JKS-57005	10/23/2019	Chloride	mg/L	TRUE	841	Interwell	NDD	X	X	X		X		0
JKS-45	JKS-45-WG-20170328	3/28/2017	pH	SU	TRUE	3.98	Intrawell	NDD	X	X	X	X	X	X	0
JKS-57	JKS-57-WG-20170328	3/28/2017	pH	SU	TRUE	5.13	Intrawell	NDD	X	X	X	X	X	X	0
JKS-45	JKS45620556-016	4/9/2019	Sulfate	mg/L	TRUE	874	Intrawell	NDD		X					
JKS-45	JKS-45561478-015	8/29/2017	Total dissolved solids	mg/L	TRUE	1680	Intrawell	NDD	X	X	X	X	X	X	0

NOTES:

NDD: No Discernible Distribution
SU: Standard units
Outer tests were performed on detected data only.
Statistical outliers were determined using a Dixon's test for N < 25 and with Rosner's test for N > 25.
Visual outliers were identified if they fall above the confidence envelope on the QQ plot.
Data points were considered potential outliers if they were both statistical and visual outliers.
NDD wells had data points considered as potential outliers if they were either a normal or lognormal outlier.
[Blank] data distribution indicates that the well data did not have enough detected data points for outlier analysis.
Lognormally distributed data was first log-transformed before visual and statistical outlier tests were performed.
Normal data distribution indicates that the well data was directly used for statistical and visual outlier tests.
NDD indicates that both the untransformed and transformed data were examined with statistical and visual outlier tests.
'0' indicates that the data point was a statistical and visual outlier but was retained after review by the hydrogeologist.

APPENDIX B - TABLE 4
Mann Kendall Test for Trends in Upgradient Wells
Calaveras Power Station
Fly Ash Landfill

Analyte	UPL Type	Well	N	Num Detects	Percent Detect	p-value	tau	Conclusion
Boron	Intrawell	JKS-45	12	12	100%	0.00318	0.636	Increasing Trend
Boron	Intrawell	JKS-57	12	12	100%	0.638	0.121	Stable, No Trend
Calcium	Intrawell	JKS-45	12	12	100%	0.192	0.29	Stable, No Trend
Calcium	Intrawell	JKS-57	11	11	100%	0.0264	0.527	Increasing Trend
Chloride	Interwell	JKS-45, JKS-57	23	23	100%	0.432	0.123	Stable, No Trend
Fluoride	Intrawell	JKS-45	12	8	67%	0.208	-0.286	Stable, No Trend
Fluoride	Intrawell	JKS-57	12	11	92%	0.459	-0.182	Stable, No Trend
pH	Intrawell	JKS-45	12	12	100%	0.536	0.137	Stable, No Trend
pH	Intrawell	JKS-57	12	12	100%	0.372	-0.198	Stable, No Trend
Sulfate	Intrawell	JKS-45	12	12	100%	0.197	0.303	Stable, No Trend
Sulfate	Intrawell	JKS-57	12	12	100%	0.00876	0.576	Increasing Trend
Total dissolved solids	Intrawell	JKS-45	12	12	100%	0.582	-0.123	Stable, No Trend
Total dissolved solids	Intrawell	JKS-57	12	12	100%	0.0138	0.545	Increasing Trend

NOTES:

Non-detects were substituted with a value of zero for trend calculations
N: number of data points
tau: Kendall's tau statistic
p-value: A two-sided p-value describing the probability of the H0 being true (a=0.05)
Trend tests were performed on all upgradient data, only if the dataset met the minimum data quality criteria (ERM 2017).

APPENDIX B - TABLE 5
Calculated UPLs for Upgradient Datasets
Calaveras Power Station
Fly Ash Landfill

Analyte	UPL Type	Trend	Well	N	Num Detects	Percent Detects	LPL	UPL	Units	ND Adjustment	Transformation	Alpha	Method	Final LPL	Final UPL
Boron	Intrawell	Increasing Trend	JKS-45	12	12	100%		3.71	mg/L	None	No	0.00438	NP Detrended UPL		
Boron	Intrawell	Stable, No Trend	JKS-57	12	12	100%		4.29	mg/L	None	No	0.00438	Param Intra 1 of 2		X
Calcium	Intrawell	Stable, No Trend	JKS-45	12	12	100%		198	mg/L	None	No	0.00438	Param Intra 1 of 2		
Calcium	Intrawell	Increasing Trend	JKS-57	11	11	100%		583	mg/L	None	No	0.00438	NP Detrended UPL		X
Chloride	Interwell	Stable, No Trend	JKS-45, JKS-57	23	23	100%		841	mg/L	None	No	0.00337	NP Inter (normality) 1 of 2		X
Fluoride	Intrawell	Stable, No Trend	JKS-45	12	8	67%		0.359	mg/L	Kaplan-Meier	No	0.00438	Param Intra 1 of 2		
Fluoride	Intrawell	Stable, No Trend	JKS-57	12	11	92%		4.86	mg/L	None	No	0.00438	Param Intra 1 of 2		X
pH	Intrawell	Stable, No Trend	JKS-45	12	12	100%	3.98	5.82	SU	None	No	0.022	NP Intra (normality) 1 of 2	X	
pH	Intrawell	Stable, No Trend	JKS-57	12	12	100%	5.13	6.73	SU	None	No	0.022	NP Intra (normality) 1 of 2		X
Sulfate	Intrawell	Stable, No Trend	JKS-45	12	12	100%		874	mg/L	None	No	0.011	NP Intra (normality) 1 of 2		
Sulfate	Intrawell	Increasing Trend	JKS-57	12	12	100%		7630	mg/L	None	No	0.00438	NP Detrended UPL		X
Total dissolved solids	Intrawell	Stable, No Trend	JKS-45	12	12	100%		1670	mg/L	None	No	0.00438	Param Intra 1 of 2		
Total dissolved solids	Intrawell	Increasing Trend	JKS-57	12	12	100%		11900	mg/L	None	No	0.00438	NP Detrended UPL		X

NOTES:

Non-detects (ND) were substituted with a value of half the detection limit for calculations
UPL: upper prediction limit
LPL: Lower prediction limit. These were only calculated for pH
UPLs were constructed with a site wide false positive rate of 0.1 and a 1 of 2 retesting.
UPLs were calculated using Sanitas Software.
SU: Standard units
NP: non parametric
Intra: indicates an intrawell UPL was used
Inter: indicates an interwell UPL was used
In the case where multiple UPLs were calculated for an analyte, the maximum UPL was used as the final UPL.
In the case where multiple LPLs were calculated for an pH the minimum LPL was used as the final LPL.

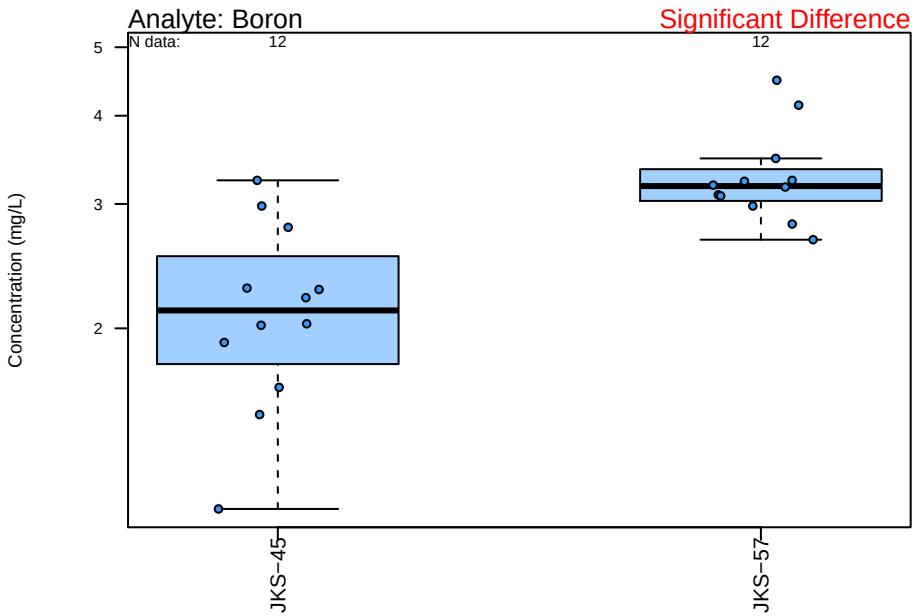
APPENDIX B - TABLE 6
Comparisons of Downgradient Wells to UPLs
Calaveras Power Station
Fly Ash Landfill

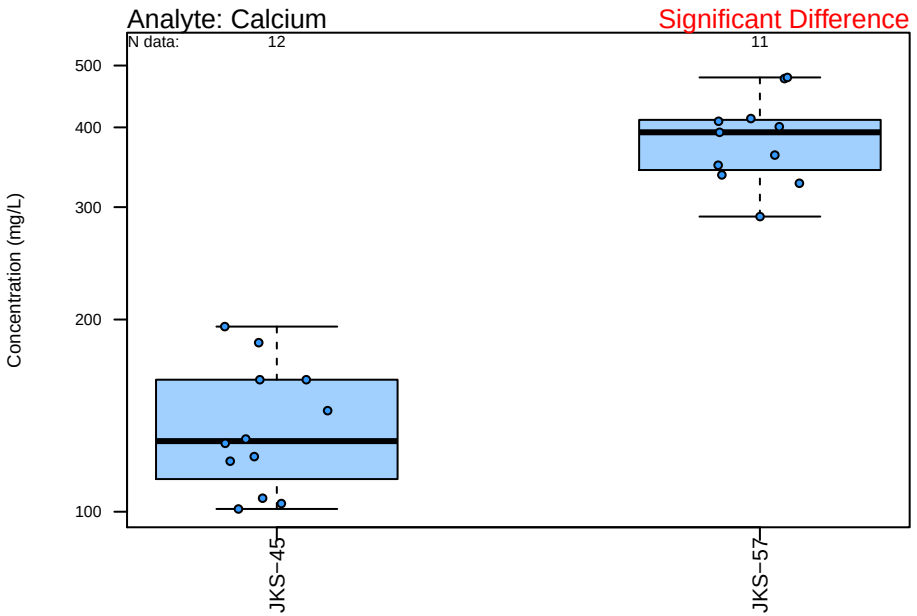
Analyte	Well	LPL	UPL	Units	Recent Date	Observation	Qualifier	Obs > UPL	Notes	Mann Kendall p-value	Mann Kendall tau
Boron	JKS-31		4.29	mg/L	10/22/2019	0.483					
Boron	JKS-33		4.29	mg/L	10/22/2019	1.18					
Boron	JKS-46		4.29	mg/L	10/23/2019	1.01					
Boron	JKS-60		4.29	mg/L	10/23/2019	0.377					
Calcium	JKS-31		583	mg/L	10/22/2019	200					
Calcium	JKS-33		583	mg/L	10/22/2019	553					
Calcium	JKS-46		583	mg/L	10/23/2019	172					
Calcium	JKS-60		583	mg/L	10/23/2019	524					
Chloride	JKS-31		841	mg/L	10/22/2019	267					
Chloride	JKS-33		841	mg/L	10/22/2019	773					
Chloride	JKS-46		841	mg/L	10/23/2019	13					
Chloride	JKS-60		841	mg/L	10/23/2019	183					
Fluoride	JKS-31		4.86	mg/L	10/22/2019	0.784					
Fluoride	JKS-33		4.86	mg/L	10/22/2019	1.24					
Fluoride	JKS-46		4.86	mg/L	10/23/2019	2.22					
Fluoride	JKS-60		4.86	mg/L	10/23/2019	0.231					
pH	JKS-31	3.98	6.73	SU	10/22/2019	2.62		X	Trend Test: Decreasing Trend	0.00876	-0.576
pH	JKS-33	3.98	6.73	SU	10/22/2019	5.18					
pH	JKS-46	3.98	6.73	SU	10/23/2019	2.62		X	Trend Test: Decreasing Trend	0.0138	-0.545
pH	JKS-60	3.98	6.73	SU	10/23/2019	6.23					
Sulfate	JKS-31		7630	mg/L	10/22/2019	819					
Sulfate	JKS-33		7630	mg/L	10/22/2019	1690					
Sulfate	JKS-46		7630	mg/L	10/23/2019	1020					
Sulfate	JKS-60		7630	mg/L	10/23/2019	1320					
Total dissolved solids	JKS-31		11900	mg/L	10/22/2019	1620					
Total dissolved solids	JKS-33		11900	mg/L	10/22/2019	4040					
Total dissolved solids	JKS-46		11900	mg/L	10/23/2019	1500					
Total dissolved solids	JKS-60		11900	mg/L	10/23/2019	2820					

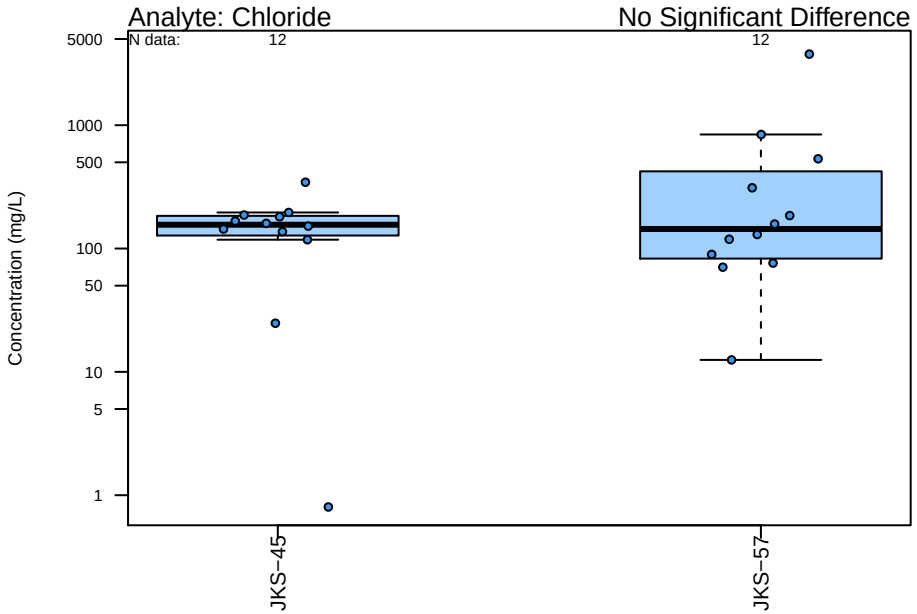
NOTES:

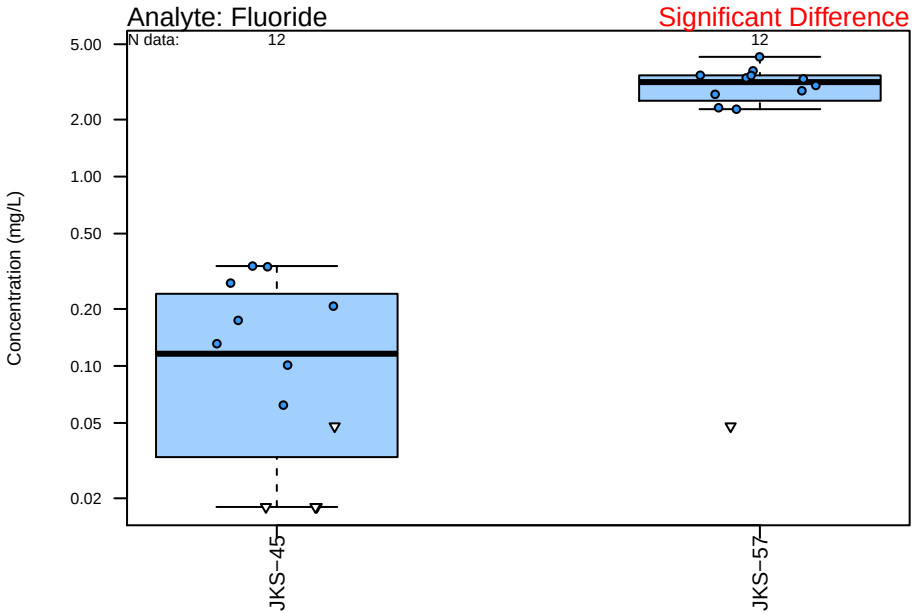
Non-detects (ND) were substituted with a value of zero for trend calculations
UPL: Upper Prediction Limit
ND: Not detected
SU: Standard units
tau: Kendall's tau statistic
Obs > UPL: Exceed 'X' indicates that the most recent observed value is higher than the UPL (or out of range of the LPL and UPL in the case of pH.)
Obs > UPL: Exceed 'X0' indicates that the two most recent values are higher than the UPL, but the upgradient well is 100% ND.
Obs > UPL: Exceed '0' indicated that the most recent observed value is higher than the UPL, but is not scored as an SSI due to Double Quantification Rule (ERM 2017).

Appendix B − Figure 1
Unit: Fly Ash Landfill
Boxplots of Upgradient Wells

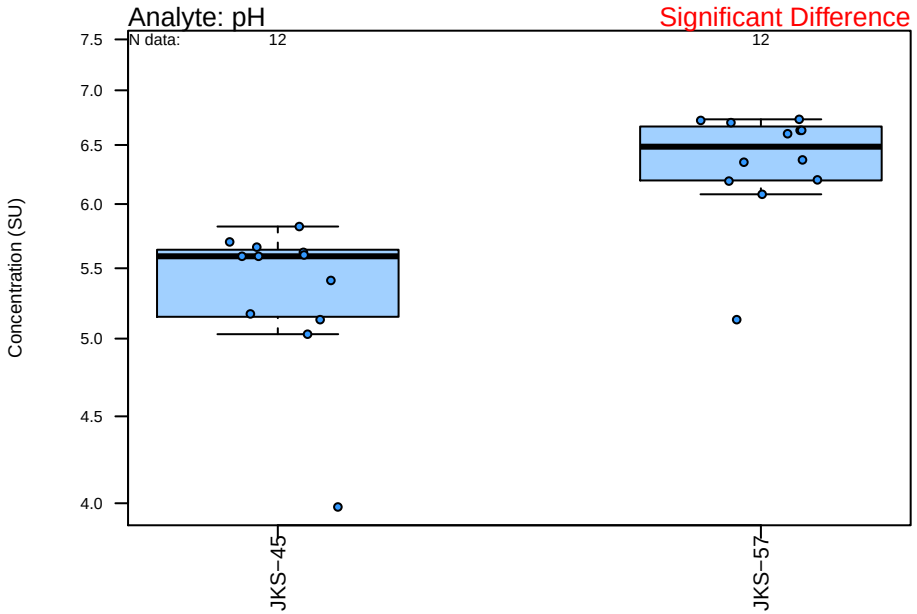


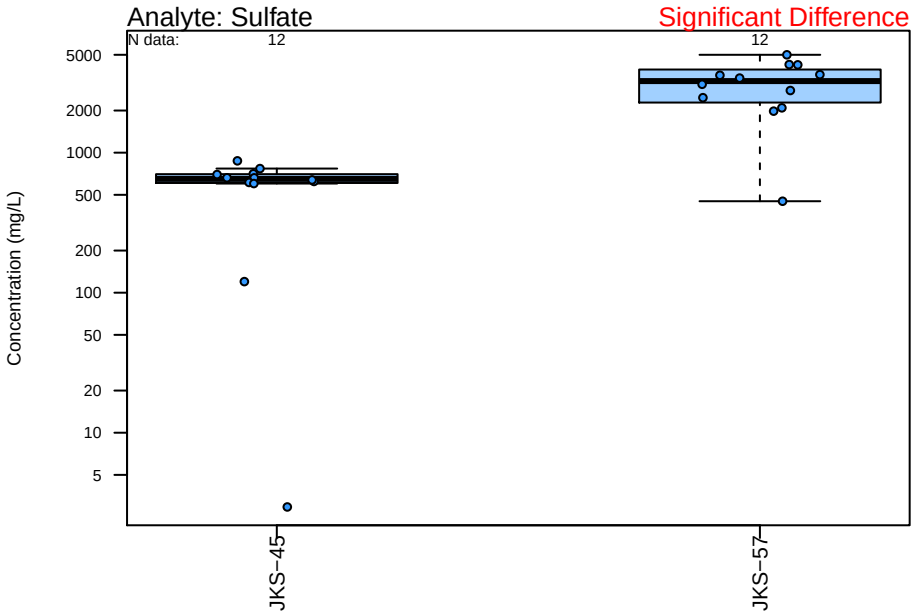


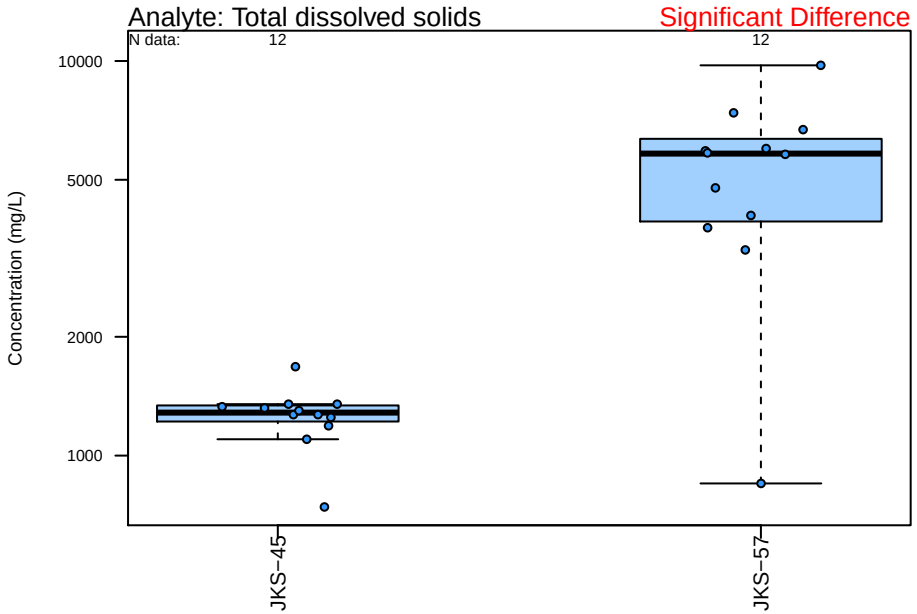




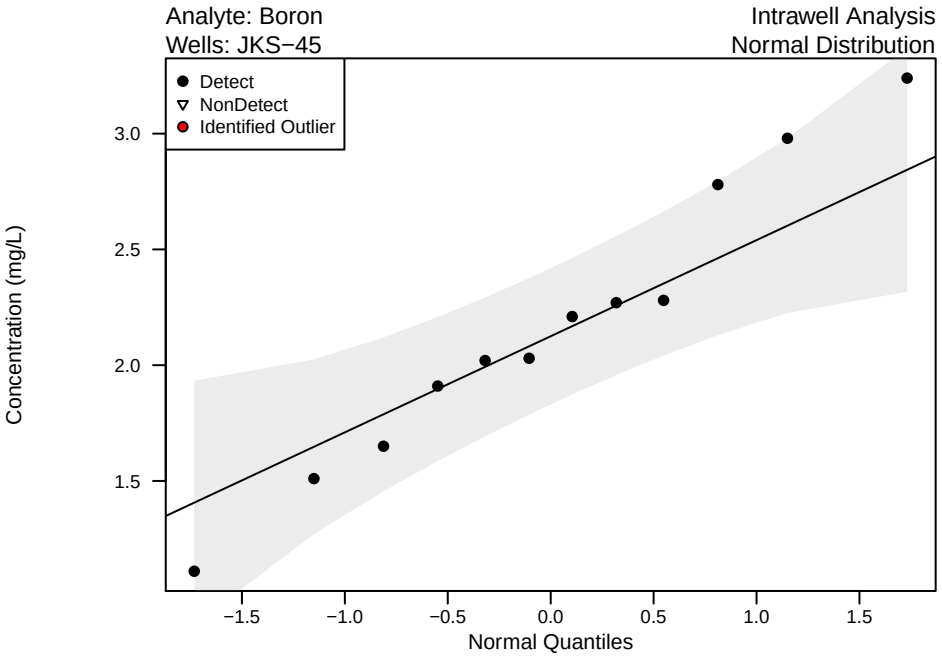
Appendix B − Figure 1
Unit: Fly Ash Landfill
Boxplots of Upgradient Wells







Appendix B − Figure 2
Unit: Fly Ash Landfill
QQ Plots of Upgradient Wells



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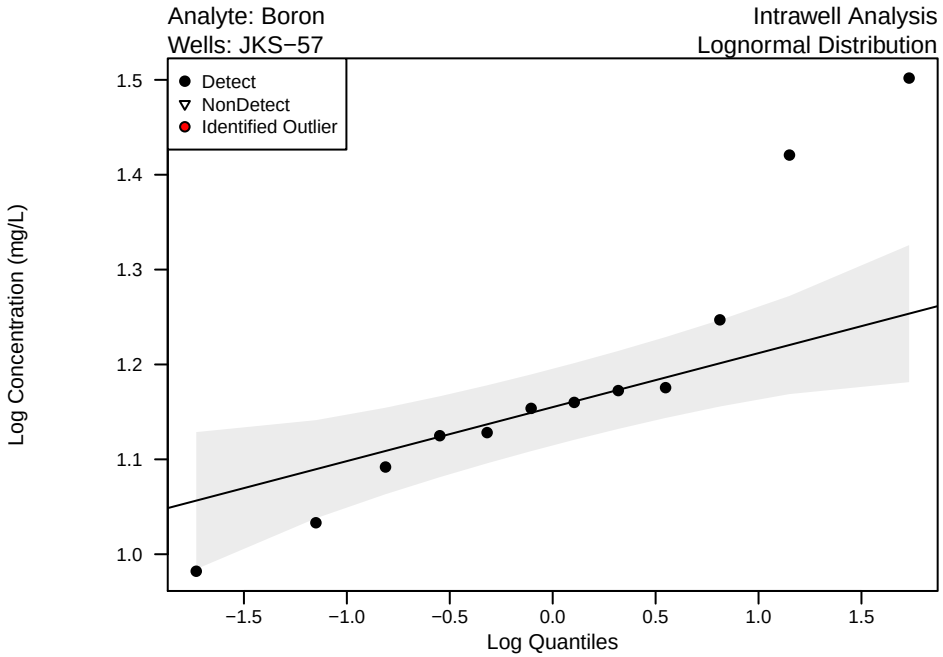
not Normal/NDD distribution.



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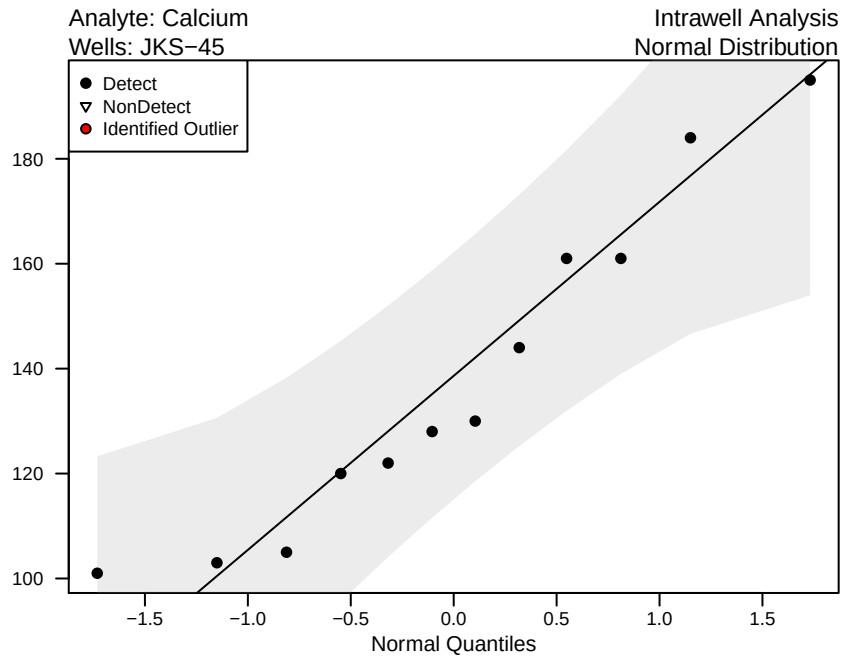
Unit: Fly Ash Landfill
QQ Plots of Upgradient Wells



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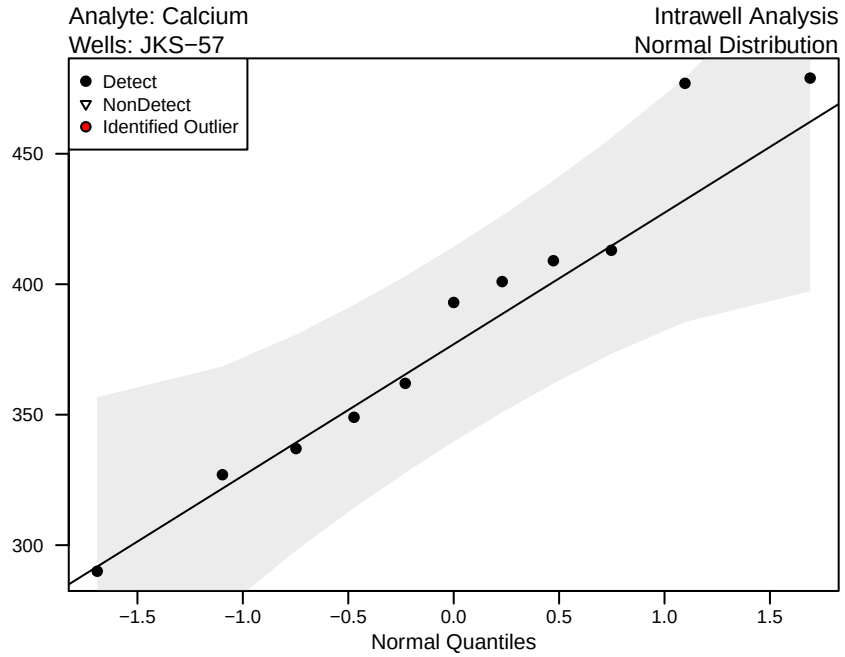

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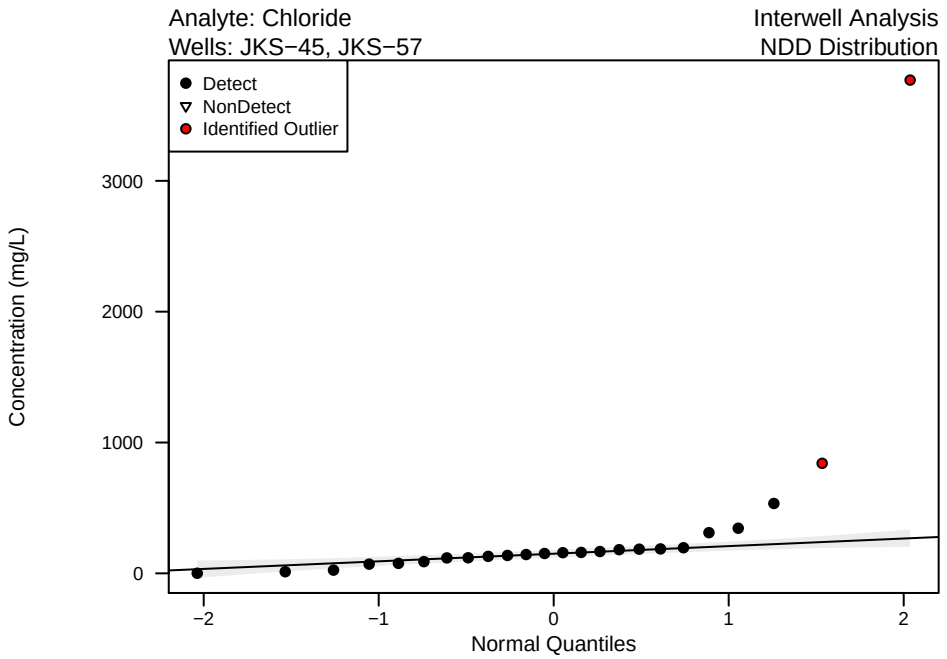
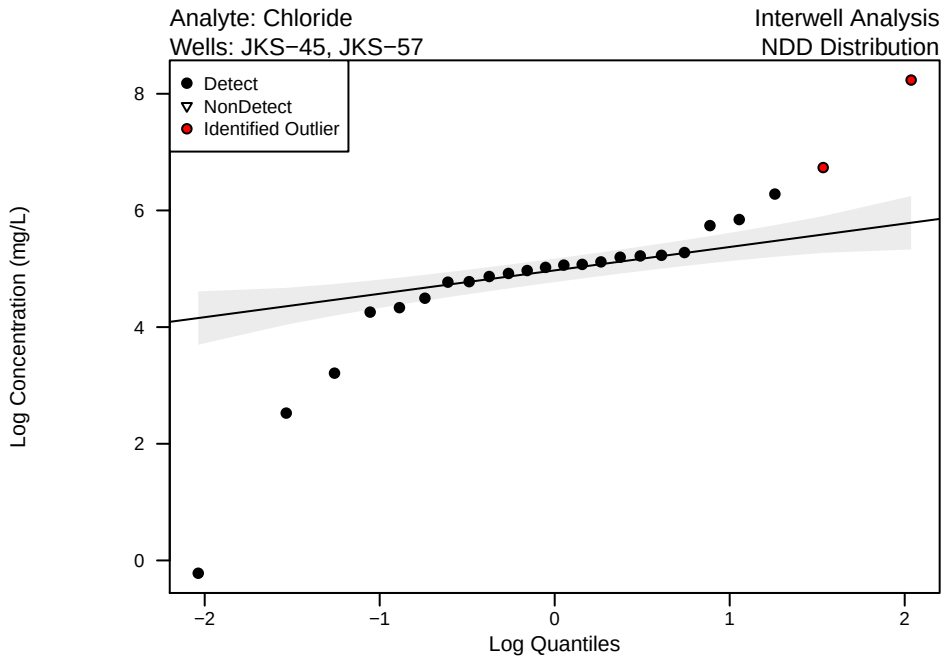
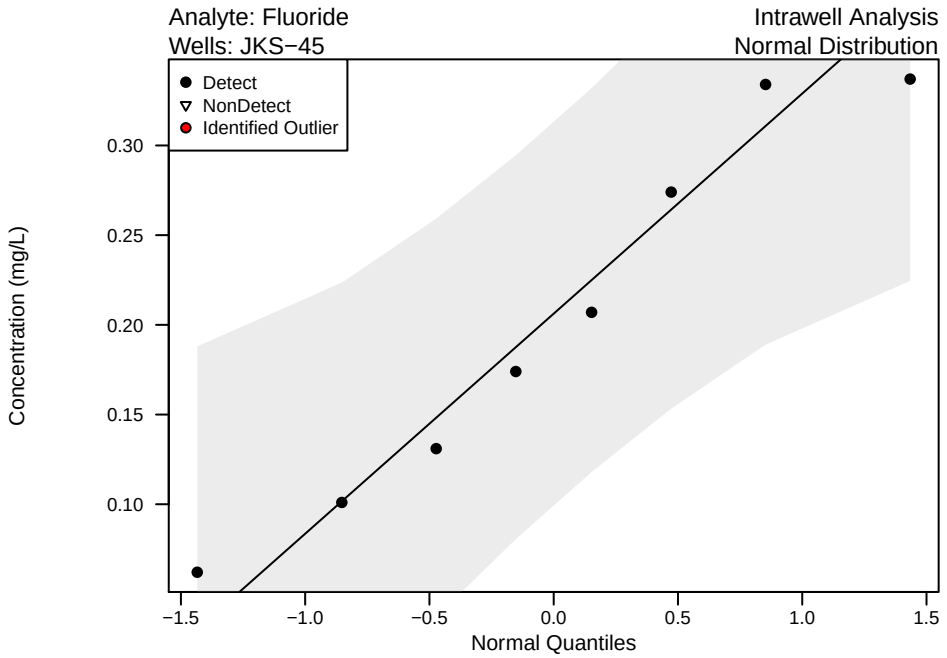
Unit: Fly Ash Landfill
QQ Plots of Upgradient Wells







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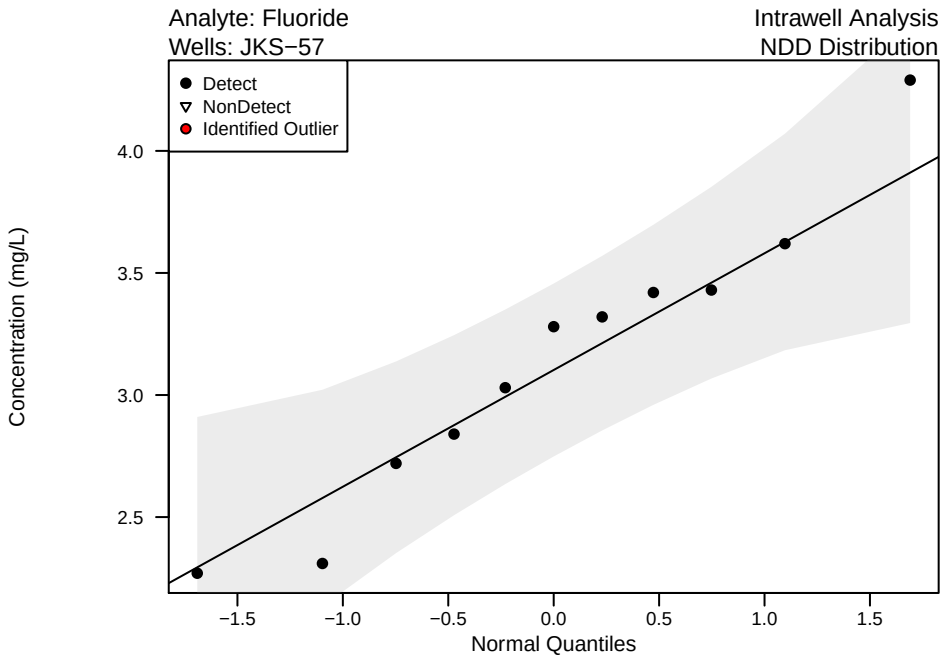
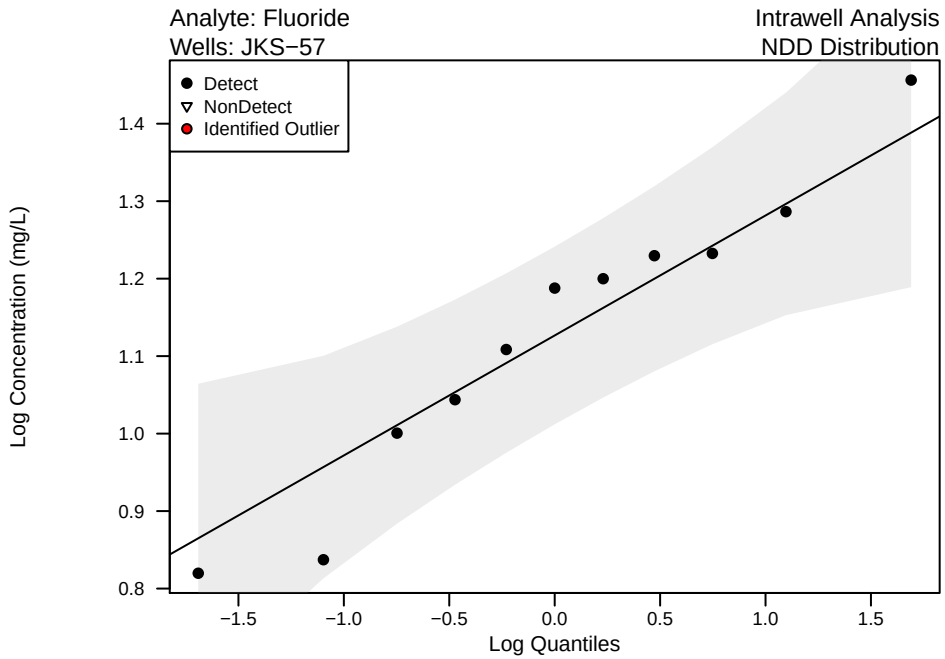
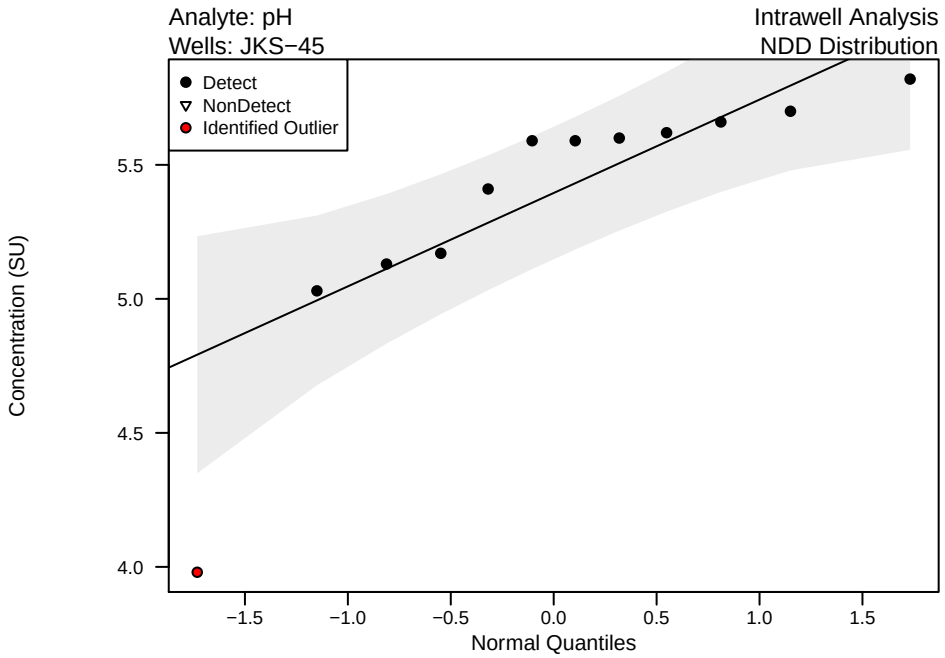
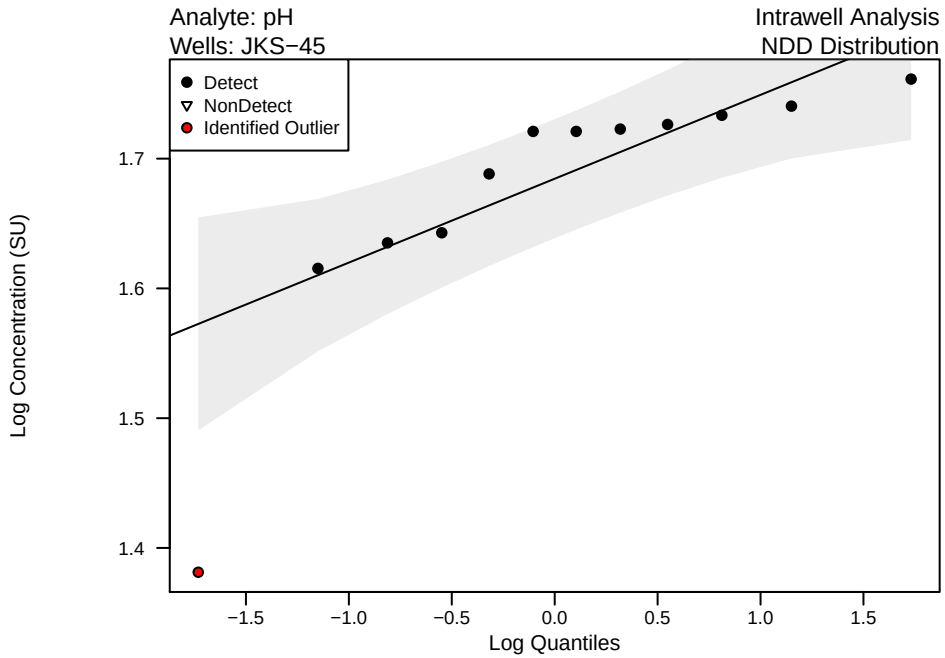
not Lognormal/NDD distribution.

Appendix B − Figure 2
Unit: Fly Ash Landfill
QQ Plots of Upgradient Wells

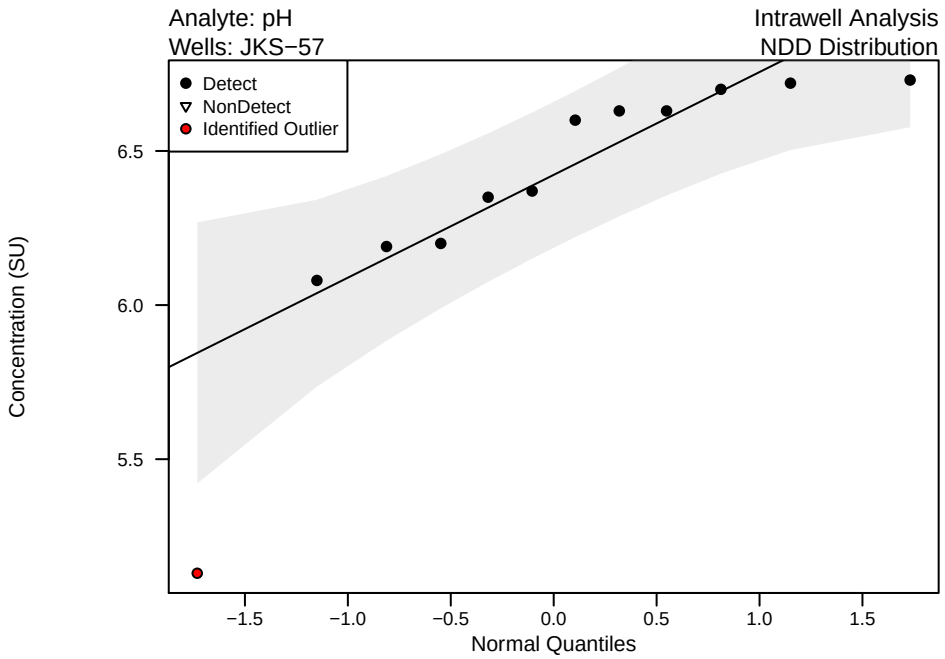


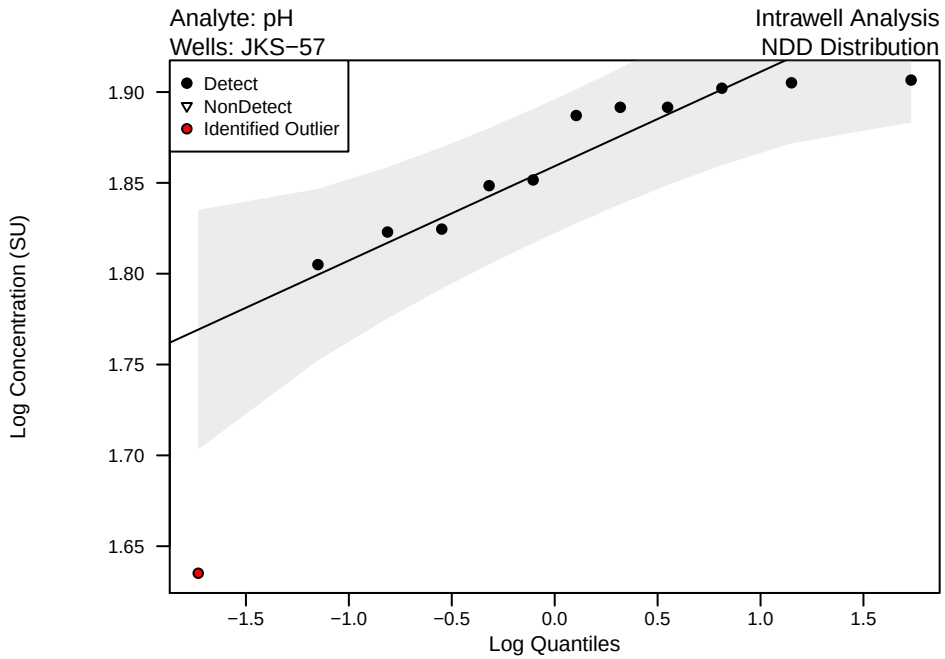


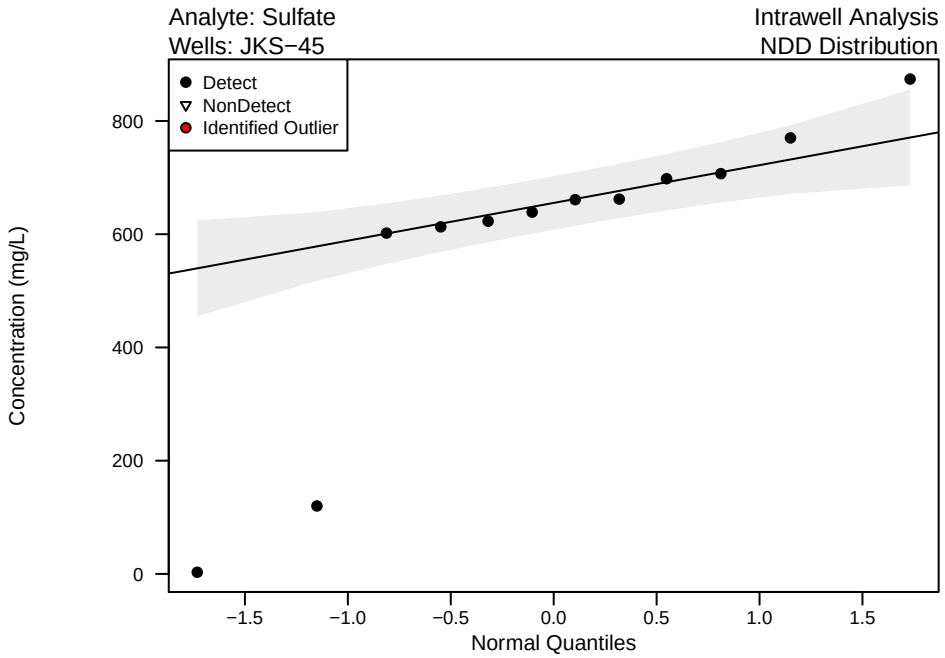


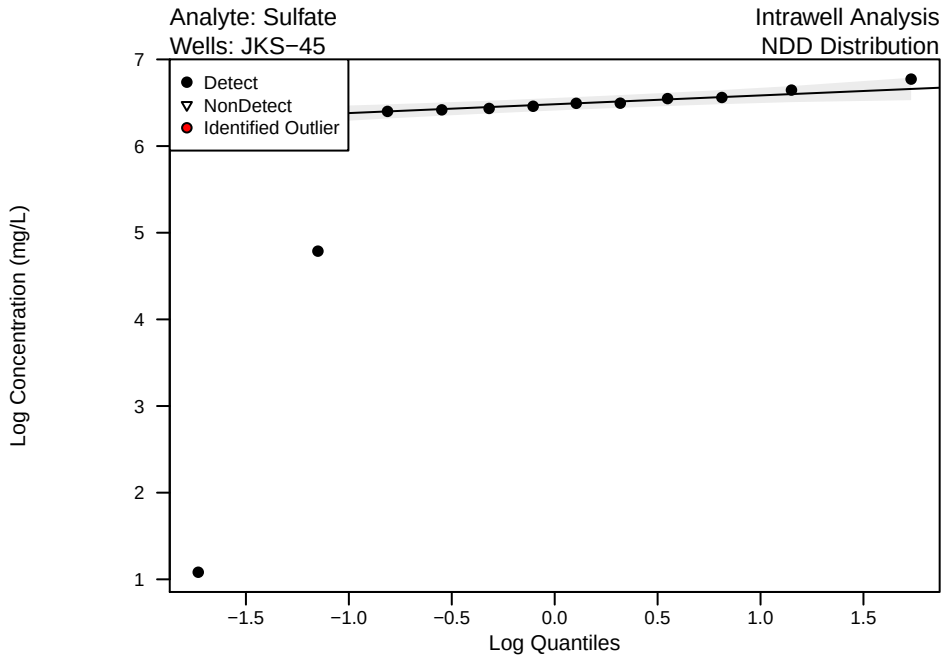


Appendix B − Figure 2
Unit: Fly Ash Landfill
QQ Plots of Upgradient Wells

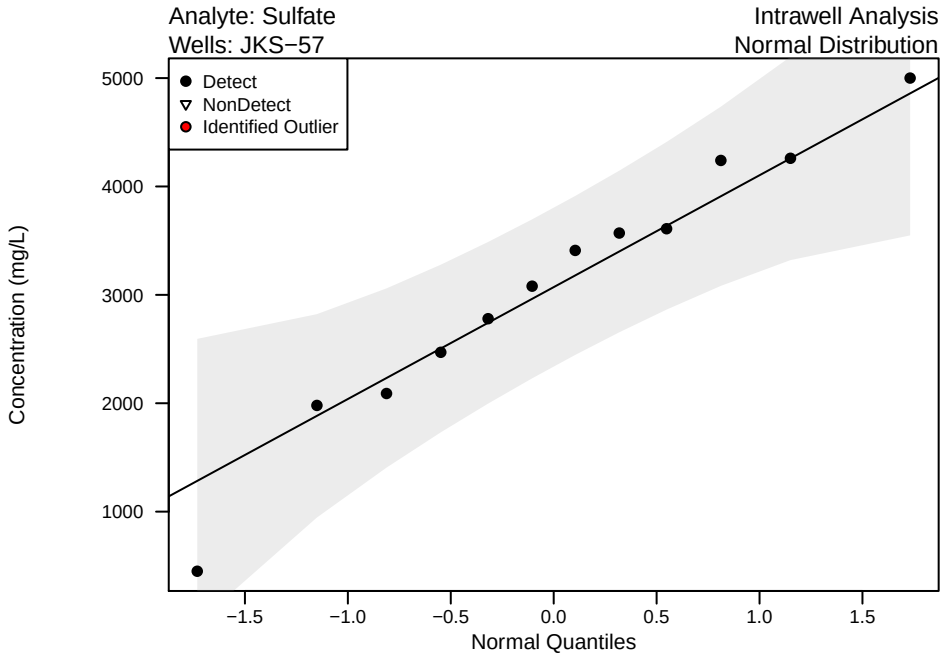








Appendix B − Figure 2
Unit: Fly Ash Landfill
QQ Plots of Upgradient Wells



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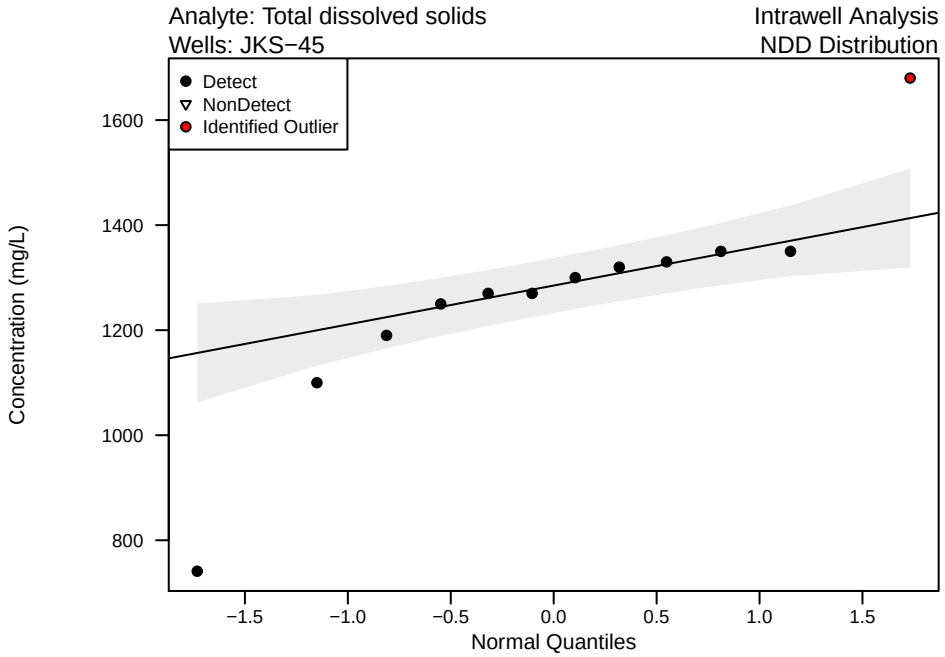
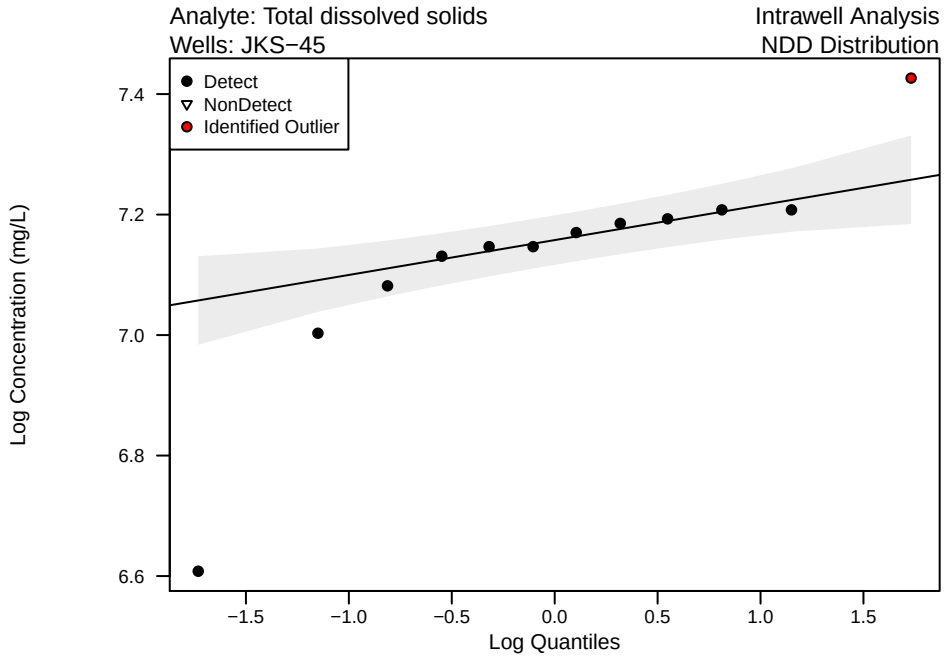
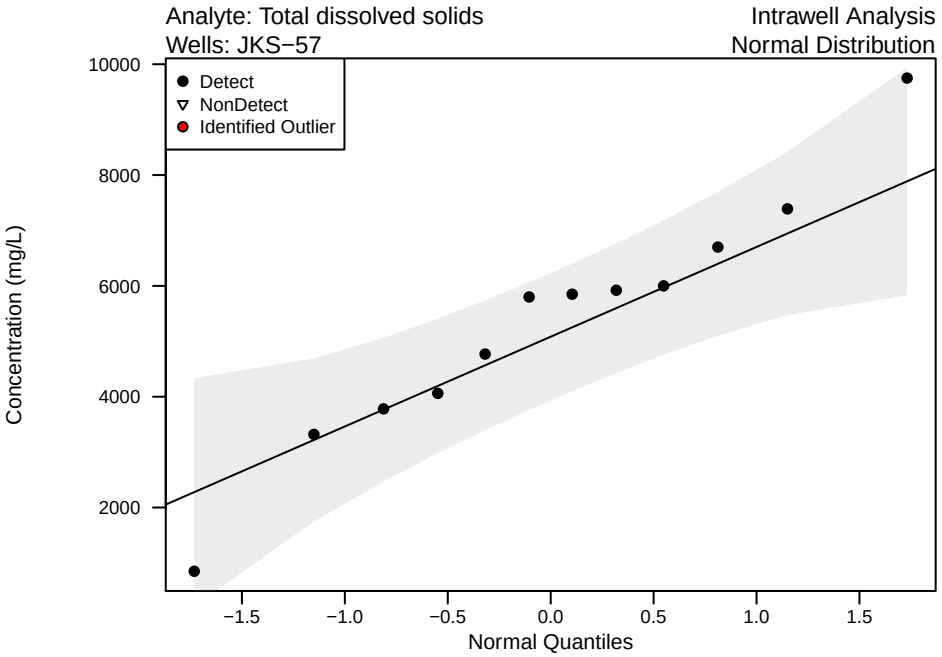
not Lognormal/NDD distribution.





Appendix B − Figure 2
Unit: Fly Ash Landfill
QQ Plots of Upgradient Wells



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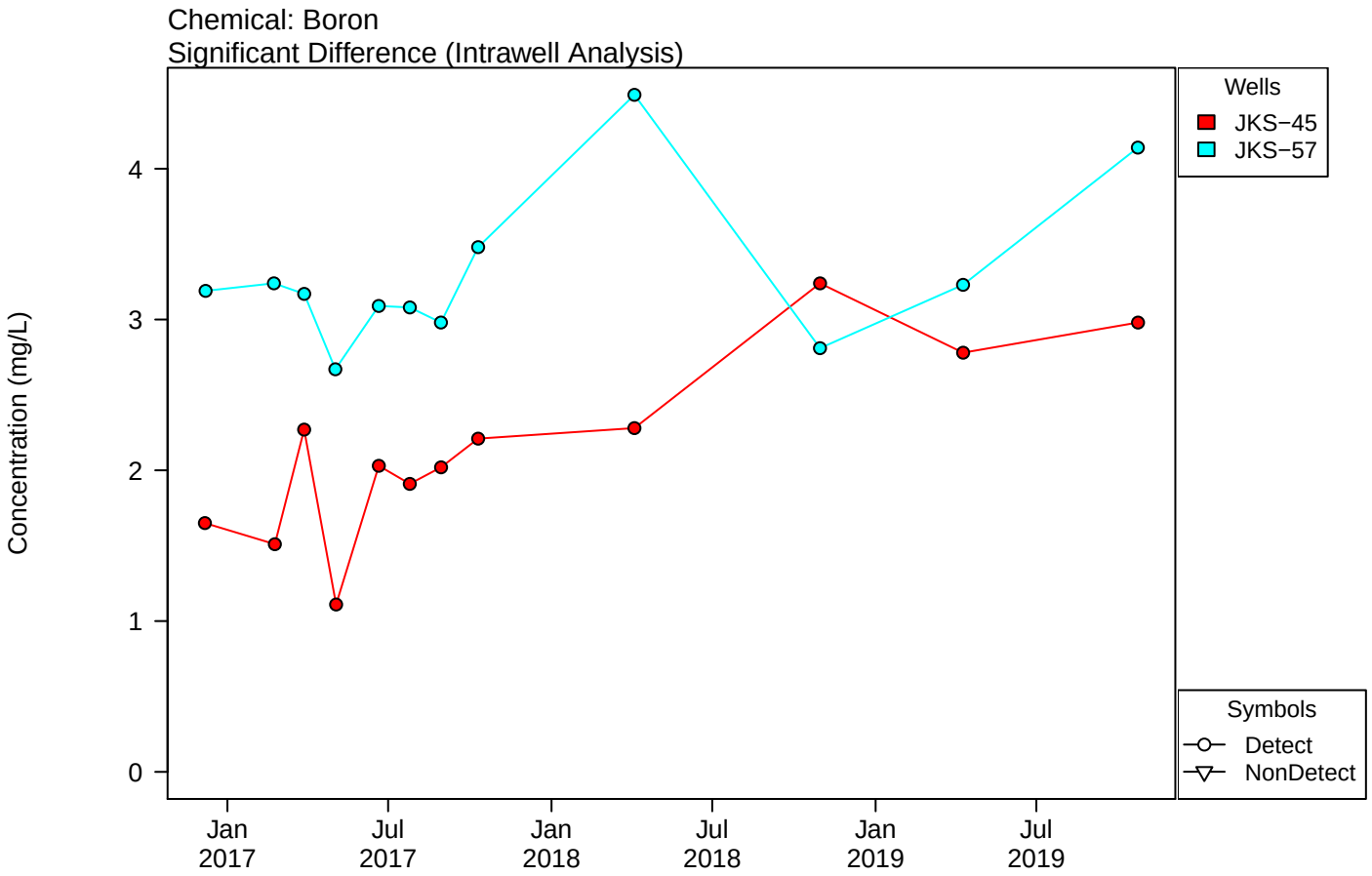
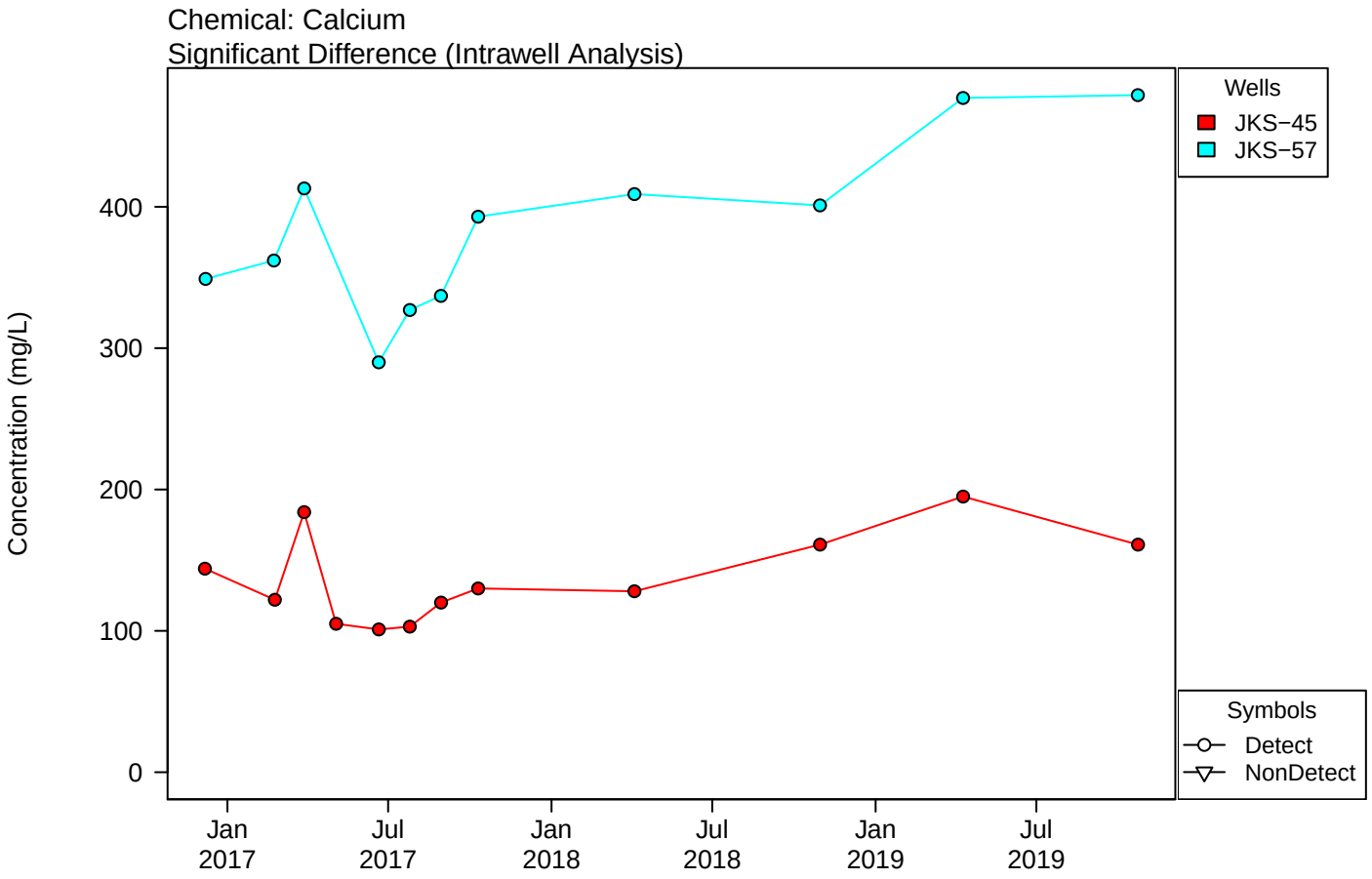
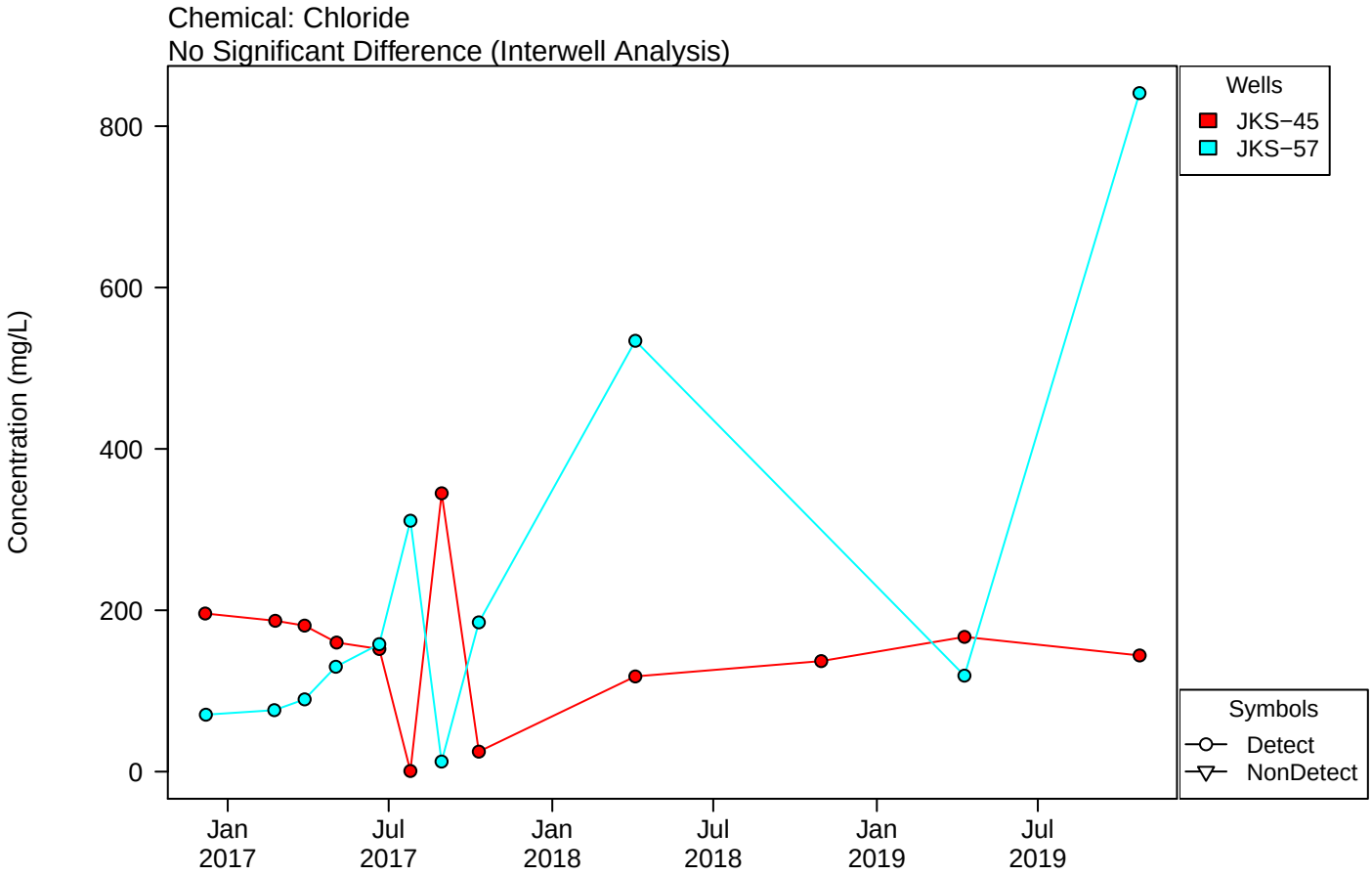
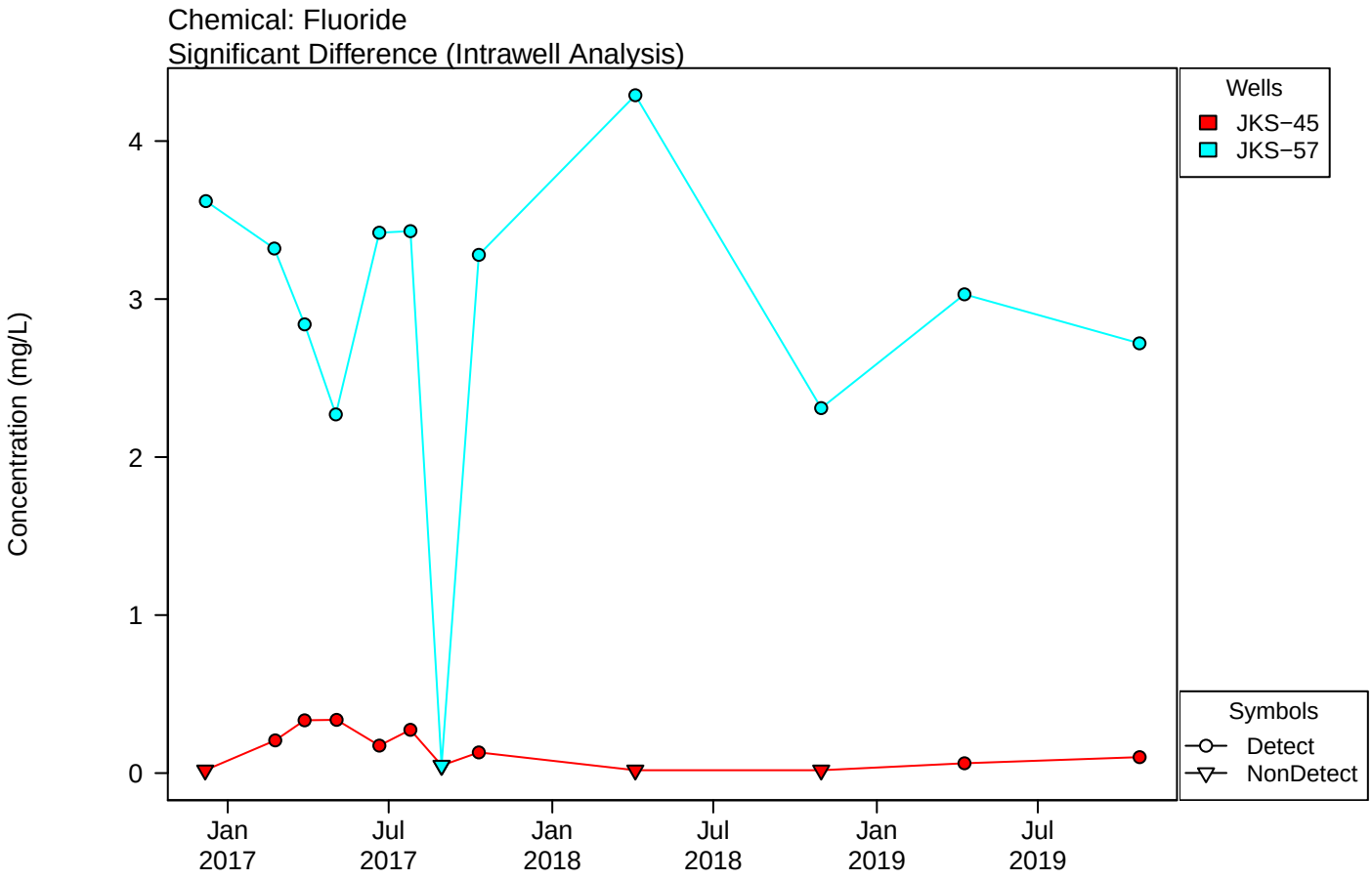
Appendix B − Figure 3
Unit: Fly Ash Landfill
Timeseries of Upgradient Wells



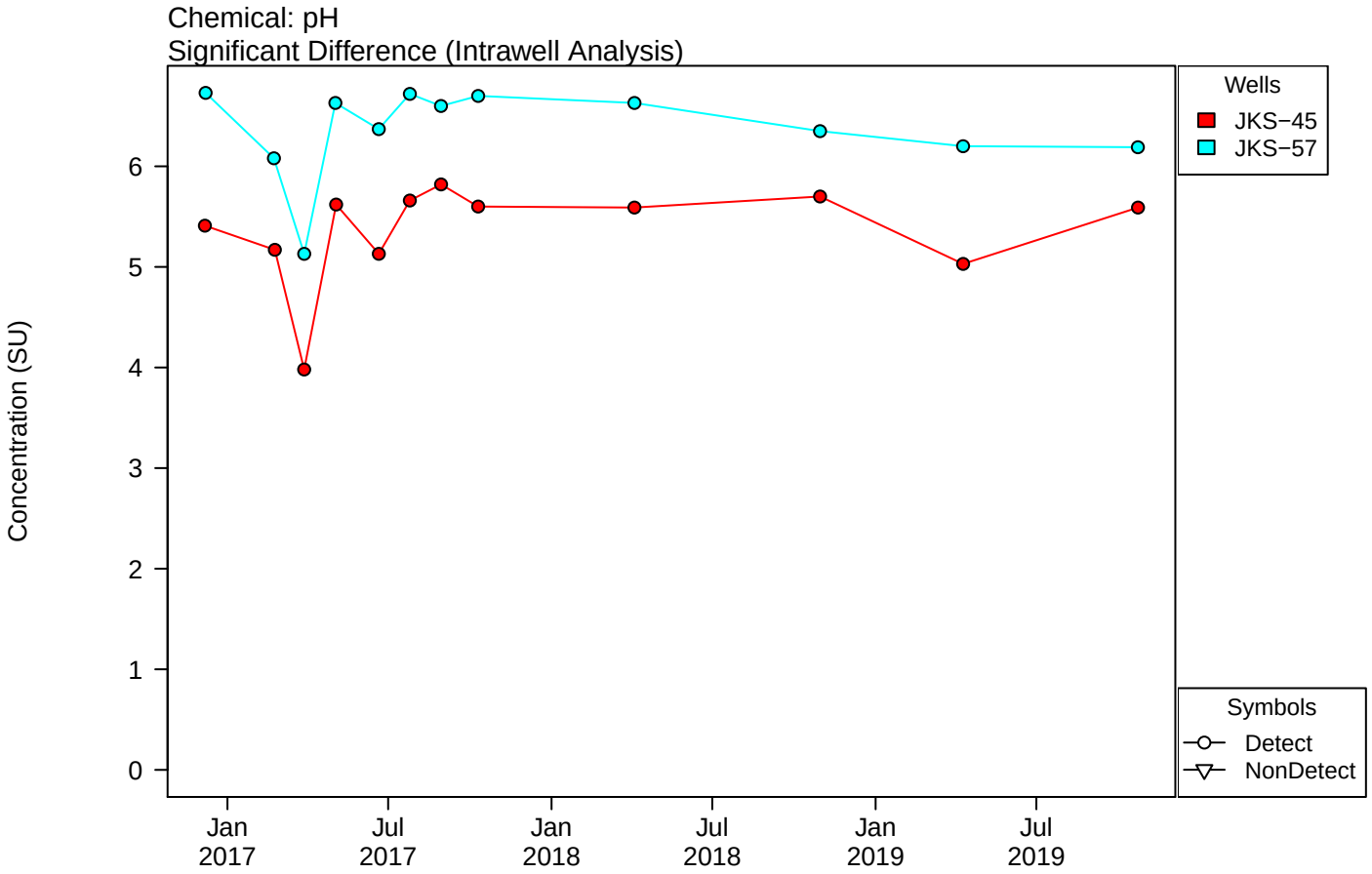


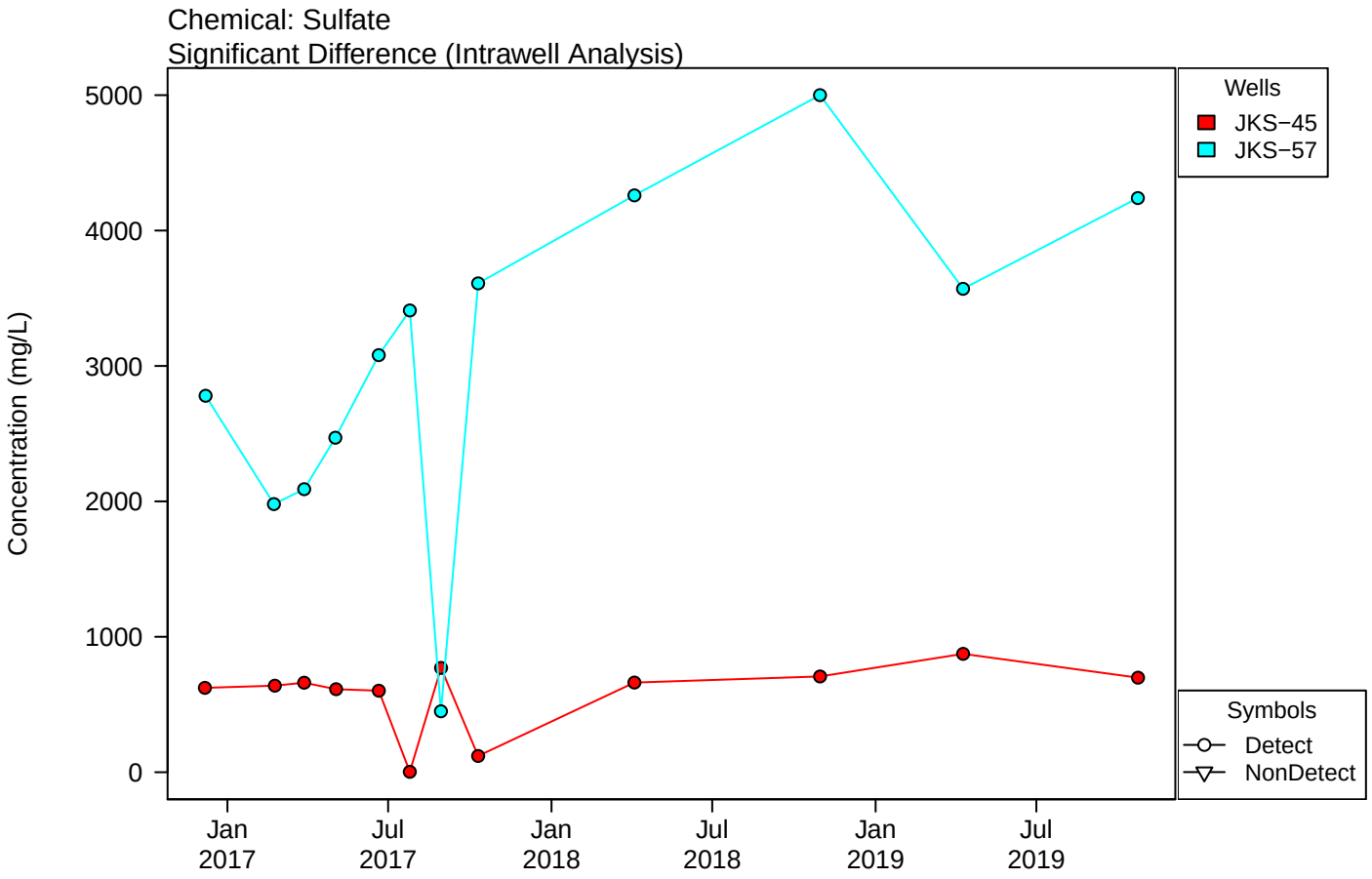
Appendix B − Figure 3
Unit: Fly Ash Landfill
Timeseries of Upgradient Wells



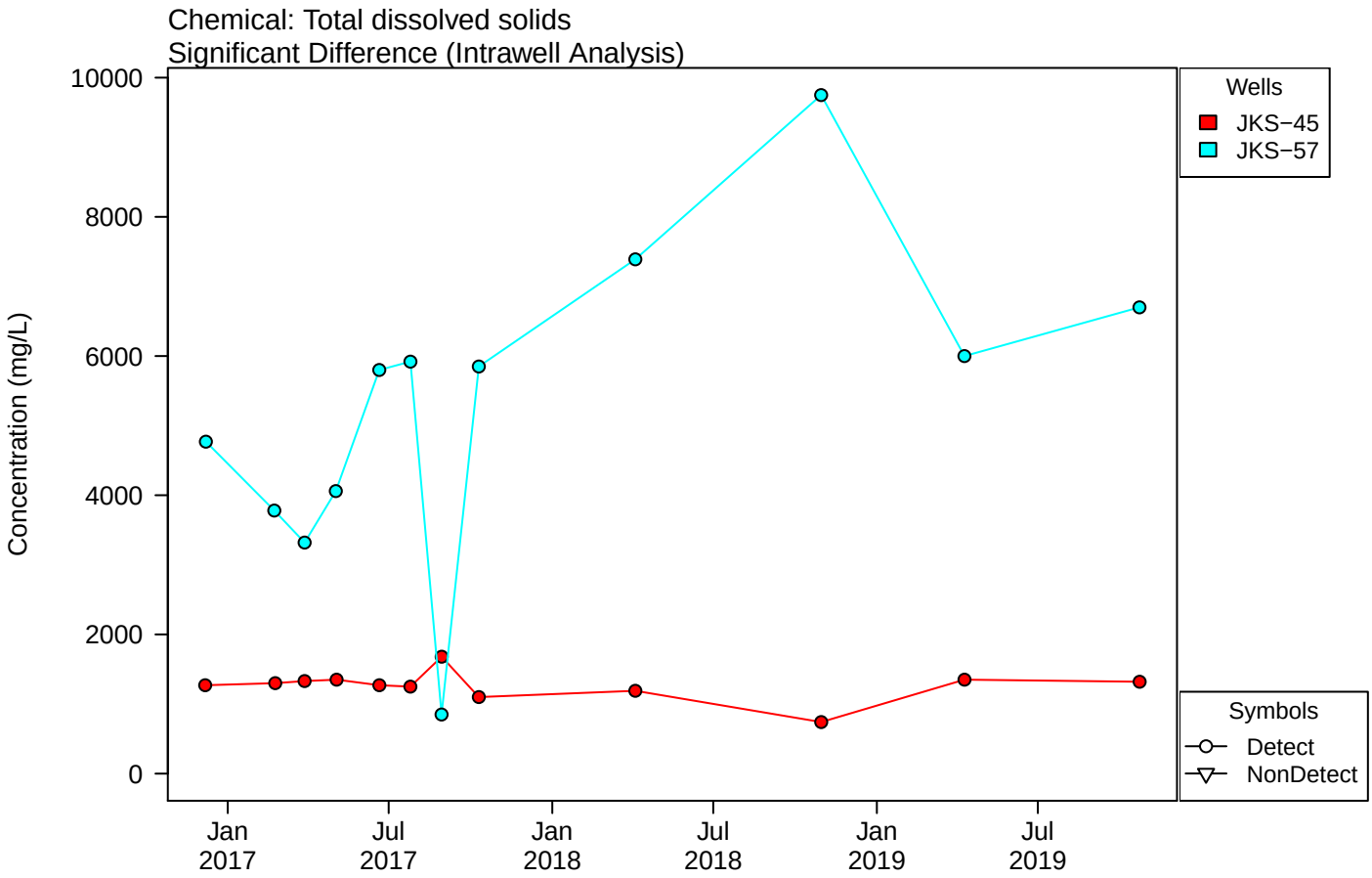


Appendix B − Figure 3
Unit: Fly Ash Landfill
Timeseries of Upgradient Wells

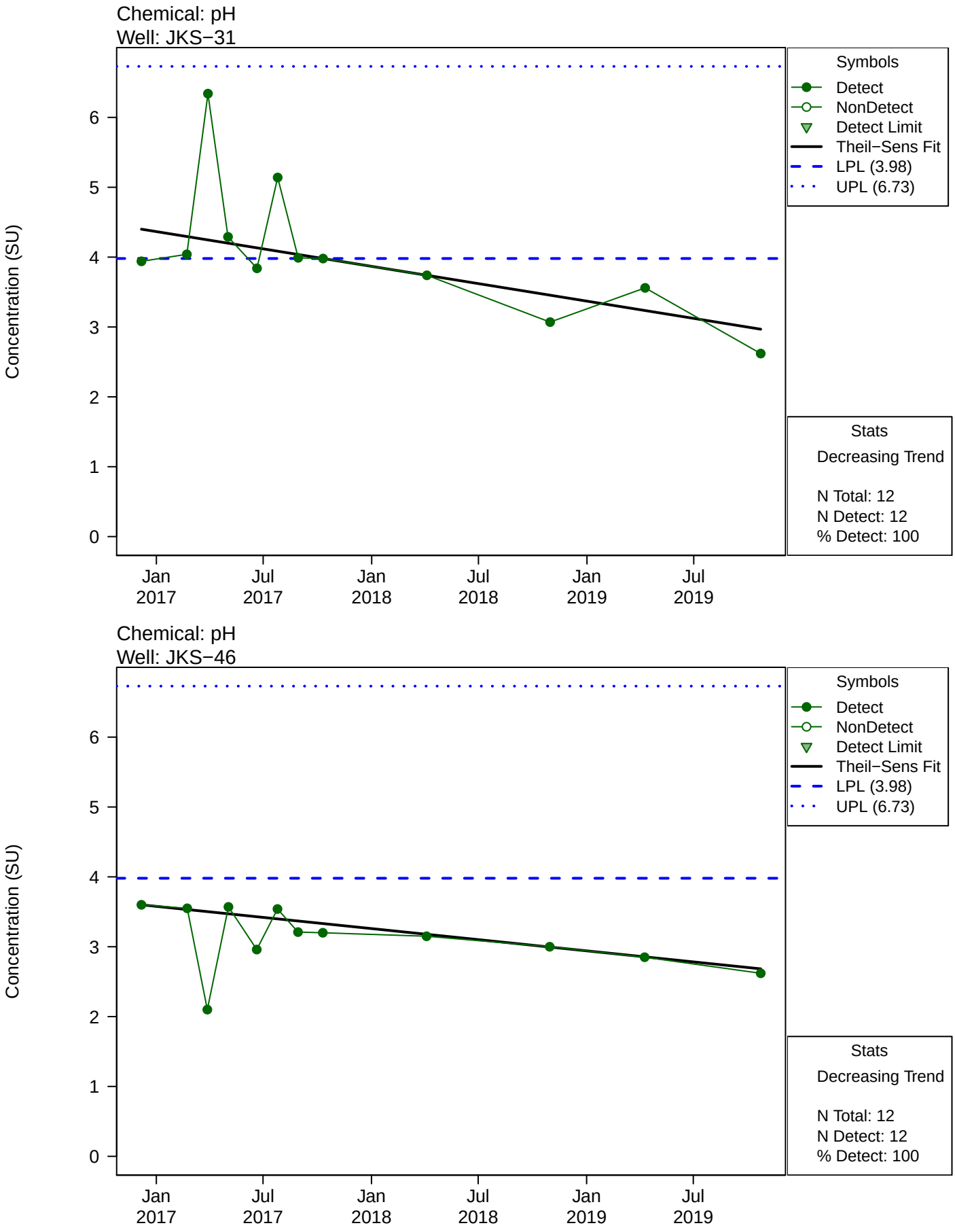




Appendix B − Figure 3
Unit: Fly Ash Landfill
Timeseries of Upgradient Wells



Appendix B − Figure 4
Unit: Fly Ash Landfill
Trend Analysis of Downgradient Wells with Exceedances



April 2019 Groundwater Sampling Event – Calaveras Power Station CCR Units

Appendix C

Environmental Resources Management

CityCentre Four
840 West Sam Houston Pkwy N.
Suite 600
Houston, Texas 77024
(281) 600-1000
(281) 600-1001 (Fax)

July 11, 2019

Mr. Michael Malone
CPS Energy
145 Navarro Street
San Antonio, Texas 78205

Project No. 0503422

Subject: April 2019 Groundwater Sampling Event
Calaveras Power Station CCR Units
San Antonio, Texas

Dear Mr. Malone:

Introduction

Title 40, Code of Federal Regulations, Part 257 (40 CFR §257) (a.k.a. the Coal Combustion Residual (CCR) Rule) was published in the Federal Register in April 2015 and became effective in October 2015. One of the many requirements of the CCR Rule was for CPS Energy to determine if there are impacts to groundwater from the surface impoundments [Evaporation Pond (EP), Bottom Ash Ponds (BAPs), and Sludge Recycling Holding (SRH) Pond] and the landfill [Fly Ash Landfill (FAL)] that contain CCR at the Calaveras Power Station.

In the initial *Annual Groundwater Monitoring and Corrective Action Report* for each CCR unit, the downgradient monitoring well results from the October 2017 sampling event were compared to Upper Prediction Limits (UPLs) and Lower Prediction Limits (LPLs). UPLs and LPLs were calculated in the respective *Annual Groundwater Monitoring and Corrective Action Reports* for the purpose of determining a potential statistically significant increase (SSI) over background levels. In the second *Annual Groundwater Monitoring and Corrective Action Report* for each CCR unit, the downgradient monitoring well results from the October 2018 sampling event were compared to updated UPLs and LPLs. These updated UPLs and LPLs were recalculated in the respective *Annual Groundwater Monitoring and Corrective Action Reports* using the additional 2018 data. The evaluations of the April 2019 groundwater sample results indicated a potential SSI for a limited number of constituents from the EP, FAL, BAPs, and SRH Pond.

According to the CCR Rule [§257.94(e)], if the owner or operator of a CCR unit determines there is a SSI over background levels for one or more Appendix III constituents, the owner or operator may demonstrate that a source other than the CCR unit caused the SSI over background levels or that the SSI resulted from error in sampling, analysis, statistical evaluation or natural variation in

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groundwater quality. The CCR Rule also indicates that the owner or operator must complete the written demonstration within 90 days of detecting a SSI over the background levels. If a successful demonstration is completed within the 90-day period, the owner or operator may continue with a detection monitoring program.

To address the potential SSIs identified in the initial *Annual Groundwater Monitoring and Corrective Action Reports*, CPS Energy prepared *Written Demonstration – Responses to Potential Statistically Significant Increases (*dated April 4, 2018). To address the potential SSIs identified in the second *Annual Groundwater Monitoring and Corrective Action Reports*, CPS Energy prepared *Written Demonstration – Responses to Potential Statistically Significant Increases (*dated February 27, 2019). Based on the evidence provided in the *Written Demonstrations*, no SSIs over background levels were determined for any of the CPS Energy CCR units (EP, FAL, BAPs, and SRH Pond) and therefore, CPS Energy continued with a detection monitoring program that would include semiannual sampling.

Sampling Event Summary

The first semiannual groundwater sampling event for 2019 was conducted on April 9 through April 10. The sampling event included the collection of water level measurements and groundwater samples from all the background and downgradient monitoring wells in the CCR monitoring program. The groundwater samples were analyzed for Appendix III constituents.

For each CCR unit, the downgradient monitoring well results from the April 2019 sampling event were compared to the updated UPLs and LPLs recalculated in their respective second *Annual Groundwater Monitoring and Corrective Action Report*. The April 2019 groundwater sample results for the downgradient monitoring wells in each CCR unit are summarized in Attachment 1.

Although the evaluations of the April 2019 groundwater sample results indicated a potential SSI for a limited number of constituents, with the exception of calcium in JKS-60 associated with the FAL and fluoride in JKS-52 associated with the SRH Pond, the constituents associated with the potential SSIs are the same constituents, detected at similar concentrations, that were previously identified in one or both of the *Written Demonstrations*. The evaluations of the April 2019 groundwater sample results with potential SSIs are summarized below.

EP – The constituents associated with potential SSIs include boron in JKS-61; fluoride in JKS-36, JKS-61, and JKS-62; and pH in JKS-36. As previously presented in the *Written Demonstrations*, the concentrations of boron, fluoride, and pH appear to reflect natural variation in groundwater quality in the vicinity of the CCR unit. The reported April 2019 concentrations were within the range of naturally occurring concentrations identified in the *Written Demonstrations*.

FAL – The constituents associated with potential SSIs include calcium in JKS-33 and JKS-60; chloride in JKS-33; and pH in JKS-31 and JKS-46. As previously presented in the *Written Demonstrations*, the concentrations of calcium, chloride, and pH appear to reflect natural variation in groundwater quality in the vicinity of the CCR unit. The reported April 2019 concentrations were within the range of naturally occurring concentrations identified in the *Written Demonstrations*.

BAPs – The constituents associated with potential SSIs include boron in JKS-50R and JKS-56 and fluoride in JKS-48. As previously presented in the *Written Demonstrations*, the concentrations of boron and fluoride appear to reflect natural variation in groundwater quality in the vicinity of the CCR unit. The reported April 2019 concentrations were within the range of naturally occurring concentrations identified in the *Written Demonstrations*.

SRH Pond – The constituent associated with a potential SSI is fluoride in JKS-52. Although a potential SSI of fluoride was not previously presented in the *Written Demonstrations*, the concentrations of fluoride appear to reflect natural variation in groundwater quality in the vicinity of the CCR unit and the reported April 2019 concentration is within the range of naturally occurring concentrations identified in the *Annual Groundwater Monitoring and Corrective Action Reports*. Also note that although the normal groundwater sample collected from JKS-52 indicated a potential SSI of fluoride, a field duplicate sample collected from JKS-52 after the normal sample did not indicate a potential SSI.

Conclusions

Based on the April 2019 groundwater sample results and the evidence provided in one or both of the *Written Demonstration*s, no SSIs over background levels have been determined for any of the CPS Energy CCR units (EP, FAL, BAPs, and SRH Pond) and therefore, CPS Energy should continue with a detection monitoring program. The second semiannual sampling event should be performed in October 2019.

We appreciate the opportunity to work with you on this project. Please contact me if you should have any questions.

Sincerely,

Environmental Resources Management

Wally Zverina
Principal Consultant

Attachment 1
April 2019 Groundwater Sample Results

July 2019
Project No. 0503422
CPS Energy

Environmental Resources Management
CityCentre Four
840 West Sam Houston Pkwy N. Suite 600
Houston, Texas 77024
(281) 600-1000

April 2019 Groundwater Sample Results
CCR Unit: Evaporation Pond
CPS Energy Calaveras Power Station
San Antonio, TX

			CCR Unit	EP	EP	EP	EP
			Well Designation	Downgradient	Downgradient	Downgradient	Downgradient
			Well ID	JKS-36	JKS-61	JKS-62	JKS-62
			Sample Date	4/9/2019	4/9/2019	4/9/2019	4/9/2019
			Sample Type Code	N	N	N	FD
Chemical	Units	2017-2018 LPL - EP	2017-2018 UPL - EP				
Boron	mg/L	--	1.33	0.663	2.72	0.612	0.554 X
Calcium	mg/L	--	1310	315 D	176	205 D	173 X
Chloride	mg/L	--	2120	285	253	336	329
Fluoride	mg/L	--	0.271	1.45	0.403 J	0.356 J	0.349 J
pH, Field	SU	5.36	6.63	3.71	6.52	6.29	6.29
Sulfate	mg/L	--	2110	697	619	191	194
Total dissolved solids	mg/L	--	6450	1520	1650	1190	1300

NOTES:

Shaded cell indicates exceedance in either the Upper Prediction Limit (UPL) or the Lower Prediction Limit (LPL) for this CCR unit.
Sample Type Code: N - Normal; FD - Field Duplicate
J - Estimated concentration. Qualified due to high matrix spike % recovery.
X - MS/MSD recoveries were outside of the laboratory contol limts due to possible matrix interference or a concentration of target analyte high enough to affect the recovery of the spike concentration.
D - Sample was diluted due to targets detected over the highest point of the calibration curve or due to matrix interference.

April 2019 Groundwater Sample Results
CCR Unit: Fly Ash Landfill
CPS Energy Calaveras Power Station
San Antonio, TX

			CCR Unit	FAL	FAL	FAL	FAL	FAL
			Well Designation	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient
			Well ID	JKS-31	JKS-33	JKS-46	JKS-60	JKS-60
			Sample Date	4/9/2019	4/9/2019	4/9/2019	4/9/2019	4/9/2019
			Sample Type Code	N	N	N	N	FD
Chemical	Units	2017-2018 LPL - FAL	2017-2018 UPL - FAL					
Boron	mg/L	--	4.22	0.557	1.13	0.997	0.405	0.375
Calcium	mg/L	--	453	295 D	631	212 D	501 D	506 D
Chloride	mg/L	--	380	322	806	13.2	149 X	151
Fluoride	mg/L	--	5.19	0.791	1.23	2.52	0.187 J	0.187 J
pH, Field	SU	3.98	6.73	3.56	5.98	2.85	5.93	5.93
Sulfate	mg/L	--	6370	852	1640	1030	968	976
Total dissolved solid	mg/L	--	11200	1660	2650 JL	1550	2010	2020

NOTES:

Shaded cell indicates exceedance in either the Upper Prediction Limit (UPL) or the Lower Prediction Limit (LPL) for this CCR unit.
Sample Type Code: N - Normal; FD - Field Duplicate
D - Sample was diluted due to targets detected over the highest point of the calibration curve or due to matrix interference.
J - Estimated concentration. Qualified due to high matrix spike % recovery.
JL - Estimated concentration biased low - analyzed outside of recommended holding time.
X - MS/MSD recoveries were outside of the laboratory contol limts due to possible matrix interference or a concentration of target analyte high enough to affect the recovery of the spike concentration.

April 2019 Groundwater Sample Results
CCR Unit: Bottom Ash Ponds
CPS Energy Calaveras Power Station
San Antonio, TX

			CCR Unit	BAP	BAP	BAP	BAP	BAP	BAP
			Well Designation	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient
			Well ID	JKS-48	JKS-50R	JKS-52	JKS-52	JKS-55	JKS-56
			Sample Date	4/9/2019	4/9/2019	4/9/2019	4/9/2019	4/9/2019	4/9/2019
			Sample Type Code	N	N	N	FD	N	N
Chemical	Units	2017-2018 LPL - BAP	2017-2018 UPL - BAP						
Boron	mg/L	--	2.71	2.22	5.85	1.46 X	1.62	0.74	3.85
Calcium	mg/L	--	229	166 D	159 D	195 DX	188 D	165 D	150 D
Chloride	mg/L	--	484	467	70	336	339	438	81
Fluoride	mg/L	--	0.834	1.46	0.319 J	0.831	0.799	0.822	0.372 J
pH, Field	SU	5.48	7.19	7.06	6.8	6.91	6.91	6.9	6.76
Sulfate	mg/L	--	389	271	168	268	285	168	193
Total dissolved solids	mg/L	--	1870	1420	842	1170	1250	1420	918

NOTES:

Shaded cell indicates exceedance in either the Upper Prediction Limit (UPL) or the Lower Prediction Limit (LPL) for this CCR unit.
Sample Type Code: N - Normal; FD - Field Duplicate
D - Sample was diluted due to targets detected over the highest point of the calibration curve or due to matrix interference.
J - Estimated concentration. Qualified due to high matrix spike % recovery.
X - MS/MSD recoveries were outside of the laboratory contol limts due to possible matrix interference or a concentration of target analyte high enough to affect the recovery of the spike concentration.

April 2019 Groundwater Sample Results
CCR Unit: SRH Pond
CPS Energy Calaveras Power Station
San Antonio, TX

			CCR Unit	SRH Pond	SRH Pond	SRH Pond	SRH Pond
			Well Designation	Downgradient	Downgradient	Downgradient	Downgradient
			Well ID	JKS-52	JKS-52	JKS-53	JKS-54
			Sample Date	4/10/2019	4/10/2019	4/10/2019	4/10/2019
			Sample Type Code	N	FD	N	N
Chemical	Units	2017-2018 LPL - SRH	2017-2018 UPL - SRH				
Boron	mg/L	--	2.71	1.46 X	1.62	1.42	1.38
Calcium	mg/L	--	231	195 DX	188 D	116	117
Chloride	mg/L	--	476	336	339	354	385
Fluoride	mg/L	--	0.816	0.831	0.799	0.27 J	0.711
pH, Field	SU	5.48	7.19	6.91	6.91	6.6	6.75
Sulfate	mg/L	--	382	268	285	224	309
Total dissolved solids	mg/L	--	1830	1170	1250	1150	1470

NOTES:

Shaded cell indicates exceedance in either the Upper Prediction Limit (UPL) or the Lower Prediction Limit (LPL) for this CCR unit.
Sample Type Code: N - Normal; FD - Field Duplicate
D - Sample was diluted due to targets detected over the highest point of the calibration curve or due to matrix interference.
J - Estimated concentration. Qualified due to high matrix spike % recovery.
X - MS/MSD recoveries were outside of the laboratory contol limts due to possible matrix interference or a concentration of target analyte high enough to affect the recovery of the spike concentration.