Colbert Landfill Remediation Project Annual Report 2023

Progress Report for

April 2022 through June 2023

Prepared by:

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***Historical monitoring well analytical results and remedial progress reports can be found on the Spokane County Solid Waste Department website at:**

https://www.spokanecounty.org/4726/Colbert-Landfill

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1.0 Colbert Landfill Remediation Project Summary

The Colbert Landfill Superfund site is a closed, 40-acre, municipal solid waste landfill located approximately 15 miles north of Spokane, Washington, and about 2.5 miles north of Colbert, Washington. The landfill received waste from 1968 to 1986 when it became filled to capacity. Groundwater in the vicinity of the landfill was found to be contaminated with volatile organic compounds and in 1983, and the landfill was placed on the National Priorities List (NPL) by EPA. In 1989, a consent decree (CD) was executed to implement a site remedy. The site remedy includes:

- An available alternate water supply for residential wells impacted by groundwater contamination originating from the landfill.
- Institutional Controls
- Construction and operation of a pump and treat system to capture and prevent further spread of groundwater contaminants.
- Landfill closure according to the State of Washington regulations Minimal Functional Standards (WAC173-304).
- Monitoring of contaminants to protect human health and the environment at the site.

Construction of a pump and treat (P&T) system was completed in 1994. The P&T system operated successfully for 20 years. In 2014, an EPA-recommended shut-down test was initiated to determine if the facility was continuing to add any significant benefit to the clean-up. The programs currently in place include a Shut-down Test (lower aquifer) for the pump and treat system; upper aquifer compliance groundwater monitoring (includes 1,4-dioxane monitoring and Minimal Functional Standards (MFS) monitoring of the upper aquifer); residential well monitoring (includes both upper and lower aquifers); supplemental sampling (includes both upper and lower aquifers); and landfill cover maintenance and monitoring. The groundwater monitoring programs and criteria are summarized below.

Current Monitoring Programs

Program	Aquifer	Parameters	Schedule
Shut-down Test	Lower	VOC's	Annual (Extraction wells Quarterly)
Upper Aquifer Compliance	Upper	VOC's	Annual (Extraction wells Quarterly)
1,4-Dioxane Sampling	Lower/ Upper	1,4-Dioxane	Annual/Monthly
MFS Monitoring	Upper	Cl/NH3/NO2/NH3/ SO4/Fe/Mn/Zn/TOC/COD	Annual
Residential Monitoring	Lower/ Upper	VOC's	Monthly/Quarterly/SemiAnnual/ Annual/BiAnnual
Supplemental Sampling	Lower/ Upper	VOC's	Every five years

Program Criteria

PROGRAM	CRITERIA	TCA	DCE	DCA	TCE	PCE	MC	1,4-Dioxane		Units
CONSENT DECREE	Performance	200	7	4050	5	0.7	2.5			ug/L
	Evaluation	200	7	4050	5	0.7	2.5	7		
SHUT-DOWN TEST	Action Level	130	4.55	2632	3.25	0.5	1.63			
	Evaluation	200	7	4050	5	0.7	2.5			
RESIDENTIAL										ug/L
Monthly sampling initiated, evaluated in 12 months	Action Level	130	4.55	2632	3.25	0.5	1.63			
Exceedance requires alternative drinking water source be supplied	MCL	200	7	4050	5	0.7	2.5			
		Cl	**Fe**	**Mn**	**Zn**	**TOC**	**COD**	**SO4**	**NO3**	
MFS	(mg/L)	250	0.3	0.05	5	NA	NA	250	10	mg/L

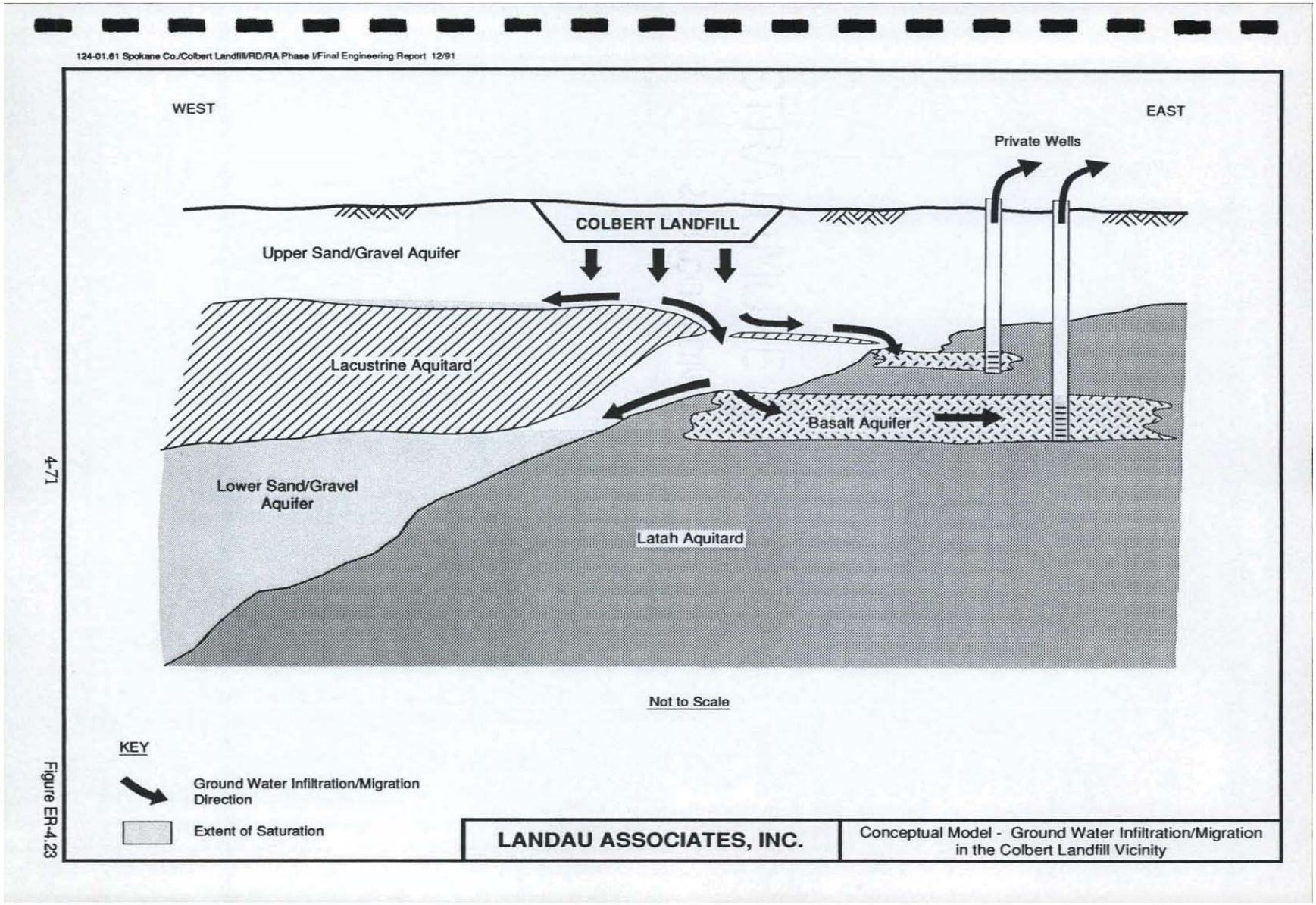
1.1 Geology/Hydrogeology

Hydrogeologic cross-sections for the Colbert Landfill is presented in Appendix D. The geology beneath the Site consists of six vertically stratified and laterally discontinuous geologic units derived from glacial and fluvial material, modified by erosional (and possibly landslide) processes, overlaid on granitic bedrock. There are two primary aquifers that include the saturated portion of the Upper Sand and Gravel Unit and the saturated portion of the Lower Sand and Gravel Unit, which are separated by a Lacustrine Unit that serves as an aquitard. The Latah Formation serves as an aquitard that underlies the Lower Sand and Gravel Aquifer at most locations. A basalt unit forms a secondary aquifer interbedded in the Latah Aquitard and is referred to as the Basalt Aquifer. The Granite Unit is an aquitard that underlies the Latah Formation and serves as the lower boundary to the regional flow system. For more information, please refer to the Phase I Engineering Report (Landau Associates 1991).

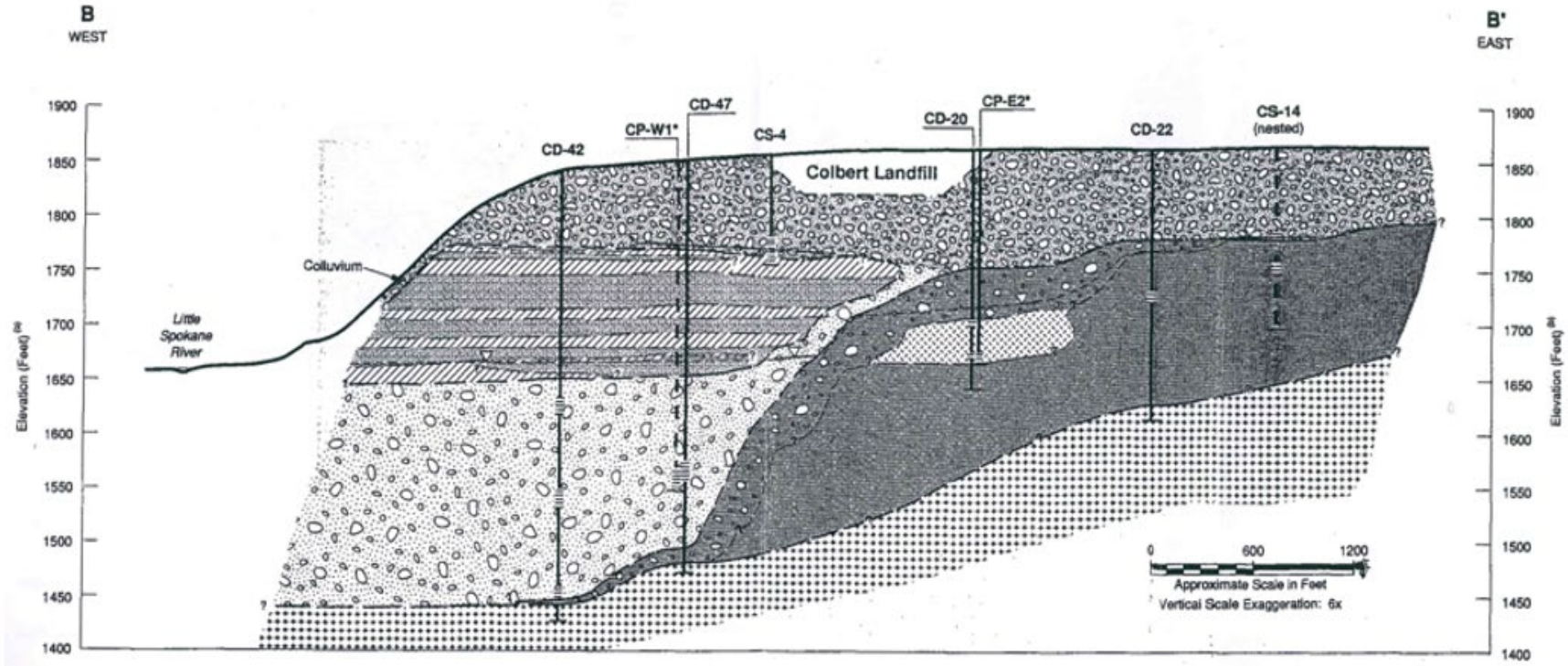
The Upper Sand and Gravel Unit aquifer (Upper Aquifer) is unconfined with a water table that lies approximately 90 ft below the ground surface. Groundwater flow in this aquifer is generally north to south, changing to the southeast approximately 1 mile south of the Site. The direction of flow appears to be influenced by the topography of the upper surface of the Lacustrine Aquitard (Landau Associates 1991).

The Lower Sand and Gravel Unit aquifer (Lower Aquifer) is confined to the west of the landfill and unconfined to the east of the landfill. To the west of the landfill, the Upper and Lower aquifers are separated by the Lacustrine unit, which causes the confined conditions in that area. Groundwater flow in the Lower Aquifer is predominantly toward the west with discharge to the Little Spokane River.

Colbert Landfill Hydrogeology/Groundwater Migration



Colbert Landfill Hydrogeology Overview



1.2 Colbert Landfill Monitoring – Overview of Results/Discussion

Shut-down Test - Lower Aquifer

The highest constituent of concern (COC) concentrations in the vicinity of the Colbert Landfill are found in the lower aquifer. After the shutdown of the Colbert Landfill extraction system, overall COC concentrations exhibited an initial increase followed by a decrease/plateau starting in 2017 and ending in 2021/2022. Currently, COC concentrations in the lower aquifer, especially TCA and DCE, continue to be on increasing trends. All COC constituent concentrations found in the lower aquifer extraction wells exhibited increases in concentrations between April 2022 and April 2023, with the exception of DCA for CP-W2. COC Concentrations found in the lower aquifer compliance wells exhibited decreases for TCA in CD-43C1/DCE in CD-44C1, and increases for TCA in CD-44C1, CD-45C1, and CD-49. Despite the current increasing trend(s), there have been no COC criteria exceedances in any of the Shutdown compliance monitoring wells. Individual COC concentration increases/decreases for all shutdown compliance/extraction wells between April 2022 and April 2023 are presented in Table 2-8. For more information regarding the shutdown program, see Section 1.3.

Upper Aquifer Compliance Monitoring

COC concentrations in the upper aquifer compliance wells have exhibited stable/decreasing trends following the shutdown of the extraction wells, with a few exceptions. COC concentrations found in CS-04A1, CP-S1, CP-S4, and CD-36A1 continued to increase from April 2022 to April 2023. Select COC concentrations exhibited decreases, such as DCA and TCE for 1573A-1, TCA and DCA for CD-40C1, TCA for CD-60A1, and DCA for CP-S4. Similar to several monitoring wells found in the lower aquifer, COC concentrations exhibited an initial increase after the shutdown of the extraction system, followed by a decrease/plateau starting in 2016/2017 and ending in 2021/2022. Individual COC concentration increases/decreases for all upper aquifer compliance/extraction wells between April 2022 and April 2023 are presented in Table 3-8. For more information regarding the Upper Aquifer Compliance Monitoring program, see Section 1.4.

Residential Well Monitoring

There are currently 29 residential wells that Spokane County monitors through the Residential Well Monitoring program. COC concentrations for residential wells in both the lower and upper aquifers have exhibited decreases prior to the shutdown of the extraction system. After the shutdown of the extraction system, COC concentrations have remained non-detection or at very low concentrations for all of the residential wells sampled through the Residential Monitoring Program. The only COC concentrations above the detection limit during this reporting period were low concentrations (0.95 ug/L) of DCA found in residential well 1073L-1. For more information regarding the Residential Well Monitoring program, see Section 1.5.

1,4-Dioxane Monitoring

From 2005 to 2008, Spokane County conducted an evaluation for 1,4-Dioxane prevalence and distribution in both the upper and lower aquifers. After the conclusion of the evaluation, only 5 wells in the upper aquifer were added to the Spokane County 1,4-Dioxane monitoring program for

annual sampling. In 2021, Spokane County received grant funding to conduct another evaluation for the prevalence/distribution of 1,4-Dioxane in post-shutdown conditions. For the lower aquifer, 1,4-Dioxane concentrations were detected in all of the extraction wells, along with residential well 1073Q-4. 1,4-Dioxane concentrations ranged from 0.0206 ug/l (CP-E3) to 2.54 ug/l (CP-W3). For the upper aquifer, 1,4-Dioxane concentrations were detected in several residential wells, compliance monitoring wells, and extraction wells. Most detections found in the upper aquifer were low concentrations of 1,4-Dioxane, with the exceptions of CP-S1 (4.96 ug/l) and CD-36A1 (10.5 ug/l). CD-36A1 has consistently exhibited the highest concentrations of 1,4-Dioxane at the Colbert Landfill since the 1,4-Dioxane evaluation sampling began in 2021. 1,4-Dioxane concentrations ranged from 0.127 ug/l (1573A-1) to 10.5 ug/l (CD-36A1).

While the distribution of 1,4-Dioxane appears to be greater since the 2005 evaluation due to a higher number of detections, this is most likely the result of a much lower detection limit used in the laboratory analyses during this evaluation (0.01 ug/L) compared to the 2005 evaluation (up to 5 ug/L). For more information regarding the current 1,4-Dioxane monitoring, see Section 1.6.

Colbert Landfill Upper/Lower Aquifer Data Evaluation

As discussed in the Shut-down Test (lower aquifer) and the Upper Aquifer Compliance Monitoring sections, monitoring wells in both the upper and lower aquifers are continuing to exhibit increasing trends in COC concentrations following a decrease/stabilization of COC concentrations starting in 2016/2017. For the lower aquifer, the increasing trends in COC concentrations are continuing to occur in COC source areas, wells downgradient of the COC source areas, and downgradient compliance monitoring wells. All COC constituent concentrations found in the lower aquifer extraction wells exhibited increases in concentrations between April 2022 and April 2023, with the exception of DCA for CP-W2. COC Concentrations found in the lower aquifer compliance wells exhibited decreases for TCA in CD-43C1/DCE in CD-44C1, and increases for TCA in CD-44C1, CD-45C1, and CD-49. Despite the current increasing trend(s), there have been no COC criteria exceedances in any of the Shutdown compliance monitoring wells. If the current increase in COC source-area concentrations/western migration of the constituents of concern continues its current trajectory, downgradient/compliance wells could continue to exhibit increasing trends. For the upper aquifer, the Annual/Supplemental Sampling conducted during this reporting period indicated that several compliance monitoring wells are currently exhibiting increasing trends for several contaminants of concern.

The increasing trends for COC concentrations in both the lower and upper aquifer continue to coincide with increasing groundwater elevations, along with the lower aquifer approaching the end of the shutdown test. Groundwater velocities in the Lower Aquifer under non-pumping conditions were reported to be on the order of 100 to 200 ft/yr in the 1991 Final Phase I Engineering Report (Landau Associates 1991), and the existing downgradient compliance monitoring wells are about 900 ft west of the western extraction wells. Therefore, it is anticipated that monitoring for the shutdown test will need to continue for up to 9 years to determine the impact (if any) the system shutdown has on groundwater quality downgradient from the West System extraction wells. Since the shutdown test officially began on April 1, 2014, a 9-year shutdown test would end on April 1,

2023. Spokane County will submit a separate evaluation/report summarizing a recommended action plan for the Colbert Landfill in late 2023/early 2024. For more information regarding the lower and upper aquifer sampling results, see Section 2.0 and Section 3.0 (respectively).

1.3 Shut-down Test - Lower Aquifer

A pump and treat system was successfully operated from 1994 through March 31, 2014, to prevent further spread of groundwater contamination emanating from the landfill. A shut-down test for the lower aquifer pump and treat system was deemed appropriate for the site after a Remedial System Evaluation (RSE) was performed as recommended in the 2009 Five Year Review (EPA). The RSE recommendation stated that with the extensive groundwater monitoring programs in place and with concentrations having decreased substantially after 20 years of operation, the current pump and treat system may not be adding significant benefit to the overall protectiveness of the remedy and that a shut-down test would help determine its efficacy. The shut-down test procedures are outlined in the Final Work Plan, Groundwater Pump and Treat System Shut-down Test, Colbert Landfill CERCLA Site, Spokane County Utilities/ Landau Assoc. 2013. See Section 2 of this report for more details. The upper aquifer monitoring wells are governed by the Consent Decree (CD) compliance, Post Closure (Minimal Functional Standards), and 1,4-dioxane sampling programs and are not included in the Shut-down test work plan. Shut-down testing results and information is presented in Section 2.0.

1.4 Upper Aquifer Monitoring

1.4.1 Compliance Monitoring (VOC's)

The compliance monitoring sampling program is outlined in the Consent Decree and performed according to the Colbert Landfill Operations and Maintenance manual *(Colbert Landfill Operations and Maintenance Manual, 1998*.). During the implementation of the lower aquifer system Shut-down Test, the compliance monitoring will only apply to the upper aquifer. Per conditions outlined in the consent decree (Appendix B, page V-7), the south system extraction wells are not required to be in operation and have been on stand-by status since 2004, and therefore are included in the compliance monitoring program. Compliance monitoring results and information is presented in Section 3.2.

1.4.2 1,4-Dioxane Sampling

In previous years, the 1,4-Dioxane monitoring program only applied to select wells in the upper aquifer. The selected upper aquifer well locations were sampled for 1,4-dioxane according to the *1,4-Dioxane Work Plan for the Colbert Landfill (December 2007)*. Spokane County is currently conducting a 1,4-Dioxane evaluation in the upper and lower aquifers. See section 1.6 for additional 1,4-Dioxane monitoring requirements/information.

1.4.3 Minimal Functional Standards (MFS) Post Closure

The landfill was closed pursuant to requirements of the Minimal Functional Standards for Solid Waste Handling (MFS, WAC173-304). Lower aquifer locations, as outlined in the MFS Groundwater Monitoring Plan (Landau Assoc., 1996), require no additional monitoring after the 2 year monitoring period, which ended in January 1999. Monitoring for the upper aquifer will continue according to the *Colbert Landfill Operations and Maintenance Manual, 1998*., and the *MFS Groundwater Monitoring Plan, 1996*. MFS analytical results and information is presented in Section 3.4.

1.5 Residential Well Monitoring

The Consent Decree specified that domestic wells within the vicinity of the landfill be monitored to protect human health. Domestic well locations and schedules for this program were selected by proximity to landfill contamination and are evaluated on a regular basis to accommodate any changes in groundwater contamination. This program includes well locations in both the upper and lower aquifers. Sampling for this program is done in accordance with the Quality Assurance and *Field Sampling Plan-Colbert Residential Well Sampling, 1991*, and is governed by the Consent Decree. Residential program analytical results and information is presented in Section 4.0.

1.6 1,4-Dioxane Sampling

In 2005, the EPA specified an additional constituent (1,4-Dioxane) for evaluation at the Colbert Landfill site. After extensive monitoring in both the upper and lower aquifers, it was determined that an ongoing monitoring program would apply to selected wells in the upper aquifer only. During the 2019 EPA Five-Year Site Review, the EPA recommended that, "*Sampling for 1,4-Dioxane should be performed across a broader network of monitoring wells, including residential wells for at least two sampling events*" to evaluate the presence and extent of 1,4-Dioxane in post-shutdown conditions. The monitoring wells that are sampled annually for 1,4-Dioxane were selected prior to the P&T system shutdown based on sampling events conducted from 2005 - 2008, and groundwater flow conditions/contaminant transport may have changed. 1,4-Dioxane analytical results and information is presented in Section 5.0.

1.7 Supplemental Sampling

Supplemental sampling occurs every five years and is intended to collect additional data from monitoring and residential wells not regularly sampled. Although there are no criteria for monitoring or reporting associated with supplemental sampling, data collected helps provide a more accurate snapshot of groundwater flow and contamination throughout the area. The next Supplemental sampling will occur in April and May 2027.

1.8 Landfill Operations and Maintenance

In 1997, the landfill closure construction (cover system and components) was completed as part of the MFS requirements. The landfill gas collection and treatment system is monitored and maintained on a regular basis as outlined in the *Operations and Maintenance Manual for Colbert Landfill Closure, CH2MHill, May 1997*. Landfill operations and maintenance information is presented in Section 8.0.

2.0 Shut-down Test

A shut-down test of the Colbert Landfill Groundwater Pump and Treat facility was initiated April 1, 2014, when all lower aquifer extraction wells were turned off and placed in standby mode. The shut-down test was deemed appropriate for the site after a Remedial System Evaluation (RSE) was performed as recommended in the 2009 Five-Year Review (EPA). The shut-down test is performed according to the *Final Work Plan, Groundwater Pump and Treat System Shut-down Test, Colbert Landfill CERCLA Site, Spokane County Utilities/ Landau Assoc. 2013*.

2.1 Shut-down Testing Locations and Schedule

The lower aquifer wells selected as monitoring locations for the Colbert Landfill pump and treat system shut-down test include: the compliance monitoring well clusters (CD-41, CD-42, CD-43, CD-44, CD-45, and CD-48), monitoring well CD-49, and the lower aquifer extraction wells (CP-E1, CP-E2, CP-E3, CP-W1, CP-W2, and CP-W3). Locations are presented in Figure 2-1. Collection of groundwater samples (contaminant sampling) from the shut-down locations, along with the collection of water level measurements, was performed as outlined in Table 2-1.

2.2 Shut-down Test Monitoring

The lower aquifer extraction wells, the compliance monitoring well clusters (CD-41, CD-42, CD-43, CD-44, CD-45, and CD-48), and monitoring well CD-49 were sampled according to the *Colbert Landfill Operations and Maintenance Manual, 1998.* Field parameters were taken and VOC samples were collected.

2.2.1 Groundwater Elevations

Groundwater elevations for the reporting period are shown in Table 2-2 and Figure 2-2. Estimated groundwater contours and flow are shown in Figure 2-3 and Figure 2-4. Measurements were consistent and followed typical seasonal variation with levels slightly higher in the spring and slightly lower during the fall. Extraction well hydrographs show the increase in groundwater levels in the immediate vicinity of those wells in April 2014 when the system was shut down. Groundwater elevations in the lower aquifer appear to be on a current increasing trend since early 2022, which followed a decreasing trend since the increase observed after the extraction wells were shut down.

2.2.2 Field Parameters

Field parameters taken at the shut-down test locations are shown in Table 2-2. The highest conductivities were mostly seen in the east system extraction wells. Conductivity values in monitoring wells ranged from 311 to 1118 umhos/cm. Measurements of pH ranged from 6.9 to 8.1. The highest conductivity/lowest pH values are generally found in the east system extraction wells.

2.2.3 Constituents of Concern (COC's)

Constituent of concern concentrations for Shut-down Test locations are presented in Table 2-4 and Table 2-5. COC Concentrations versus time graphs for Shut-down locations are presented in Figure 2-5 through Figure 2-12. Estimated COC plume boundaries and COC detections in the lower aquifer are presented in Figure 2-13 through Figure 2-23. All detected concentrations found in the shut-

down test compliance wells were well below any applicable criteria. Colbert Landfill COC Criteria are shown in Table 2-3.

The COC's found in the shut-down program criteria-dependent (SD compliance) wells were low concentrations of TCA and DCE. No concentrations of DCA, PCE, TCE, or MC were detected in the criteria-dependent wells during this reporting period. Analytical results from the shut-down program criteria-dependent wells are shown in Table 2-4. Time versus concentration plots are presented in Figure 2-5 through Figure 2-8. Although concentrations for TCA and DCE began to decrease/plateau after increases post-shutdown, concentrations for these constituents are currently exhibiting increasing trends for wells CD-49 (TCA and DCE) and CD-45C1 (TCA). TCA concentrations for CD-43C1 appear to be plateauing/decreasing after initial increases following the shutdown of the extraction wells. DCE concentrations for CD-49 increased from 2.47 ppb in April 2022 to 3.99 ppb in April 2023, further approaching the action-level shutdown criteria of 4.55 ug/L. Fluctuations in TCA and DCE concentrations for CD-49 appear to occur concurrently with fluctuations in TCA/DCE concentrations found in the lower extraction wells: concentrations peaking in November 2022, decreasing in January 2023, and increasing/continuing increasing trends through April 2023. According to Spokane County's shutdown plan, if analyte concentrations exceed the action-level criteria for four consecutive quarters, a restart of the P&T system *may* occur if deemed necessary after further evaluating all COC concentrations/groundwater flow data in the lower aquifer. Monitoring wells CD-49 and CD-43C1 were kept on a quarterly sampling schedule to better evaluate the increasing trends in TCA/DCE concentrations. None of the SD compliance wells exceeded any criteria during this reporting period.

Lower aquifer extraction wells are not criteria-dependent locations, and therefore actions during the shut-down test are not governed by COC concentrations in these wells. Analytical results from the extraction wells are shown in Table 2-5. Time versus concentration plots are found in Figure 2-9 through Figure 2-12. Similar to the SD compliance wells, concentrations for most of the constituents of concern are currently exhibiting increasing trends after a decrease/stabilization of concentrations occurring in 2018 following the initial increases (rebound/back-diffusion) of concentrations post-shutdown. All COC constituent concentrations found in the lower aquifer extraction wells exhibited increases in concentrations between April 2022 and April 2023, with the exception of DCA for CP-W2. Lower aquifer extraction well criteria exceedances are summarized below (consent decree criteria only):

- CP-E1 exceeded the criteria for DCE, PCE, and TCE.
- CP-E2 exceeded the criteria for DCE, PCE, and TCE.
- CP-E3 exceeded the criteria for DCE.
- CP-W2 exceeded the criteria for DCE.
- CP-W3 exceeded the criteria for DCE and TCE.

A comparison summarizing the differences in COC concentrations observed in the Shutdown/Extraction wells from 2018, 2022, and 2023 is presented in Table 3-8.

2.3 Data Evaluation

Data indicate that, although there was a stabilization/decrease of COC concentrations following the initial increase of concentrations post-shutdown (rebound/back-diffusion), most COC concentrations continue to exhibit increasing trends that started in 2021, especially for TCA and DCE. The increase in COC concentrations found in CD-49 (primarily TCA and DCE), along with increasing COC concentrations in CP-W3 and CP-E2, indicate that the western migration/plume connectivity of the Colbert Landfill contaminants of concern is not only prevalent, but potentially even exacerbated. The concurrent fluctuations of COC concentrations found in CD-49 and the lower aquifer extraction wells further support this. The sudden increase in COC concentrations coincides with an increase in groundwater elevations for the lower aquifer compliance wells, with the exception of CP-E2.

Conclusions from the Colbert Landfill Phase I Engineering Report found that the wells screened within the basalt aquifer (CP-E2 and CD-04E1) are directly (although incompletely) hydrologically connected to the lower sand/gravel aquifer, along with the monitoring and residential wells screened within it. This hydraulic connection potentially provides a hydrogeologic pathway connecting some of the wells with the highest COC concentrations (CD-21C3, CP-E2, and CD-04E1) to the downgradient wells screened in the lower aquifer (CP-W3 and CD-49). Between the increasing concentrations found in upgradient wells and the abiotic degradation of TCA to DCE, increasing COC concentration trends could persist for the downgradient compliance monitoring wells. County personnel will continue to add additional wells to the quarterly/annual sampling programs (if necessary) to better evaluate the current increasing trends observed in source areas, source-area downgradient wells, and compliance monitoring wells.

2.4 Program Changes or Modifications

Criteria Exceedances in the lower aquifer are presented in Table 2-6 (Consent Decree criteria) and Table 2-7 (updated criteria values from the Colbert Landfill 6th Five-year Review, which includes an increase for Trichloroethene [PCE] from the performance standard in the ROD [0.7 µg/L] to the current MCL [5µg/L], and a decrease for 1,1-Dichloroethane [1,1-DCA] to the regional screening level [RSL] of 2.6 µg/L). The only criteria exceedances that occurred within this reporting period were found in the extraction wells, and those wells are not criteria-dependent.

Sampling at the lower aquifer compliance monitoring wells will continue on an annual basis until a different sampling interval/remedial program is implemented. The exceptions to this are monitoring well CD-49 and cluster well CD-43C1. Quarterly sampling will continue at CD-49 and CD-43C1 to monitor the increasing trends in TCA/DCE concentrations. Quarterly sampling will continue at the extraction wells, as running the wells periodically will assist with preventive maintenance and provide indicators for any possible changes in COC concentrations near the landfill boundaries.

Groundwater velocities in the Lower Aquifer under non-pumping conditions were reported to be on the order of 100 to 200 ft/yr in the 1991 Final Phase I Engineering Report (Landau Associates 1991), and the existing downgradient compliance monitoring wells are about 900 ft west of the western extraction wells. Therefore, it is anticipated that monitoring for the shutdown test will need to continue for up to 9 years to determine the impact (if any) the system shutdown has on

groundwater quality downgradient from the West System extraction wells. Since the shutdown test officially began on April 1, 2014, a 9-year shutdown test would end on April 1, 2023. Spokane County will begin evaluating all available data and will submit a separate evaluation/report summarizing a recommended action plan for the Colbert Landfill in late 2023/early 2024.

2.5 Cost Savings

Typical electrical costs associated with operating the pump-and-treat system for the lower aquifer continually for one year were approximately $59,000. From April 2022 through April 2023, the cost of electricity at the facility during the ninth year of the shut-down test was $18,169. Costs incurred during this reporting period were significantly higher than typical annual sampling years due to the increased number of wells sampled, groundwater samples analyzed at the laboratories, additional labor costs associated with the Supplemental Sampling event, and price increases at both laboratories. The increased costs resulted in Spokane County spending an additional $36,519 (approximately) above the typical annual electrical costs during this reporting period.

Typical Annual Electrical Costs		**$60,000**
Electrical Costs for Ninth Year of Shut-down Test		($18,169)
Additional Lab Cost Associated with Shut-down Test		($63,344)
Estimated labor costs for additional sample rounds		($15,006)
Estimated Total Cost Savings		($36,519)

Figure 2-1 Shut-down Test Locations

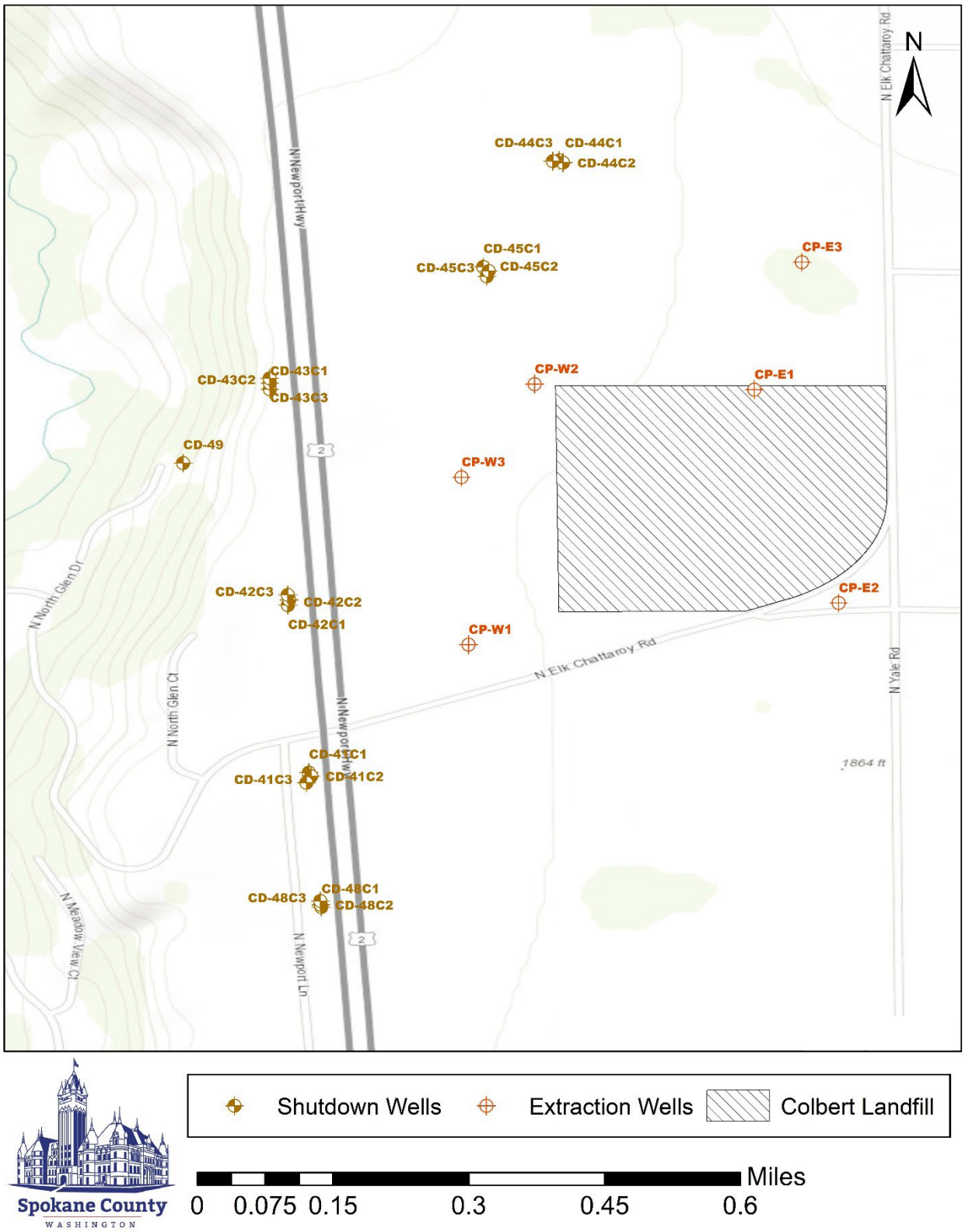
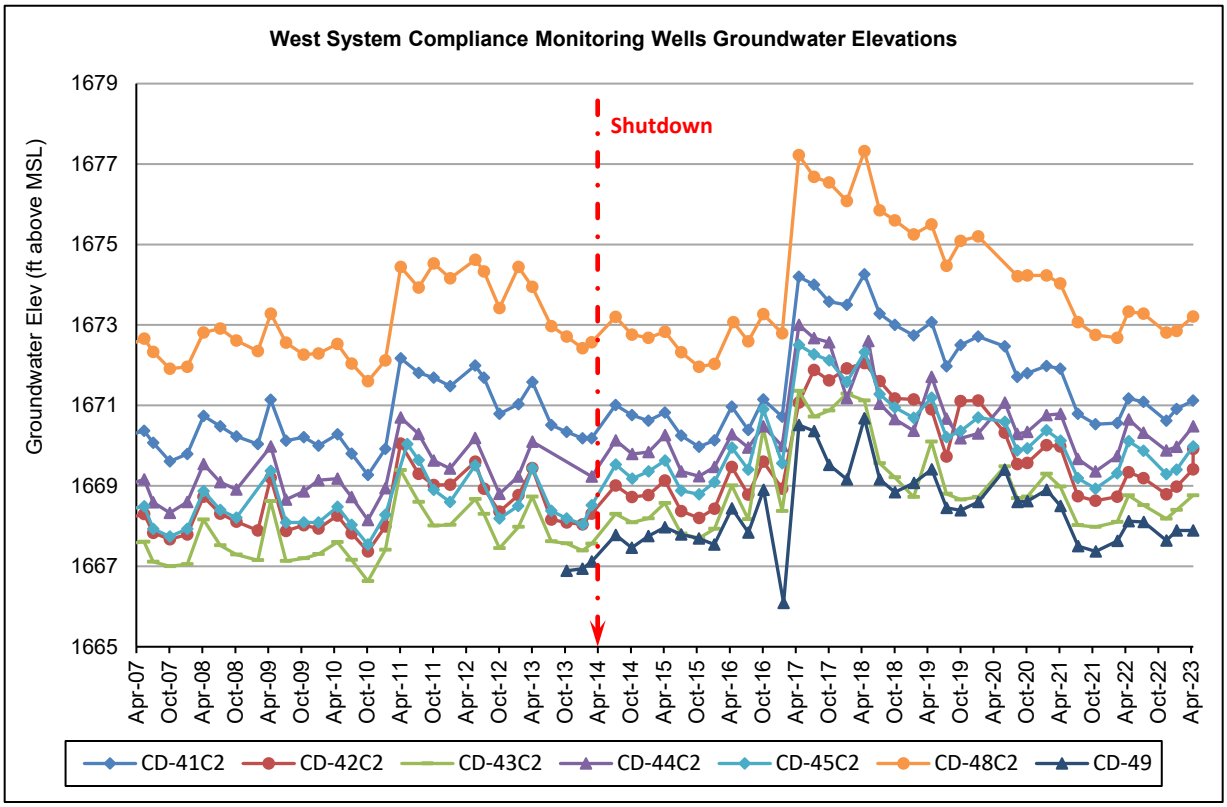


Table 2-1 Colbert Landfill Shut-down Test Sampling Schedule (May 2022 - June 2023)

System	Well ID	Monitoring Frequency		Shut-down Criteria Applies?
		Water Levels	Sampling	
West	CD-41C1	Quarterly	Annual	Yes
	CD-41C2	Quarterly	Annual	
	CD-41C3	Quarterly	Annual	
	CD-42C1	Quarterly	Annual	Yes
	CD-42C2	Quarterly	Annual	
	CD-42C3	Quarterly	Annual	
	CD-43C1	Quarterly	Quarterly	Yes
	CD-43C2	Quarterly	Annual	
	CD-43C3	Quarterly	Annual	
	CD-44C1	Quarterly	Annual	Yes
	CD-44C2	Quarterly	Annual	
	CD-44C3	Quarterly	Annual	
	CD-45C1	Quarterly	Annual	Yes
	CD-45C2	Quarterly	Annual	
	CD-45C3	Quarterly	Annual	
	CD-48C1	Quarterly	Annual	Yes
	CD-48C2	Quarterly	Annual	
	CD-48C3	Quarterly	Annual	
	CD-49	Quarterly	Quarterly	Yes
	CP-W1	Quarterly	Quarterly	No
	CP-W2	Quarterly	Quarterly	
	CP-W3	Quarterly	Quarterly	
East	CP-E1	Quarterly	Quarterly	No
	CP-E2	Quarterly	Quarterly	
	CP-E3	Quarterly	Quarterly	

Changes to the program are highlighted in **RED**

Figure 2-2 Lower Aquifer Groundwater Elevations



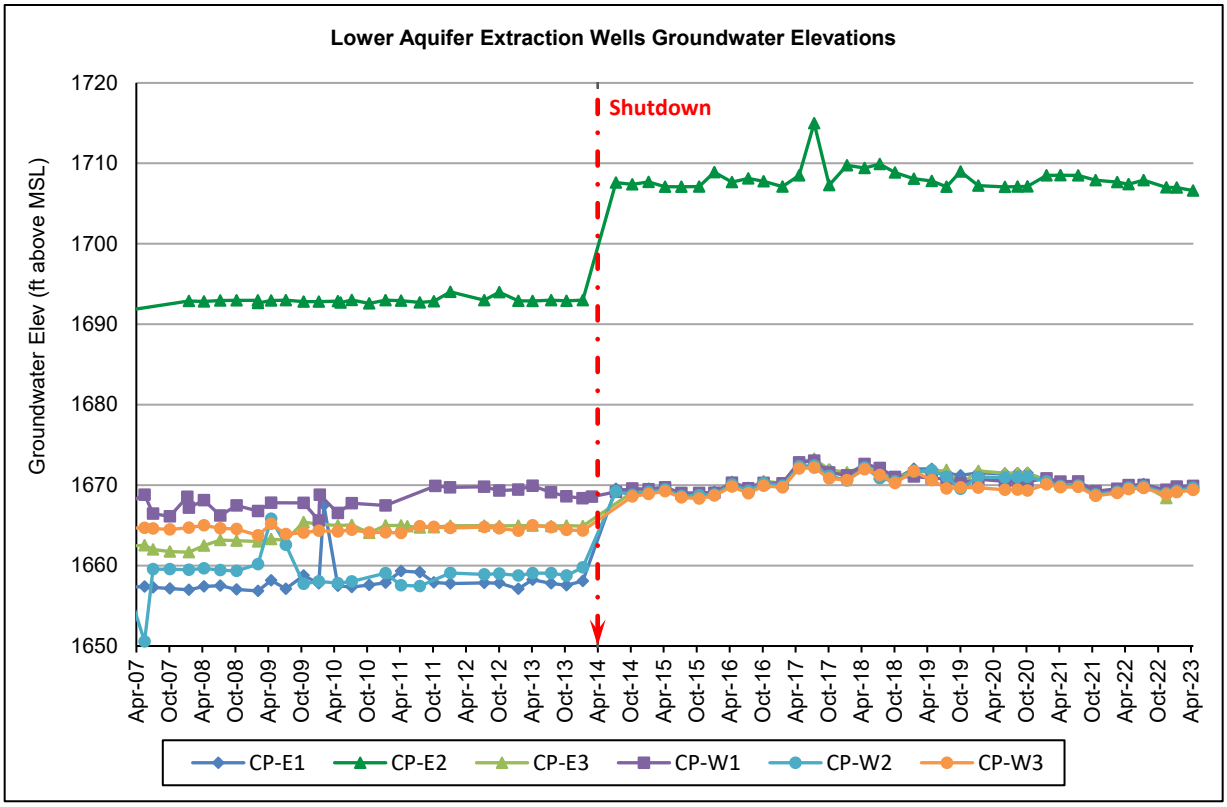
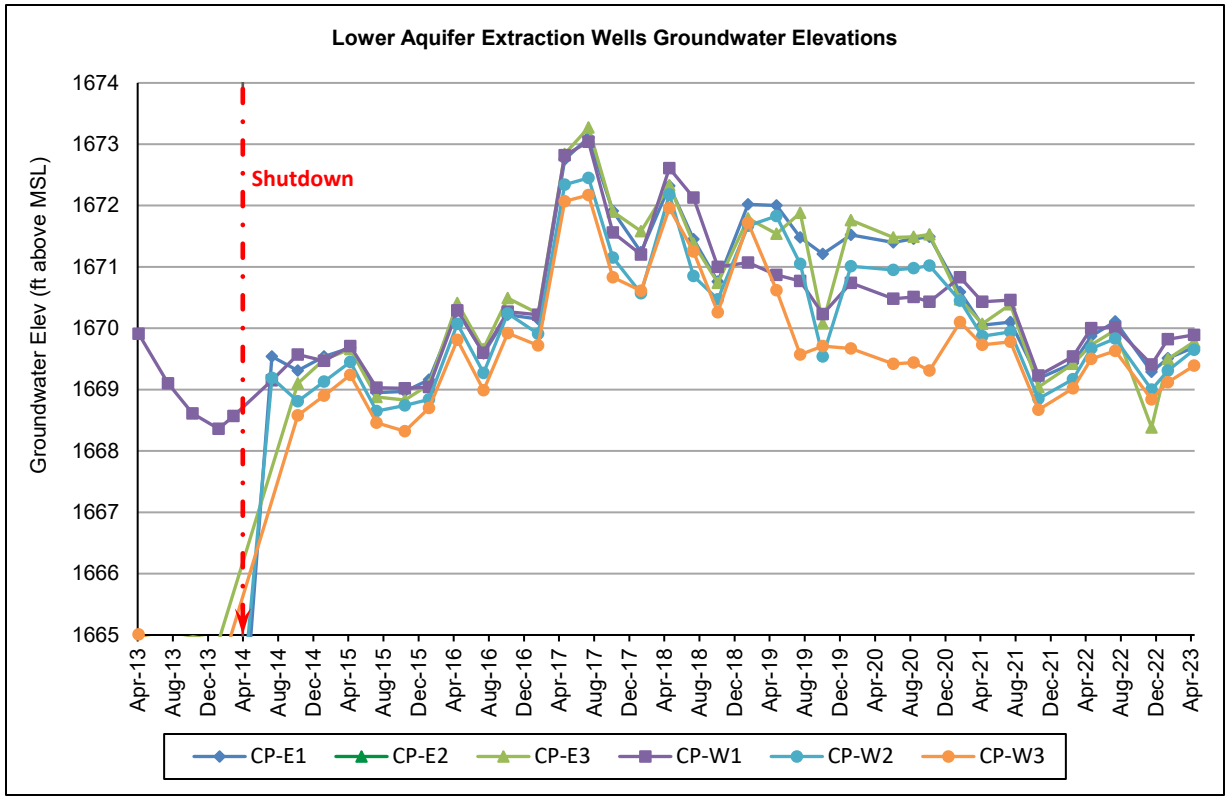


Figure 2-3 Lower Aquifer Groundwater Elevations (cont.)



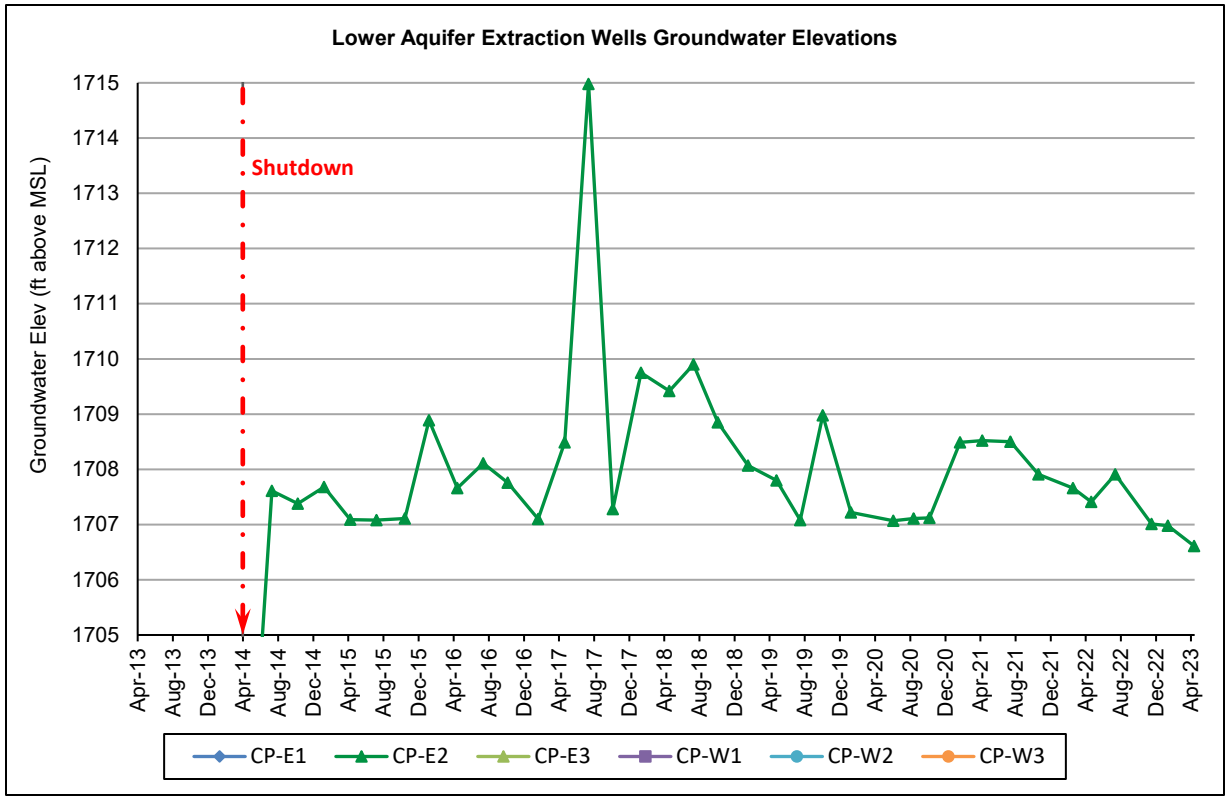


Figure 2-4 Lower Aquifer Groundwater Contours

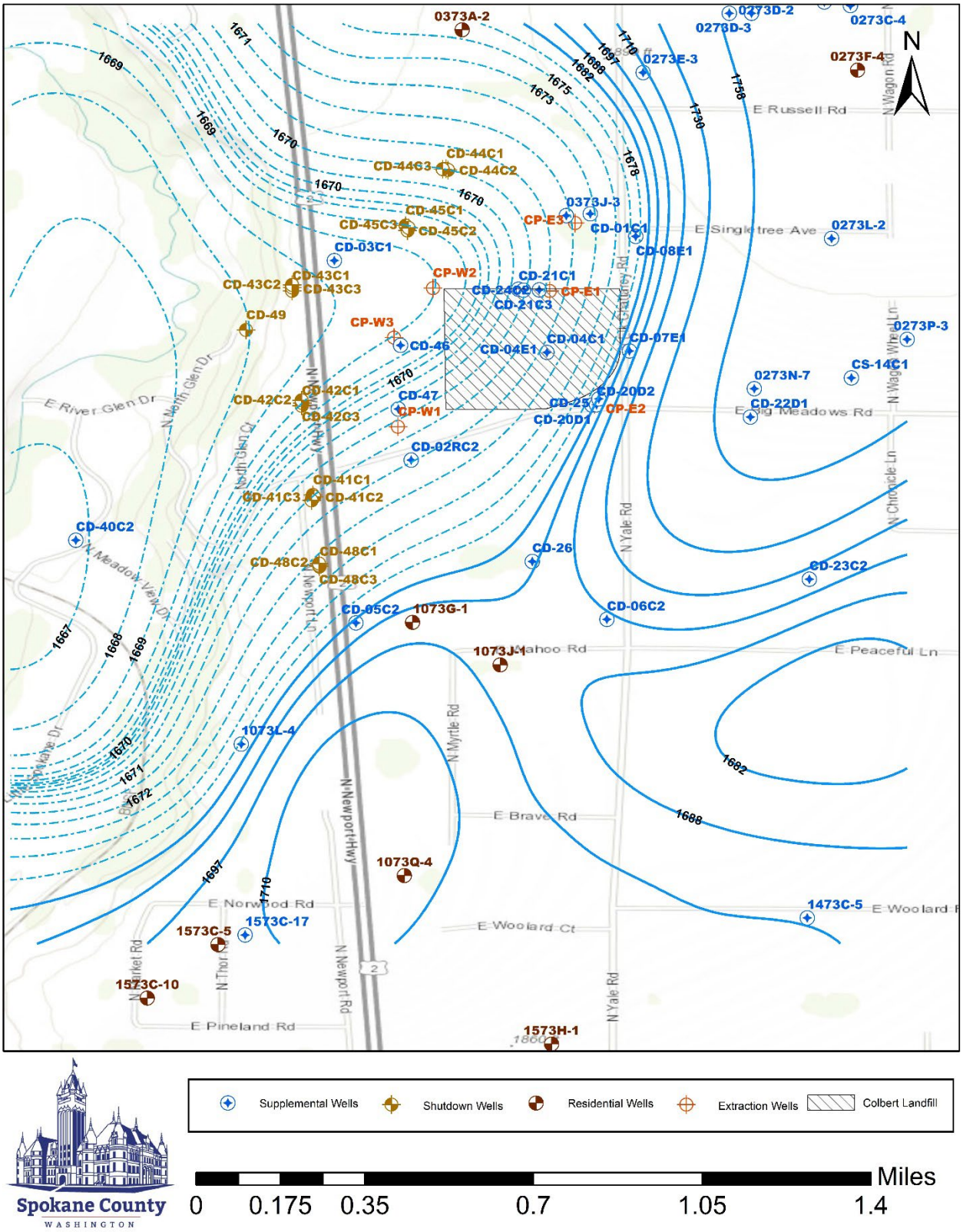


Figure 2-5 Lower Aquifer Groundwater Elevation Map

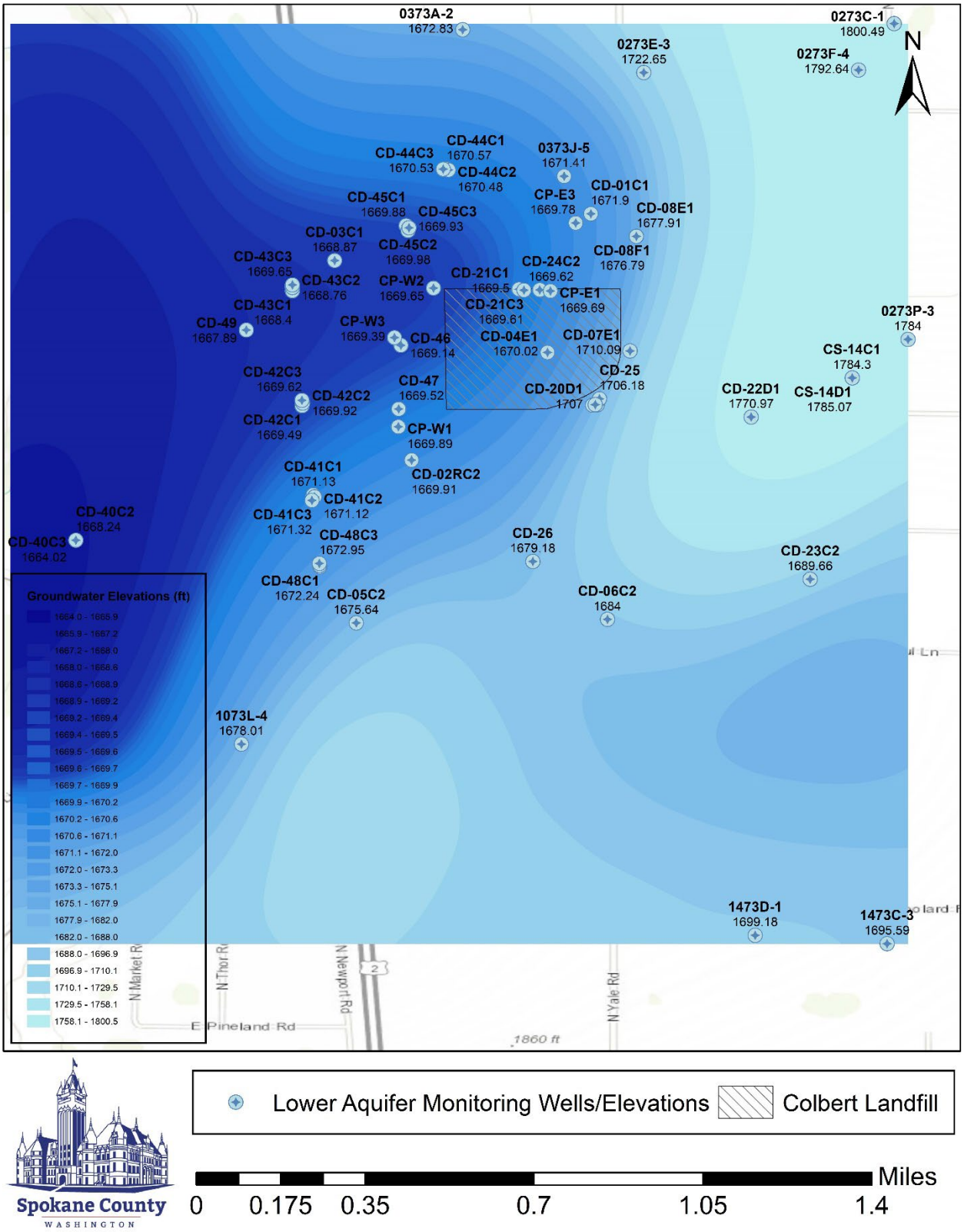


Table 2-2 Shut-down Test Location Field Parameters

StationID	SampleDate	WtrElev	Temp	PH	Conductivity	Turbidity	Aquifer	Program
CD-41C1	4/11/2023	1671.13	11.7	7.97	404	0.15	lower	SD
CD-41C2	4/11/2023	1671.12	11.5	8.07	415	0.24	lower	SD
CD-41C3	4/11/2023	1671.32	11.8	7.93	459	0.22	lower	SD
CD-42C1	4/11/2023	1669.49	11.6	7.9	477	0.72	lower	SD
CD-42C2	4/11/2023	1669.41	11.6	7.95	464	0.66	lower	SD
CD-42C2	4/12/2023	1669.92	11.7	7.62	457	0.22	lower	SD
CD-42C3	4/11/2023	1669.62	12.4	8.02	407	0.48	lower	SD
CD-43C1	7/12/2022	1668.17	10.8	7.95	525	0.16	lower	SD
CD-43C1	11/15/2022	1667.85	10.2	7.88	527	0.11	lower	SD
CD-43C1	1/11/2023	1668.06	10.4	7.9	473	0.14	lower	SD
CD-43C1	4/11/2023	1668.4	10.3	7.98	469	0.67	lower	SD
CD-43C2	4/11/2023	1668.76	10.7	8.1	389	0.29	lower	SD
CD-43C3	4/11/2023	1669.65	11.3	7.98	311	0.45	lower	SD
CD-44C1	4/12/2023	1670.57	16.3	7.65	460	0.3	lower	SD
CD-44C2	4/12/2023	1670.48	11.7	7.62	457	0.22	lower	SD
CD-44C3	4/12/2023	1670.53	10.7	7.68	461	0.66	lower	SD
CD-45C1	4/12/2023	1669.88	10.2	7.75	529	0.14	lower	SD
CD-45C2	4/12/2023	1669.98	10.6	7.74	466	0.15	lower	SD
CD-45C3	4/12/2023	1669.93	10.6	8.1	466	0.17	lower	SD
CD-48C1	4/11/2023	1672.24	11.7	7.88	497	0.4	lower	SD
CD-48C2	4/11/2023	1673.21	11.2	7.98	458	0.42	lower	SD
CD-48C3	4/11/2023	1672.95	11.6	7.96	454	0.42	lower	SD
CD-49	7/12/2022	1668.1	13.5	7.82	527	0.1	lower	SD
CD-49	11/15/2022	1667.64	12	7.78	534	0.03	lower	SD
CD-49	1/11/2023	1667.89	12.7	7.79	488	0.12	lower	SD
CD-49	4/12/2023	1667.89	12	7.8	532	0.22	lower	SD
CP-E1	7/12/2022	1670.11	12	7.03	1024	0.71	lower	SD
CP-E1	11/15/2022	1669.29	11.2	7.25	1039	0.91	lower	SD
CP-E1	1/11/2023	1669.51	9.8	7.33	1083	0.66	lower	SD
CP-E1	4/12/2023	1669.69	10.1	7.34	1117	0.51	lower	SD
CP-E2	7/12/2022	1707.91	13.2	7.32	989	0.89	lower	SD
CP-E2	11/15/2022	1707.01	12.2	7.43	1109	0.99	lower	SD
CP-E2	1/11/2023	1706.98	11.7	7.46	1118	0.67	lower	SD
CP-E2	4/12/2023	1706.61	12.4	6.98	848	0.37	lower	SD
CP-E3	7/12/2022	1669.97	11	7.35	850	0.72	lower	SD
CP-E3	11/15/2022	1668.38	11.3	7.21	891	0.81	lower	SD
CP-E3	1/11/2023	1669.5	11.3	7.12	807		lower	SD
CP-E3	4/12/2023	1669.78	11.8	6.9	704	1.74	lower	SD
CP-W1	7/12/2022	1670.01	11.5	7.86	545	0.71	lower	SD
CP-W1	11/15/2022	1669.41	11.2	7.78	517	0.65	lower	SD
CP-W1	1/11/2023	1669.82	10.7	7.98	449		lower	SD
CP-W1	4/12/2023	1669.89	10.6	7.99	463	0.19	lower	SD
CP-W2	7/12/2022	1669.83	11.4	7.69	686	0.44	lower	SD
CP-W2	11/15/2022	1669	10	7.51	700	0.89	lower	SD
CP-W2	1/11/2023	1669.31	9.7	7.75	532	0.29	lower	SD
CP-W2	4/12/2023	1669.65	10	7.7	522	0.33	lower	SD
CP-W3	7/12/2022	1669.63	11.5	7.49	691	0.89	lower	SD
CP-W3	11/15/2022	1668.84	11	7.39	790	1.09	lower	SD
CP-W3	1/11/2023	1669.12	10.8	7.42	788	0.89	lower	SD
CP-W3	4/12/2023	1669.39	11.4	7.23	614	0.34	lower	SD

Temp=degrees C; Conductivity=umhos/cm; Turbidity= NTU

Table 2-3 Colbert Landfill Shut-down Test Criteria

Groundwater monitoring associated with the P&T system currently includes water level measurements and groundwater quality monitoring at extraction and compliance monitoring wells in accordance with the Quality Assurance Project Plan (QAPP; Landau Associates 1992b) to meet the criteria established in the Consent Decree. The purpose of this monitoring is to evaluate the performance of the P&T system in preventing the spread of contaminated groundwater downgradient from the capture zone for the West System. Compliance monitoring wells are currently sampled on an annual basis and the extraction wells are sampled on a quarterly basis. The consent decree evaluation criteria and action level criteria for the shut-down test are presented below:

SHUT-DOWN TEST CRITERIA		
COC	**ACTION LEVEL CRITERIA (ug/L)**	**CONSENT DECREE EVALUATION CRITERIA (ug/L)**
TCA	**130**	**200**
DCA	**2632**	**4050**
DCE	**4.55**	**7**
MC	**1.6**	**2.5**
PCE	**0.5**	**0.7**
TCE	**3.25**	**5**

Table 2-4 Shut-down Test Compliance Well Analytical Results (reported in ug/L)

StationID	SampleDate	DCA	DCE	MC	PCE	TCA	TCE
CD-41C1	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C2	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C3	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C1	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C2	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C3	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C1	7/12/2022	<0.5	<0.5	<0.5	<0.5	**5.53**	<0.5
CD-43C1	11/15/2022	<0.5	<0.5	<0.5	<0.5	**4.87**	<0.5
CD-43C1	1/11/2023	<0.5	<0.5	<0.5	<0.5	**3.94**	<0.5
CD-43C1	4/11/2023	<0.5	<0.5	<0.5	<0.5	**3.29**	<0.5
CD-43C2	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C3	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C1	4/12/2023	<0.5	<0.5	<0.5	<0.5	**1.28**	<0.5
CD-44C2	4/12/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C3	4/12/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C1	4/12/2023	<0.5	<0.5	<0.5	<0.5	**1.77**	<0.5
CD-45C2	4/12/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C3	4/12/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C1	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C2	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C3	4/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-49	7/12/2022	<0.5	**3.12**	<0.5	<0.5	**3.54**	<0.5
CD-49	11/15/2022	<0.5	**4.39**	<0.5	<0.5	**4.21**	<0.5
CD-49	1/11/2023	<0.5	**3.43**	<0.5	<0.5	**4.05**	<0.5
CD-49	4/12/2023	<0.5	**3.99**	<0.5	<0.5	**4.61**	<0.5

***Bold** indicates a value greater than non-detection.

Table 2-5 Lower Aquifer Extraction Well Analytical Results (reported in ug/L)

StationID	SampleDate	DCA	DCE	MC	PCE	TCA	TCE
CP-E1	7/12/2022	**9.43**	**17.6**	<0.5	**3.15**	**5.63**	**10.1**
CP-E1	11/15/2022	**10.3**	**25.2**	<0.5	**2.81**	**6.34**	**10**
CP-E1	1/11/2023	**9.06**	**18.7**	<0.5	**3.39**	**5.65**	**9.53**
CP-E1	4/12/2023	**9.47**	**19.3**	<0.5	**2.94**	**5.59**	**9.58**
CP-E2	7/12/2022	**39.8**	**164**	**2.48**	**1.04**	**37.1**	**186**
CP-E2	11/15/2022	**44.8**	**227**	<0.5	**1.27**	<0.5	**221**
CP-E2	1/11/2023	**36.5**	**154**	<0.5	**1.11**	**37**	**172**
CP-E2	4/12/2023	**42**	**186**	<0.5	**1.1**	**37**	**196**
CP-E3	7/12/2022	**2.51**	**16.1**	<0.5	<0.5	**8.91**	**1.99**
CP-E3	11/15/2022	**2.41**	**17.6**	<0.5	<0.5	**7.52**	**1.97**
CP-E3	1/11/2023	**2.27**	**14.2**	<0.5	<0.5	**7.73**	**1.95**
CP-E3	4/12/2023	**2.27**	**15.3**	<0.5	<0.5	**7.73**	**1.85**
CP-S1	7/12/2022	**0.97**	**0.67**	<0.5	<0.5	**0.73**	**1.45**
CP-S1	11/15/2022	**1.05**	**0.52**	<0.5	<0.5	**0.57**	**0.99**
CP-S1	1/11/2023	**1.2**	**0.51**	<0.5	<0.5	**0.58**	**1.04**
CP-S1	4/12/2023	**1.34**	<0.5	<0.5	<0.5	**0.54**	**0.97**
CP-S4	7/12/2022	**1.29**	<0.5	<0.5	**0.63**	<0.5	**1.92**
CP-S4	11/15/2022	**1.17**	<0.5	<0.5	**0.68**	<0.5	**2.19**
CP-S4	1/11/2023	**1.24**	<0.5	<0.5	**0.62**	<0.5	**2.09**
CP-S4	4/12/2023	**1.21**	<0.5	<0.5	**0.62**	**0.51**	**2.14**
CP-S5	7/12/2022	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S5	11/15/2022	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S5	1/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S5	4/12/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	7/12/2022	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	11/15/2022	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	1/11/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-S6	4/12/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CP-W1	7/12/2022	<0.5	**4.28**	<0.5	<0.5	**2.97**	<0.5
CP-W1	11/15/2022	<0.5	**5.6**	<0.5	<0.5	**3.23**	<0.5
CP-W1	1/11/2023	<0.5	**4.13**	<0.5	<0.5	**2.86**	<0.5
CP-W1	4/12/2023	<0.5	**4.32**	<0.5	<0.5	**2.73**	<0.5
CP-W2	7/12/2022	**2.87**	**9.62**	<0.5	<0.5	**28.8**	<0.5
CP-W2	11/15/2022	**2.88**	**13.1**	<0.5	<0.5	**30**	<0.5
CP-W2	1/11/2023	**2.23**	**10.1**	<0.5	<0.5	**25.4**	<0.5
CP-W2	4/12/2023	**2.31**	**11**	<0.5	<0.5	**21.4**	<0.5
CP-W3	7/12/2022	**18.6**	**38.3**	<0.5	<0.5	**43.1**	**47.4**
CP-W3	11/15/2022	**22**	**73**	<0.5	<0.5	**65.5**	**63**
CP-W3	1/11/2023	**23.9**	**46.9**	<0.5	<0.5	**48.8**	**54.8**
CP-W3	4/12/2023	**34.1**	**57.5**	<0.5	<0.5	**55.1**	**60.5**

***Bold** indicates a value greater than non-detection.

Table 2-6 Shutdown Program Criteria Exceedances (Consent Decree criteria)

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CP-E1	7/12/2022	lower	SD	1,1-Dichloroethene	17.6	ug/L	Exceedance
CP-E1	11/15/2022	lower	SD	1,1-Dichloroethene	25.2	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	1,1-Dichloroethene	18.7	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	1,1-Dichloroethene	17.7	ug/L	Exceedance
CP-E1	4/12/2023	lower	SD	1,1-Dichloroethene	19.3	ug/L	Exceedance
CP-E1	7/12/2022	lower	SD	Tetrachloroethene	3.15	ug/L	Exceedance
CP-E1	11/15/2022	lower	SD	Tetrachloroethene	2.81	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	Tetrachloroethene	3.12	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	Tetrachloroethene	3.39	ug/L	Exceedance
CP-E1	4/12/2023	lower	SD	Tetrachloroethene	2.94	ug/L	Exceedance
CP-E1	7/12/2022	lower	SD	Trichloroethene	10.1	ug/L	Exceedance
CP-E1	11/15/2022	lower	SD	Trichloroethene	10	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	Trichloroethene	10.3	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	Trichloroethene	9.53	ug/L	Exceedance
CP-E1	4/12/2023	lower	SD	Trichloroethene	9.58	ug/L	Exceedance
CP-E2	7/12/2022	lower	SD	1,1-Dichloroethene	164	ug/L	Exceedance
CP-E2	11/15/2022	lower	SD	1,1-Dichloroethene	227	ug/L	Exceedance
CP-E2	1/11/2023	lower	SD	1,1-Dichloroethene	154	ug/L	Exceedance
CP-E2	4/12/2023	lower	SD	1,1-Dichloroethene	186	ug/L	Exceedance
CP-E2	7/12/2022	lower	SD	Tetrachloroethene	1.04	ug/L	Exceedance
CP-E2	11/15/2022	lower	SD	Tetrachloroethene	1.27	ug/L	Exceedance
CP-E2	1/11/2023	lower	SD	Tetrachloroethene	1.11	ug/L	Exceedance
CP-E2	4/12/2023	lower	SD	Tetrachloroethene	1.1	ug/L	Exceedance
CP-E2	7/12/2022	lower	SD	Trichloroethene	186	ug/L	Exceedance
CP-E2	11/15/2022	lower	SD	Trichloroethene	221	ug/L	Exceedance
CP-E2	1/11/2023	lower	SD	Trichloroethene	172	ug/L	Exceedance
CP-E2	4/12/2023	lower	SD	Trichloroethene	196	ug/L	Exceedance
CP-E3	7/12/2022	lower	SD	1,1-Dichloroethene	16.1	ug/L	Exceedance
CP-E3	11/15/2022	lower	SD	1,1-Dichloroethene	17.6	ug/L	Exceedance
CP-E3	1/11/2023	lower	SD	1,1-Dichloroethene	14.2	ug/L	Exceedance
CP-E3	4/12/2023	lower	SD	1,1-Dichloroethene	15.3	ug/L	Exceedance
CP-W2	7/12/2022	lower	SD	1,1-Dichloroethene	9.62	ug/L	Exceedance
CP-W2	7/12/2022	lower	SD	1,1-Dichloroethene	9.58	ug/L	Exceedance
CP-W2	11/15/2022	lower	SD	1,1-Dichloroethene	13.1	ug/L	Exceedance
CP-W2	11/15/2022	lower	SD	1,1-Dichloroethene	13	ug/L	Exceedance
CP-W2	1/11/2023	lower	SD	1,1-Dichloroethene	10.1	ug/L	Exceedance
CP-W2	4/12/2023	lower	SD	1,1-Dichloroethene	11	ug/L	Exceedance
CP-W3	7/12/2022	lower	SD	1,1-Dichloroethene	38.3	ug/L	Exceedance
CP-W3	11/15/2022	lower	SD	1,1-Dichloroethene	73	ug/L	Exceedance
CP-W3	1/11/2023	lower	SD	1,1-Dichloroethene	46.9	ug/L	Exceedance
CP-W3	4/12/2023	lower	SD	1,1-Dichloroethene	57.5	ug/L	Exceedance
CP-W3	7/12/2022	lower	SD	Trichloroethene	47.4	ug/L	Exceedance
CP-W3	11/15/2022	lower	SD	Trichloroethene	63	ug/L	Exceedance
CP-W3	1/11/2023	lower	SD	Trichloroethene	54.8	ug/L	Exceedance
CP-W3	4/12/2023	lower	SD	Trichloroethene	60.5	ug/L	Exceedance

Table 2-7 Shutdown Program Criteria Exceedances (*Updated criteria values)

*Increase for Trichloroethene (PCE) from the performance standard in the ROD (0.7 µg/L) to the current MCL (5 µg/L), and a decrease for 1,1-Dichloroethane (1,1-DCA) to the regional screening level (RSL) of 2.8 µg/L.

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CP-E1	7/12/2022	lower	SD	1,1-Dichloroethane	9.43	ug/L	Exceedance
CP-E1	11/15/2022	lower	SD	1,1-Dichloroethane	10.3	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	1,1-Dichloroethane	10.1	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	1,1-Dichloroethane	9.06	ug/L	Exceedance
CP-E1	4/12/2023	lower	SD	1,1-Dichloroethane	9.47	ug/L	Exceedance
CP-E1	7/12/2022	lower	SD	1,1-Dichloroethene	17.6	ug/L	Exceedance
CP-E1	11/15/2022	lower	SD	1,1-Dichloroethene	25.2	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	1,1-Dichloroethene	18.7	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	1,1-Dichloroethene	17.7	ug/L	Exceedance
CP-E1	4/12/2023	lower	SD	1,1-Dichloroethene	19.3	ug/L	Exceedance
CP-E1	7/12/2022	lower	SD	Trichloroethene	10.1	ug/L	Exceedance
CP-E1	11/15/2022	lower	SD	Trichloroethene	10	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	Trichloroethene	9.53	ug/L	Exceedance
CP-E1	1/11/2023	lower	SD	Trichloroethene	10.3	ug/L	Exceedance
CP-E1	4/12/2023	lower	SD	Trichloroethene	9.58	ug/L	Exceedance
CP-E2	7/12/2022	lower	SD	1,1-Dichloroethane	39.8	ug/L	Exceedance
CP-E2	11/15/2022	lower	SD	1,1-Dichloroethane	44.8	ug/L	Exceedance
CP-E2	1/11/2023	lower	SD	1,1-Dichloroethane	36.5	ug/L	Exceedance
CP-E2	4/12/2023	lower	SD	1,1-Dichloroethane	42	ug/L	Exceedance
CP-E2	7/12/2022	lower	SD	1,1-Dichloroethene	164	ug/L	Exceedance
CP-E2	11/15/2022	lower	SD	1,1-Dichloroethene	227	ug/L	Exceedance
CP-E2	1/11/2023	lower	SD	1,1-Dichloroethene	154	ug/L	Exceedance
CP-E2	4/12/2023	lower	SD	1,1-Dichloroethene	186	ug/L	Exceedance
CP-E2	7/12/2022	lower	SD	Trichloroethene	186	ug/L	Exceedance
CP-E2	11/15/2022	lower	SD	Trichloroethene	221	ug/L	Exceedance
CP-E2	1/11/2023	lower	SD	Trichloroethene	172	ug/L	Exceedance
CP-E2	4/12/2023	lower	SD	Trichloroethene	196	ug/L	Exceedance
CP-E3	7/12/2022	lower	SD	1,1-Dichloroethene	16.1	ug/L	Exceedance
CP-E3	11/15/2022	lower	SD	1,1-Dichloroethene	17.6	ug/L	Exceedance
CP-E3	1/11/2023	lower	SD	1,1-Dichloroethene	14.2	ug/L	Exceedance
CP-E3	4/12/2023	lower	SD	1,1-Dichloroethene	15.3	ug/L	Exceedance
CP-W2	7/12/2022	lower	SD	1,1-Dichloroethane	2.85	ug/L	Exceedance
CP-W2	7/12/2022	lower	SD	1,1-Dichloroethane	2.87	ug/L	Exceedance
CP-W2	11/15/2022	lower	SD	1,1-Dichloroethane	2.88	ug/L	Exceedance
CP-W2	11/15/2022	lower	SD	1,1-Dichloroethane	2.84	ug/L	Exceedance
CP-W2	7/12/2022	lower	SD	1,1-Dichloroethene	9.58	ug/L	Exceedance
CP-W2	7/12/2022	lower	SD	1,1-Dichloroethene	9.62	ug/L	Exceedance
CP-W2	11/15/2022	lower	SD	1,1-Dichloroethene	13	ug/L	Exceedance
CP-W2	11/15/2022	lower	SD	1,1-Dichloroethene	13.1	ug/L	Exceedance
CP-W2	1/11/2023	lower	SD	1,1-Dichloroethene	10.1	ug/L	Exceedance
CP-W2	4/12/2023	lower	SD	1,1-Dichloroethene	11	ug/L	Exceedance
CP-W3	7/12/2022	lower	SD	1,1-Dichloroethane	18.6	ug/L	Exceedance
CP-W3	11/15/2022	lower	SD	1,1-Dichloroethane	22	ug/L	Exceedance
CP-W3	1/11/2023	lower	SD	1,1-Dichloroethane	23.9	ug/L	Exceedance
CP-W3	4/12/2023	lower	SD	1,1-Dichloroethane	34.1	ug/L	Exceedance
CP-W3	7/12/2022	lower	SD	1,1-Dichloroethene	38.3	ug/L	Exceedance
CP-W3	11/15/2022	lower	SD	1,1-Dichloroethene	73	ug/L	Exceedance
CP-W3	1/11/2023	lower	SD	1,1-Dichloroethene	46.9	ug/L	Exceedance
CP-W3	4/12/2023	lower	SD	1,1-Dichloroethene	57.5	ug/L	Exceedance
CP-W3	7/12/2022	lower	SD	Trichloroethene	47.4	ug/L	Exceedance
CP-W3	11/15/2022	lower	SD	Trichloroethene	63	ug/L	Exceedance
CP-W3	1/11/2023	lower	SD	Trichloroethene	54.8	ug/L	Exceedance
CP-W3	4/12/2023	lower	SD	Trichloroethene	60.5	ug/L	Exceedance

Table 2-8 Shutdown Program Concentrations: Summary of 5-year/1-year Differences

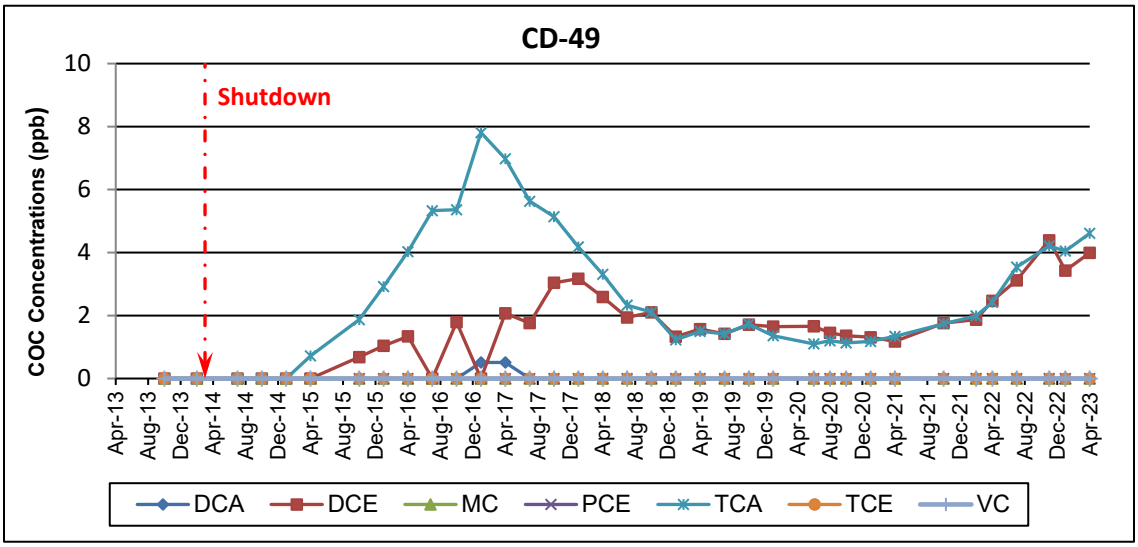
StationID	Aquifer	Program	Analyte	2018 Results	2022 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-41C1	lower	SD	TCA	0	0	0	0	0	ug/L
CD-41C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-41C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-41C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-41C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-41C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-41C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-41C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-41C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-41C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-41C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-41C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-41C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-41C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-41C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-41C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-41C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-41C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-41C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-41C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-41C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-42C1	lower	SD	TCA	0	0	0	0	0	ug/L
CD-42C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-42C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-42C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-42C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-42C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-42C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-42C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-42C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-42C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-42C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-42C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-42C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-42C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-42C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-42C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-42C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-42C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-42C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-42C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-42C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-43C1	lower	SD	TCA	1.45	5.31	3.29	1.84	-2.02	ug/L
CD-43C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-43C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-43C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-43C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-43C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-43C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-43C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-43C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-43C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-43C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-43C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-43C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-43C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-43C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-43C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-43C3	lower	SD	DCE	0	0	0	0	0	ug/L

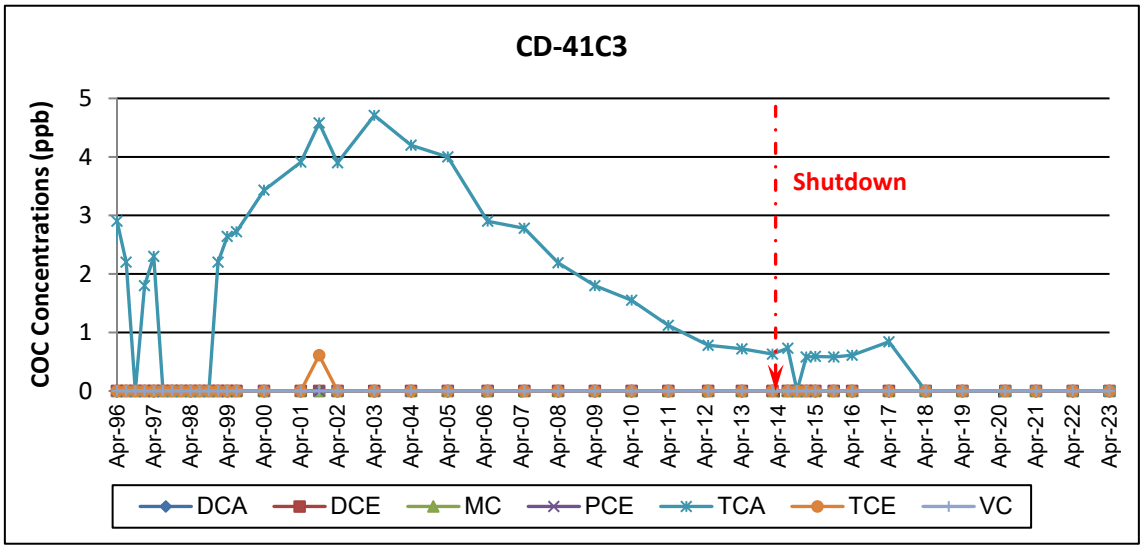
StationID	Aquifer	Program	Analyte	2018 Results	2022 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-43C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-43C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-43C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-43C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-44C1	lower	SD	TCA	1.23	1.17	1.28	0.05	0.11	ug/L
CD-44C1	lower	SD	DCA	1.76	0	0	-1.76	0	ug/L
CD-44C1	lower	SD	DCE	1.25	0.52	0	-1.25	-0.52	ug/L
CD-44C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-44C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-44C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-44C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-44C2	lower	SD	TCA	1.93	0	0	-1.93	0	ug/L
CD-44C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-44C2	lower	SD	DCE	0.62	0	0	-0.62	0	ug/L
CD-44C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-44C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-44C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-44C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-44C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-44C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-44C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-44C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-44C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-44C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-44C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-45C1	lower	SD	TCA	1.31	1.59	1.77	0.46	0.18	ug/L
CD-45C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-45C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-45C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-45C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-45C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-45C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-45C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-45C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-45C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-45C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-45C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-45C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-45C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-45C3	lower	SD	TCA	0	0	0	0	0	ug/L
CD-45C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-45C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-45C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-45C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-45C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-45C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-48C1	lower	SD	TCA	0	0	0	0	0	ug/L
CD-48C1	lower	SD	DCA	0	0	0	0	0	ug/L
CD-48C1	lower	SD	DCE	0	0	0	0	0	ug/L
CD-48C1	lower	SD	MC	0	0	0	0	0	ug/L
CD-48C1	lower	SD	PCE	0	0	0	0	0	ug/L
CD-48C1	lower	SD	TCE	0	0	0	0	0	ug/L
CD-48C1	lower	SD	VC	0	0	0	0	0	ug/L
CD-48C2	lower	SD	TCA	0	0	0	0	0	ug/L
CD-48C2	lower	SD	DCA	0	0	0	0	0	ug/L
CD-48C2	lower	SD	DCE	0	0	0	0	0	ug/L
CD-48C2	lower	SD	MC	0	0	0	0	0	ug/L
CD-48C2	lower	SD	PCE	0	0	0	0	0	ug/L
CD-48C2	lower	SD	TCE	0	0	0	0	0	ug/L
CD-48C2	lower	SD	VC	0	0	0	0	0	ug/L
CD-48C3	lower	SD	TCA	0	0	0	0	0	ug/L

StationID	Aquifer	Program	Analyte	2018 Results	2022 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-48C3	lower	SD	DCA	0	0	0	0	0	ug/L
CD-48C3	lower	SD	DCE	0	0	0	0	0	ug/L
CD-48C3	lower	SD	MC	0	0	0	0	0	ug/L
CD-48C3	lower	SD	PCE	0	0	0	0	0	ug/L
CD-48C3	lower	SD	TCE	0	0	0	0	0	ug/L
CD-48C3	lower	SD	VC	0	0	0	0	0	ug/L
CD-49	lower	SD	TCA	3.31	2.42	4.61	1.3	2.19	ug/L
CD-49	lower	SD	DCA	0	0	0	0	0	ug/L
CD-49	lower	SD	DCE	2.59	2.47	3.99	1.4	1.52	ug/L
CD-49	lower	SD	MC	0	0	0	0	0	ug/L
CD-49	lower	SD	PCE	0	0	0	0	0	ug/L
CD-49	lower	SD	TCE	0	0	0	0	0	ug/L
CD-49	lower	SD	VC	0	0	0	0	0	ug/L
CP-E1	lower	SD	TCA	8.58	4.86	5.59	-2.99	0.73	ug/L
CP-E1	lower	SD	DCA	9.66	8.29	9.47	-0.19	1.18	ug/L
CP-E1	lower	SD	DCE	16.1	16.4	19.3	3.2	2.9	ug/L
CP-E1	lower	SD	MC	0	0	0	0	0	ug/L
CP-E1	lower	SD	PCE	2.85	2.84	2.94	0.09	0.1	ug/L
CP-E1	lower	SD	TCE	9.93	8.43	9.58	-0.35	1.15	ug/L
CP-E1	lower	SD	VC	0	0	0	0	0	ug/L
CP-E2	lower	SD	TCA	62.3	32.3	37	-25.3	4.7	ug/L
CP-E2	lower	SD	DCA	38.6	36	42	3.4	6	ug/L
CP-E2	lower	SD	DCE	118	167	186	68	19	ug/L
CP-E2	lower	SD	MC	0	0	0	0	0	ug/L
CP-E2	lower	SD	PCE	0.69	1.04	1.1	0.41	0.06	ug/L
CP-E2	lower	SD	TCE	116	184	196	80	12	ug/L
CP-E2	lower	SD	VC	0	0	0	0	0	ug/L
CP-E3	lower	SD	TCA	7.53	5.84	7.73	0.2	1.89	ug/L
CP-E3	lower	SD	DCA	3.89	1.89	2.27	-1.62	0.38	ug/L
CP-E3	lower	SD	DCE	10.8	11.6	15.3	4.5	3.7	ug/L
CP-E3	lower	SD	MC	0	0	0	0	0	ug/L
CP-E3	lower	SD	PCE	0	0	0	0	0	ug/L
CP-E3	lower	SD	TCE	3.23	1.56	1.85	-1.38	0.29	ug/L
CP-E3	lower	SD	VC	0	0	0	0	0	ug/L
CP-W1	lower	SD	TCA	2.54	2.2	2.73	0.19	0.53	ug/L
CP-W1	lower	SD	DCA	0	0	0	0	0	ug/L
CP-W1	lower	SD	DCE	2.81	3.61	4.32	1.51	0.71	ug/L
CP-W1	lower	SD	MC	0	0	0	0	0	ug/L
CP-W1	lower	SD	PCE	0	0	0	0	0	ug/L
CP-W1	lower	SD	TCE	0	0	0	0	0	ug/L
CP-W1	lower	SD	VC	0	0	0	0	0	ug/L
CP-W2	lower	SD	TCA	7.04	20	21.4	14.36	1.4	ug/L
CP-W2	lower	SD	DCA	0.74	2.52	2.31	1.57	-0.21	ug/L
CP-W2	lower	SD	DCE	0.92	7.72	11	10.08	3.28	ug/L
CP-W2	lower	SD	MC	0	0	0	0	0	ug/L
CP-W2	lower	SD	PCE	0	0	0	0	0	ug/L
CP-W2	lower	SD	TCE	1.04	0	0	-1.04	0	ug/L
CP-W2	lower	SD	VC	0	0	0	0	0	ug/L
CP-W3	lower	SD	TCA	43.5	38.7	55.1	11.6	16.4	ug/L
CP-W3	lower	SD	DCA	8.87	13.3	34.1	25.23	20.8	ug/L
CP-W3	lower	SD	DCE	25.2	33.6	57.5	32.3	23.9	ug/L
CP-W3	lower	SD	MC	0	0	0	0	0	ug/L
CP-W3	lower	SD	PCE	0	0	0	0	0	ug/L
CP-W3	lower	SD	TCE	36.6	42.2	60.5	23.9	18.3	ug/L
CP-W3	lower	SD	VC	0	0	0	0	0	ug/L

Analytes that exceeded clean-up criteria this reporting period are displayed in **ORANGE**.
Increases in analyte concentrations are highlighted in **RED**.
Decreases in analyte concentrations are highlighted in **BLUE**.

Figure 2-6 Lower Aquifer Individual Monitoring Well COC Concentrations





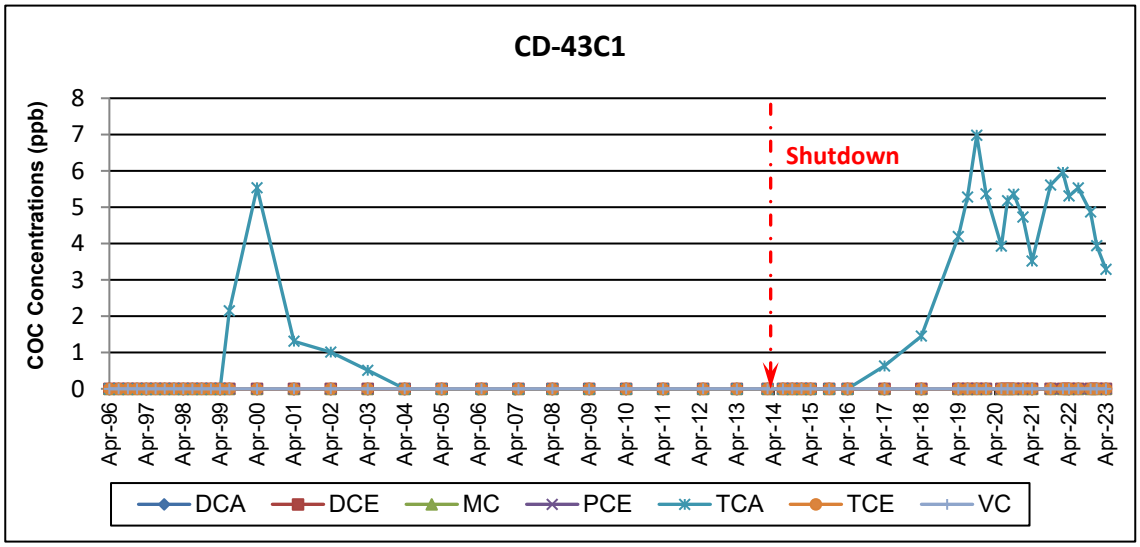
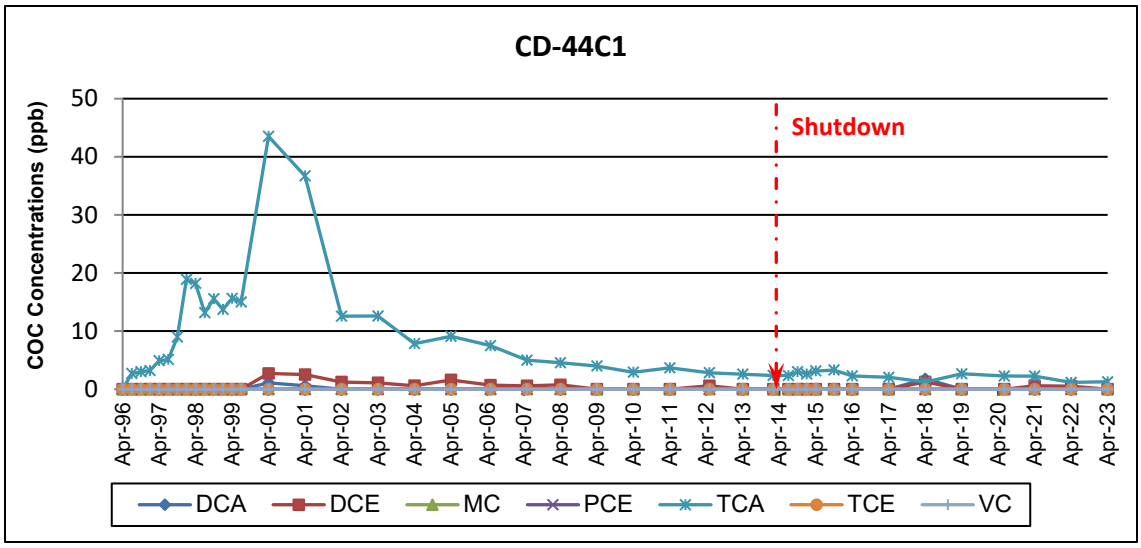
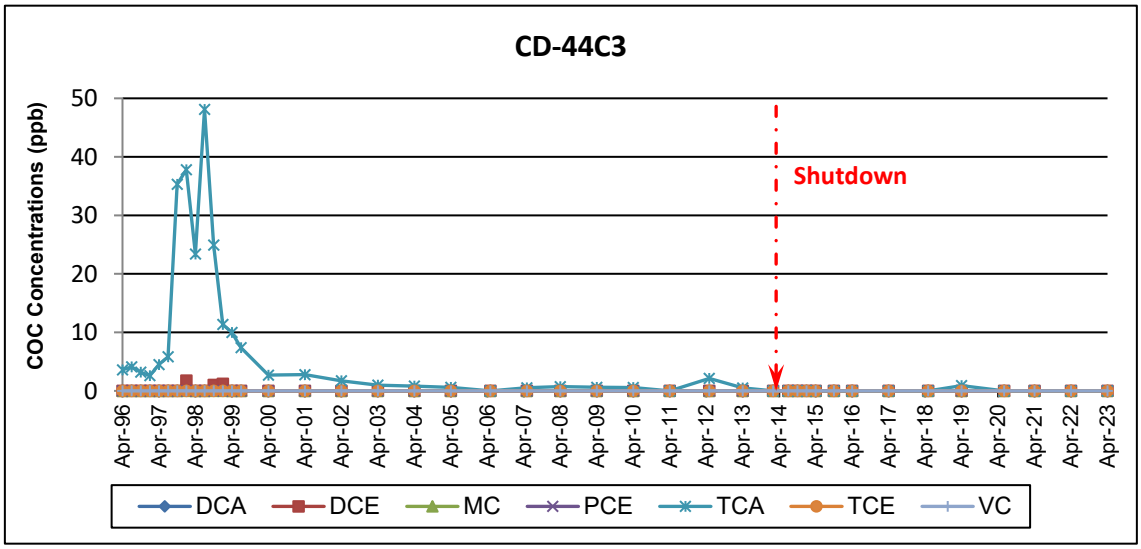


Figure 2-7 Lower Aquifer Individual Monitoring Well COC Concentrations





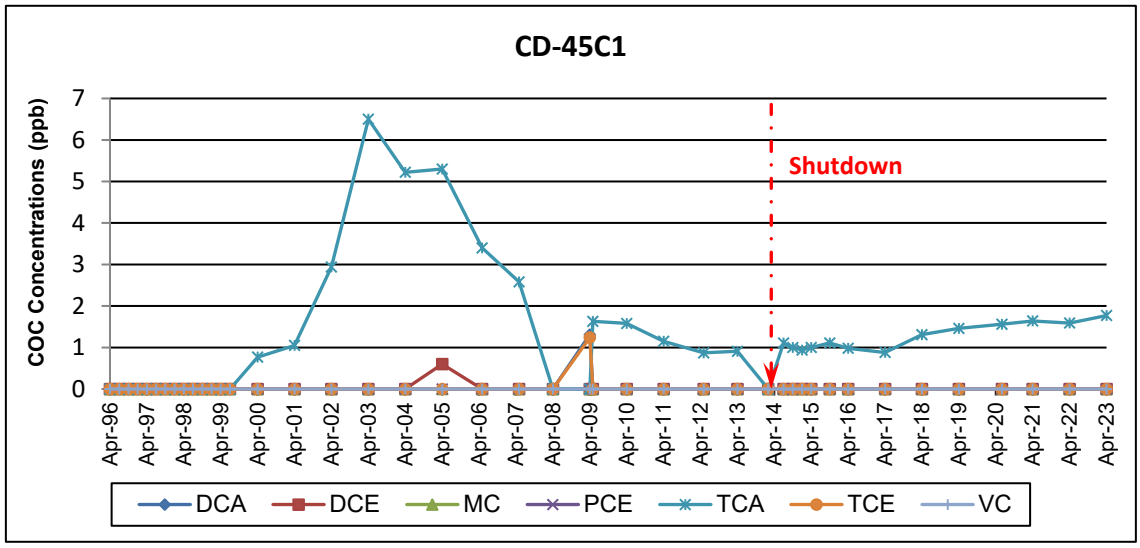
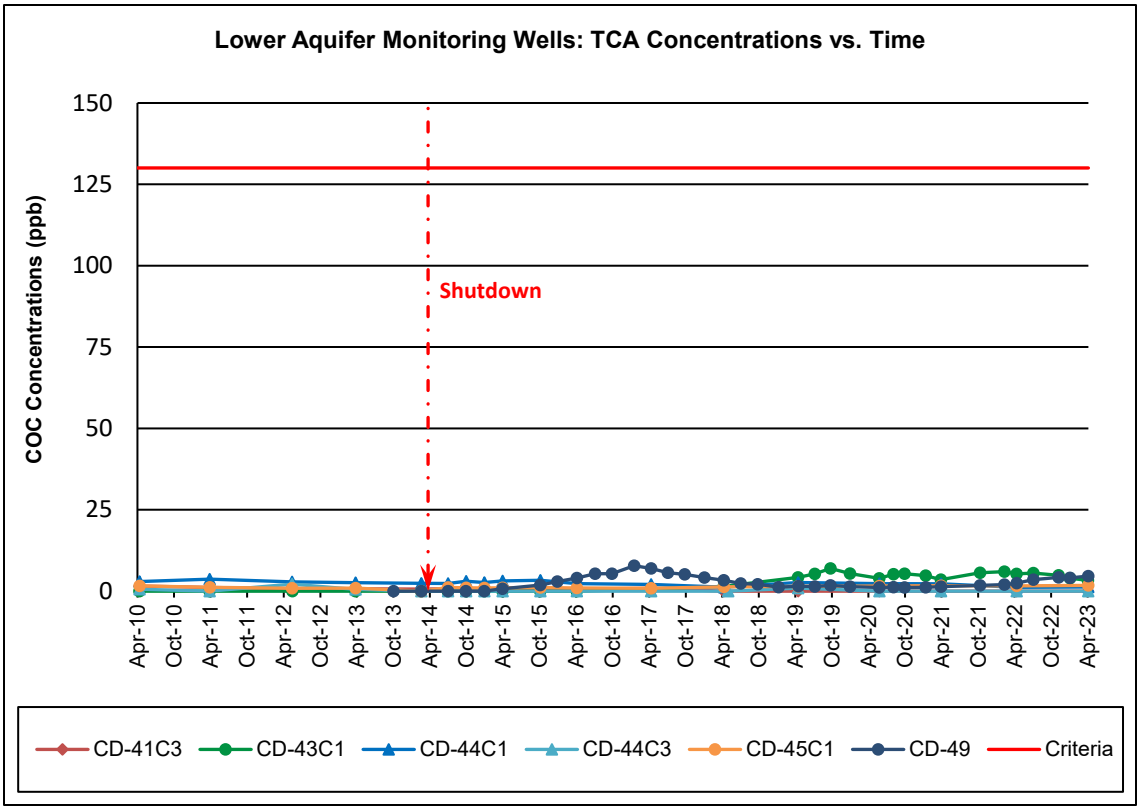


Figure 2-8 Lower Aquifer Compliance Wells TCA Concentrations



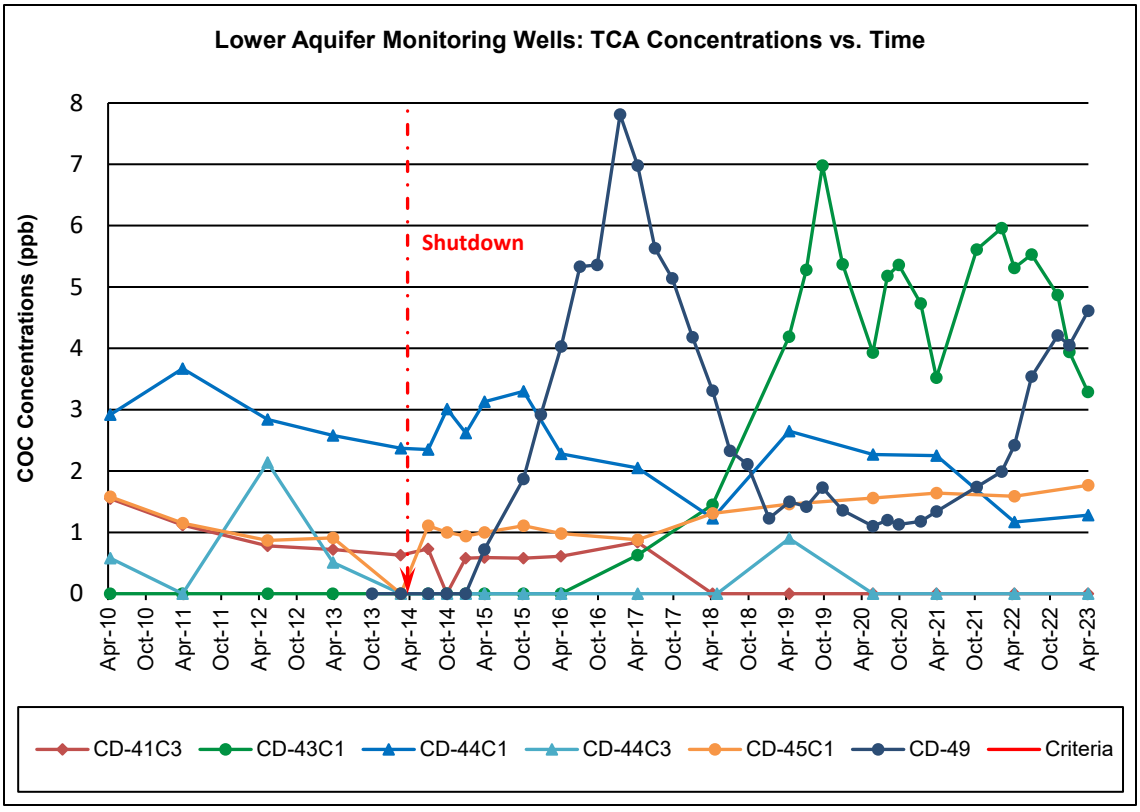
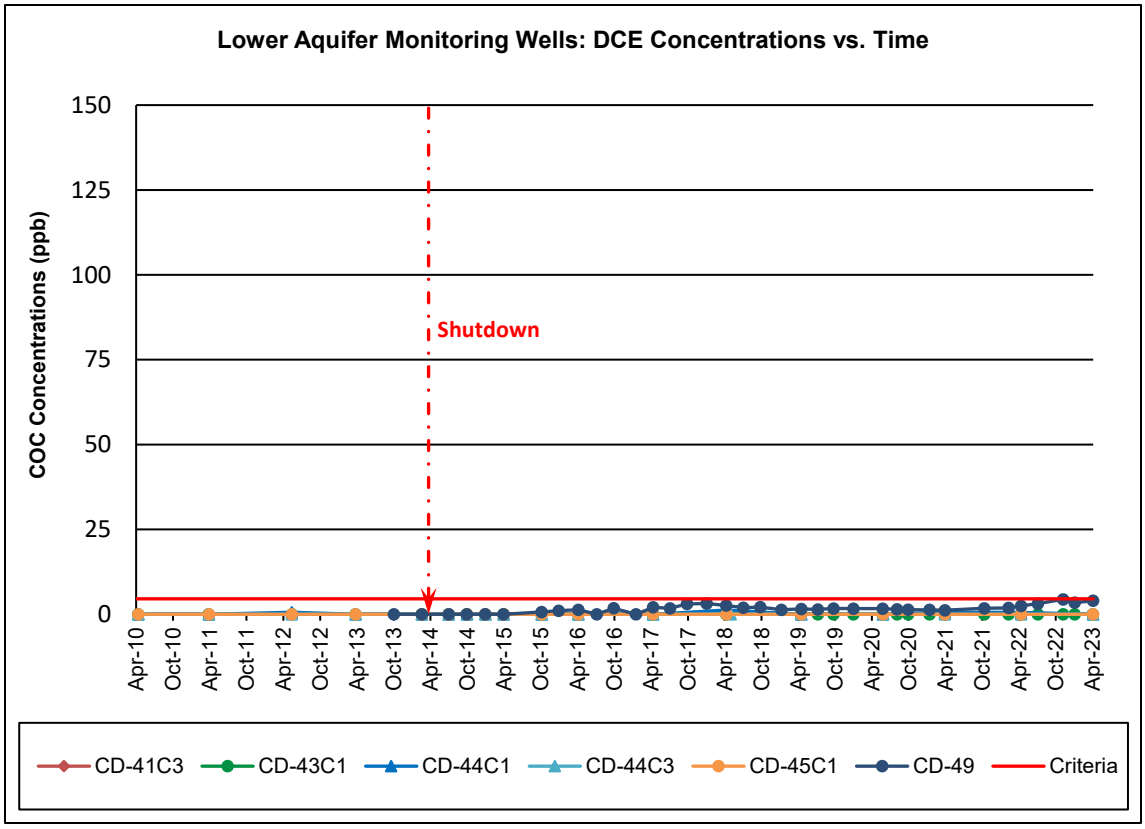


Figure 2-9 Lower Aquifer Compliance Wells DCE Concentrations



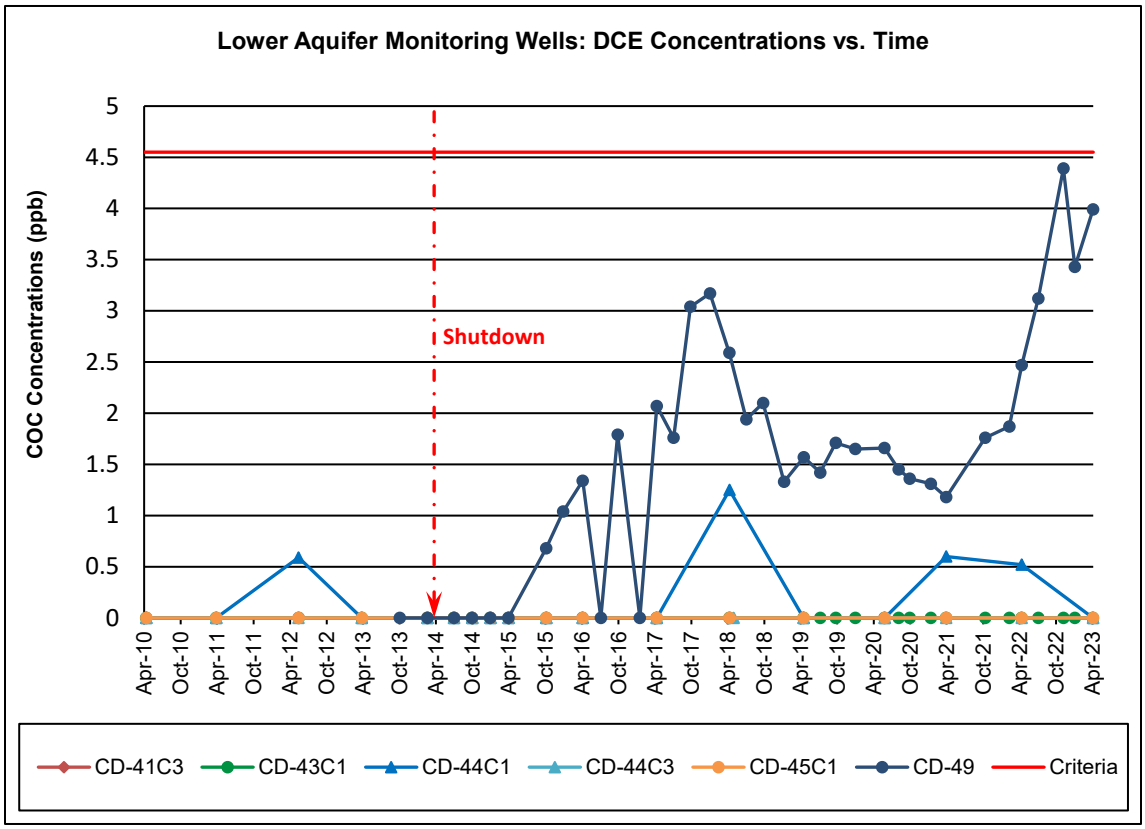
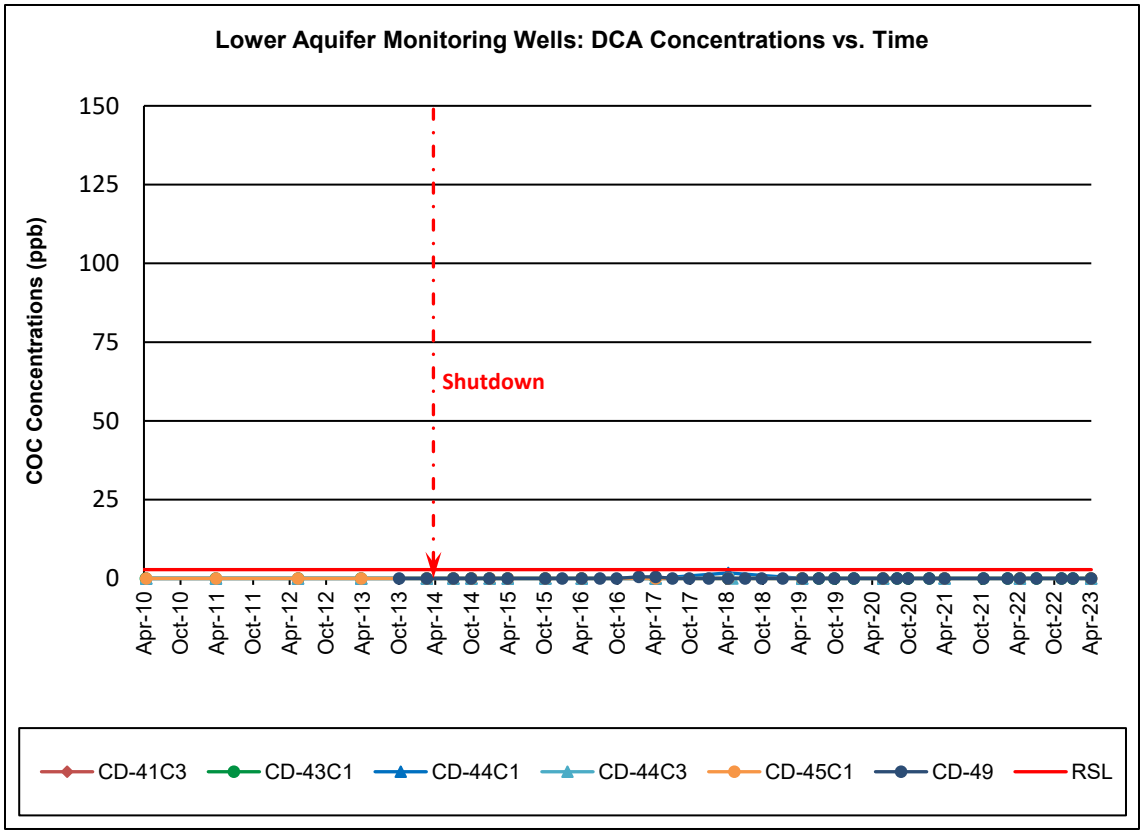


Figure 2-10 Lower Aquifer Compliance Wells DCA Concentrations



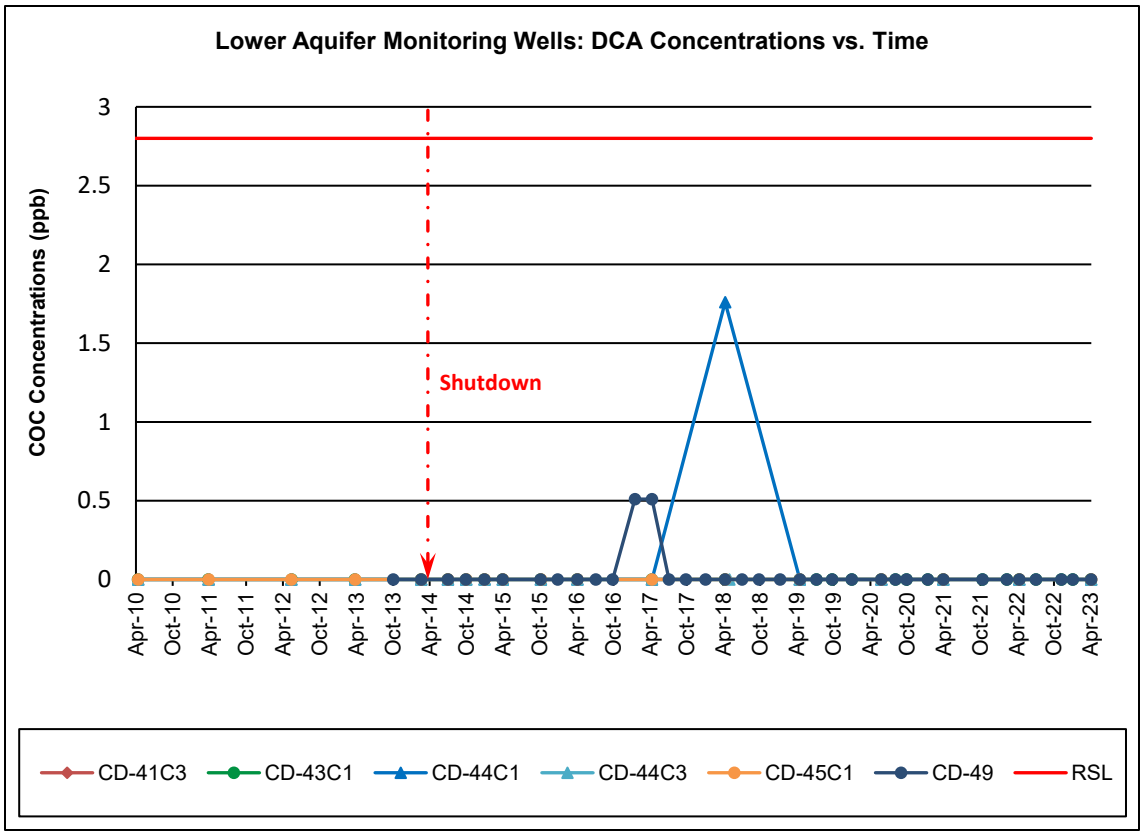
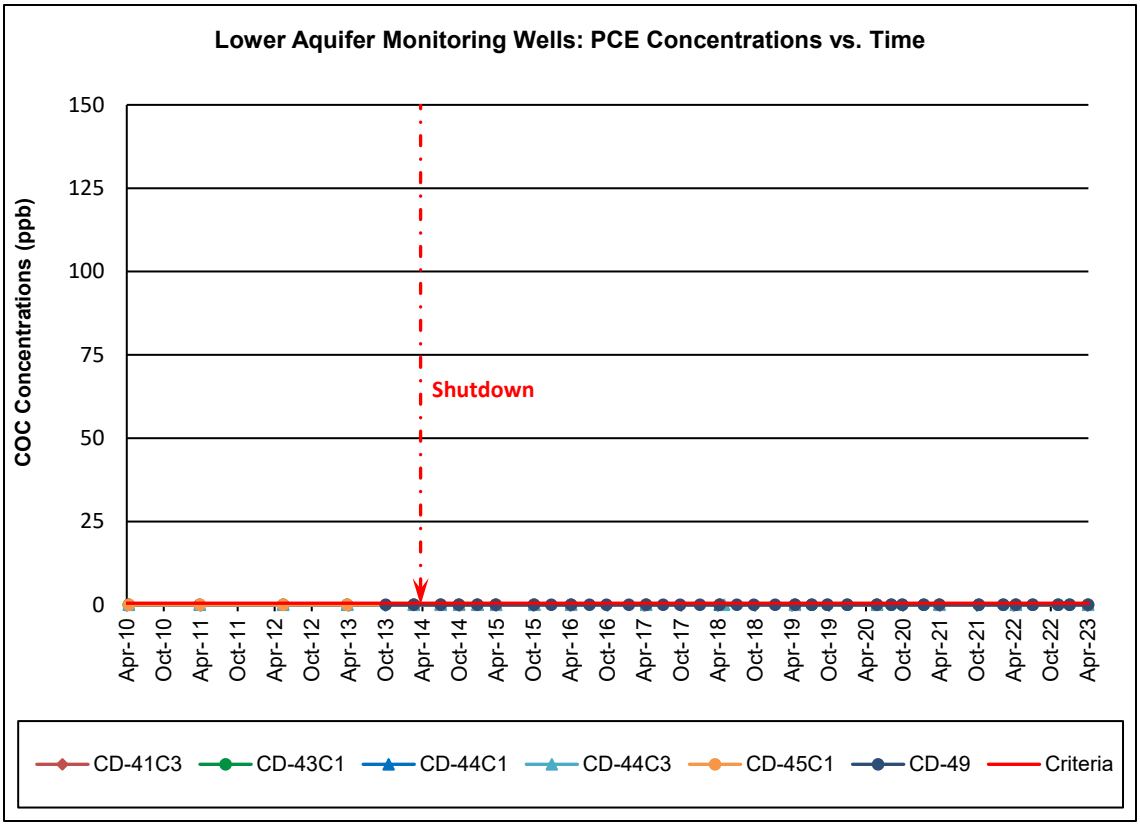


Figure 2-11 Lower Aquifer Compliance Wells PCE Concentrations



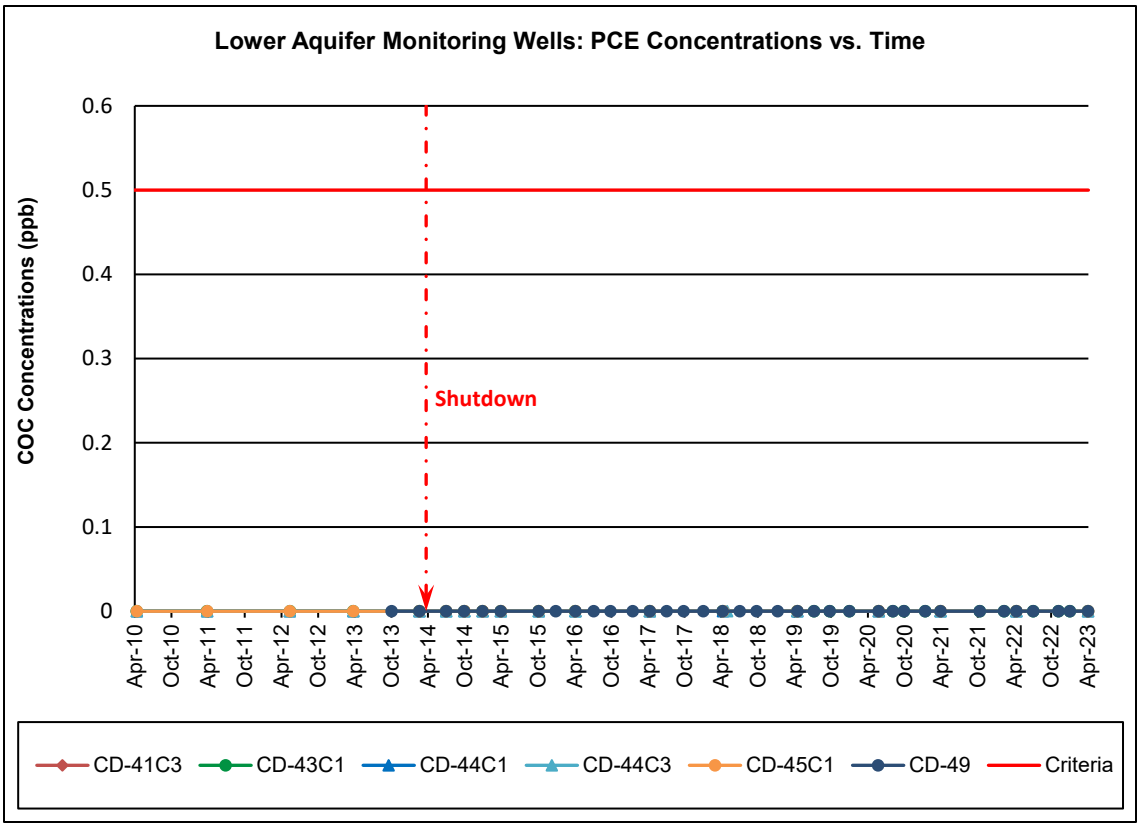
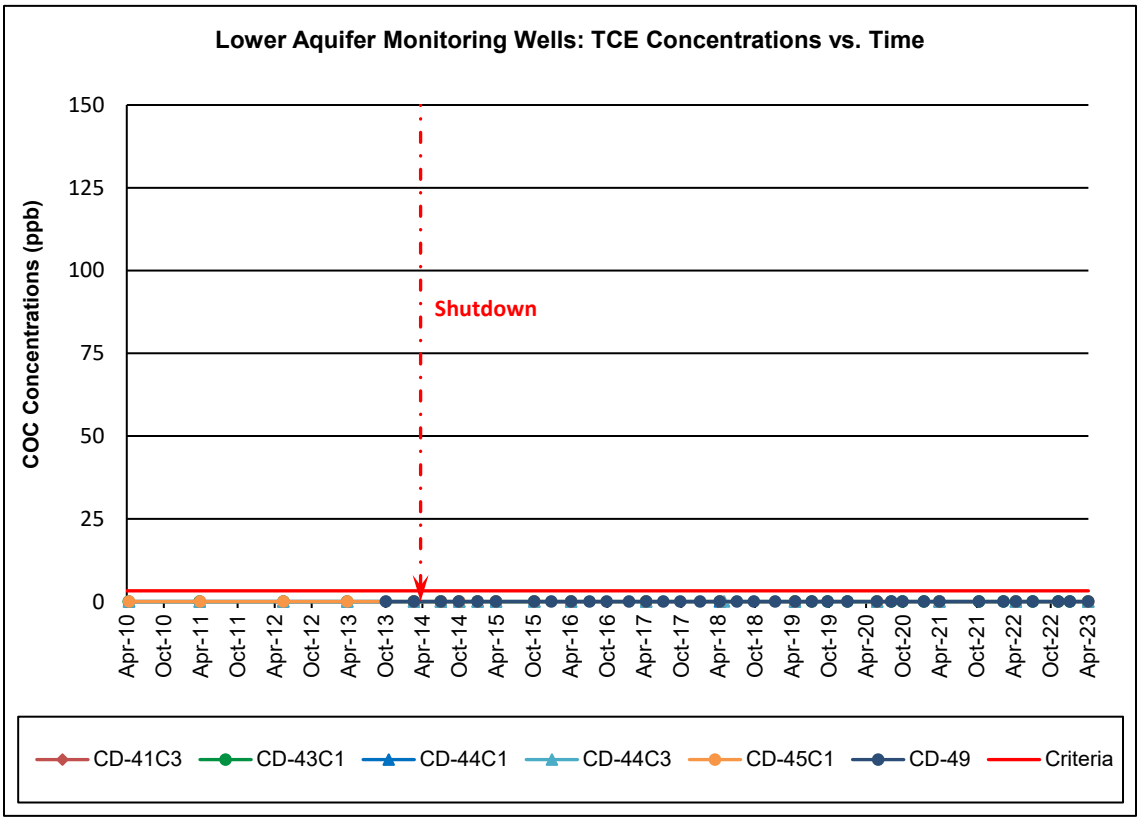


Figure 2-12 Lower Aquifer Compliance Wells TCE Concentrations



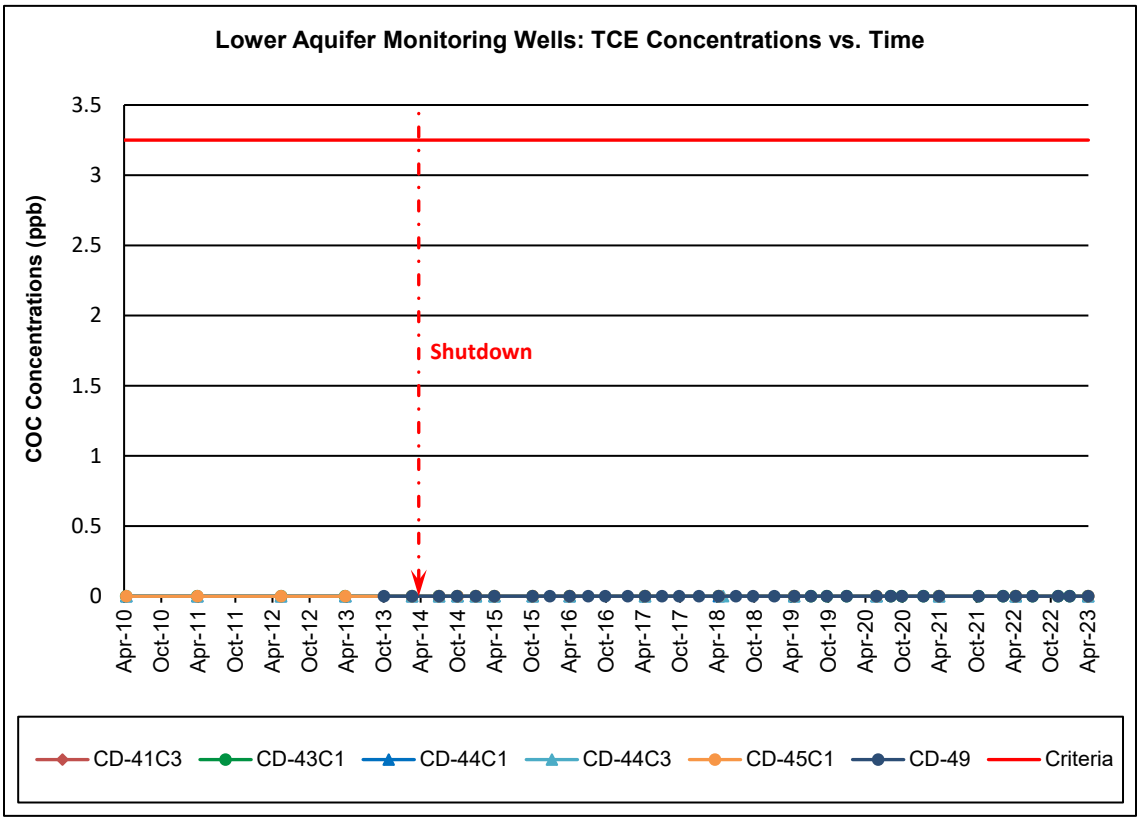


Figure 2-13 Lower Aquifer Individual Extraction Well COC Concentrations

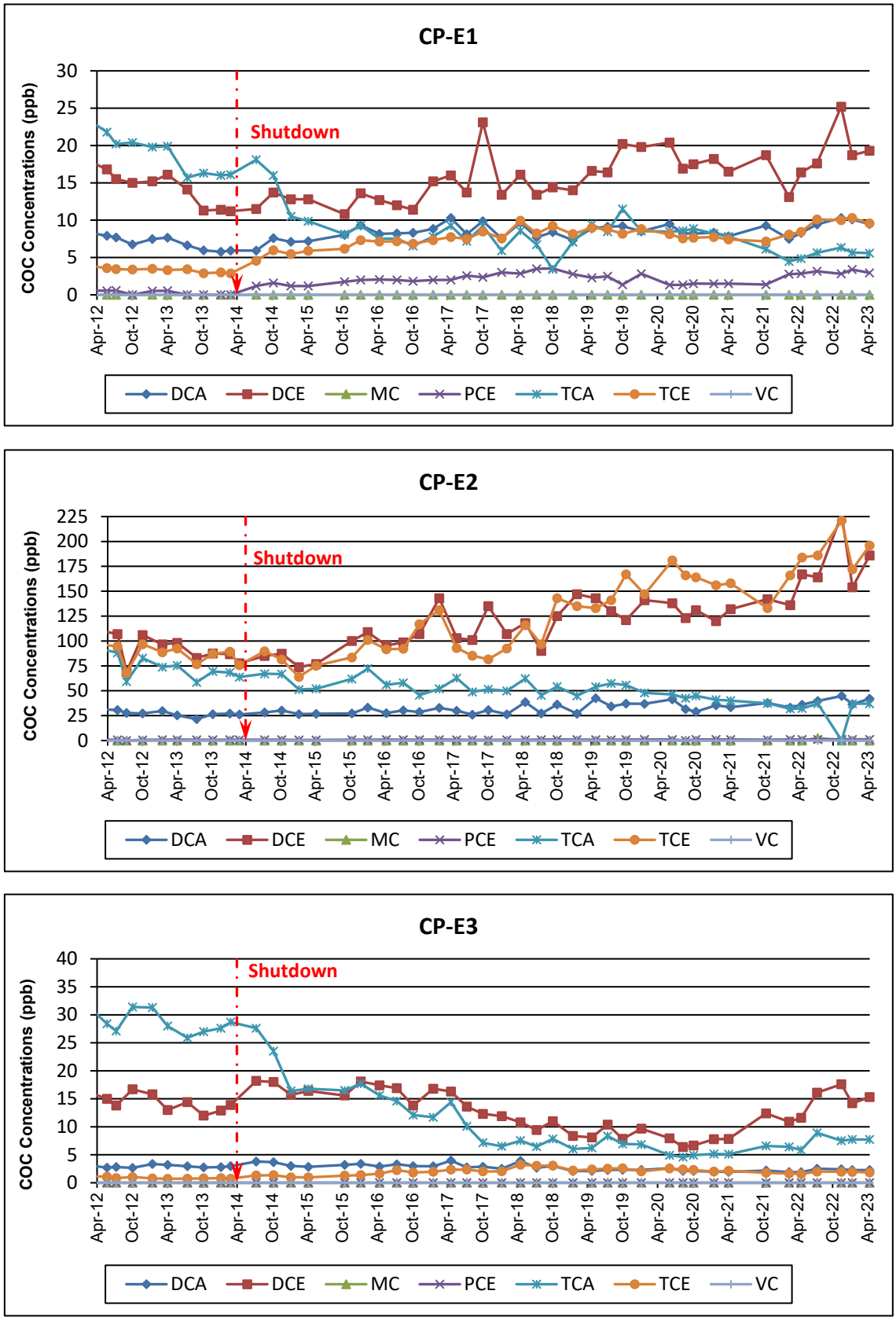


Figure 2-14 Lower Aquifer Individual Extraction Well COC Concentrations

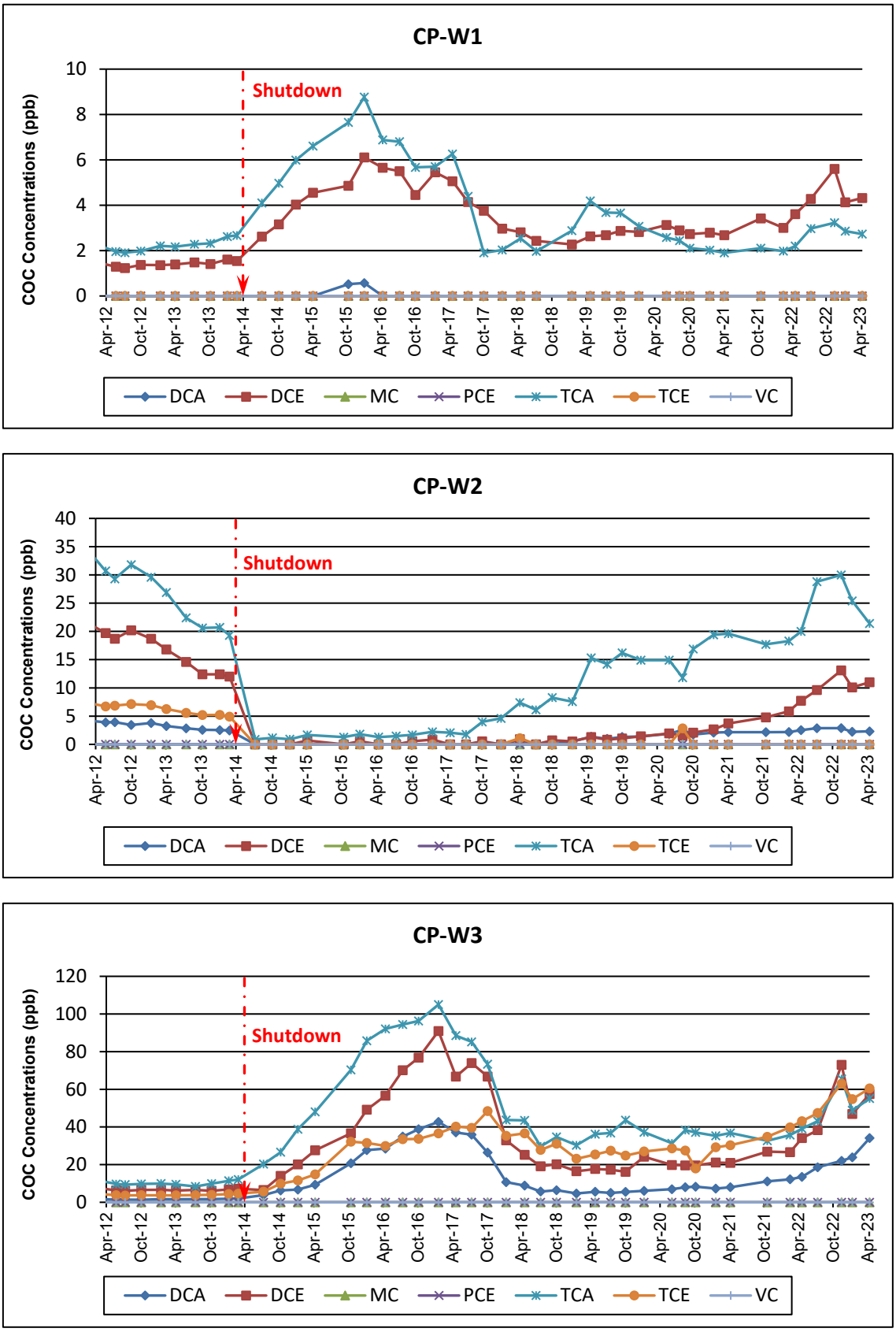
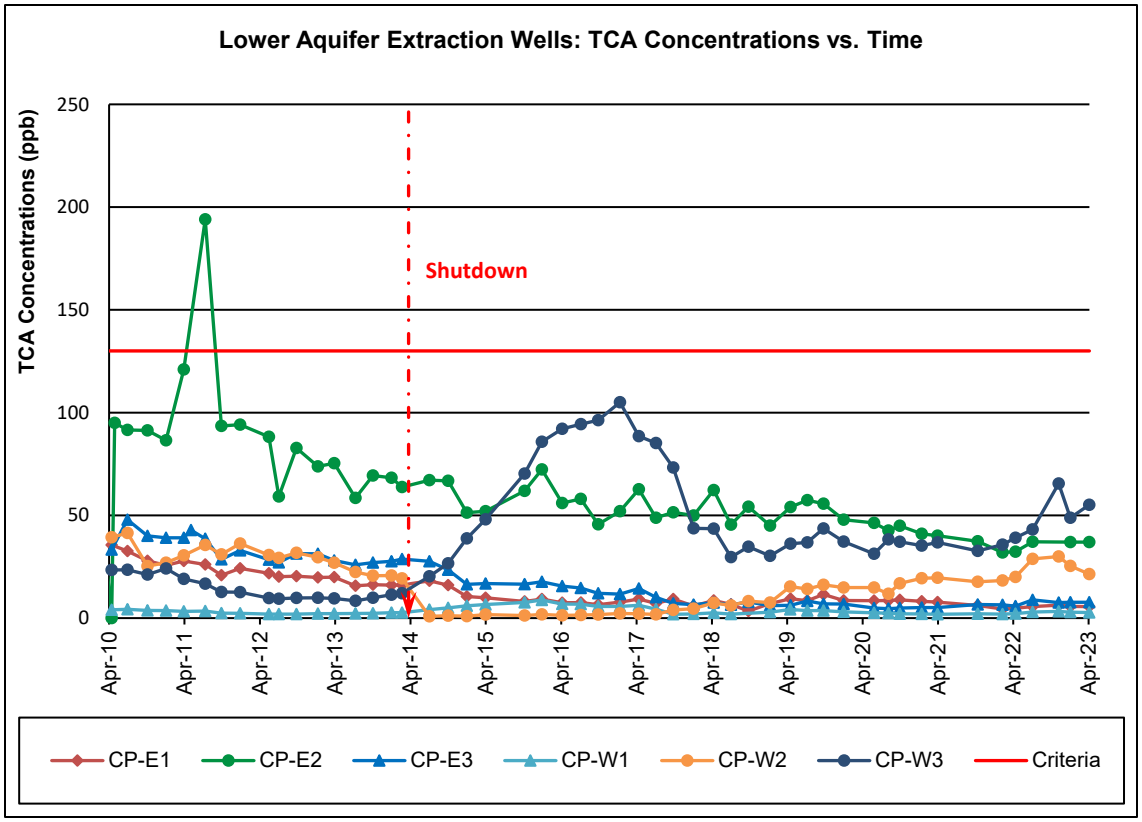


Figure 2-15 Lower Aquifer Extraction Wells TCA Concentrations vs. Time



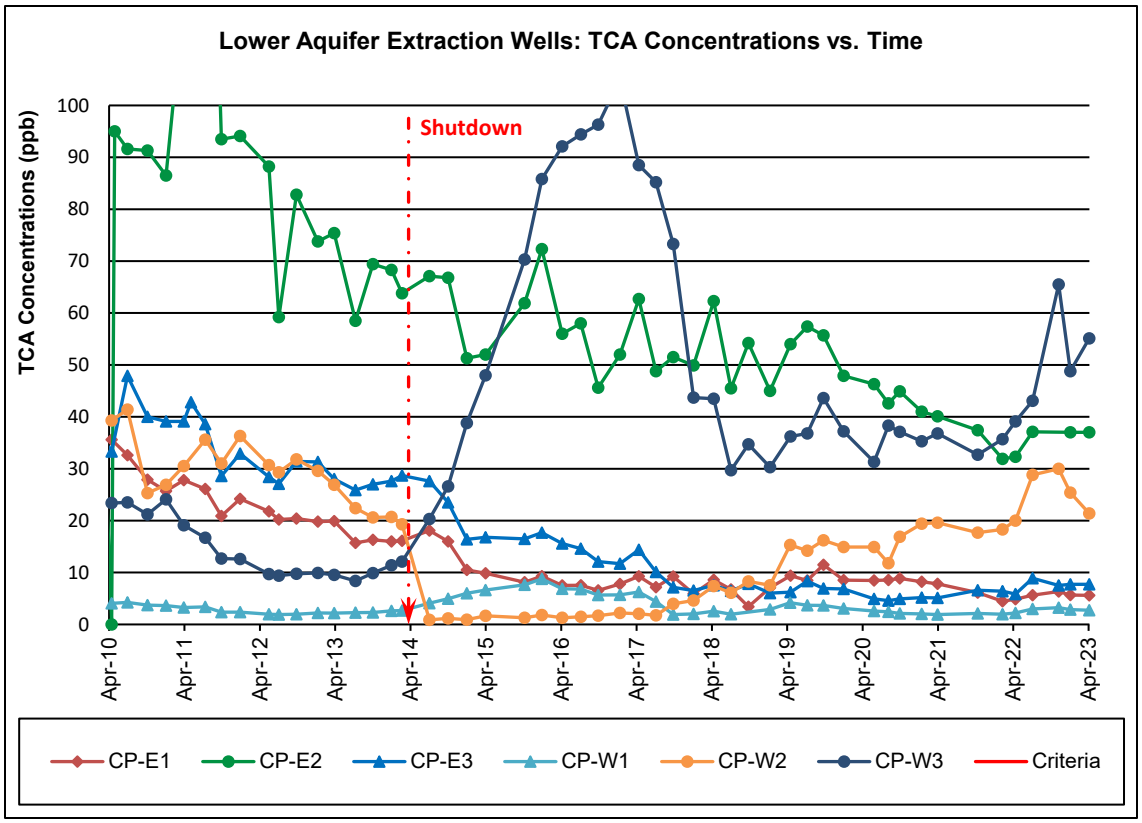
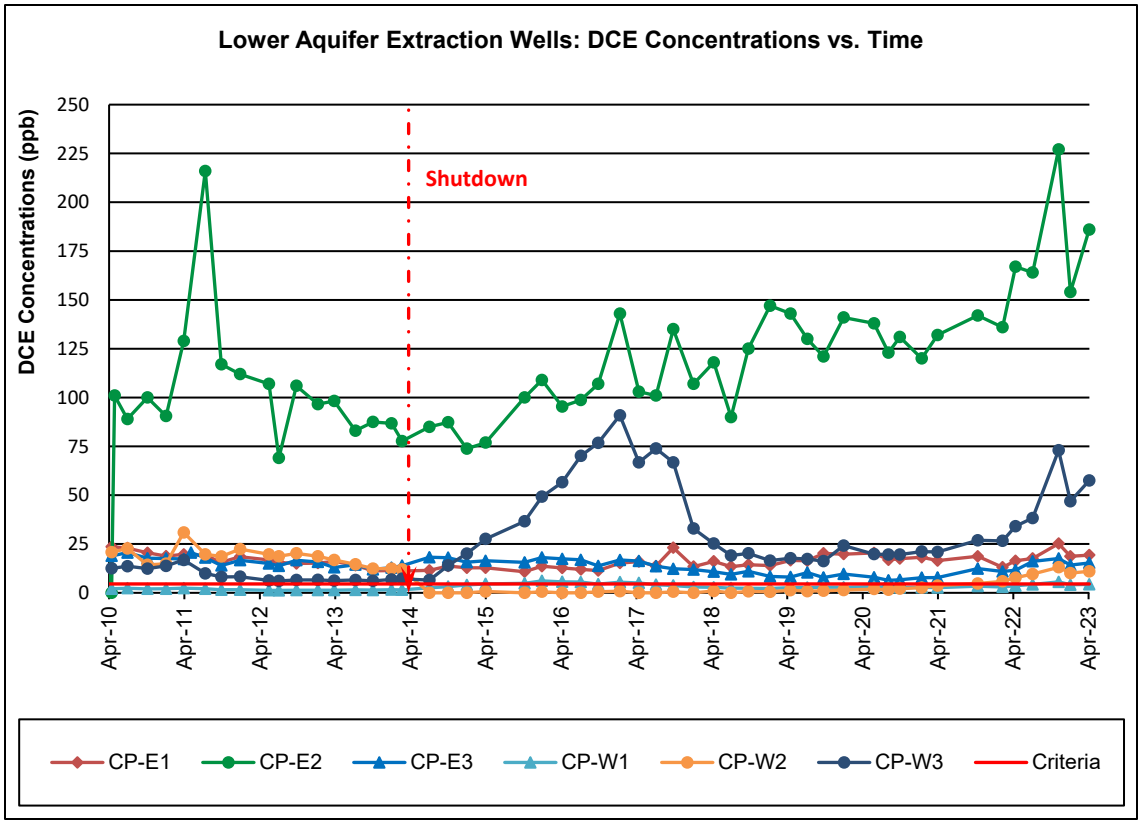


Figure 2-16 Lower Aquifer Extraction Wells DCE Concentrations vs. Time



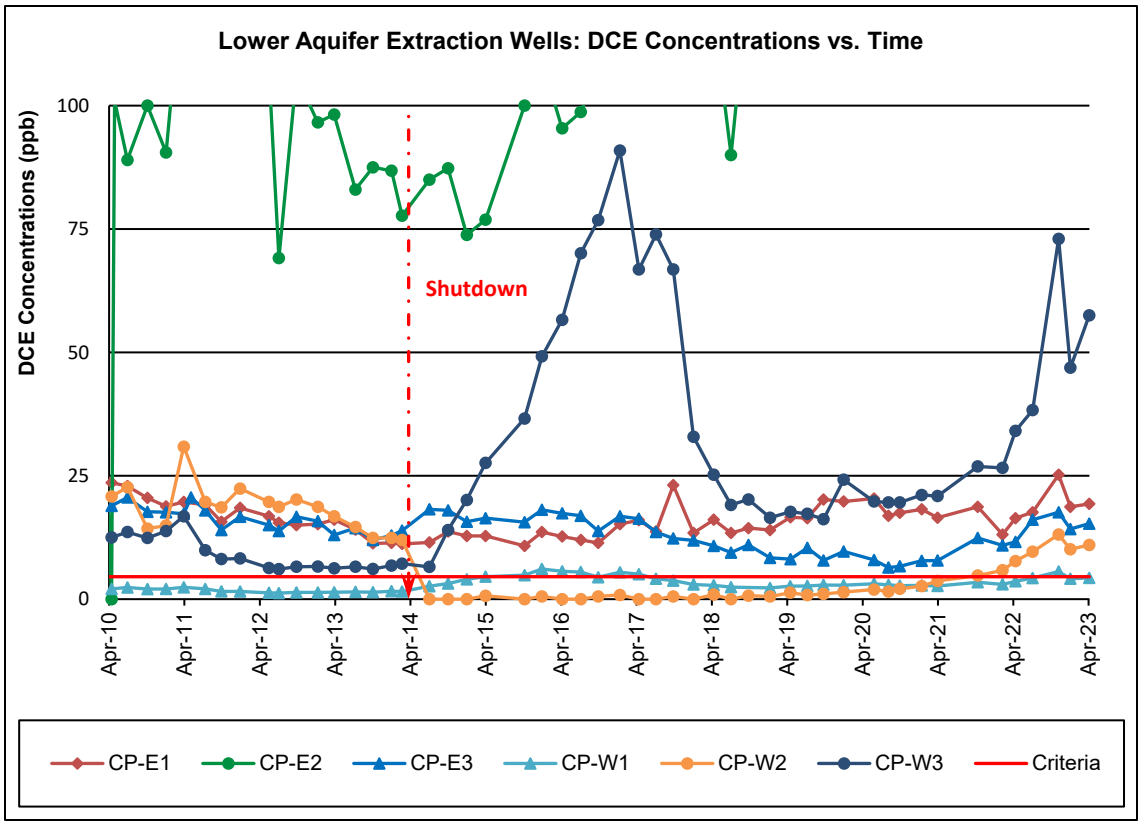
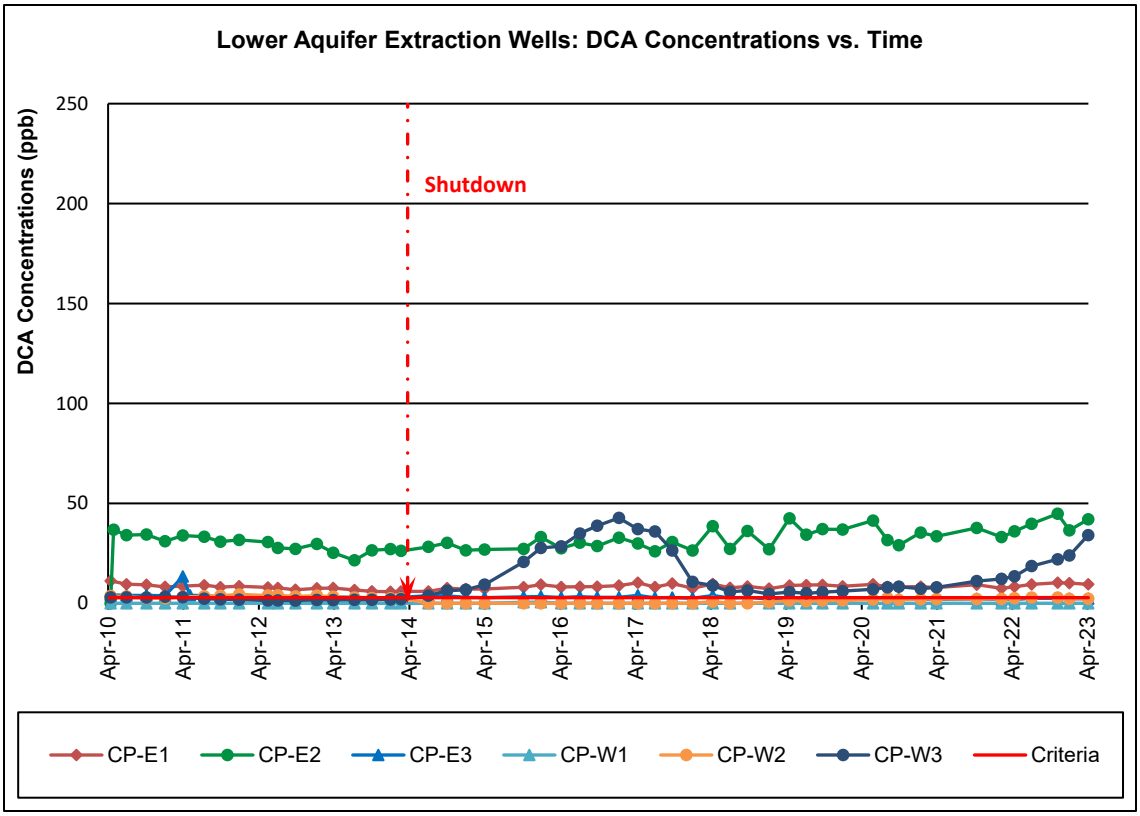


Figure 2-17 Lower Aquifer Extraction Wells DCA Concentrations vs. Time



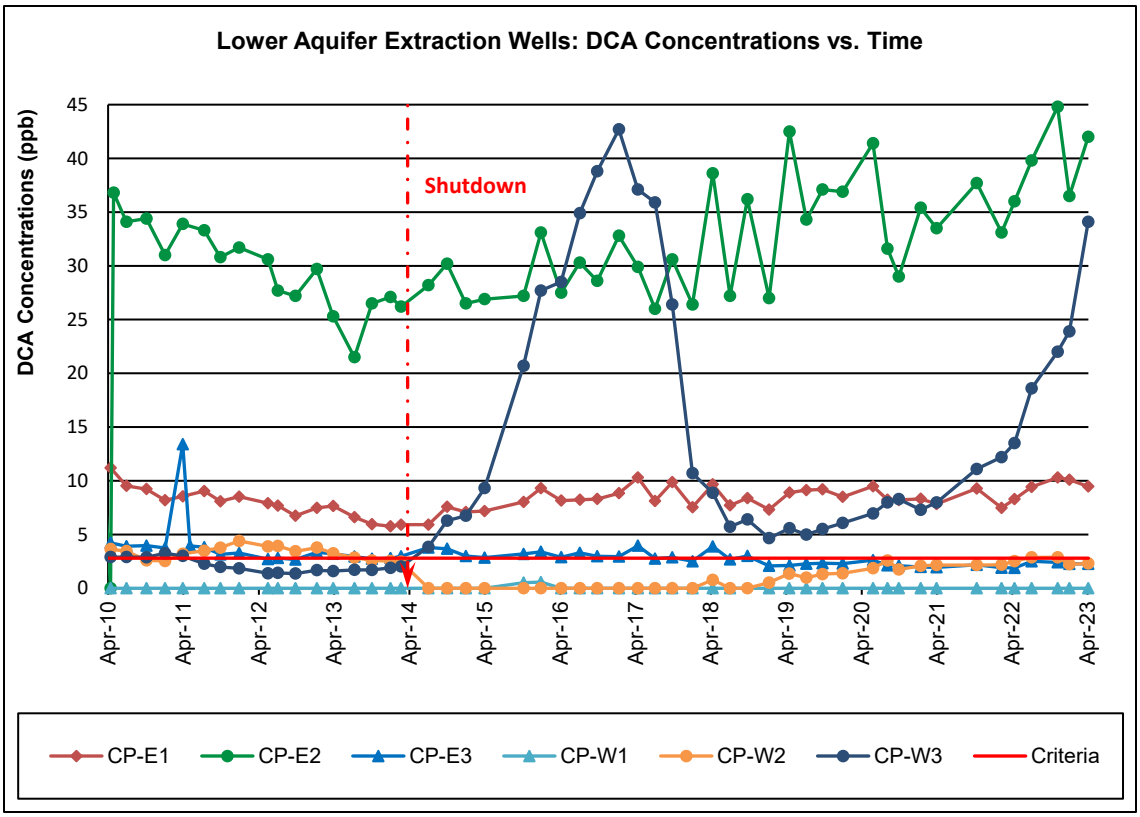
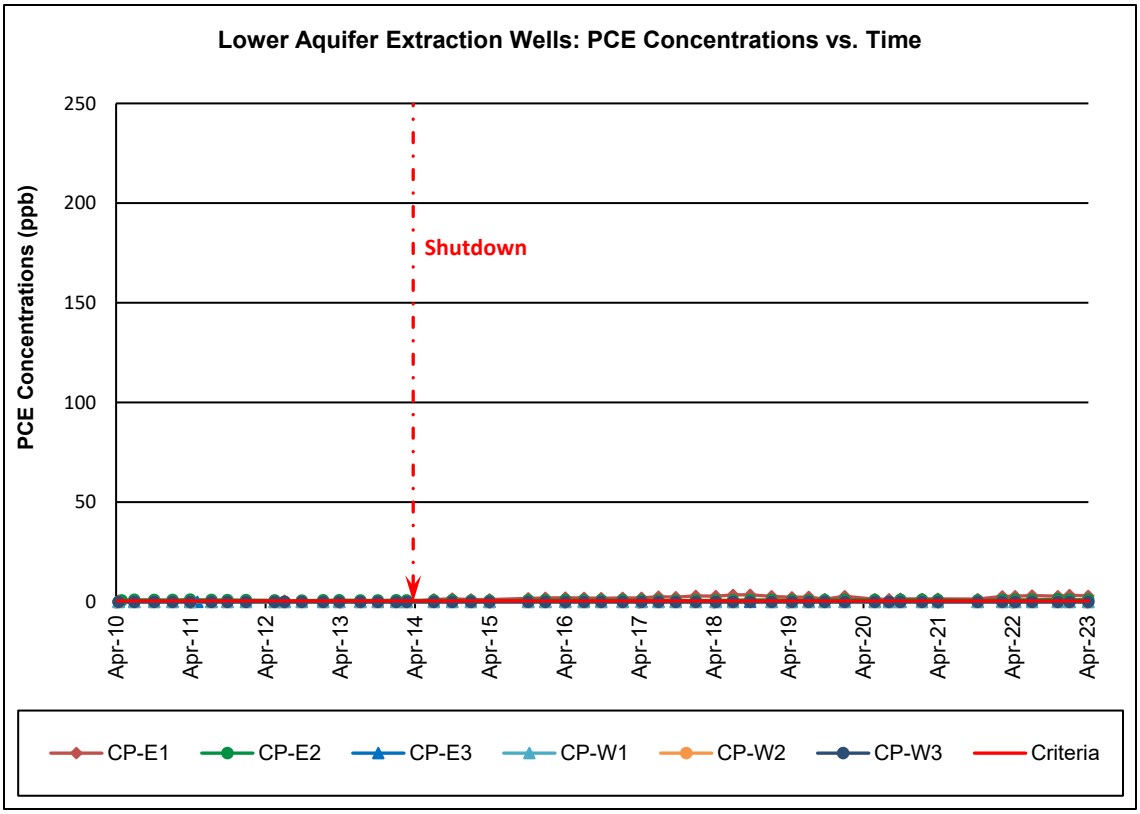


Figure 2-18 Lower Aquifer Extraction Wells PCE Concentrations vs. Time



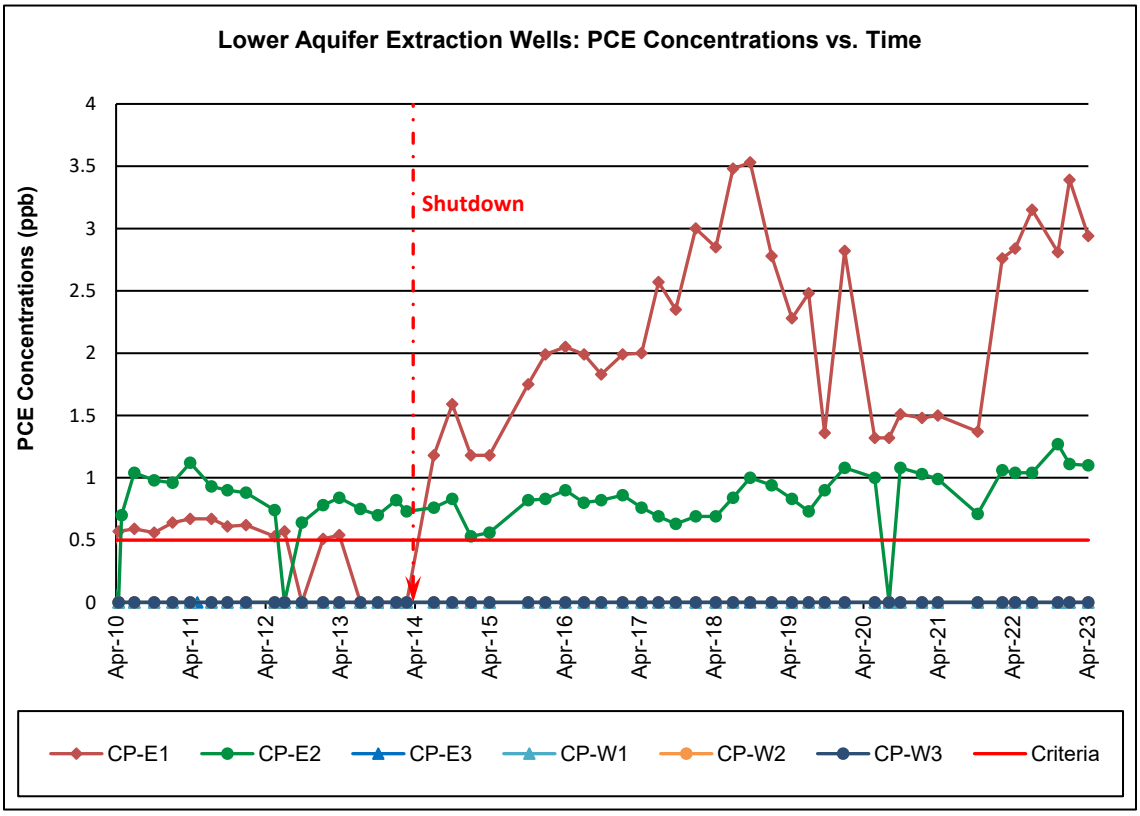
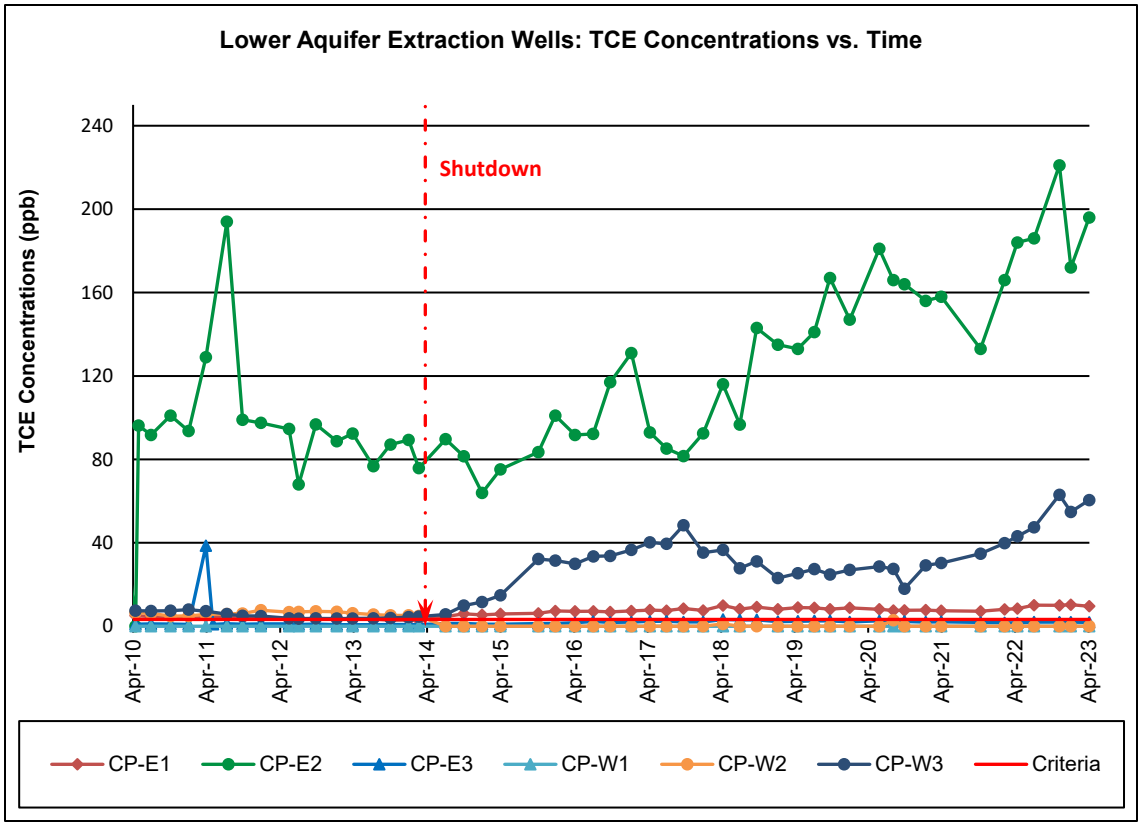


Figure 2-19 Lower Aquifer Extraction Wells TCE Concentrations vs. Time



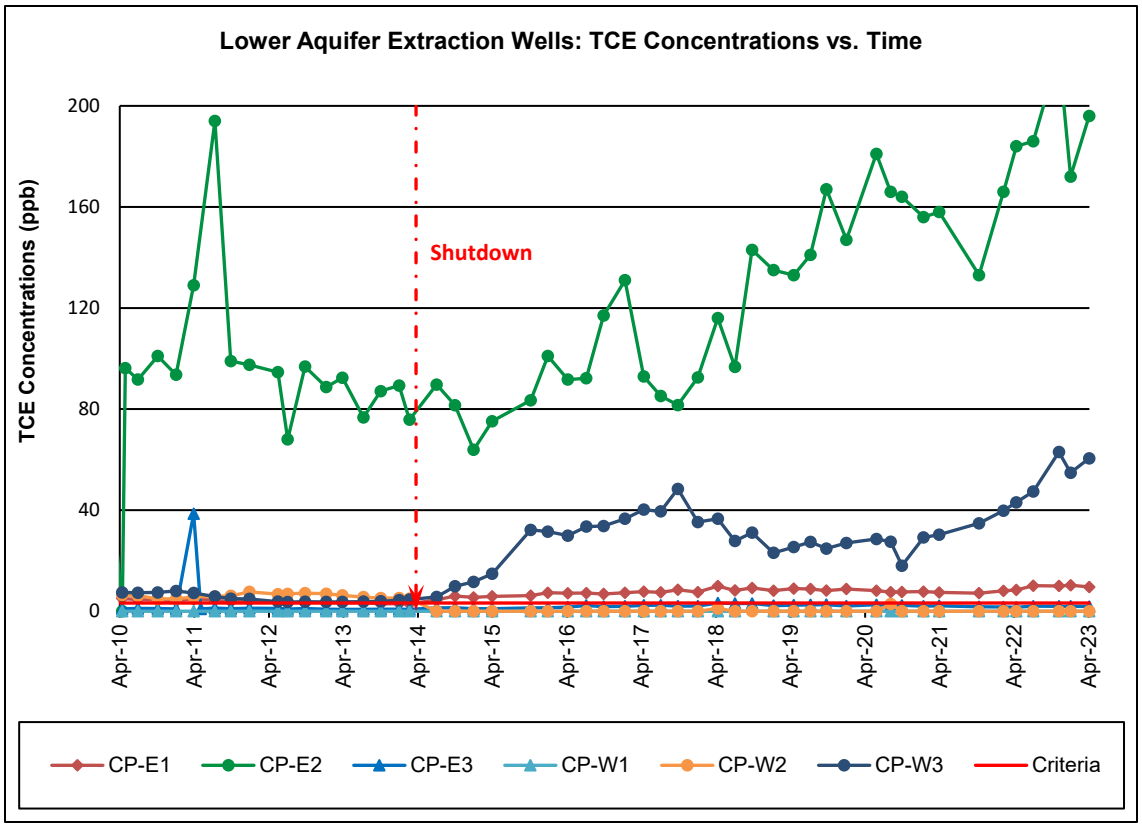


Figure 2-20 Lower Aquifer Estimated TCA Plume

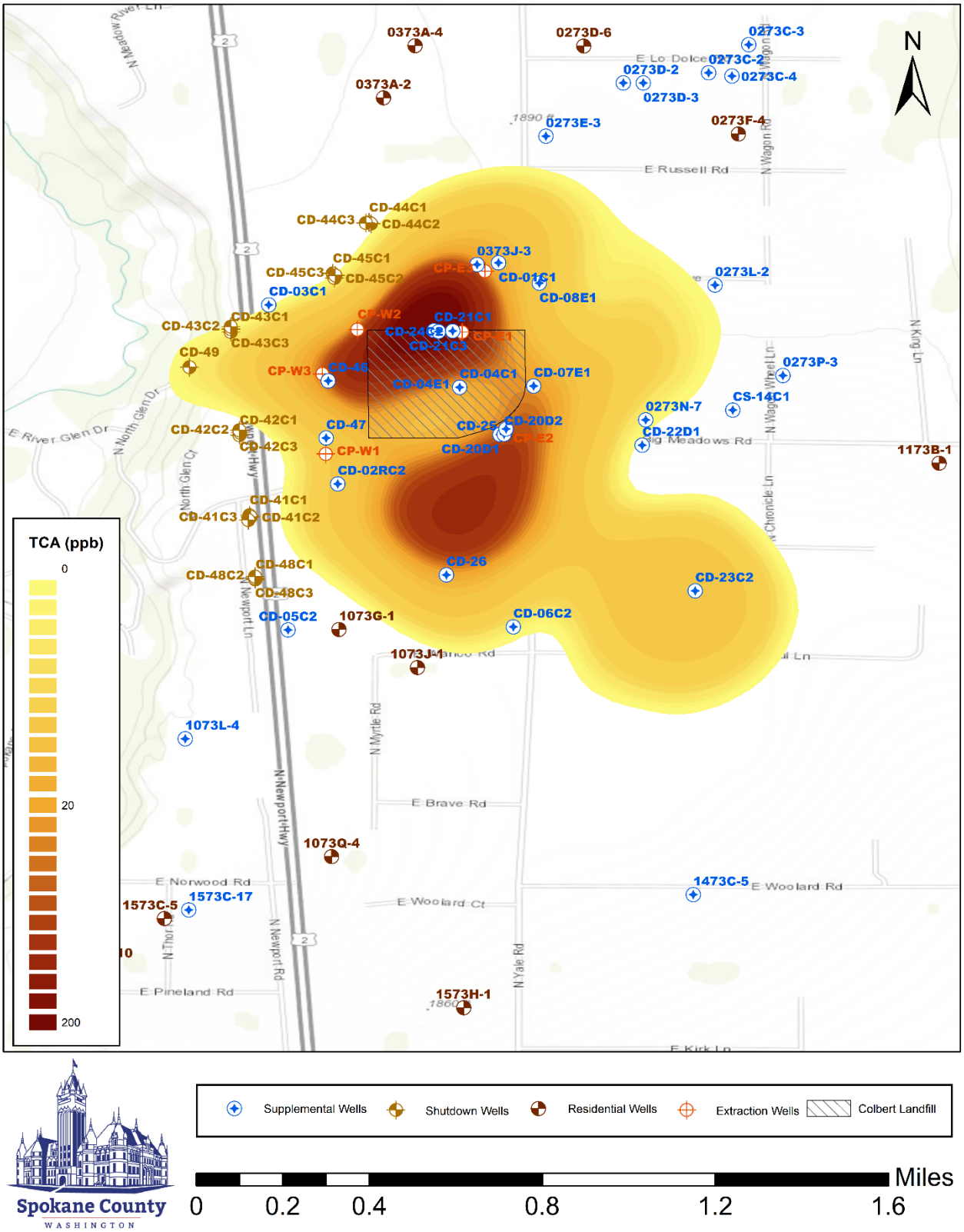


Figure 2-21 Lower Aquifer TCA Detections Map

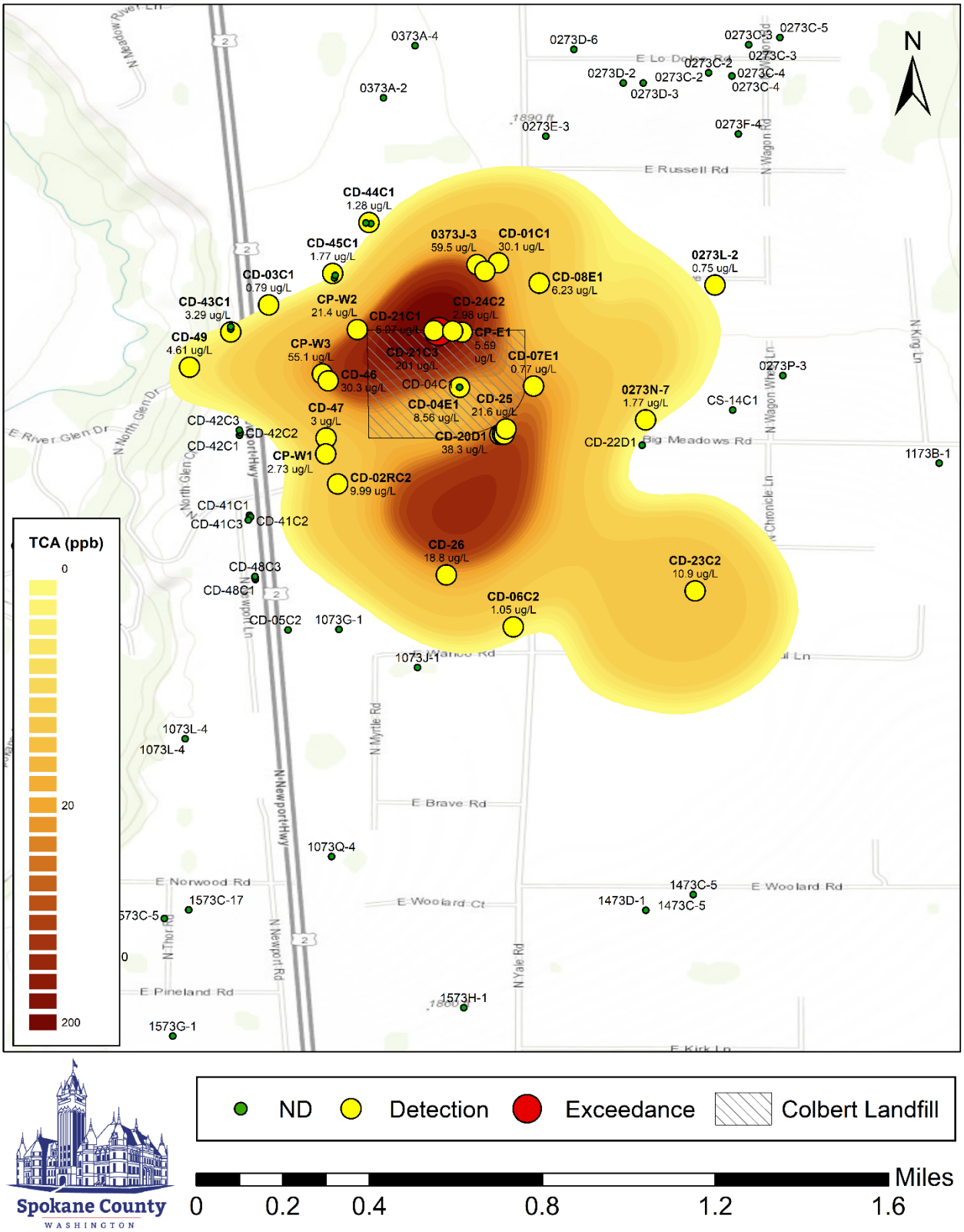


Figure 2-22 Lower Aquifer Estimated DCA Plume

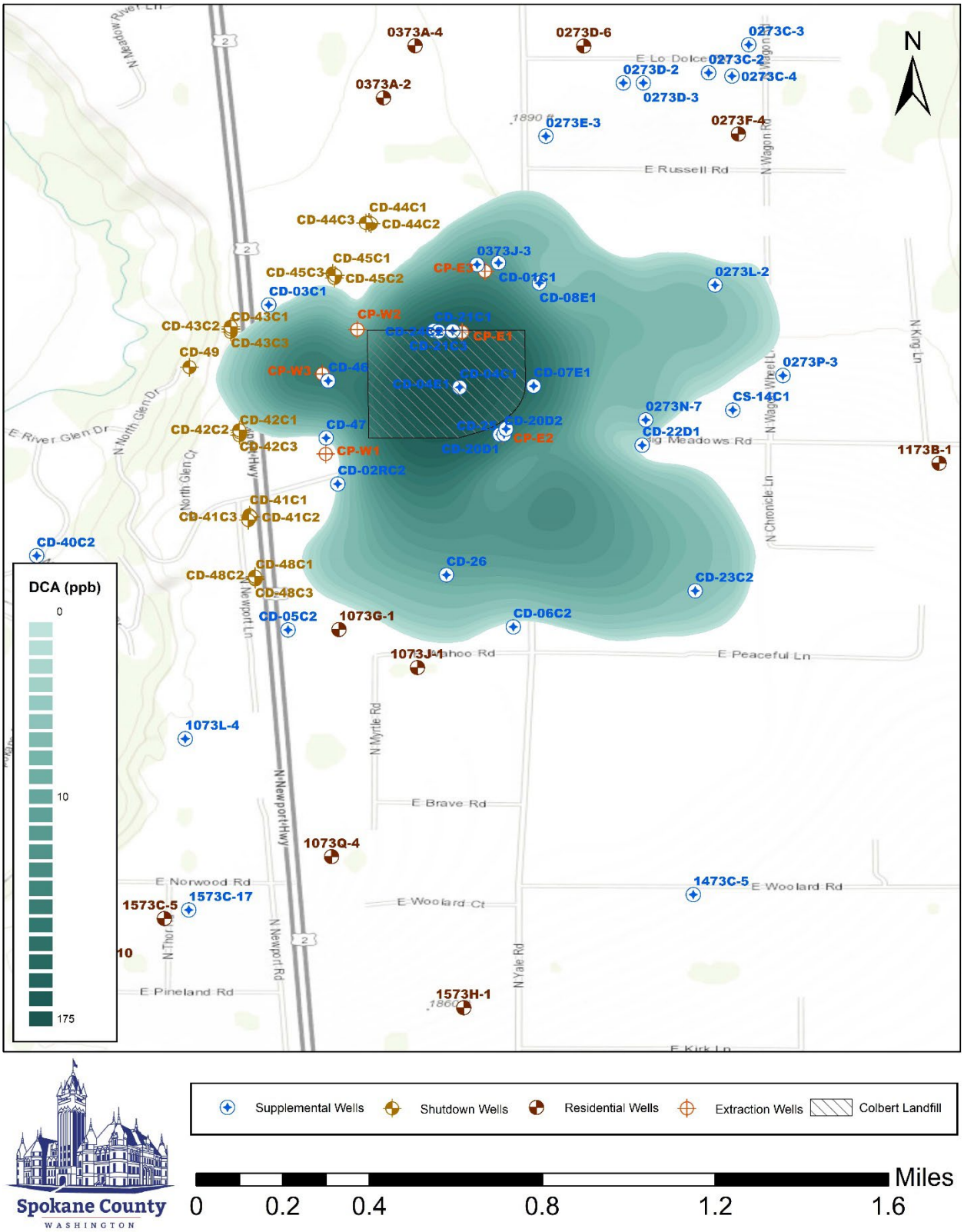


Figure 2-23 Lower Aquifer DCA Detections Map

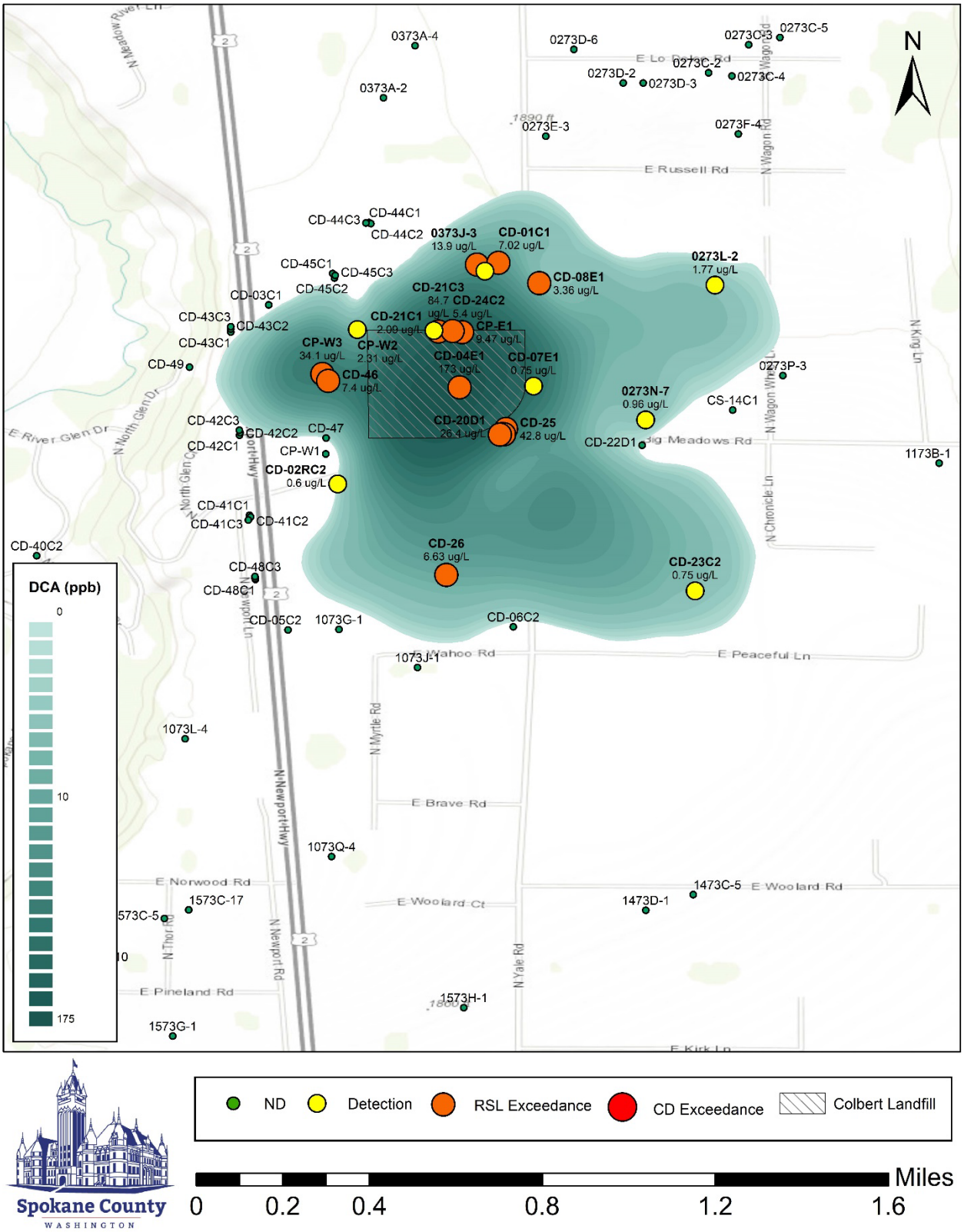


Figure 2-24 Lower Aquifer Estimated DCE Plume

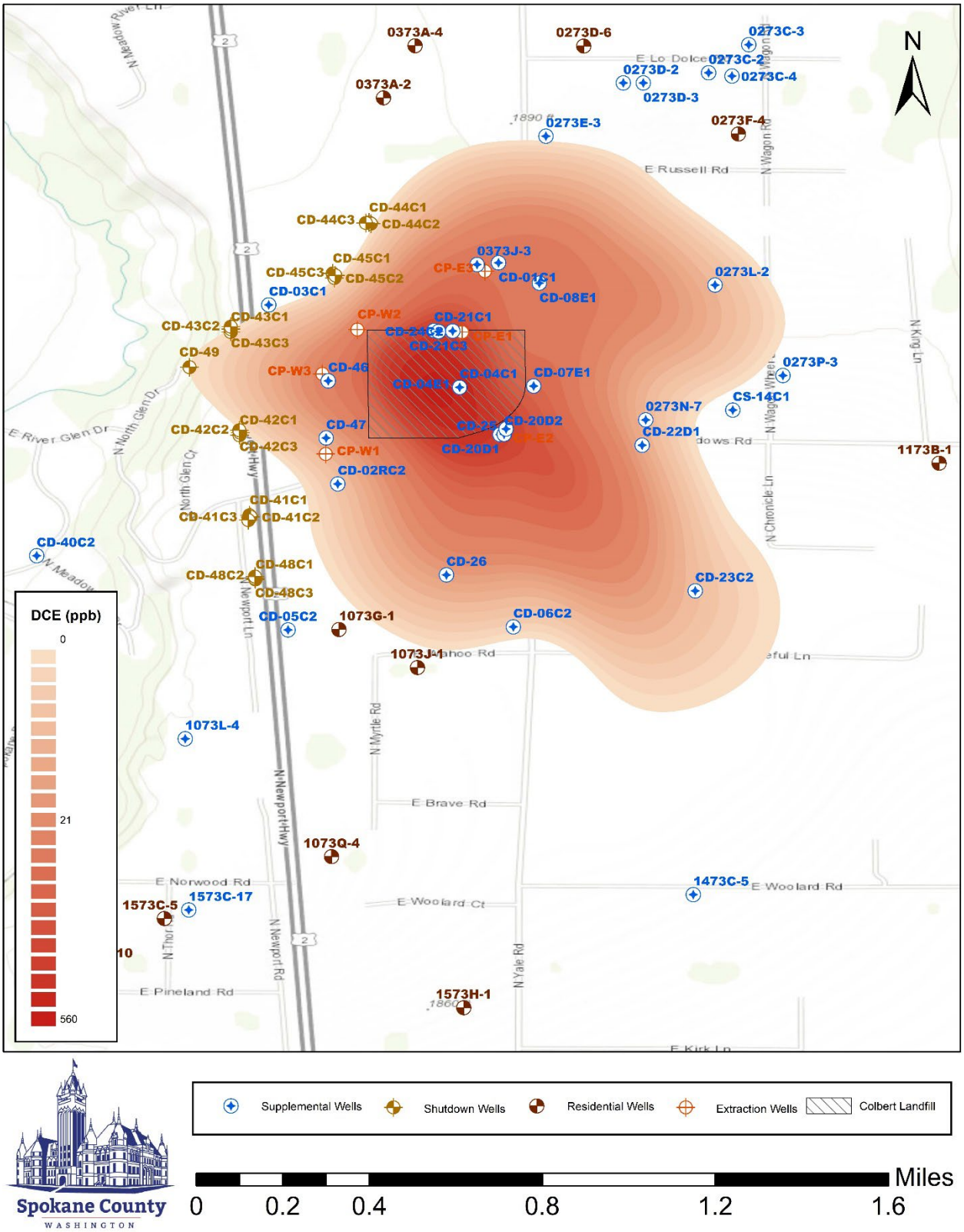


Figure 2-25 Lower Aquifer DCE Detections Map

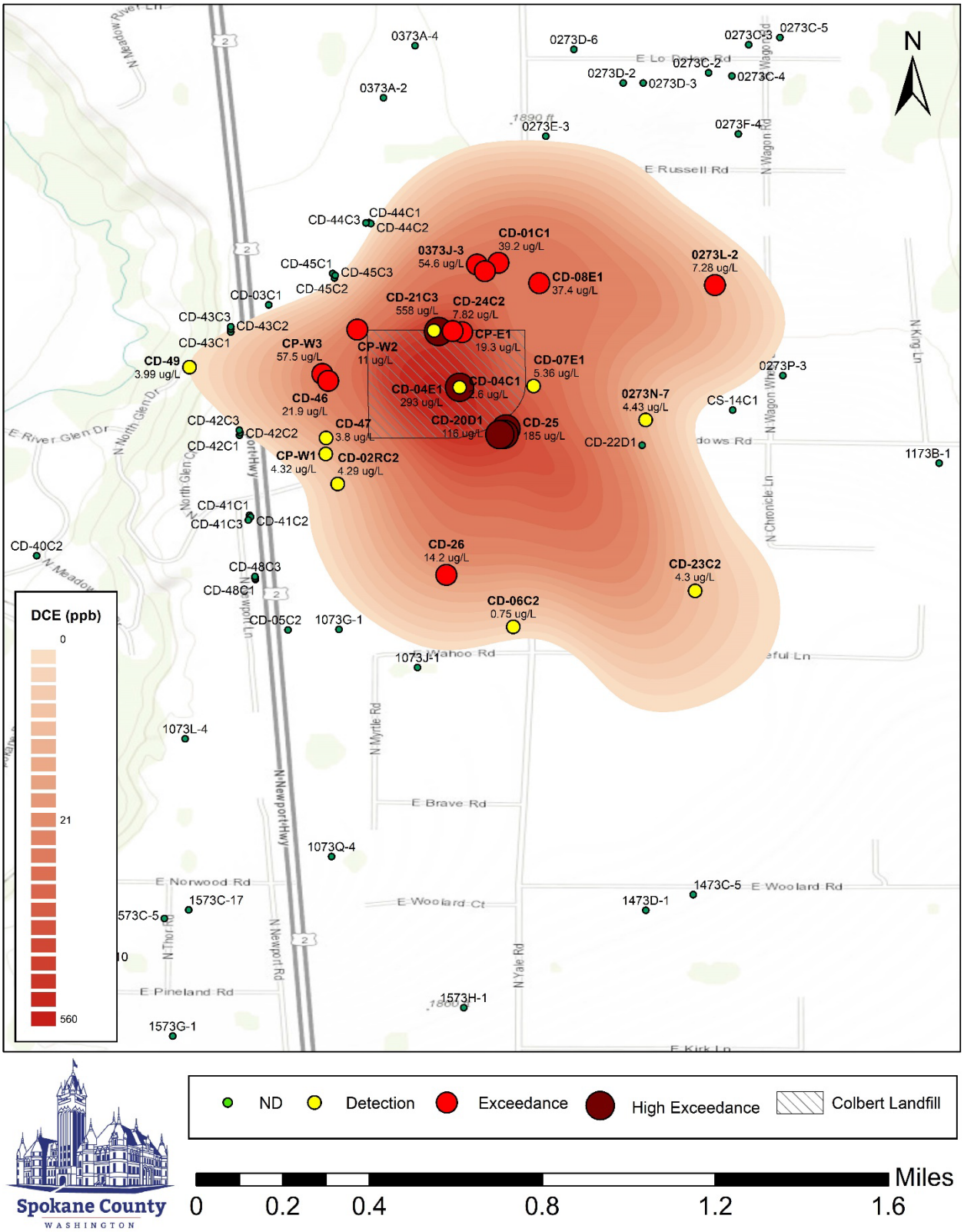


Figure 2-26 Lower Aquifer Estimated PCE Plume

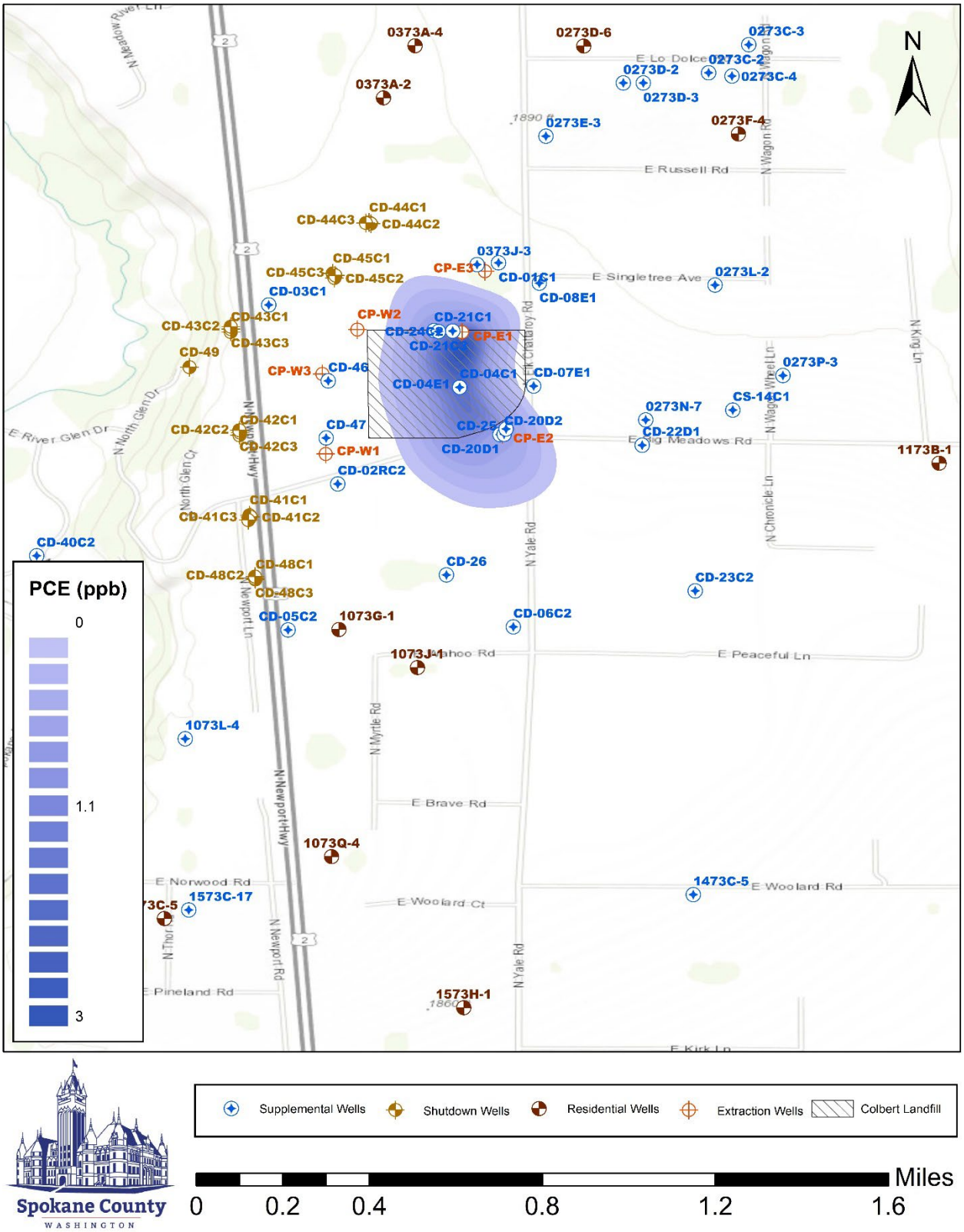


Figure 2-27 Lower Aquifer PCE Detections Map

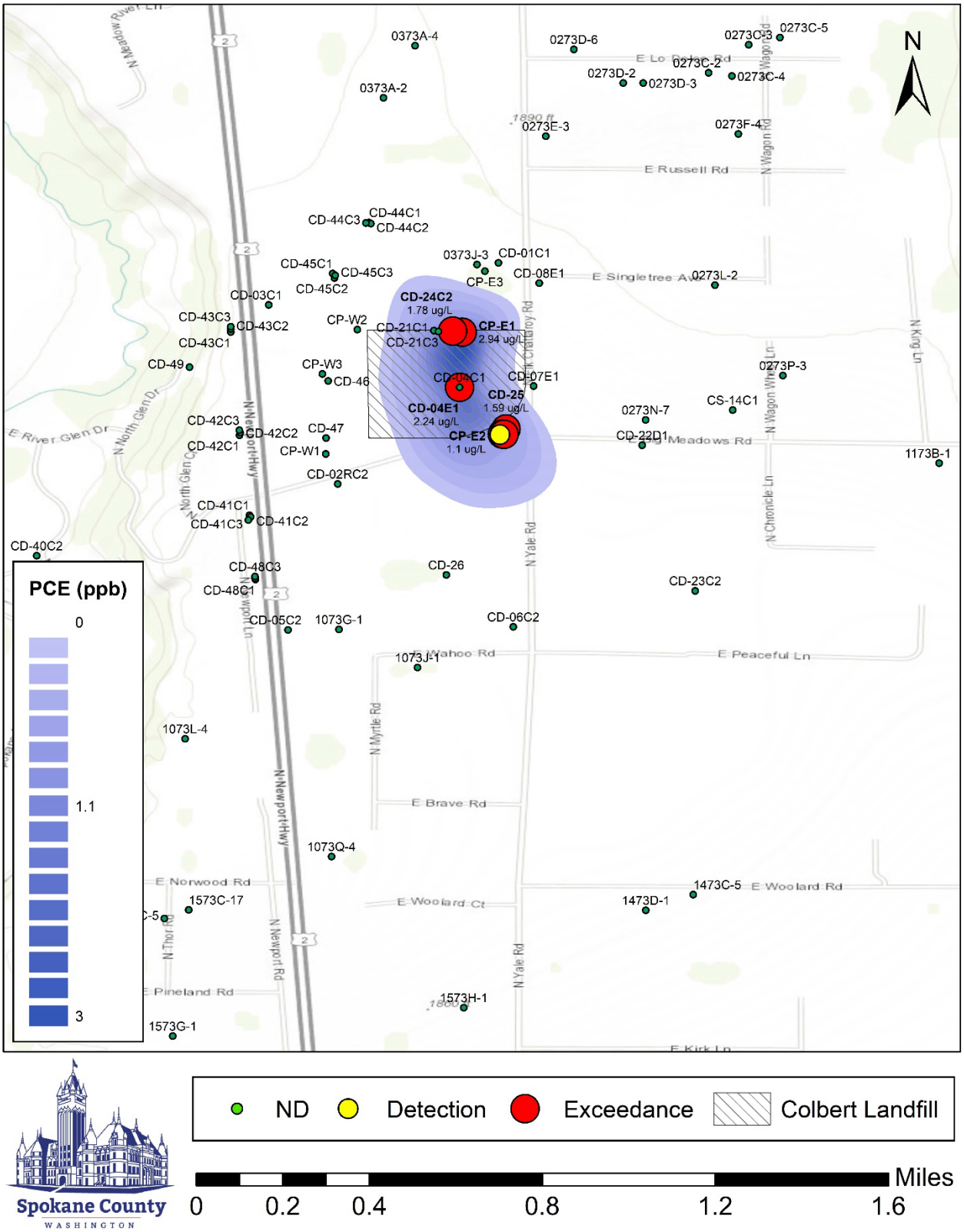


Figure 2-28 Lower Aquifer Estimated TCE Plume

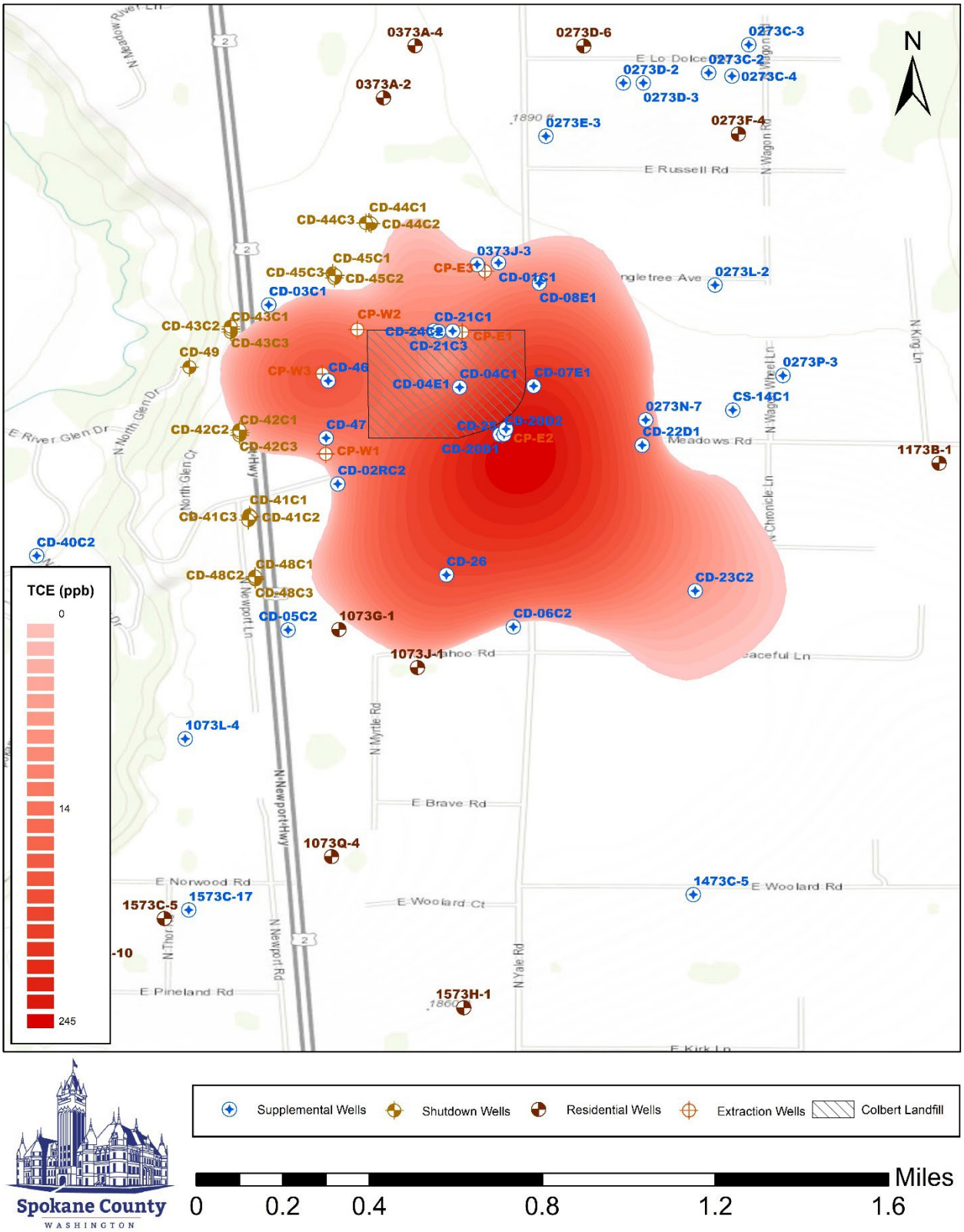


Figure 2-29 Lower Aquifer TCE Detections Map

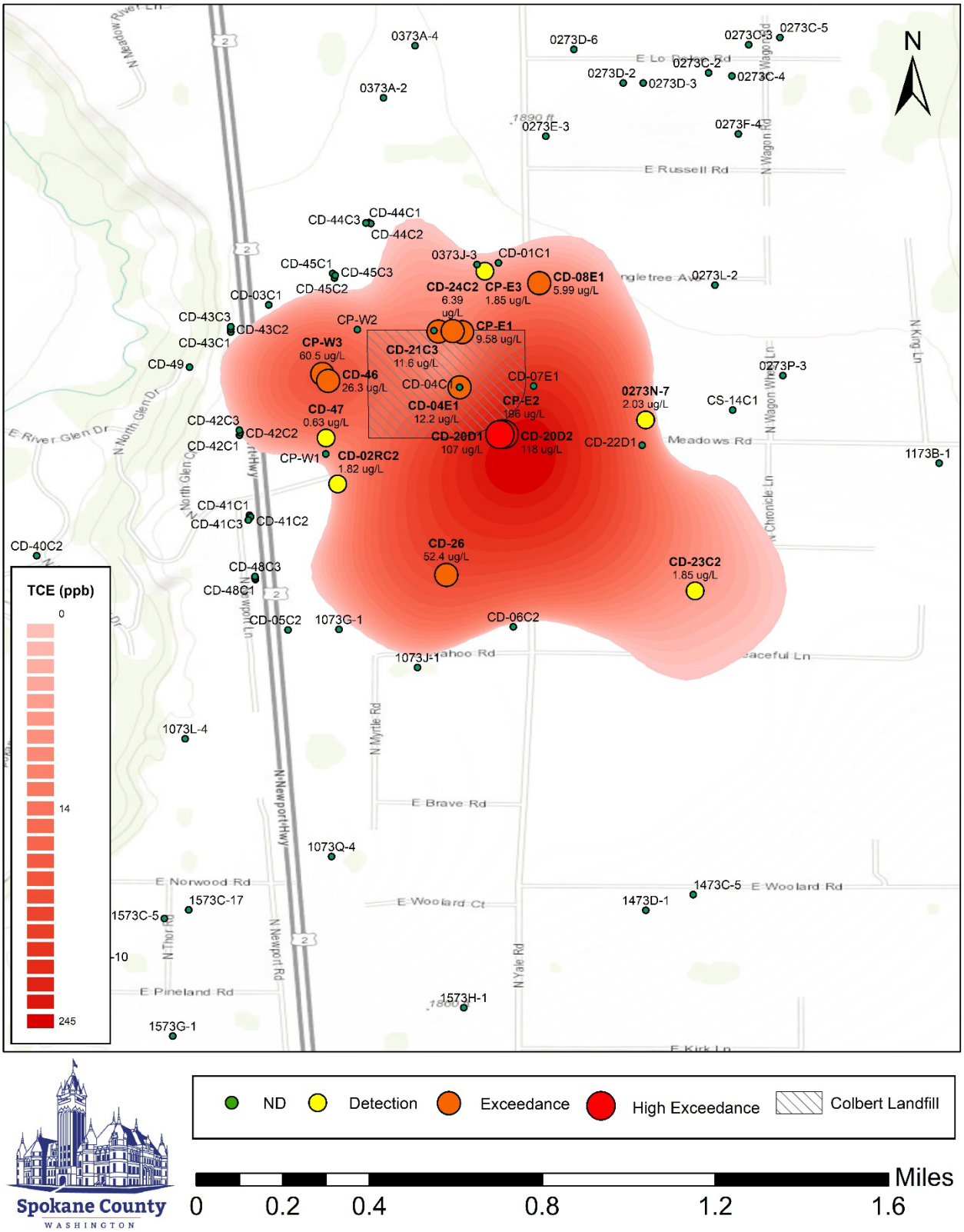
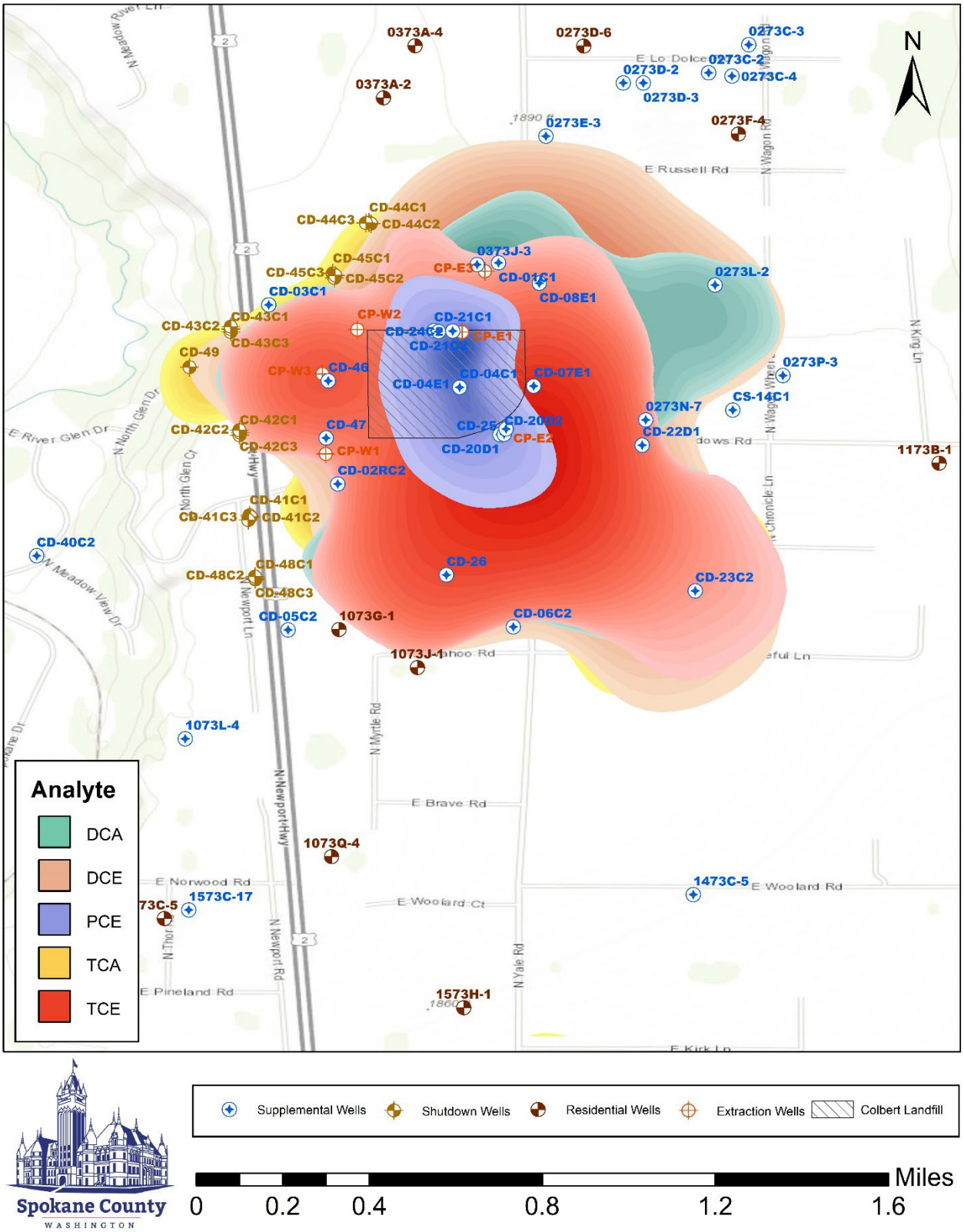


Figure 2-30 Lower Aquifer All Analytes Estimated Plume Map



3.0 Upper Aquifer Monitoring

The upper aquifer monitoring program includes the sampling of compliance indicator COC's (VOC's), 1,4-dioxane sample collection, and MFS sampling from selected monitoring wells. Table 3-1 presents all wells located in the upper aquifer monitoring program and the sample analyses assigned to each well. Upper aquifer monitoring locations are presented in Figure 3-1. All upper aquifer monitoring occurs on an annual basis with the exception of the extraction wells and CD-36A1, which are operated and sampled quarterly.

3.1 Field Data and Groundwater Elevations

All upper aquifer compliance monitoring field parameters and groundwater elevations for this reporting period are shown in Table 3-3. Conductivity values ranged from 364 to 688 umhos/cm. Field pH values ranged from 6.65 to 7.91. The highest Conductivity values and some of the lowest pH values seem to be located in the southern extraction wells. Upper aquifer groundwater elevation contours/flow paths and elevation maps are presented in Figure 3-3 and Figure 3-4.

3.2 Compliance Monitoring (VOC's)

All wells in the upper aquifer have VOC samples collected from them and analyzed, even though the VOC analysis is not required in the MFS or 1,4-Dioxane work plan specifications.

3.2.1 Chemical Data

Constituents of concern concentrations at the south system extraction wells are presented in Table 3-4. Select upper aquifer wells' COC concentrations versus time are presented in Figure 3-6 and Figure 3-7. Upper aquifer COC estimated plume boundaries and COC detection maps are shown in Figure 3-8 through Figure 3-18. DCE concentrations for CD-36A1 increased from 1.83 ppb in April 2022 to 2.67 ppb in November 2022, and then decreased to 1.85 in April 2023. DCA concentrations for CD-36A1 increased from 11.4 ppb in April 2022 to 13.9 ppb in November 2022, and then decreased to 10.9 in April 2023. COC concentrations in CP-S1 exhibited increases for TCA and DCA, and a small decrease in concentrations for TCE. COC concentrations in CP-S4 exhibited increases for TCA, PCE, and TCE, and a small decrease in concentrations for DCA. The increases in COC concentrations coincided with groundwater elevation increases for the MFS wells and elevation decreases for the upper aquifer compliance wells. A comparison summarizing the differences in COC concentrations observed in the upper aquifer monitoring wells from 2018, 2022, and 2023 is presented in Table 3-8.

3.2.2 Criteria

Criteria for the upper aquifer programs are presented in Table 3-2. All criteria exceedances in the upper aquifer programs are presented in Table 3-5 (Consent Decree criteria) and Table 3-6 (updated criteria values from the Colbert Landfill 6th Five-year Review, which includes an increase for Trichloroethene [PCE] from the performance standard in the ROD [0.7 µg/L] to the current MCL [5µg/L], and a decrease for 1,1-Dichloroethane [1,1-DCA] to the regional screening level [RSL] of 2.6 µg/L). 1,4-Dioxane concentrations for CD-36A1 exceeded the Consent Decree criteria, and DCA concentrations for CD-36A1 exceeded the EPA regional screening level (RSL) criteria during this reporting period. Monitoring well CD-36A1 has been added to the quarterly sampling schedule to

better evaluate and confirm the COC concentrations found in this well/vicinity (CP-S1 and CP-S4 are currently on the quarterly sampling schedule).

3.3 1,4-Dioxane Sampling

As outlined in the *1,4-Dioxane Workplan for the Colbert Landfill (December 2007)*, five locations were selected for annual 1,4-dioxane sampling to further evaluate the extent 1,4-Dioxane as well as protect residential wells at the Colbert Landfill site (see Table 3-1). Given potential changes in 1,4-Dioxane extent/prevalence, along with a potential change in groundwater flow conditions/ contaminant transport in post-P&T system shutdown conditions, Spokane County is conducting another evaluation for 1,4-Dioxane at the Colbert Landfill. See Section 5.0 for more information.

3.3.1 Chemical Data

The results for the 1,4-dioxane sampling during this reporting period are shown in Table 3-7. Concentrations versus time are presented in Figure 3-5. 1,4-Dioxane concentrations for monitoring well CD-36A1 exceeded the consent decree criteria during the annual sampling event in April 2023.

3.4 Upper Aquifer Minimal Functional Standards (MFS) Monitoring

Upper aquifer locations designated in the MFS groundwater monitoring program were sampled in April 2023.

3.4.1 Chemical Data

Concentrations of analytes tested for under MFS monitoring were consistent with previous results (see Figure 3-19 and Figure 3-20). None of the metals in the MFS wells had any concentrations above the reporting limit during this reporting period.

3.4.2 Criteria

None of the MFS sampling locations exceeded any of the applicable criteria during this reporting period.

3.4.3 Statistical Analysis

The MFS Groundwater Monitoring Plan (Landau Assoc., 1996) requires three statistical methods to be used when evaluating groundwater Quality in accordance with MFS requirements. Time series plots were performed and discussed previously. Box plots were required after one year of data was collected. Box plots are presented in Figure 3-23.

The third statistical method required is the Mann-Whitney nonparametric significance test. The summary results for this test are presented in Table 3-9. Although lower aquifer locations are no longer scheduled for sampling, previous results are shown here as well. A statistically significant change (less than 0.05 level of significance) from this test indicates that a difference may exist between background and downgradient wells but does not differentiate between sets. While it is true that a difference in nitrate and chloride concentrations may exist between background and downgradient wells, when taking time series plots and box plots into consideration, it is not likely these differences were due to influence by the landfill.

Table 3-1 Upper Aquifer Monitoring Programs and Locations

Program	Schedule	Parameters	Wells
Compliance Monitoring	Annual (Quarterly at extraction wells)	VOC's	CD-31A1, CD-34A1, CD-36A1, CD-37A1, CD-38A1, CD-40C1**, CP-S1, CP-S3, CP-S4, CP-S5, CP-S6
1,4-Dioxane Sampling	Annual	1,4-Dioxane	CP-S1, 1073D-1*, 1473M-1*, 1573A-1*, CD-40C1**
MFS Monitoring	Annual	Cl/NH3/NO2/NH3/SO4/ Fe/Mn/Zn/TOC/COD	CD-03A1, CD-60A1, CD-61A1, CS-04A1

* Residential use wells

**Well considered to be screened in the fluvial aquifer and COC source is from upper aquifer west of Hwy 2 (see *Phase 1 Engineering Report. Landau Assoc, 1991*.)

Table 3-2 Upper Aquifer Criteria

PROGRAM	CRITERIA	TCA	DCE	DCA	TCE	PCE	MC	1,4-Dioxane		Units
CONSENT DECREE	Performance	200	7	4050	5	0.7	2.5			ug/L
(Compliance)	Evaluation	200	7	4050	5	0.7	2.5	7		
		Cl	**Fe**	**Mn**	**Zn**	**TOC**	**COD**	**SO4**	**NO3**	
MFS	(mg/L)	250	0.3	0.05	5	NA	NA	250	10	mg/L

Figure 3-1 Upper Aquifer Compliance Monitoring Locations

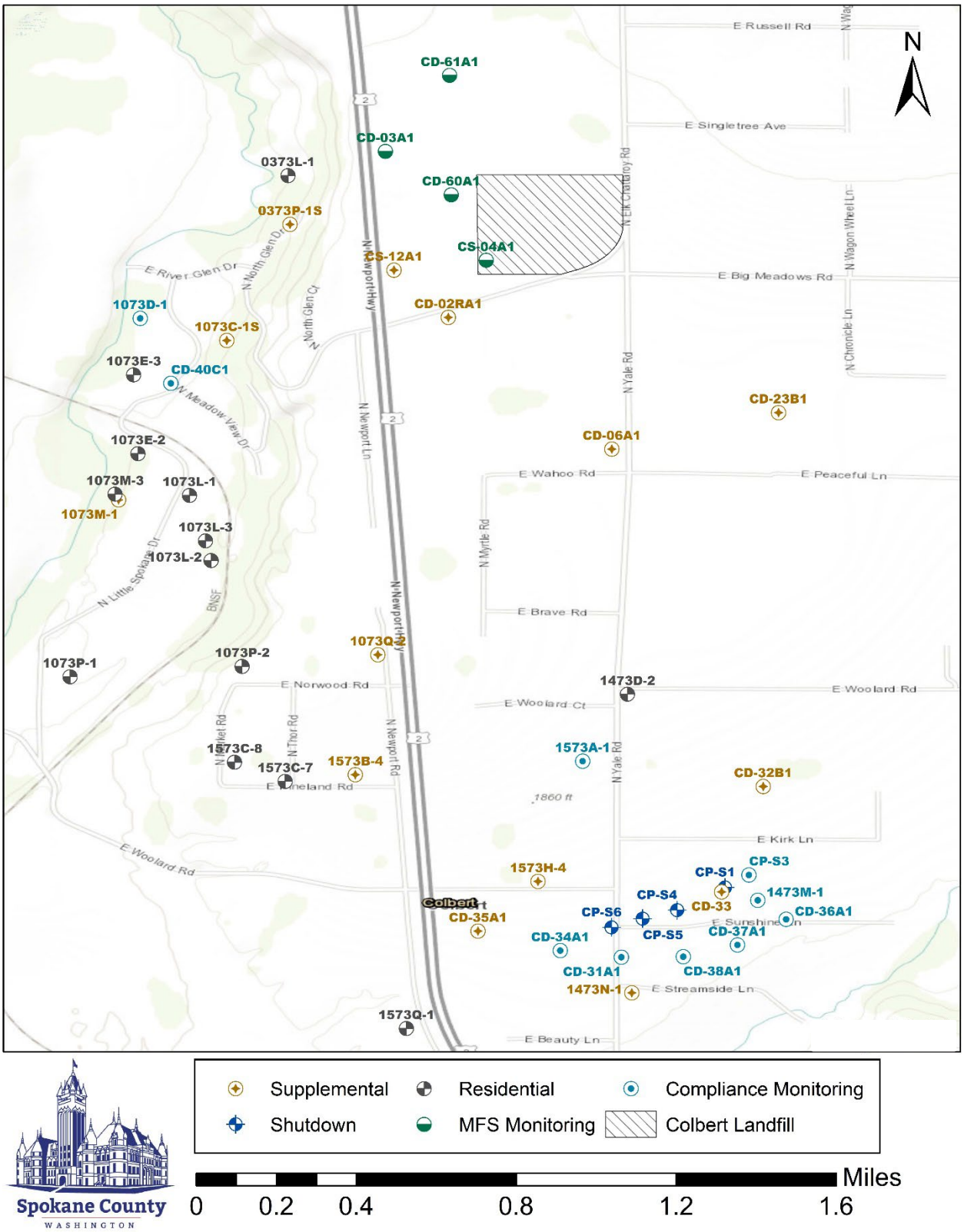
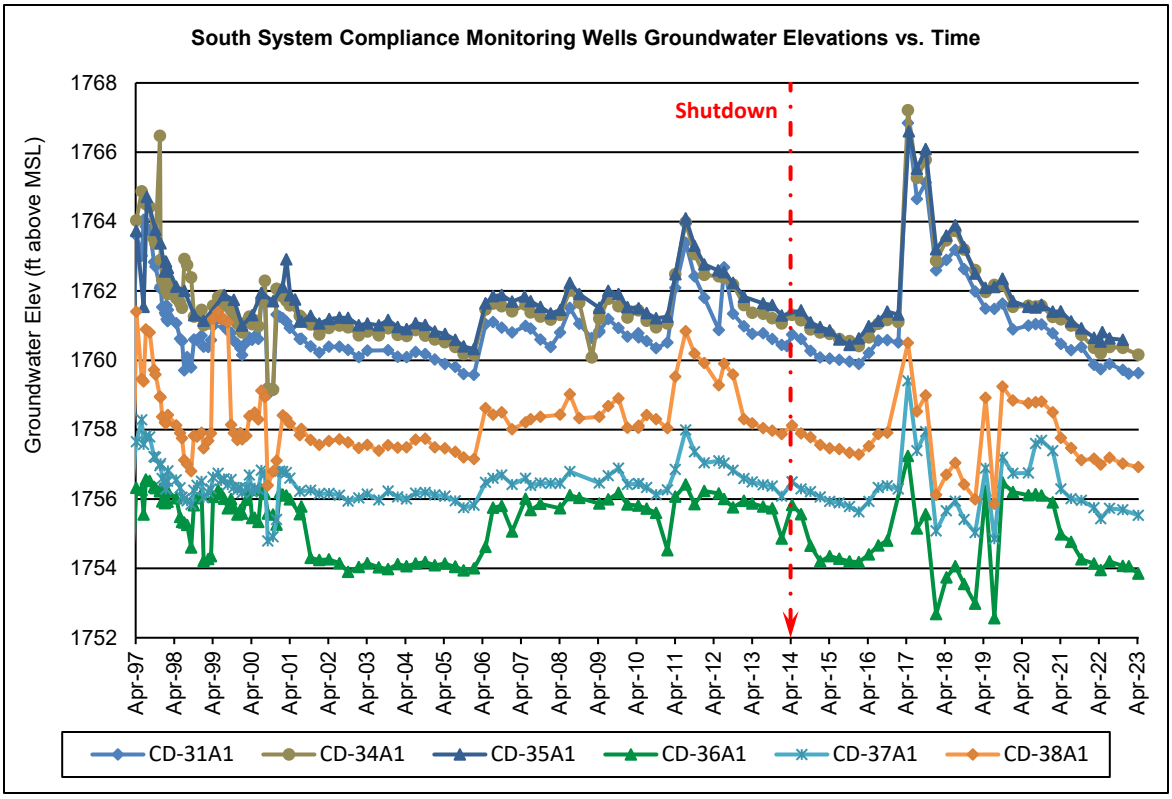


Table 3-3 Upper Aquifer Field Parameters

SampleDate	StationID	WtrElev	Temp	PH	Conductivity	Turbidity	Aquifer	Program
11/15/2022	1573A-1	1760.34	9.7	7.22	555	1.15	upper	CCM
4/12/2023	1573A-1	1760.21	10.1	7.74	511	0.21	upper	CCM
4/11/2023	CD-31A1	1759.63	10.3	7.6	655	0.17	upper	CCM
4/11/2023	CD-34A1	1760.16	10.8	7.51	612	0.29	upper	CCM
7/12/2022	CD-36A1	1754.2	12.4	7.53	597	0.51	upper	CCM
11/15/2022	CD-36A1	1754.07	9.1	7.51	654	0.22	upper	CCM
1/11/2023	CD-36A1	1754.06	9.3	7.52	587	0.72	upper	CCM
4/11/2023	CD-36A1	1753.85	583	7.55	583	0.61	upper	CCM
4/11/2023	CD-37A1	1755.53	10.8	7.26	674	0.13	upper	CCM
4/11/2023	CD-38A1	1756.92	7	7.58	571	0.18	upper	CCM
11/15/2022	CD-40C1	1661.76	9.4	7.76	574	0.1	upper	CCM
4/12/2023	CD-40C1	1662.6	10.5	7.91	537	0.23	upper	CCM
4/12/2023	CP-S3	1759	11.9	7.46	636	0.79	upper	CCM
4/13/2023	CD-03A1	1772.96	8.7	7.73	364	0.23	upper	MFS
4/13/2023	CD-60A1	1772.57	10.4	7.12	521	0.16	upper	MFS
4/13/2023	CD-61A1	1773.38	9.9	7.6	438	0.2	upper	MFS
4/13/2023	CS-04A1	1773.38	9.8	6.65	688	0.32	upper	MFS
7/12/2022	CP-S1	1758.97	11	7.65	568	0.59	upper	SD
11/15/2022	CP-S1	1758.71	10.7	7.61	577	81	upper	SD
1/11/2023	CP-S1	1758.67	9.9	7.62	584	0.66	upper	SD
4/12/2023	CP-S1	1758.67	10.6	7.38	494	0.69	upper	SD
7/12/2022	CP-S4	1759.73	11.4	7.24	686	0.68	upper	SD
11/15/2022	CP-S4	1759.81	10.6	7.34	657	0.77	upper	SD
1/11/2023	CP-S4		10	7.28	669	0.81	upper	SD
4/12/2023	CP-S4	1759.77	10.6	7.22	587		upper	SD
7/12/2022	CP-S5		10.9	7.35	677	0.57	upper	SD
11/15/2022	CP-S5		10.6	7.41	677	0.67	upper	SD
1/11/2023	CP-S5		10	7.4	679	0.57	upper	SD
4/12/2023	CP-S5	1765.48	10.7	7.21	604	0.89	upper	SD
7/12/2022	CP-S6	1760.42	10.8	7.48	669	0.41	upper	SD
11/15/2022	CP-S6	1760.27	10.5	7.5	671	0.59	upper	SD
1/11/2023	CP-S6	1760.23	9.9	7.5	674	0.41	upper	SD
4/12/2023	CP-S6	1760.23	10.1	7.2	649	0.55	upper	SD

Temp=degrees C; Conductivity=umhos/cm; Turbidity= NTU

Figure 3-2 Upper Aquifer Groundwater Elevations vs. Time



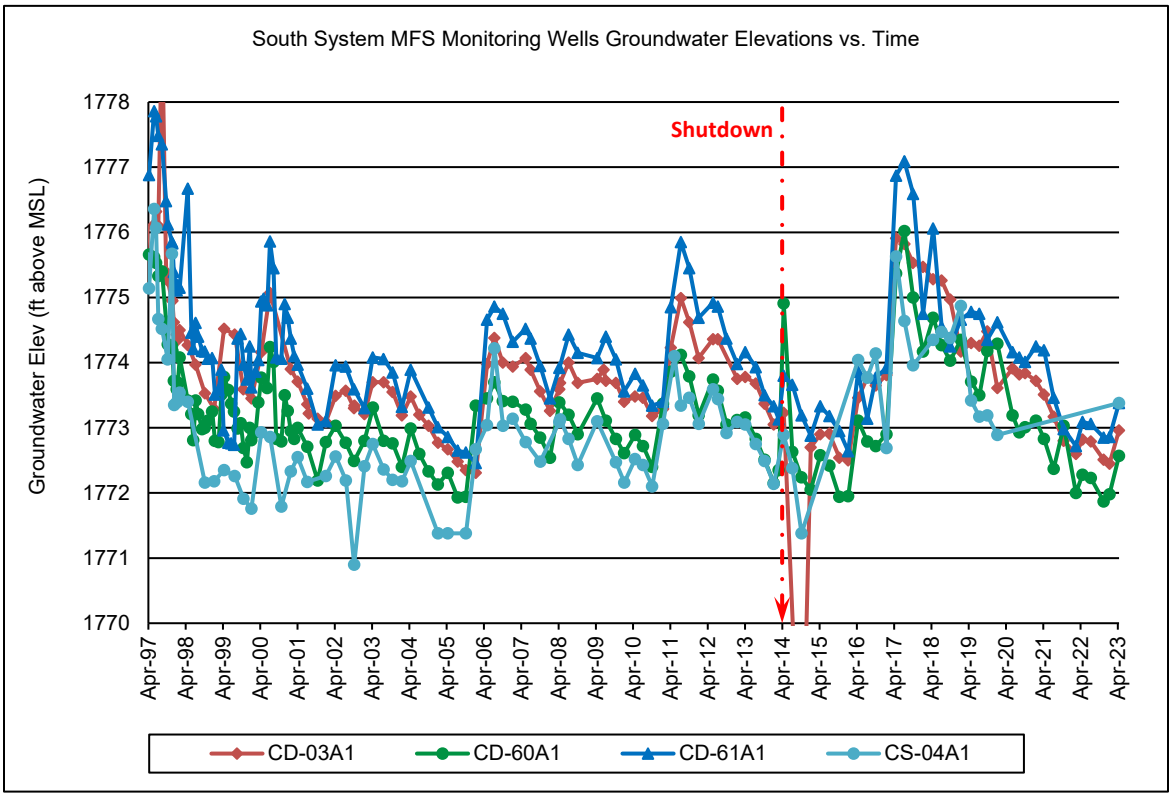
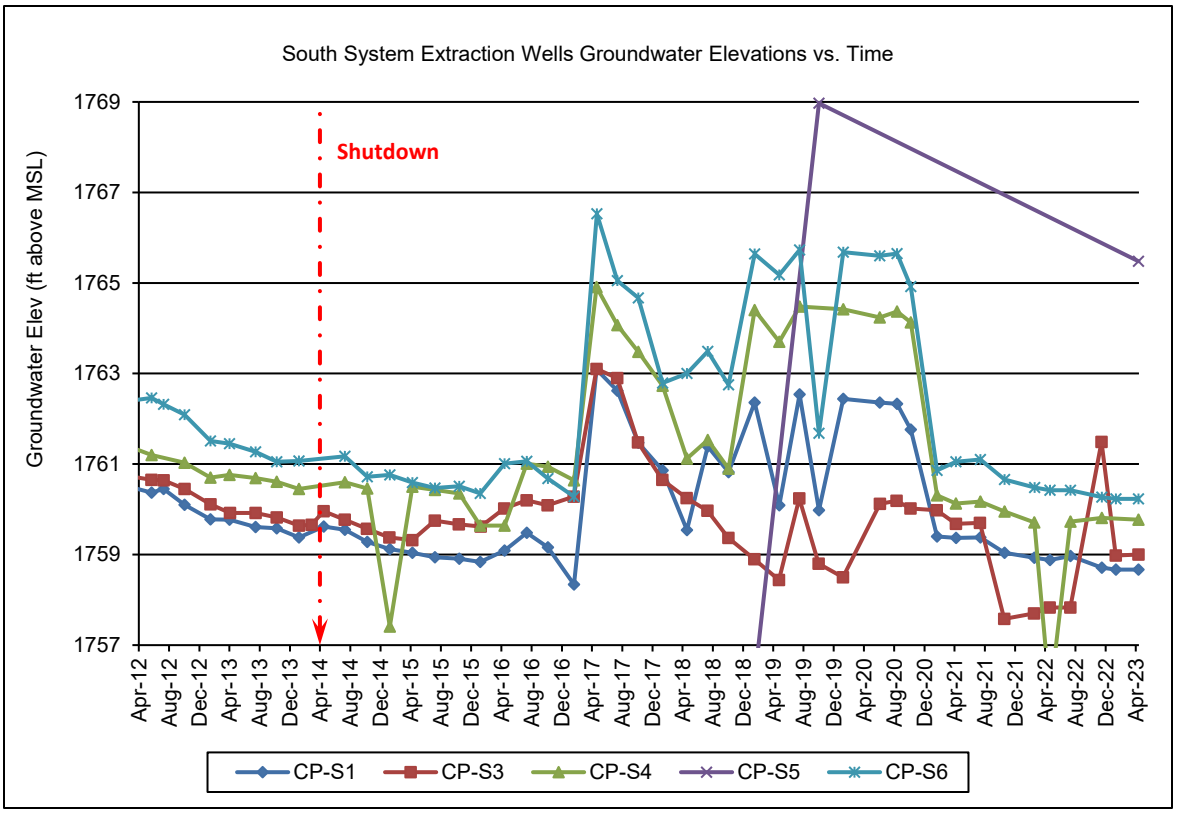


Figure 3-3 Upper Aquifer Groundwater Elevations vs. Time (cont.)



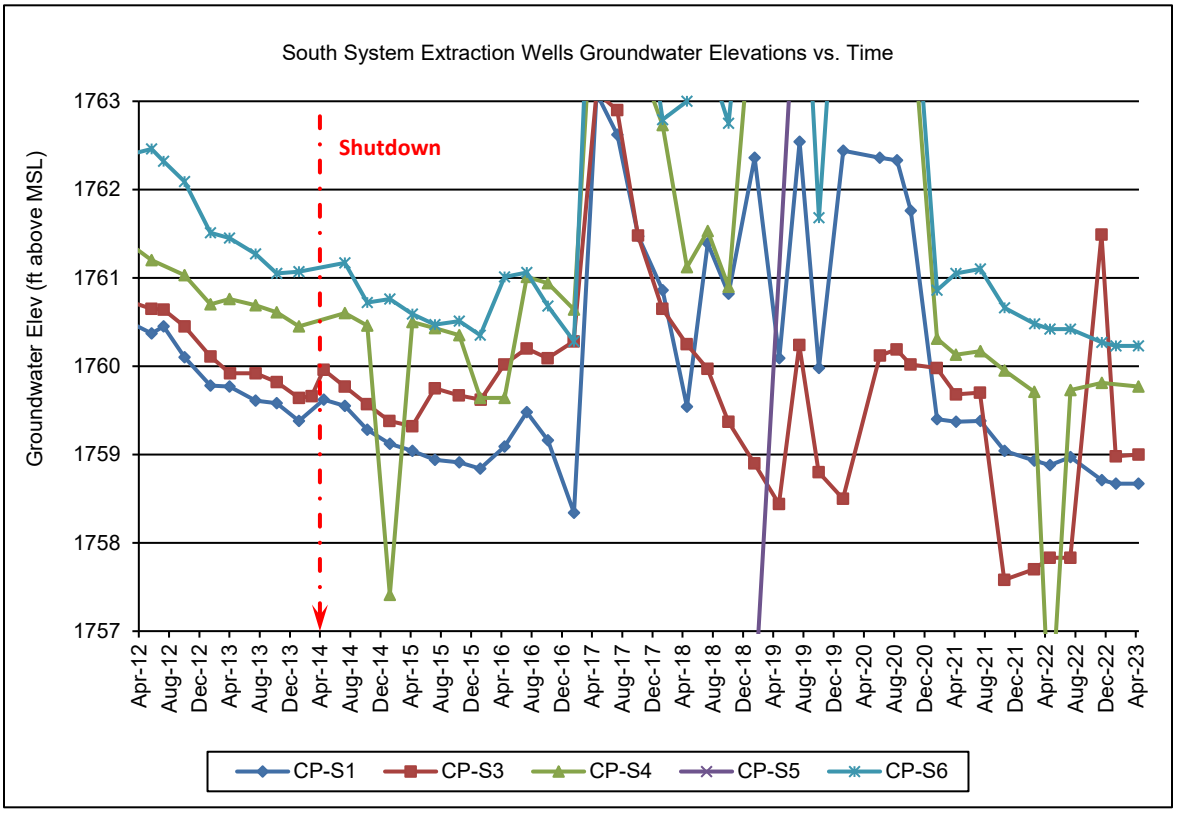


Figure 3-4 Upper Aquifer Estimated Groundwater Elevation Contours

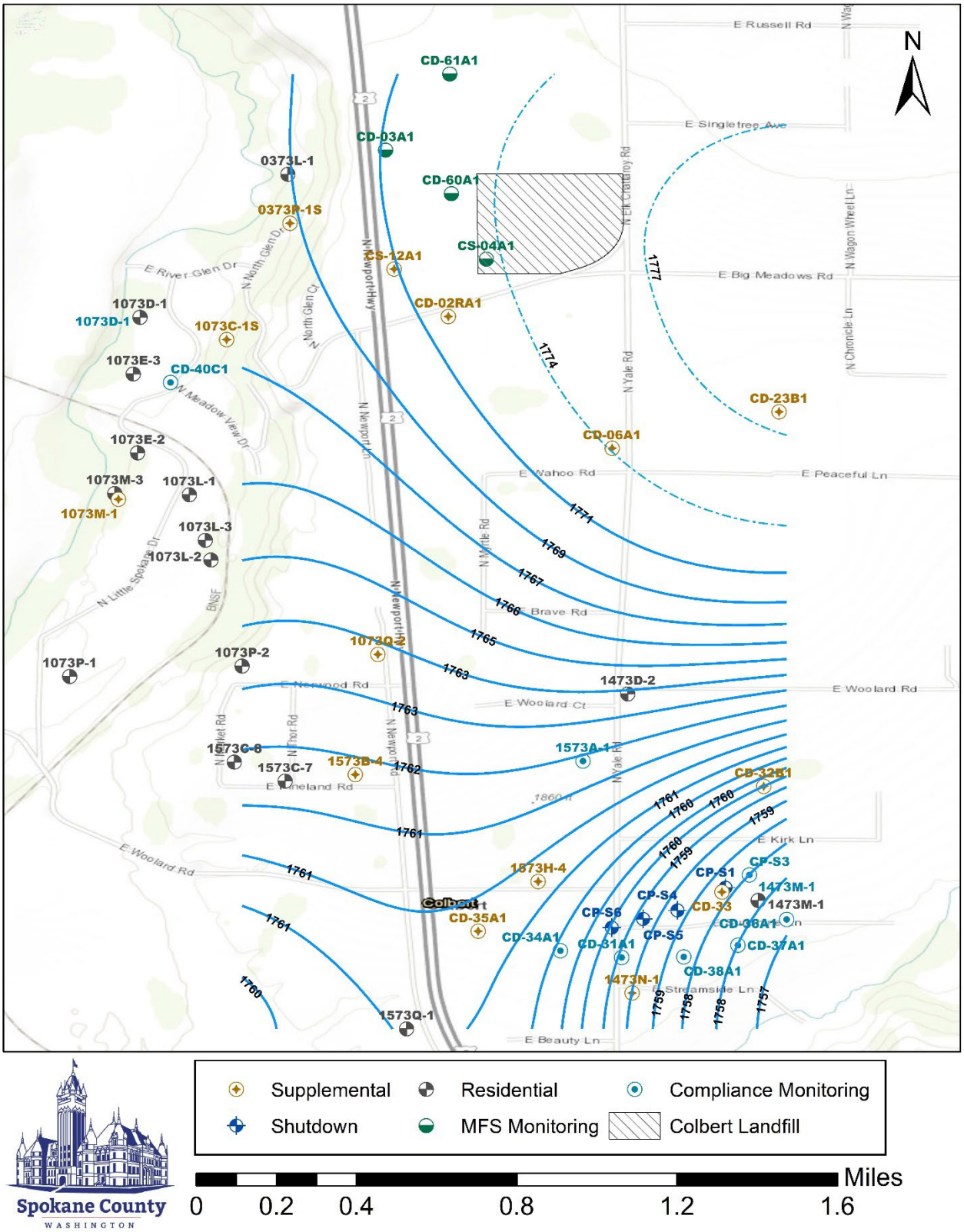


Figure 3-5 Upper Aquifer Groundwater Elevation Map

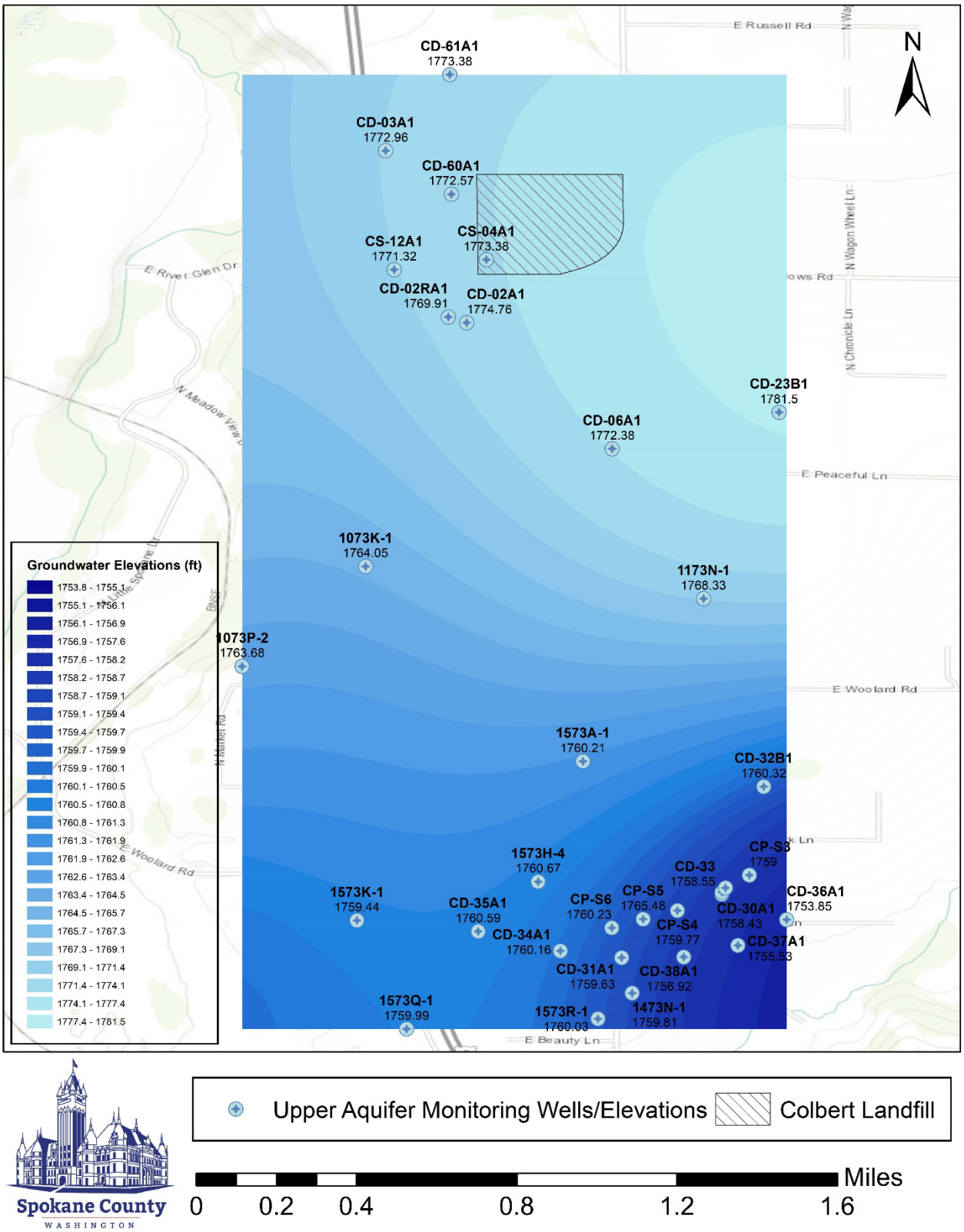


Table 3-4 Upper Aquifer Groundwater Monitoring Results

				ug/L						mg/L								
StationID	Aquifer	Program	SampleDate	DCA	DCE	MC	PCE	TCA	TCE	Cl	COD	Fe	Mn	N-NH3	N-NO3	SO4	TOC	Zn
1573A-1	upper	CCM	11/15/2022	0.59	0.55	<0.50	<0.50	0.82	0.61									
1573A-1	upper	CCM	4/12/2023	0.53	<0.50	<0.50	<0.50	0.8	0.57									
CD-31A1	upper	CCM	4/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-34A1	upper	CCM	4/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	7/12/2022	11.4	1.89	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	11/15/2022	13.9	2.67	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	1/11/2023	10.7	1.7	<0.50	<0.50	<0.50	<0.50									
CD-36A1	upper	CCM	4/11/2023	10.9	1.85	<0.50	<0.50	<0.50	<0.50									
CD-37A1	upper	CCM	4/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-38A1	upper	CCM	4/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-40C1	upper	CCM	11/15/2022	0.89	1.12	<0.50	<0.50	0.55	<0.50									
CD-40C1	upper	CCM	4/12/2023	0.89	0.98	<0.50	<0.50	0.58	<0.50									
CP-S3	upper	CCM	4/12/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CD-03A1	upper	MFS	4/13/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.55	8.9	<0.50	<0.50	<0.50	0.32	5.83	<0.50	<0.50
CD-60A1	upper	MFS	4/13/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.63	9.1	<0.50	<0.50	<0.50	1.58	6.44	1.28	<0.50
CD-61A1	upper	MFS	4/13/2023	<0.50	<0.50	<0.50	<0.50	1.05	<0.50	0.77	5.2	<0.50	<0.50	<0.50	0.134	10.8	<0.50	<0.50
CS-04A1	upper	MFS	4/13/2023	1.33	<0.50	<0.50	<0.50	<0.50	0.65	1.86	10.5	<0.50	<0.50	<0.50	1.33	4.85	1.59	<0.50
CP-S1	upper	SD	7/12/2022	0.97	0.67	<0.50	<0.50	0.73	1.45									
CP-S1	upper	SD	11/15/2022	1.05	0.52	<0.50	<0.50	0.57	0.99									
CP-S1	upper	SD	1/11/2023	1.2	0.51	<0.50	<0.50	0.58	1.04									
CP-S1	upper	SD	4/12/2023	1.34	<0.50	<0.50	<0.50	0.54	0.97									
CP-S4	upper	SD	7/12/2022	1.29	<0.50	<0.50	0.63	<0.50	1.92									
CP-S4	upper	SD	11/15/2022	1.17	<0.50	<0.50	0.68	<0.50	2.19									
CP-S4	upper	SD	1/11/2023	1.24	<0.50	<0.50	0.62	<0.50	2.09									
CP-S4	upper	SD	4/12/2023	1.21	<0.50	<0.50	0.62	0.51	2.14									
CP-S5	upper	SD	7/12/2022	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S5	upper	SD	11/15/2022	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S5	upper	SD	1/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S5	upper	SD	4/12/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	7/12/2022	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	11/15/2022	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	1/11/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									
CP-S6	upper	SD	4/12/2023	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50									

Table 3-5 Upper Aquifer Criteria Exceedances (Consent Decree criteria)

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CD-36A1	7/12/2022	upper	CCM	1,4-Dioxane	10.5	ug/L	Exceedance
CD-36A1	11/15/2022	upper	CCM	1,4-Dioxane	9.4	ug/L	Exceedance
CD-36A1	1/11/2023	upper	CCM	1,4-Dioxane	9.63	ug/L	Exceedance
CD-36A1	4/11/2023	upper	CCM	1,4-Dioxane	8.68	ug/L	Exceedance

Table 3-6 Shutdown Program Criteria Exceedances (*updated criteria values)

*Increase for Trichloroethene (PCE) from the performance standard in the ROD (0.7 µg/L) to the current MCL (5µg/L), and a decrease for 1,1-Dichloroethane (1,1-DCA) to the regional screening level (RSL) of 2.8 µg/L.

StationID	SampleDate	Aquifer	Program	Analyte	Result	Units	Flag
CD-36A1	7/12/2022	upper	CCM	1,1-Dichloroethane	11.4	ug/L	Exceedance
CD-36A1	11/15/2022	upper	CCM	1,1-Dichloroethane	13.9	ug/L	Exceedance
CD-36A1	1/11/2023	upper	CCM	1,1-Dichloroethane	10.7	ug/L	Exceedance
CD-36A1	4/11/2023	upper	CCM	1,1-Dichloroethane	10.9	ug/L	Exceedance
CD-36A1	7/12/2022	upper	CCM	1,4-Dioxane	10.5	ug/L	Exceedance
CD-36A1	11/15/2022	upper	CCM	1,4-Dioxane	9.4	ug/L	Exceedance
CD-36A1	1/11/2023	upper	CCM	1,4-Dioxane	9.63	ug/L	Exceedance
CD-36A1	4/11/2023	upper	CCM	1,4-Dioxane	8.68	ug/L	Exceedance

Table 3-7 1,4-Dioxane Monitoring Results

StationID	Aquifer	Analyte	SampleDate	Result	Units	Reporting Limit	Qualifier
1573A-1	upper	1,4-Dioxane	11/15/2022	0.127	ug/L	0.01	
CD-40C1	upper	1,4-Dioxane	11/15/2022	1.61	ug/L	0.01	
CD-40C1	upper	1,4-Dioxane	4/12/2023	1.27	ug/L	0.02	
CP-S1	upper	1,4-Dioxane	7/12/2022	1.43	ug/L	0.01	
CP-S1	upper	1,4-Dioxane	11/15/2022	2.68	ug/L	0.01	
CP-S1	upper	1,4-Dioxane	1/11/2023	4.83	ug/L	0.01	
CP-S1	upper	1,4-Dioxane	4/12/2023	4.96	ug/L	0.02	

Figure 3-6 1,4-Dioxane Concentrations vs. Time

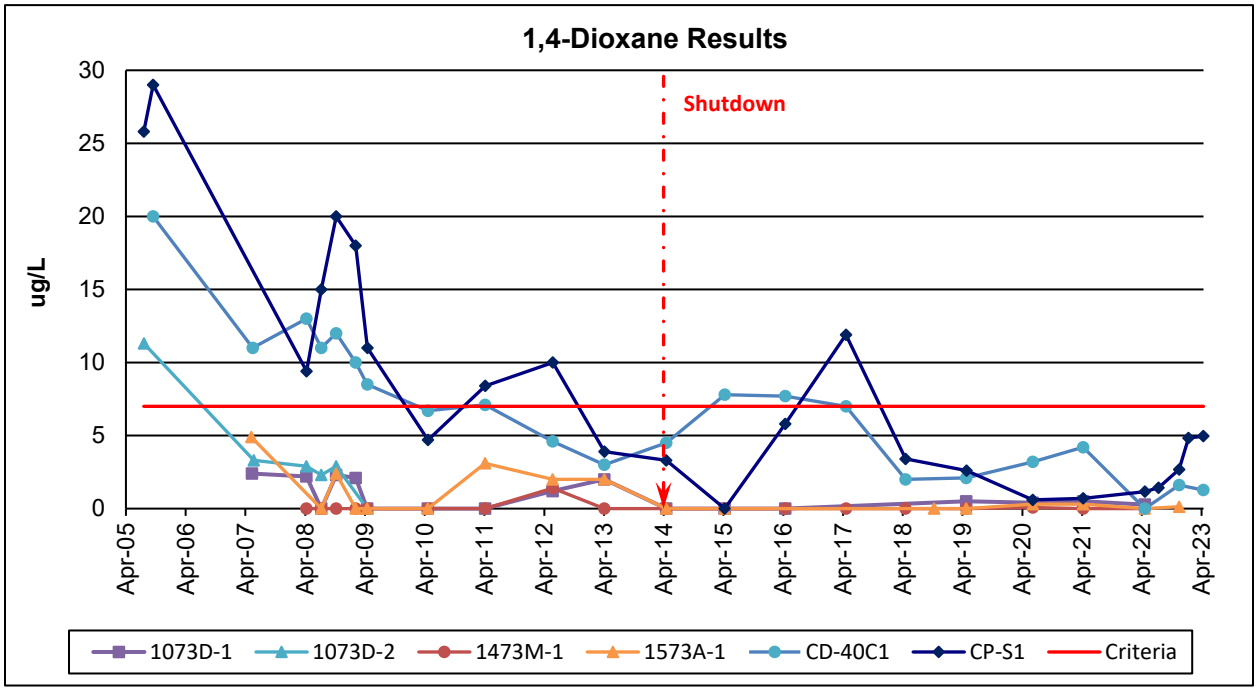


Table 3-8 Upper Aquifer Well Concentrations: Summary of 5-year/1-year Differences

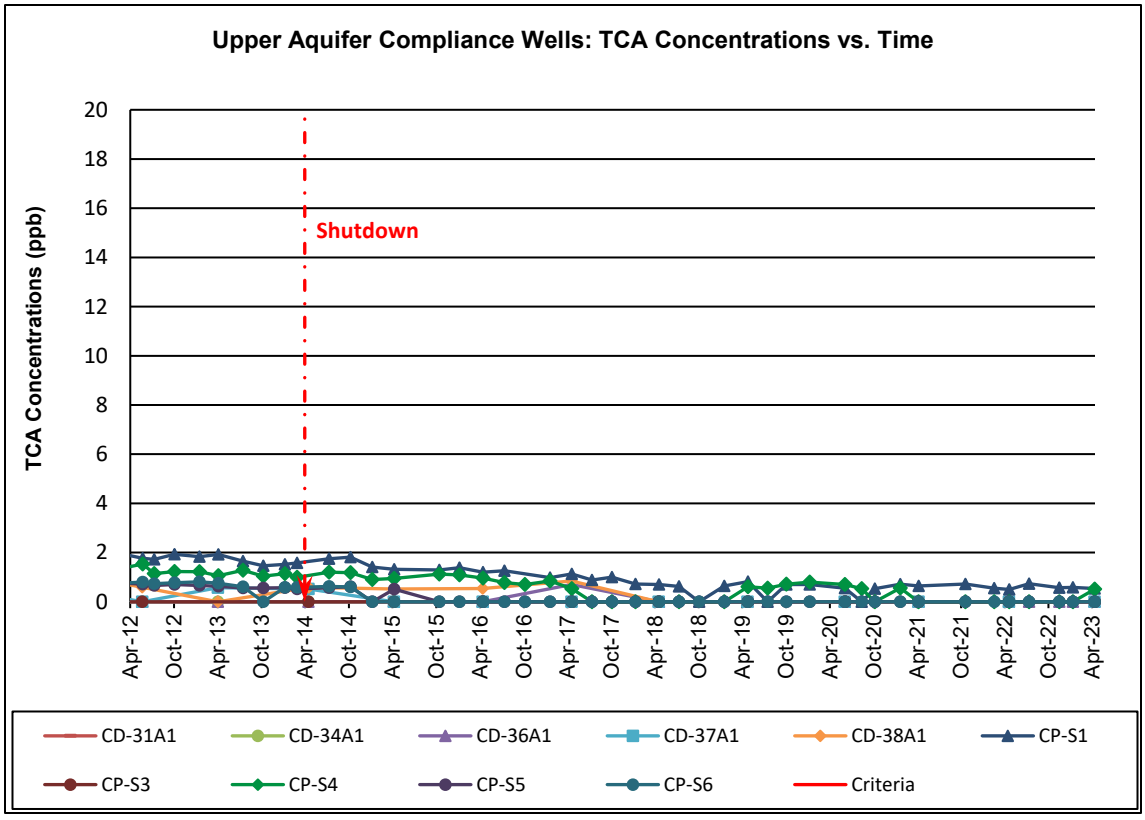
StationID	Aquifer	Program	Analyte	2018 Results	2022 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
1573A-1	upper	CCM	TCA	1.18	0.78	0.8	-0.38	0.02	ug/L
1573A-1	upper	CCM	DCA	0.84	0.61	0.53	-0.31	-0.08	ug/L
1573A-1	upper	CCM	DCE	0	0	0	0	0	ug/L
1573A-1	upper	CCM	MC	0	0	0	0	0	ug/L
1573A-1	upper	CCM	PCE	0	0	0	0	0	ug/L
1573A-1	upper	CCM	TCE	0.56	0.6	0.57	0.01	-0.03	ug/L
1573A-1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-31A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-34A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	DCA	0	11.4	10.9	10.9	-0.5	ug/L
CD-36A1	upper	CCM	DCE	0	1.83	1.85	1.85	0.02	ug/L
CD-36A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-36A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-37A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	TCA	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	DCA	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	DCE	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-38A1	upper	CCM	VC	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	TCA	2.04	0.9	0.58	-1.46	-0.32	ug/L
CD-40C1	upper	CCM	DCA	0	1.15	0.89	0.89	-0.26	ug/L

StationID	Aquifer	Program	Analyte	2018 Results	2022 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-40C1	upper	CCM	DCE	0	1.08	0.98	0.98	-0.1	ug/L
CD-40C1	upper	CCM	MC	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	PCE	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	TCE	0	0	0	0	0	ug/L
CD-40C1	upper	CCM	VC	0	0	0	0	0	ug/L
CP-S3	upper	CCM	TCA	0	0	0	0	0	ug/L
CP-S3	upper	CCM	DCA	0	0	0	0	0	ug/L
CP-S3	upper	CCM	DCE	0	0	0	0	0	ug/L
CP-S3	upper	CCM	MC	0	0	0	0	0	ug/L
CP-S3	upper	CCM	PCE	0	0	0	0	0	ug/L
CP-S3	upper	CCM	TCE	0	0	0	0	0	ug/L
CP-S3	upper	CCM	VC	0	0	0	0	0	ug/L
1073D-1	upper	CCM/res	TCA	N/A	0	N/A	**N/A**	**N/A**	ug/L
1073D-1	upper	CCM/res	DCA	N/A	0	N/A	**N/A**	**N/A**	ug/L
1073D-1	upper	CCM/res	DCE	N/A	0	N/A	**N/A**	**N/A**	ug/L
1073D-1	upper	CCM/res	MC	N/A	0	N/A	**N/A**	**N/A**	ug/L
1073D-1	upper	CCM/res	PCE	N/A	0	N/A	**N/A**	**N/A**	ug/L
1073D-1	upper	CCM/res	TCE	N/A	0	N/A	**N/A**	**N/A**	ug/L
1073D-1	upper	CCM/res	VC	N/A	0	N/A	**N/A**	**N/A**	ug/L
1473M-1	upper	CCM/res	TCA	N/A	0	N/A	**N/A**	**N/A**	ug/L
1473M-1	upper	CCM/res	DCA	N/A	0	N/A	**N/A**	**N/A**	ug/L
1473M-1	upper	CCM/res	DCE	N/A	0	N/A	**N/A**	**N/A**	ug/L
1473M-1	upper	CCM/res	MC	N/A	0	N/A	**N/A**	**N/A**	ug/L
1473M-1	upper	CCM/res	PCE	N/A	0	N/A	**N/A**	**N/A**	ug/L
1473M-1	upper	CCM/res	TCE	N/A	0	N/A	**N/A**	**N/A**	ug/L
1473M-1	upper	CCM/res	VC	N/A	0	N/A	**N/A**	**N/A**	ug/L
CD-03A1	upper	MFS	TCA	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	DCA	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	DCE	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	MC	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	PCE	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	TCE	0	0	0	0	0	ug/L
CD-03A1	upper	MFS	VC	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	TCA	0	0.87	0	0	-0.87	ug/L
CD-60A1	upper	MFS	DCA	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	DCE	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	MC	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	PCE	0.58	0	0	-0.58	0	ug/L
CD-60A1	upper	MFS	TCE	0	0	0	0	0	ug/L
CD-60A1	upper	MFS	VC	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	TCA	1.98	0	1.05	-0.93	1.05	ug/L
CD-61A1	upper	MFS	DCA	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	DCE	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	MC	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	PCE	0	0	0	0	0	ug/L
CD-61A1	upper	MFS	TCE	0	0	0	0	0	ug/L

StationID	Aquifer	Program	Analyte	2018 Results	2022 Results	Current Year Results	5-Year Difference	1-Year Difference	Units
CD-61A1	upper	MFS	VC	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	TCA	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	DCA	0.61	1.08	1.33	0.72	0.25	ug/L
CS-04A1	upper	MFS	DCE	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	MC	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	PCE	0	0	0	0	0	ug/L
CS-04A1	upper	MFS	TCE	0.55	0.61	0.65	0.1	0.04	ug/L
CS-04A1	upper	MFS	VC	0	0	0	0	0	ug/L
CP-S1	upper	SD	TCA	0.7	0.5	0.54	-0.16	0.04	ug/L
CP-S1	upper	SD	DCA	1.48	0.68	1.34	-0.14	0.66	ug/L
CP-S1	upper	SD	DCE	0.58	0	0	-0.58	0	ug/L
CP-S1	upper	SD	MC	0	0	0	0	0	ug/L
CP-S1	upper	SD	PCE	0	0	0	0	0	ug/L
CP-S1	upper	SD	TCE	1.73	0.99	0.97	-0.76	-0.02	ug/L
CP-S1	upper	SD	VC	0	0	0	0	0	ug/L
CP-S4	upper	SD	TCA	N/A	0	0.51	N/A	0.51	ug/L
CP-S4	upper	SD	DCA	N/A	1.38	1.21	N/A	-0.17	ug/L
CP-S4	upper	SD	DCE	N/A	0	0	N/A	0	ug/L
CP-S4	upper	SD	MC	N/A	0	0	N/A	0	ug/L
CP-S4	upper	SD	PCE	N/A	0.54	0.62	N/A	0.08	ug/L
CP-S4	upper	SD	TCE	N/A	1.83	2.14	N/A	0.31	ug/L
CP-S4	upper	SD	VC	N/A	0	0	N/A	0	ug/L
CP-S5	upper	SD	TCA	0	0	0	0	0	ug/L
CP-S5	upper	SD	DCA	0	0	0	0	0	ug/L
CP-S5	upper	SD	DCE	0	0	0	0	0	ug/L
CP-S5	upper	SD	MC	0	0	0	0	0	ug/L
CP-S5	upper	SD	PCE	0	0	0	0	0	ug/L
CP-S5	upper	SD	TCE	0	0	0	0	0	ug/L
CP-S5	upper	SD	VC	0	0	0	0	0	ug/L
CP-S6	upper	SD	TCA	0	0	0	0	0	ug/L
CP-S6	upper	SD	DCA	0	0	0	0	0	ug/L
CP-S6	upper	SD	DCE	0	0	0	0	0	ug/L
CP-S6	upper	SD	MC	0	0	0	0	0	ug/L
CP-S6	upper	SD	PCE	0	0	0	0	0	ug/L
CP-S6	upper	SD	TCE	0	0	0	0	0	ug/L
CP-S6	upper	SD	VC	0	0	0	0	0	ug/L

Analytes that exceeded clean-up criteria this reporting period are displayed in **ORANGE**.
Increases in analyte concentrations are highlighted in **RED**.
Decreases in analyte concentrations are highlighted in **BLUE**.

Figure 3-7 Upper Aquifer Compliance Wells TCA Concentrations vs. Time



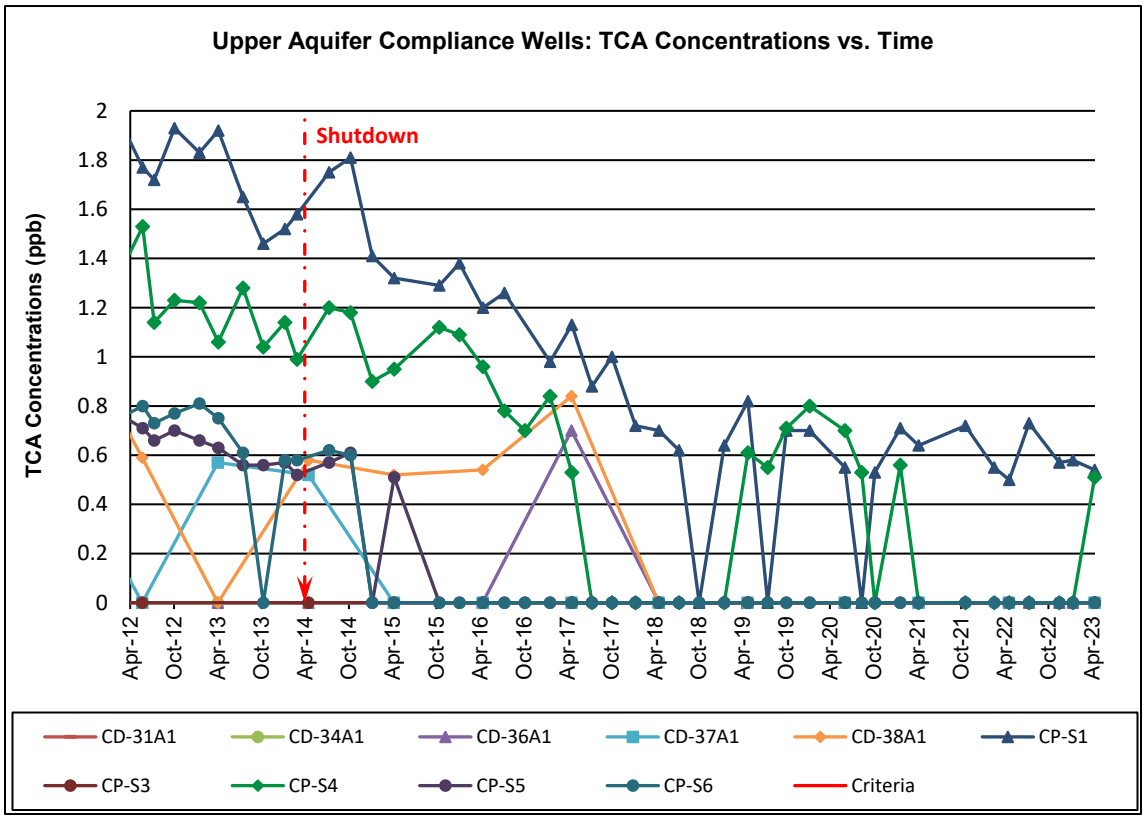
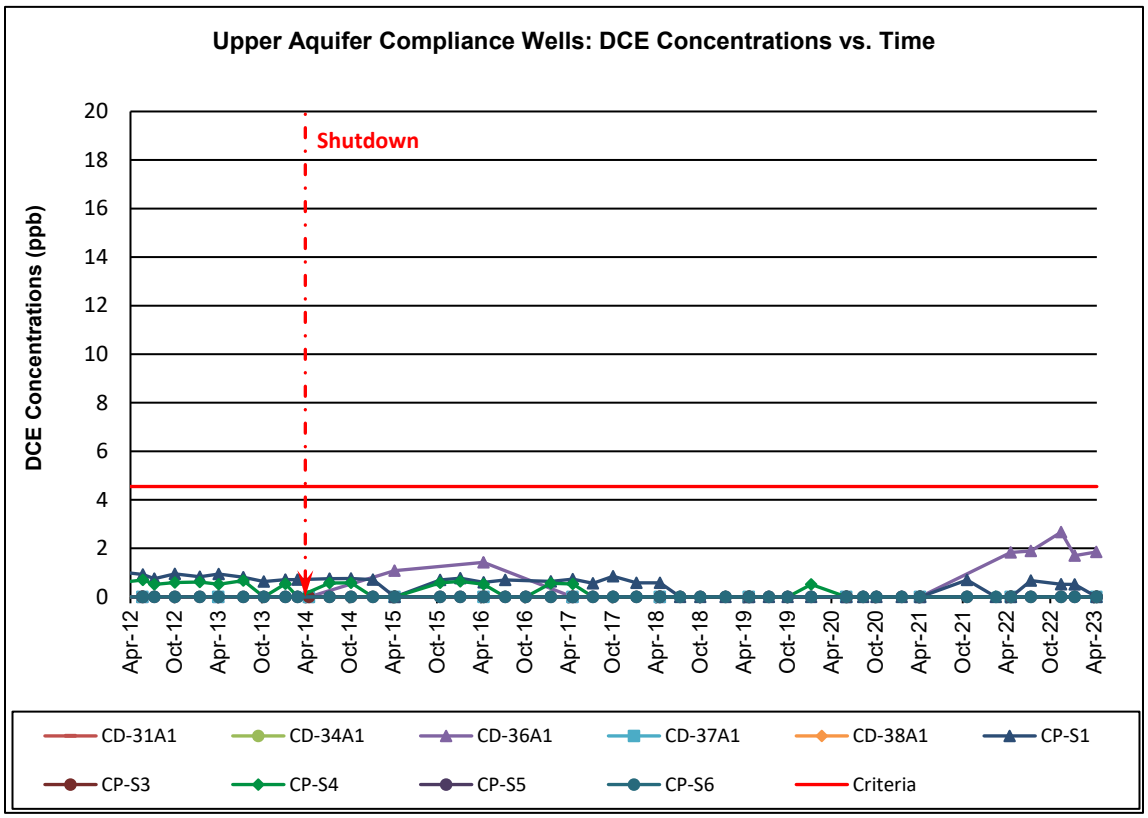


Figure 3-8 Upper Aquifer Compliance Wells DCE Concentrations vs. Time



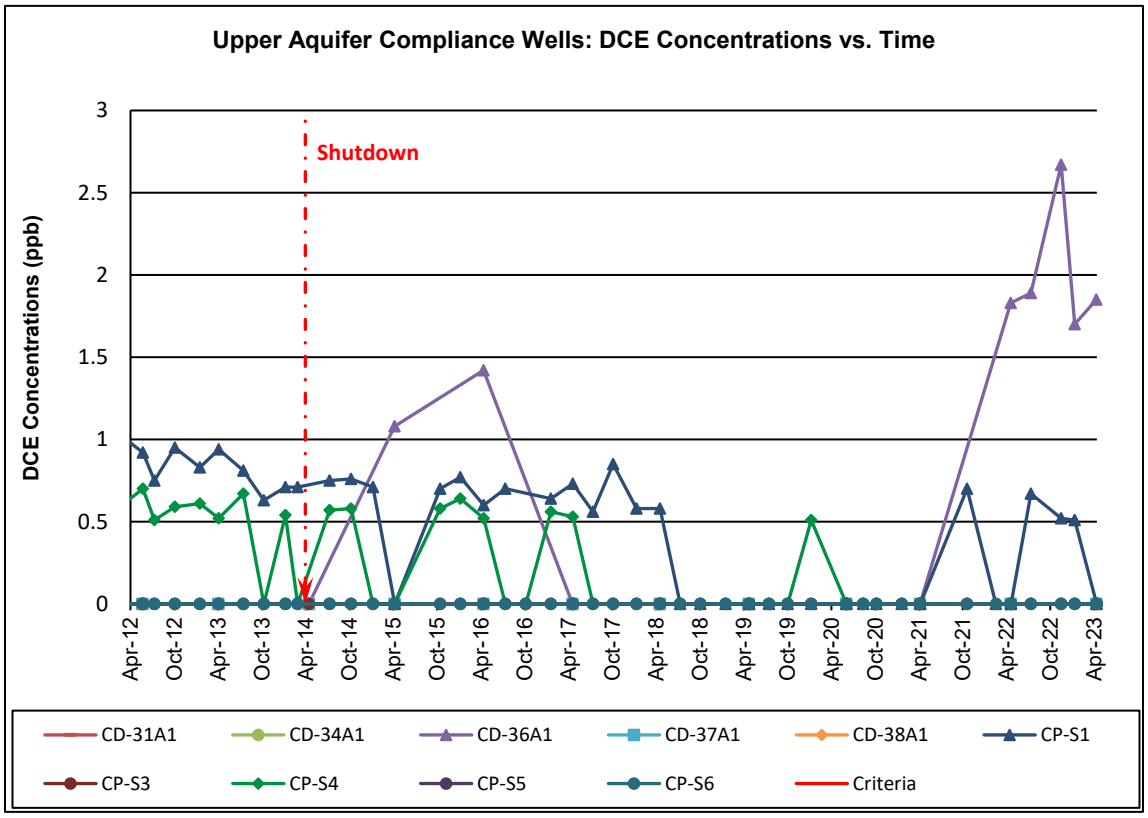
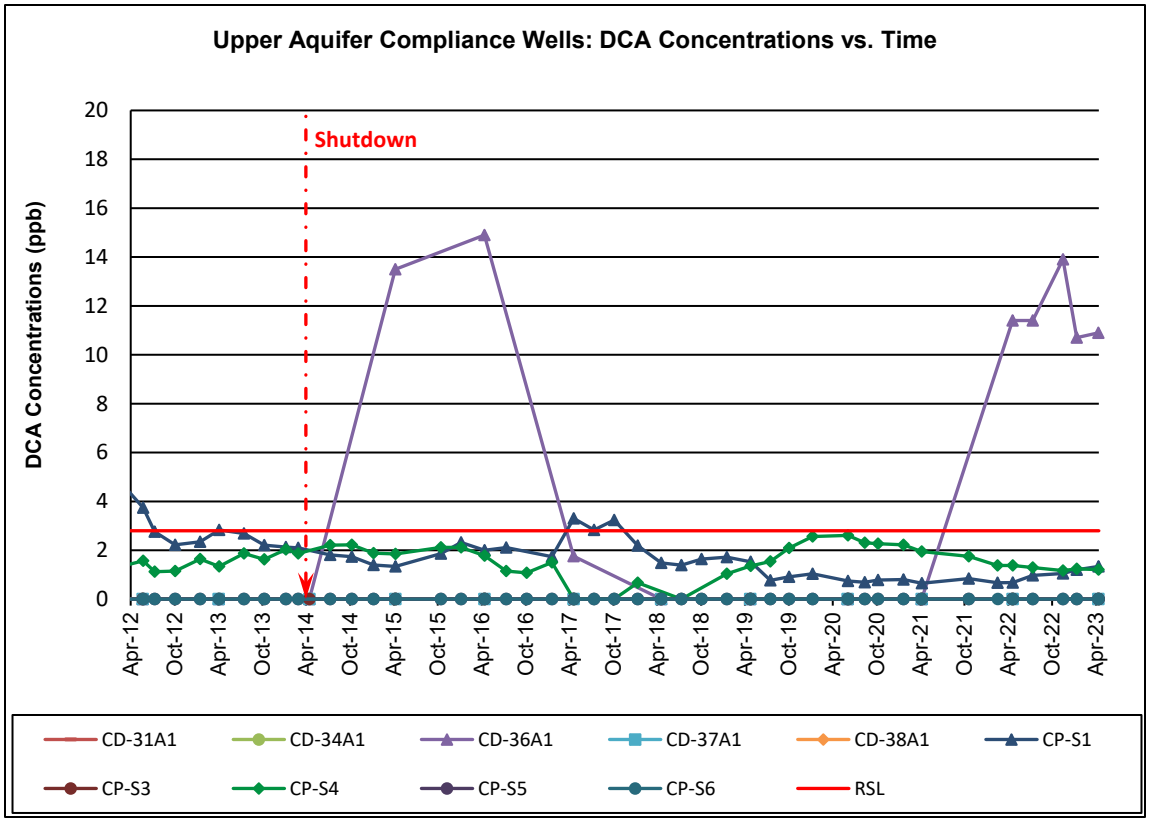


Figure 3-9 Upper Aquifer Compliance Wells DCA Concentrations vs. Time



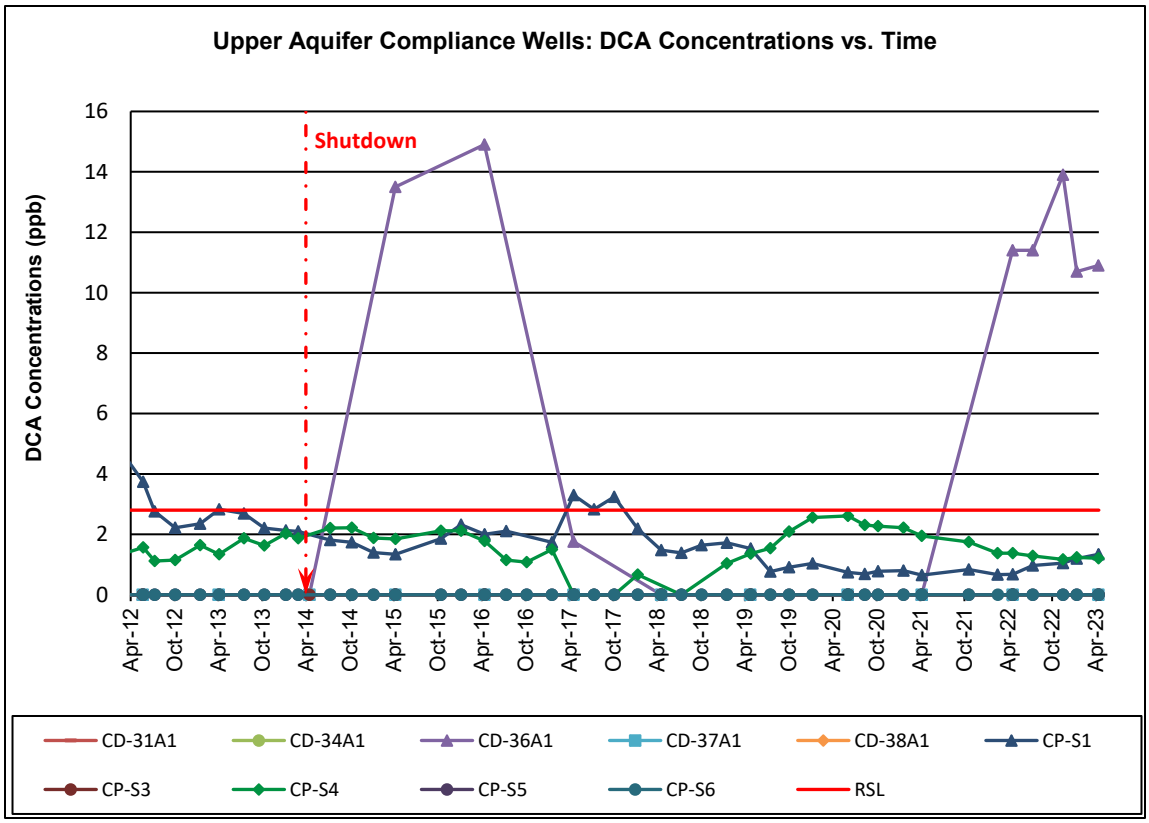
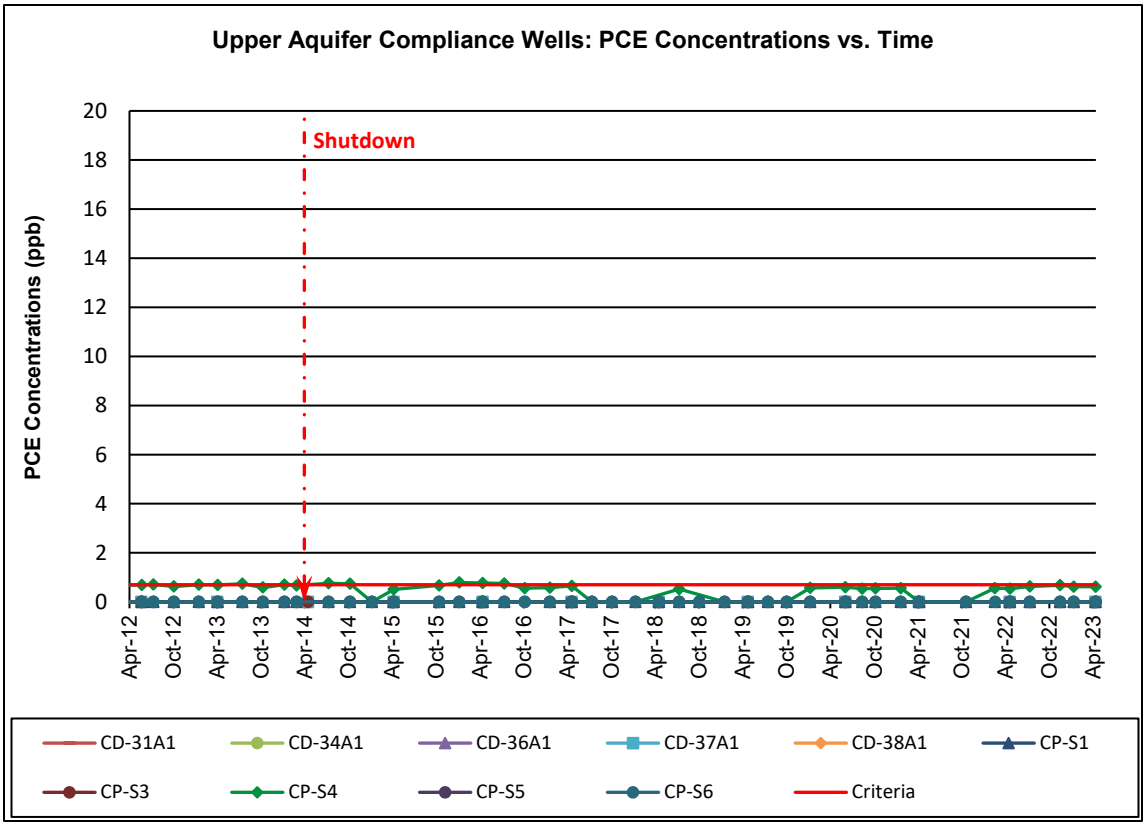


Figure 3-10 Upper Aquifer Compliance Wells PCE Concentrations vs. Time



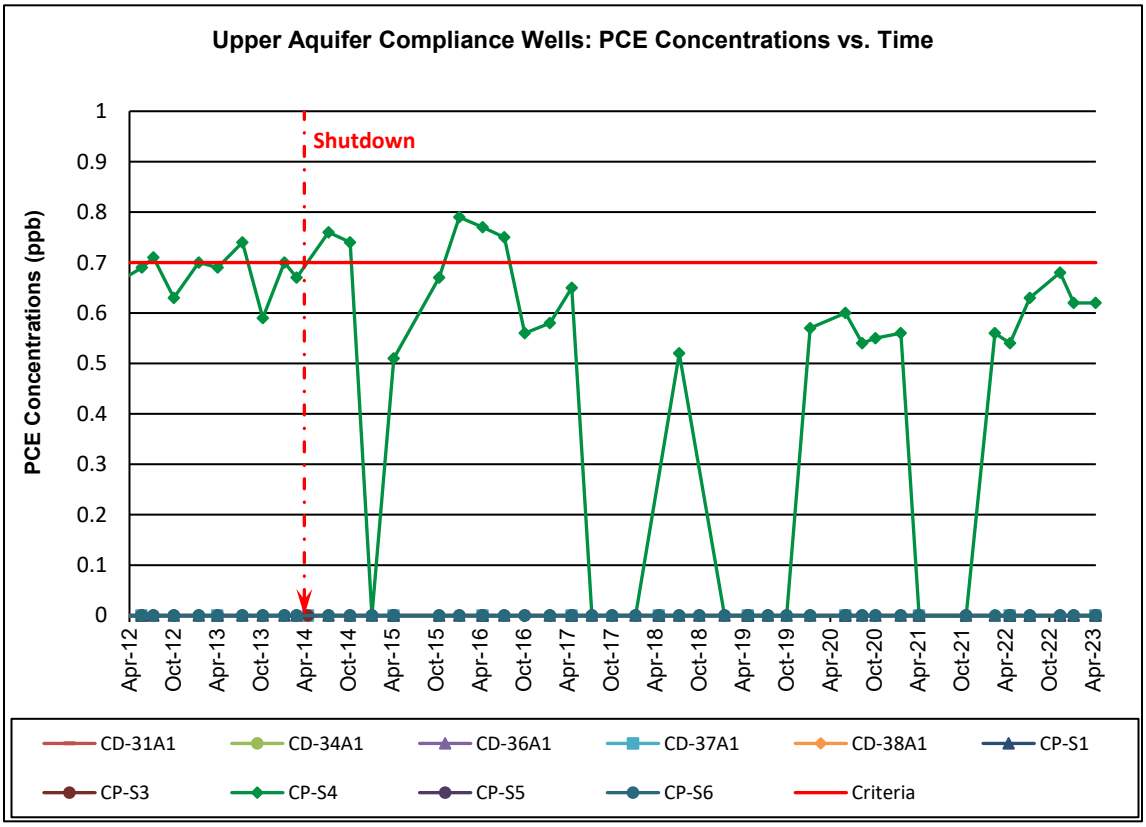
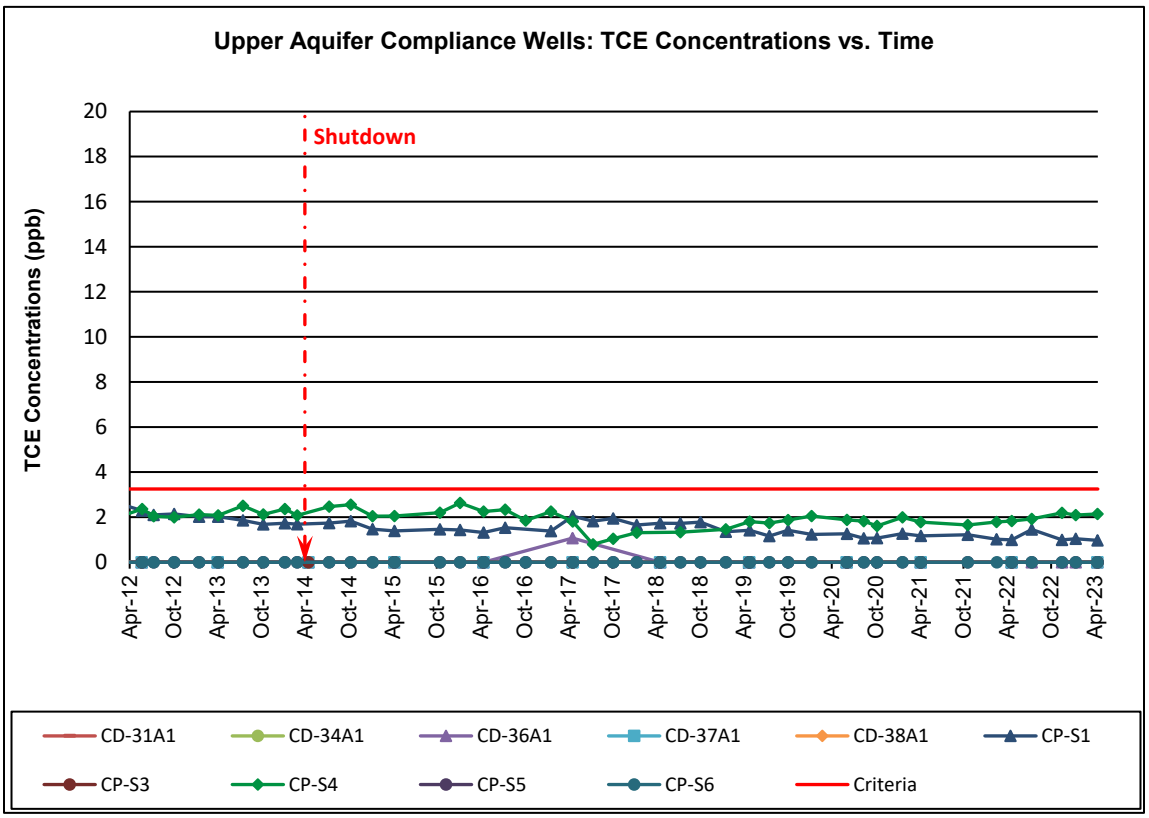


Figure 3-11 Upper Aquifer Compliance Wells TCE Concentrations vs. Time



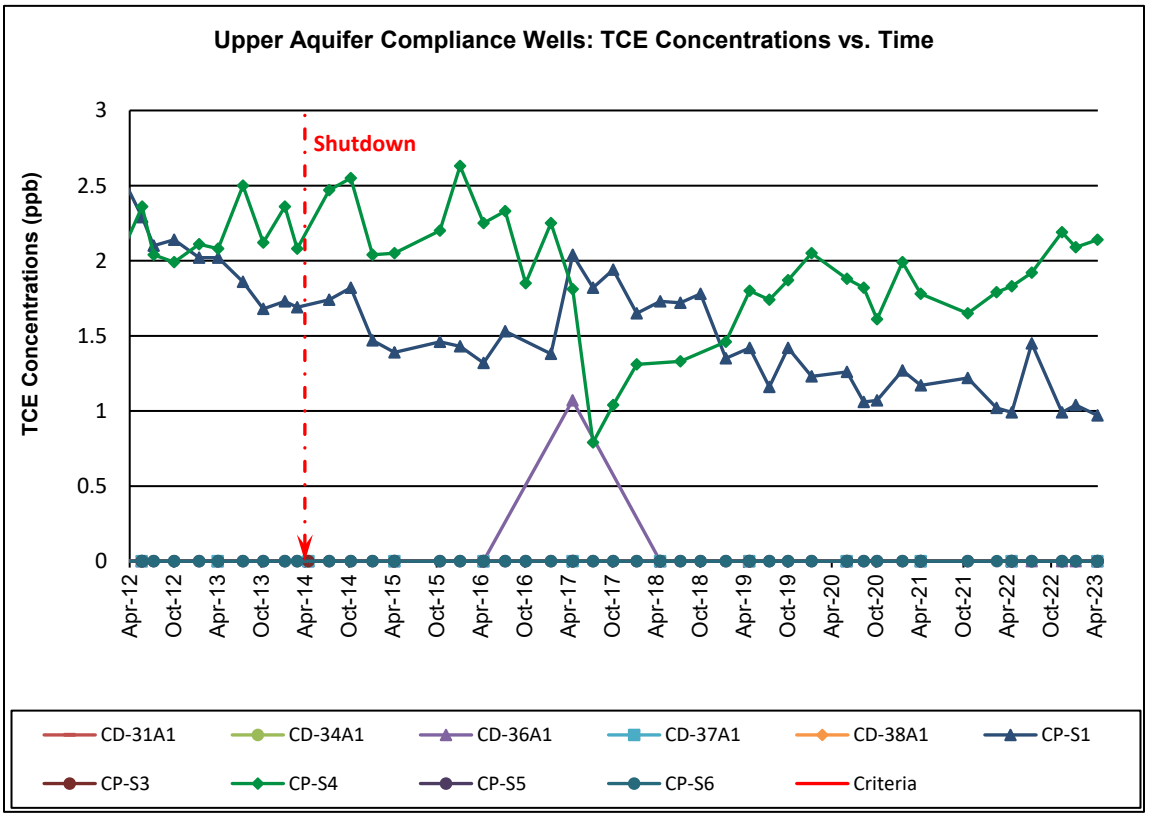


Figure 3-12 Upper Aquifer Estimated TCA Plume

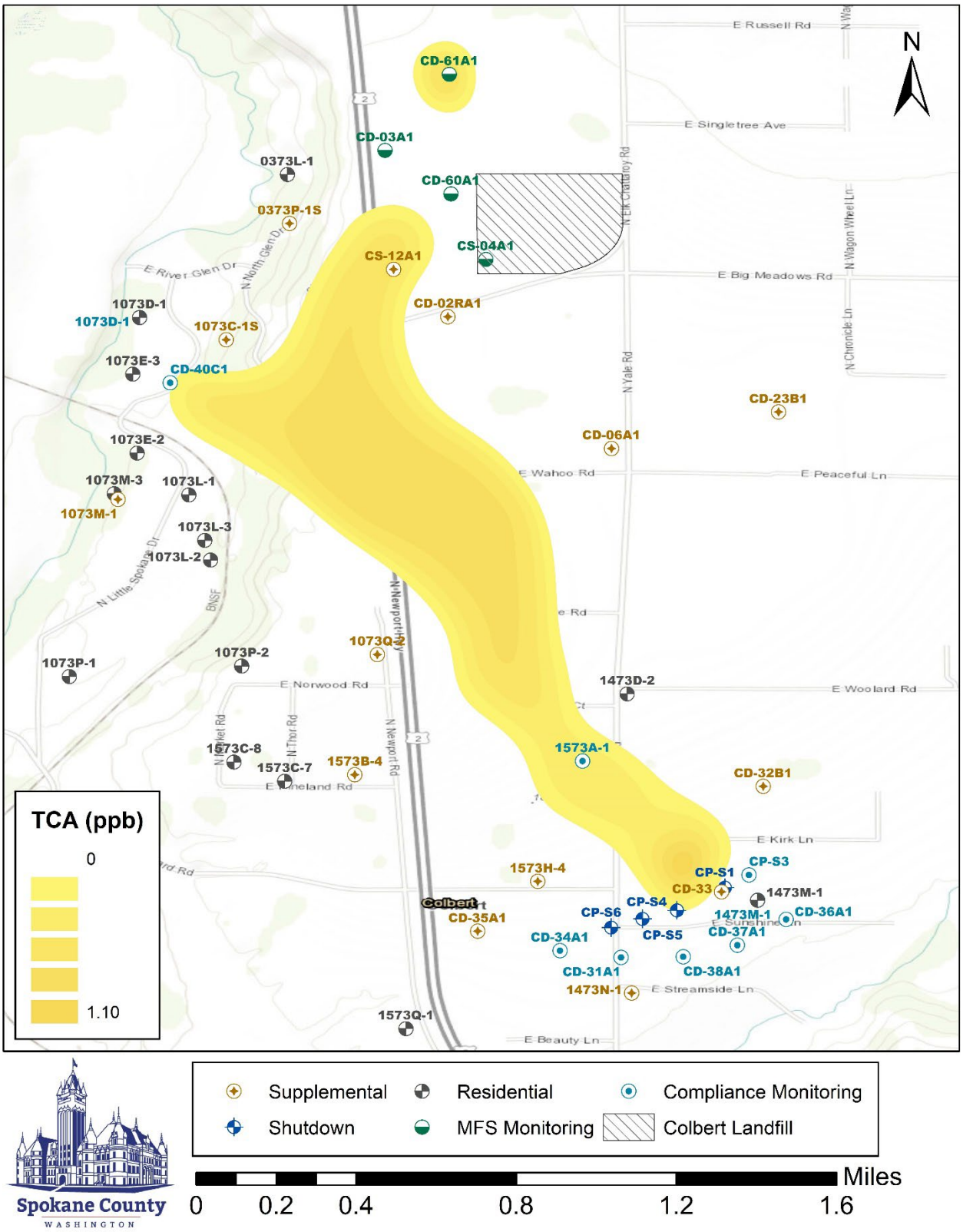


Figure 3-13 Upper Aquifer TCA Detections Map

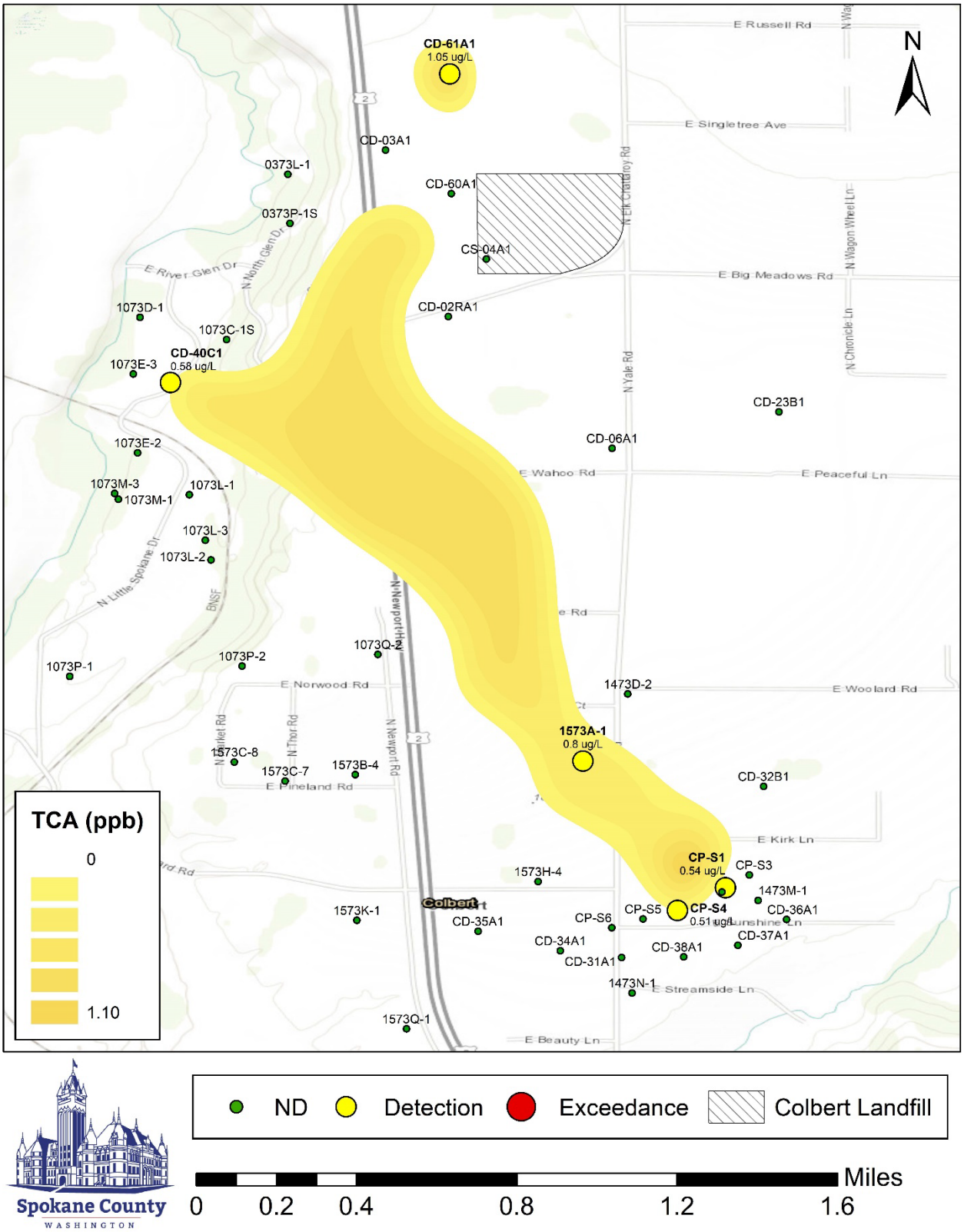


Figure 3-14 Upper Aquifer Estimated DCA Plume

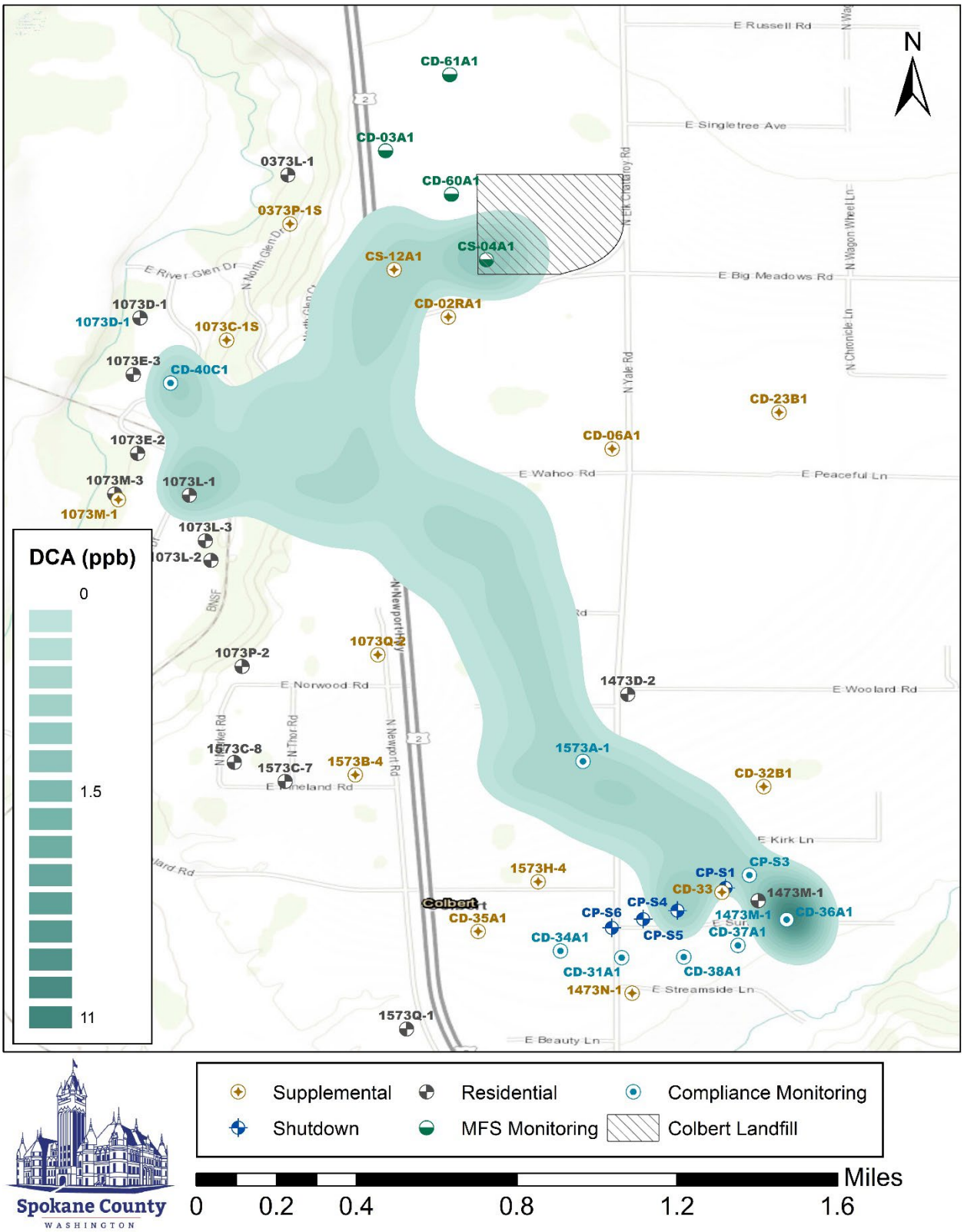


Figure 3-15 Upper Aquifer DCA Detections Map

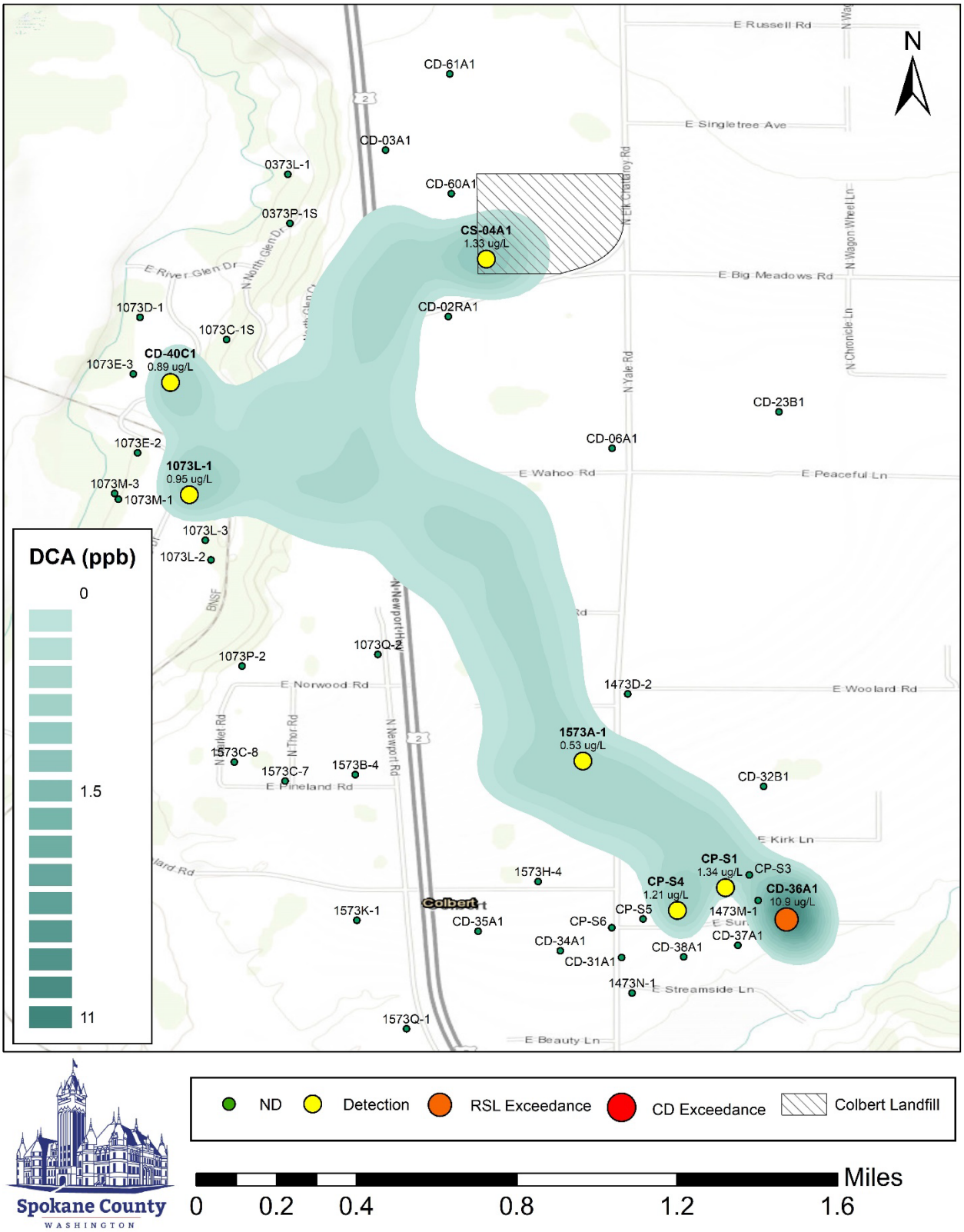


Figure 3-16 Upper Aquifer Estimated DCE Plume

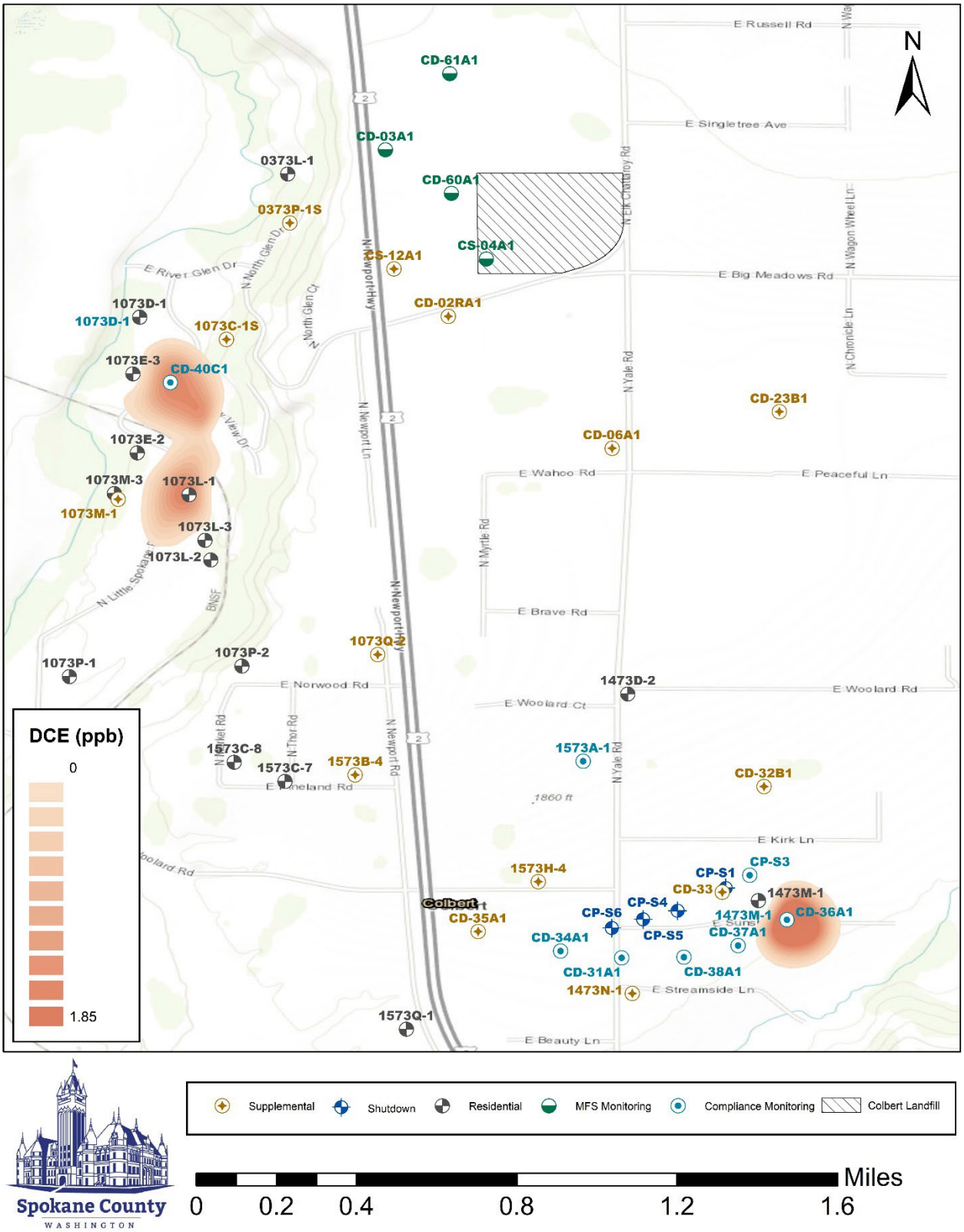


Figure 3-17 Upper Aquifer DCE Detections Map

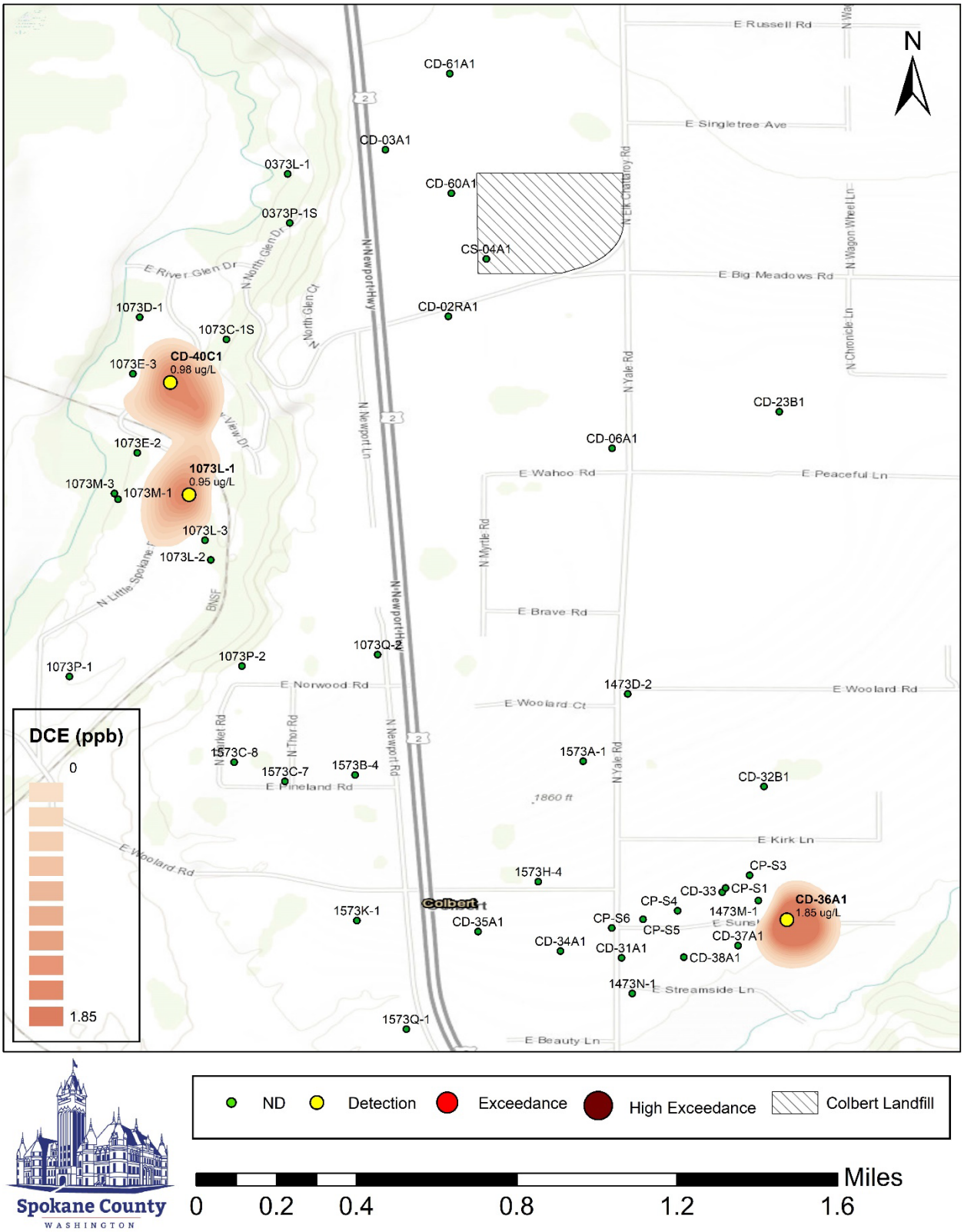


Figure 3-18 Upper Aquifer Estimated PCE Plume

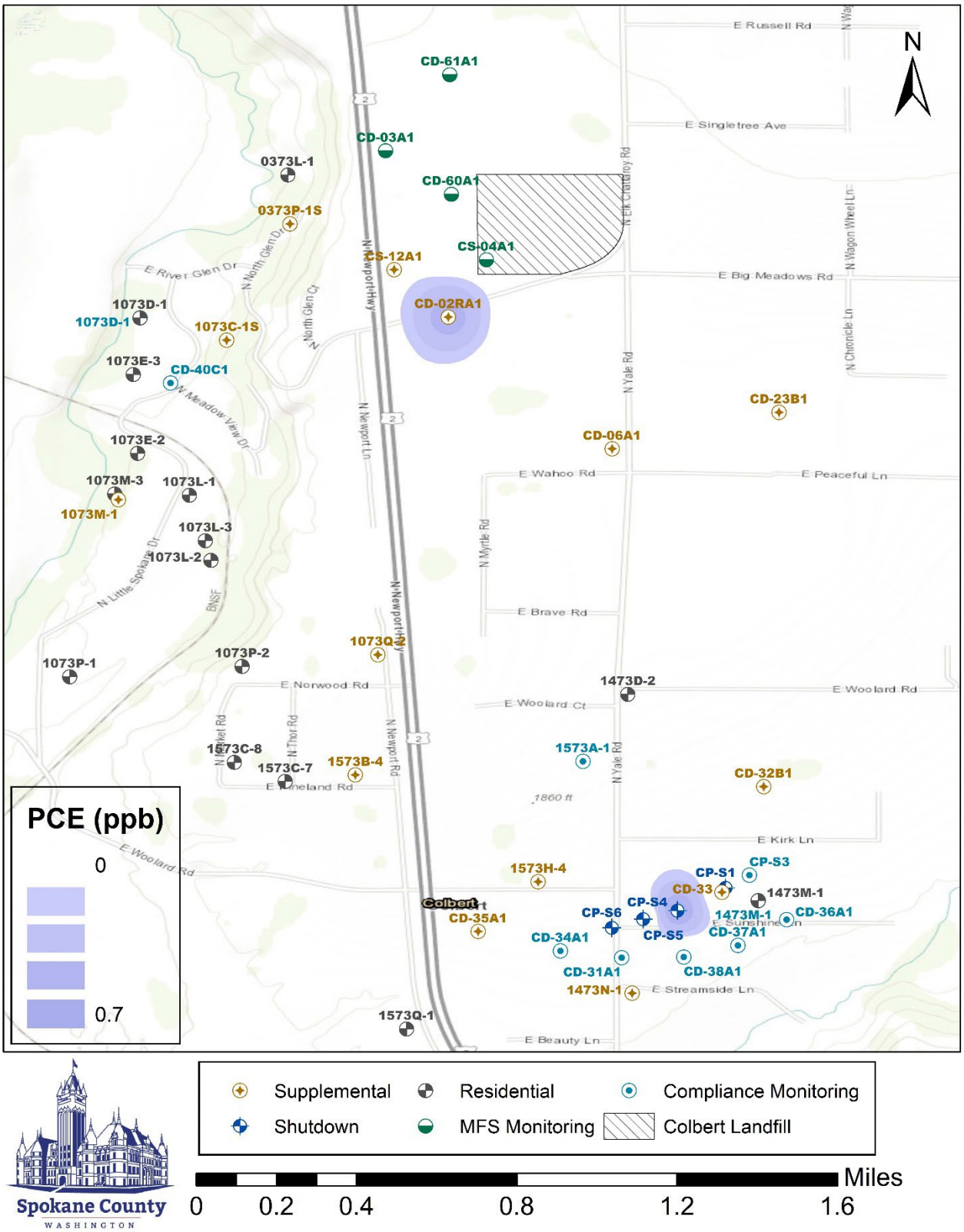


Figure 3-19 Upper Aquifer PCE Detections Map

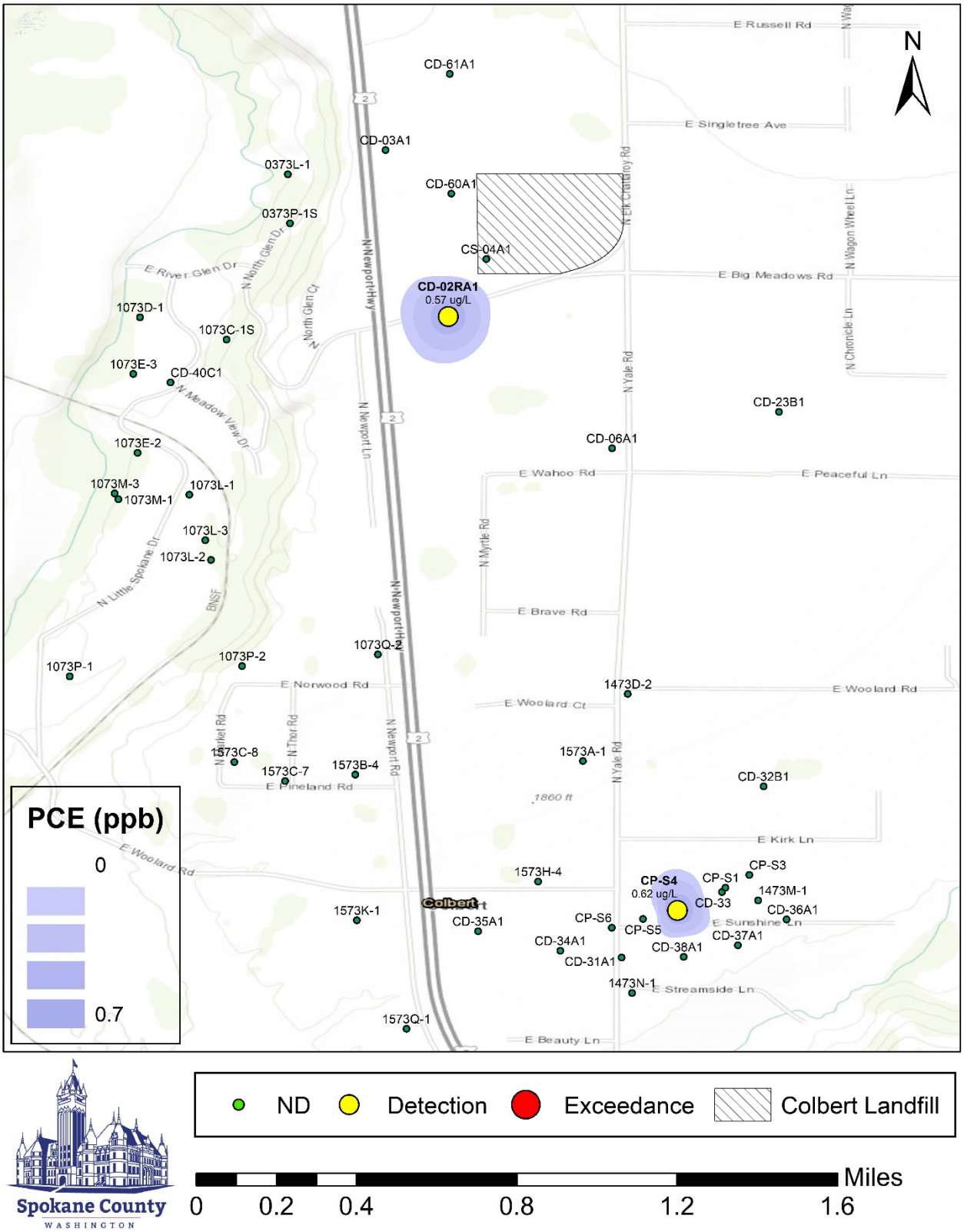


Figure 3-20 Upper Aquifer Estimated TCE Plume

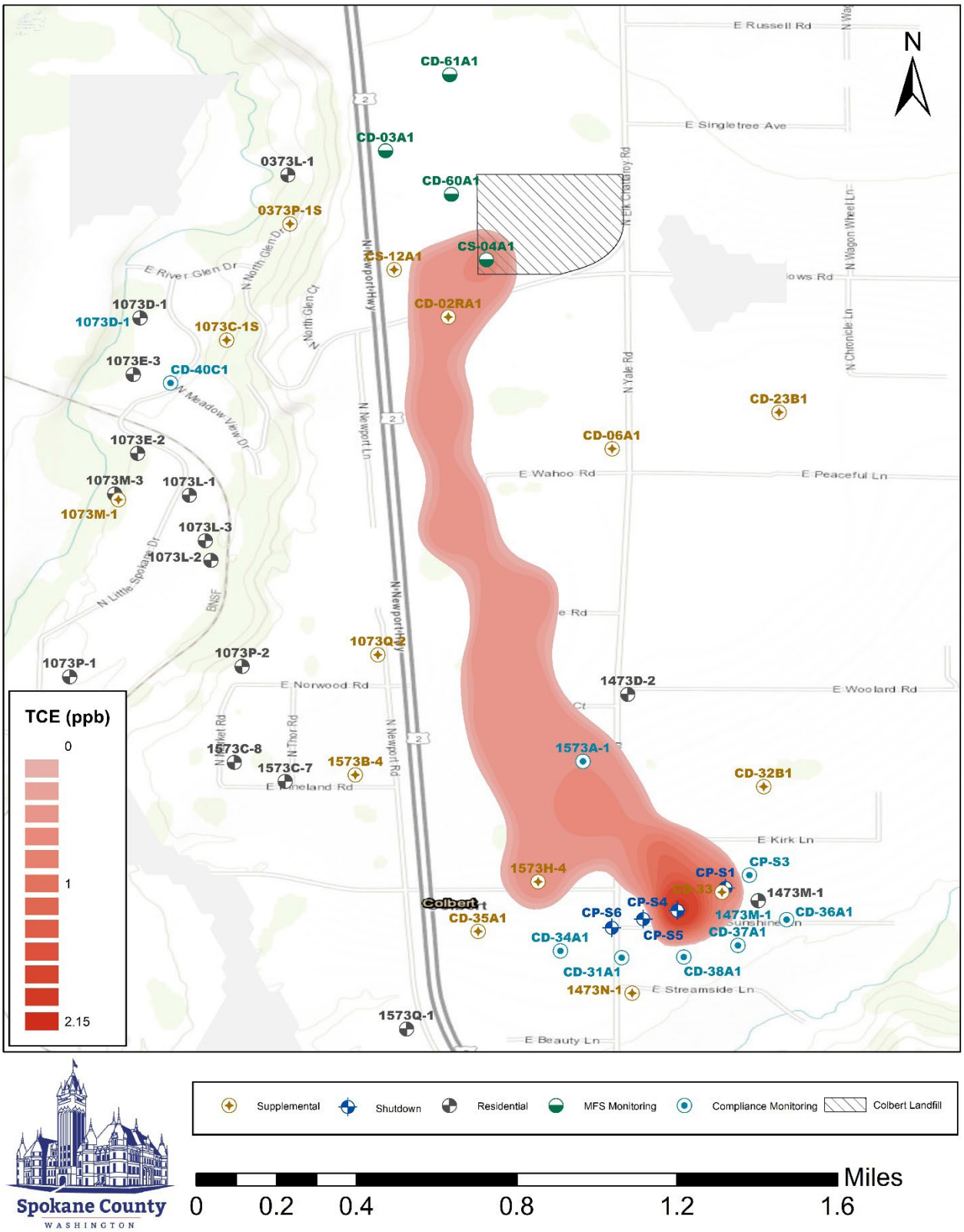


Figure 3-21 Upper Aquifer TCE Detections Map

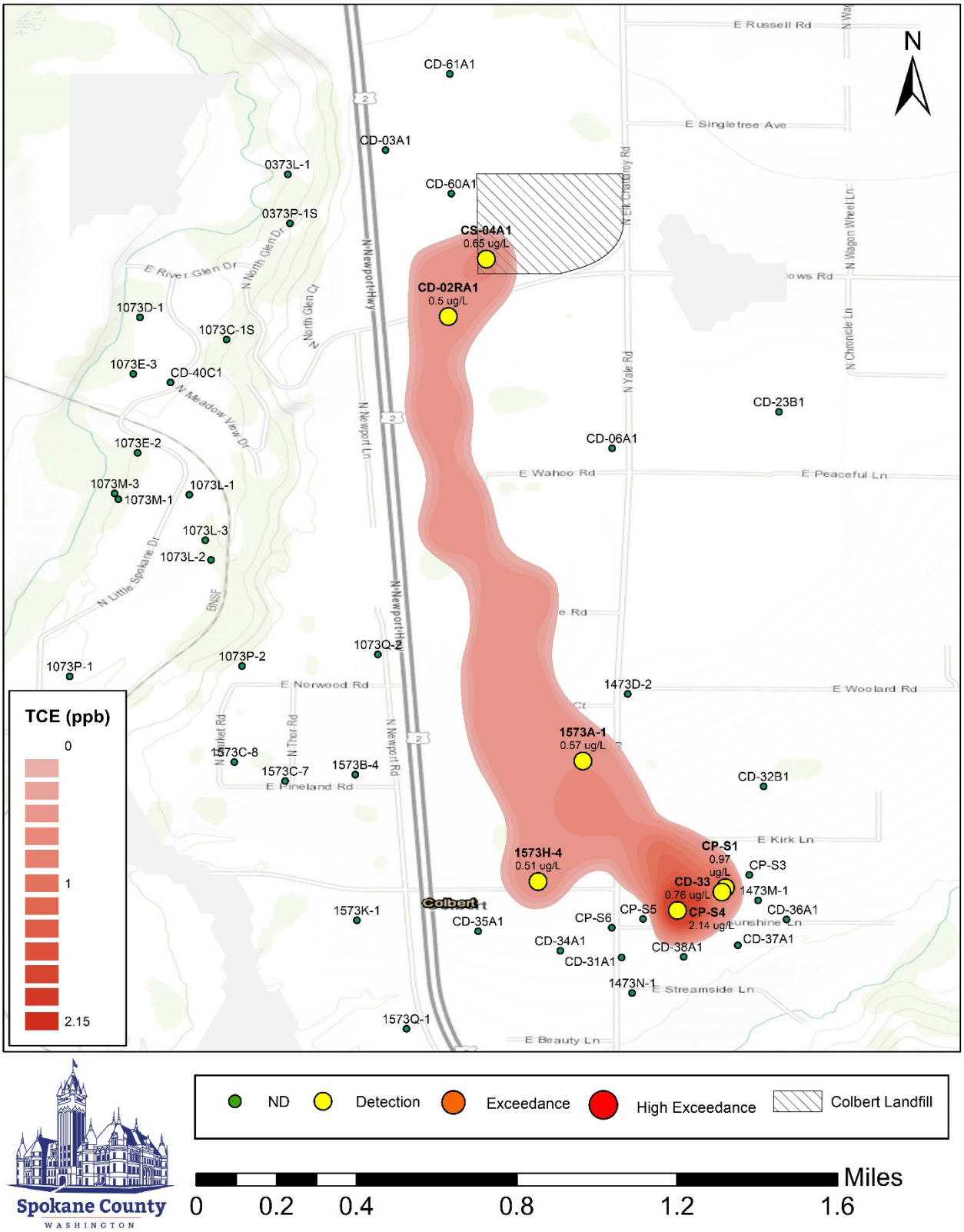


Figure 3-22 Upper Aquifer All Analytes Estimated Plume Map

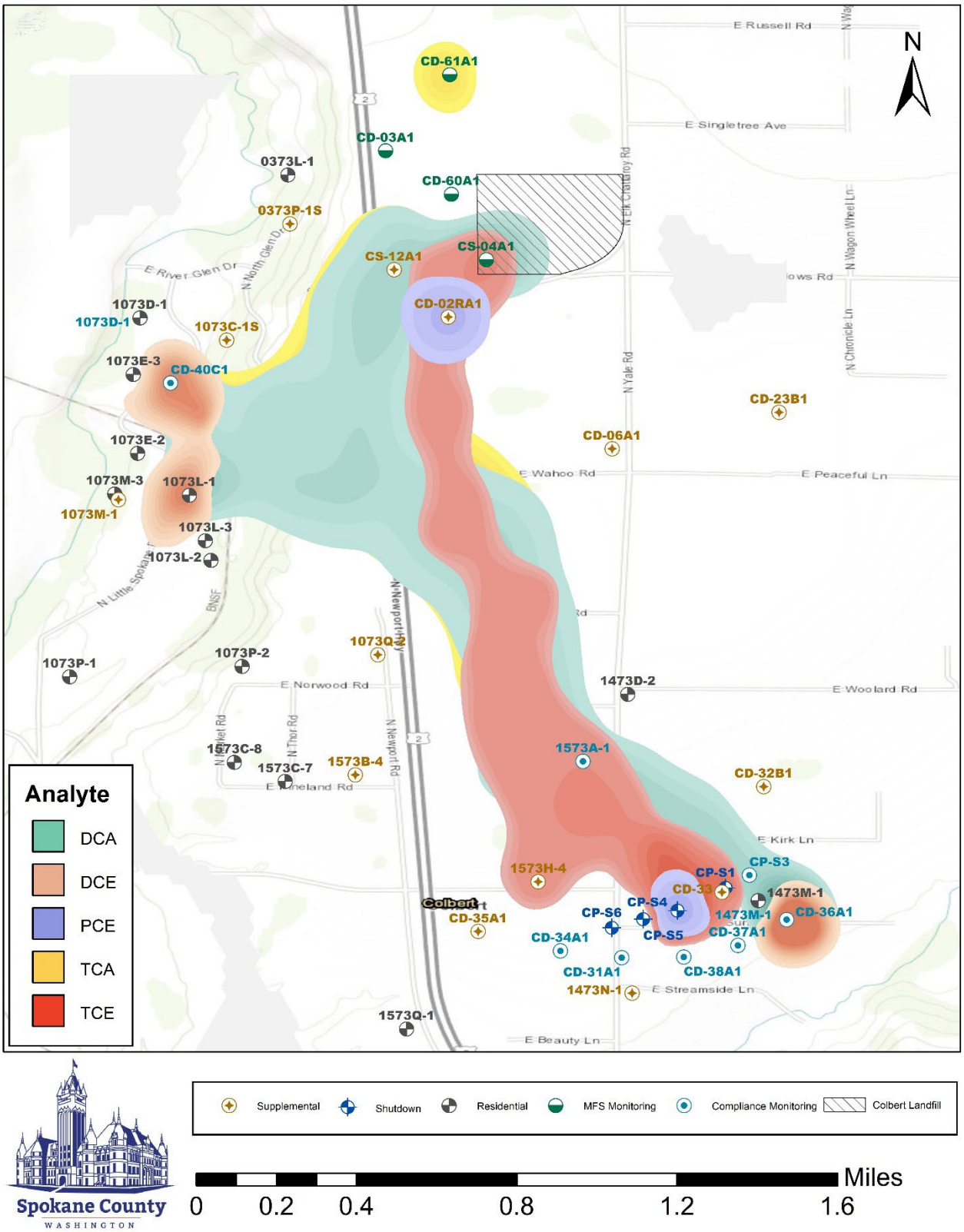
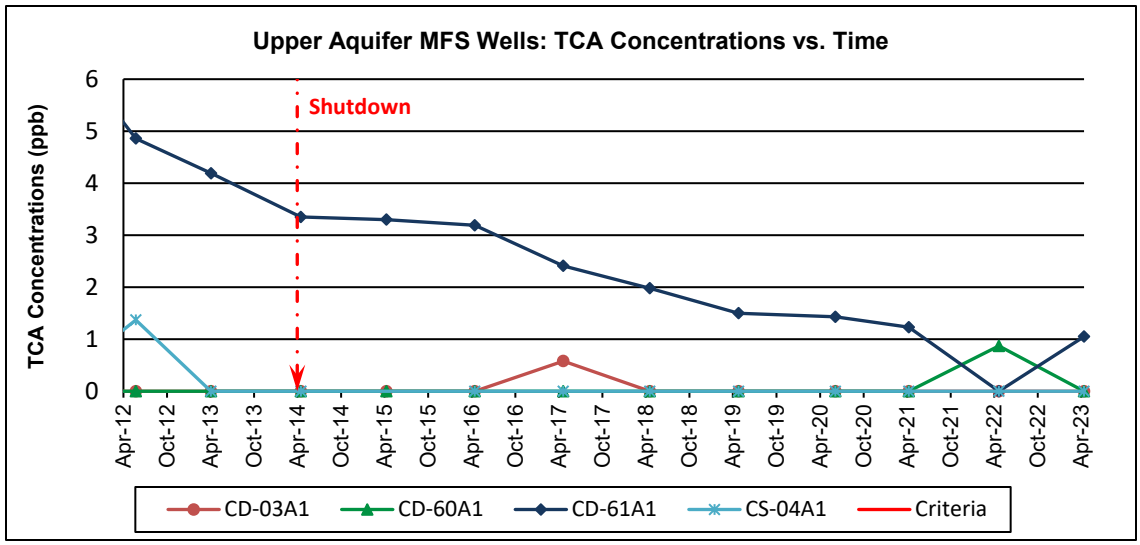
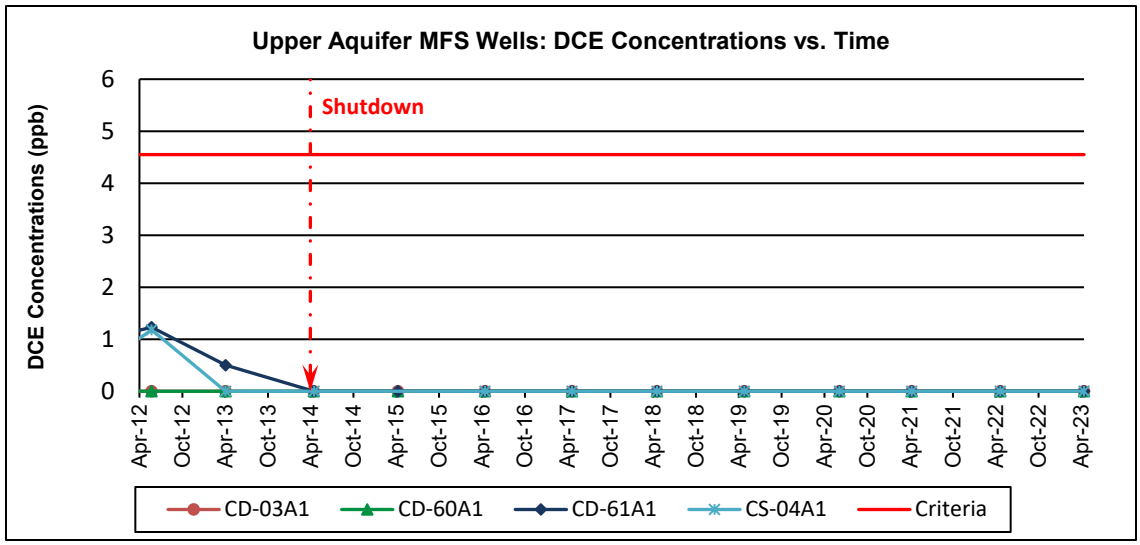


Figure 3-23 Upper Aquifer MFS Wells COC Concentrations vs. Time





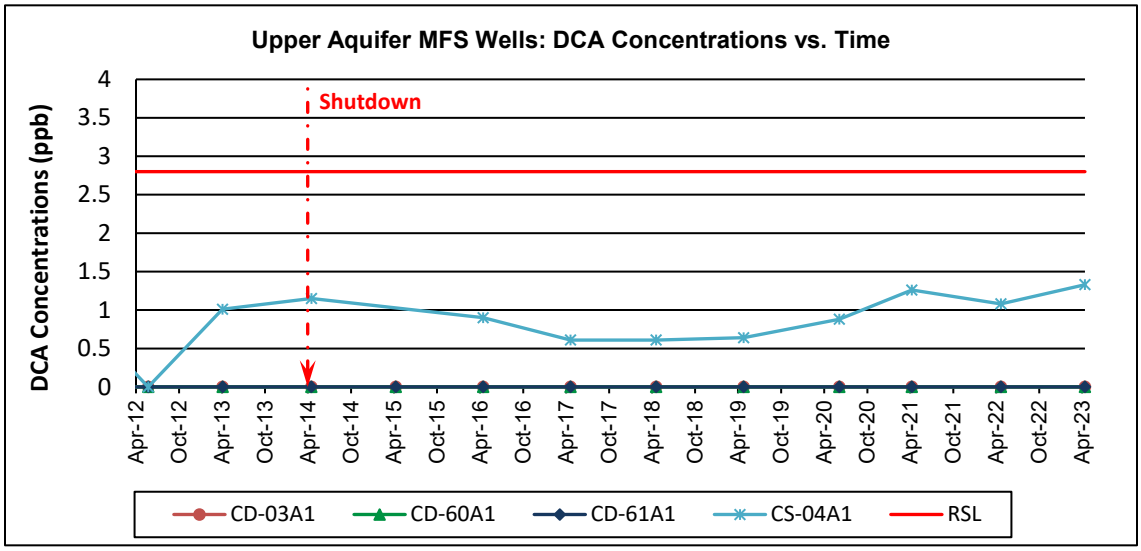


Figure 3-24 Upper Aquifer MFS Wells COC Concentrations vs. Time

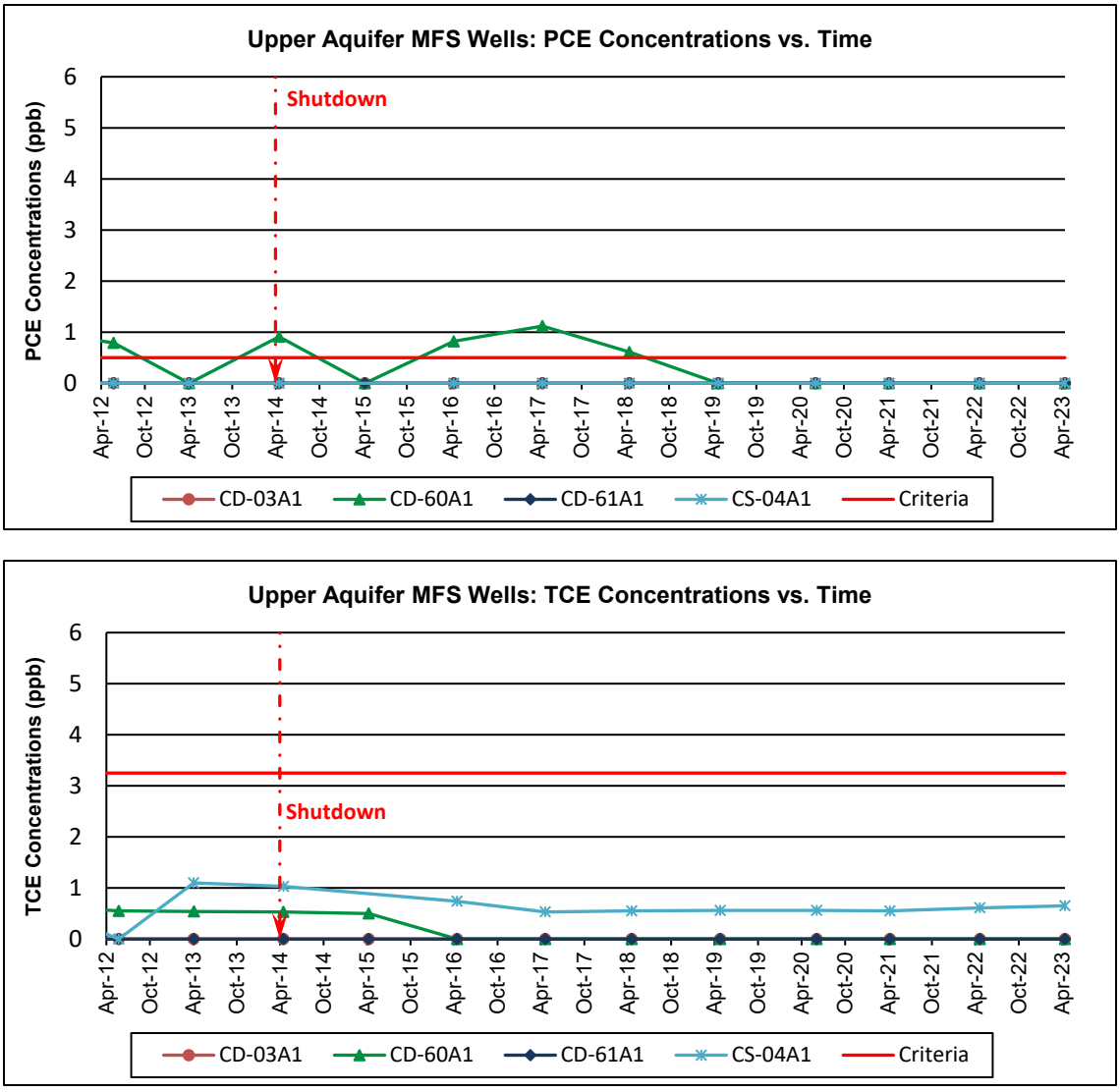
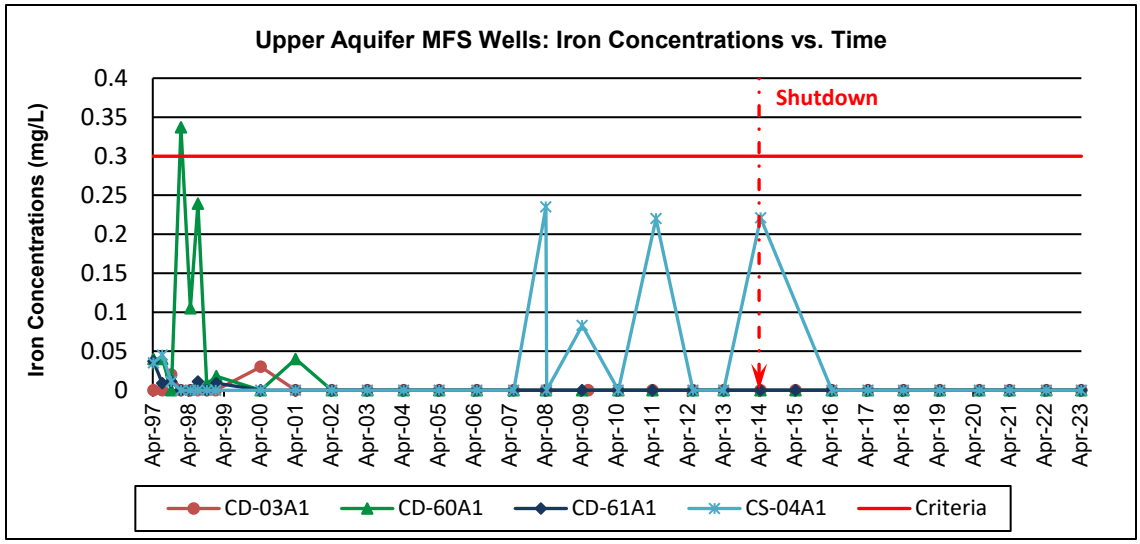
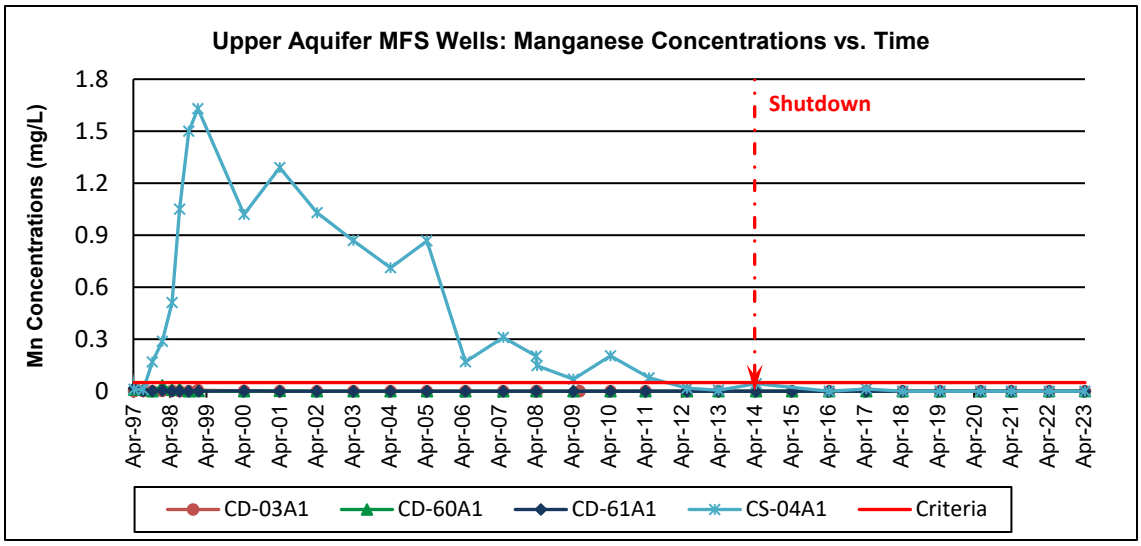


Figure 3-25 Upper Aquifer MFS Parameters vs. Time





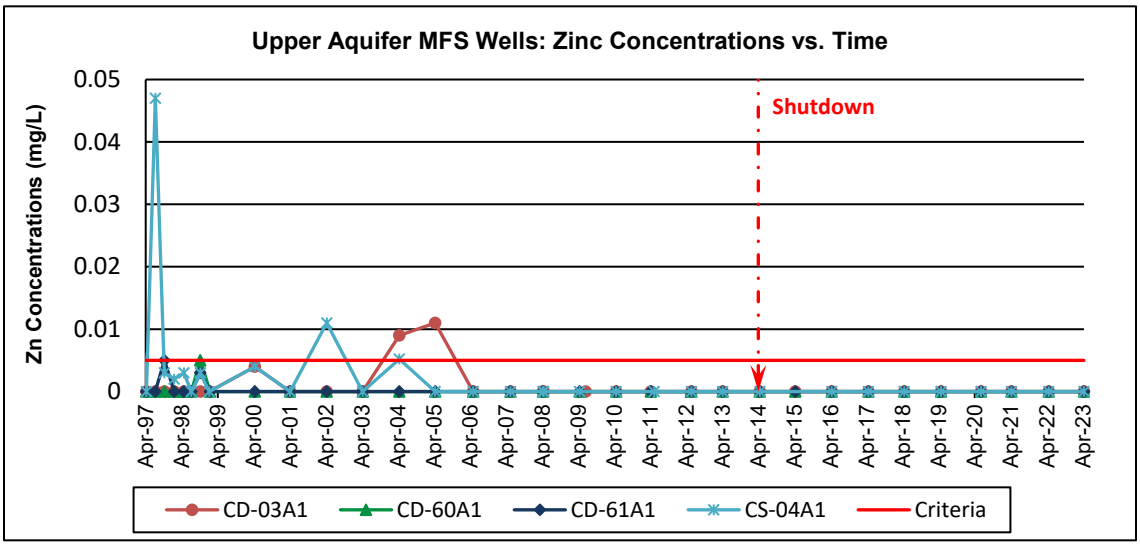
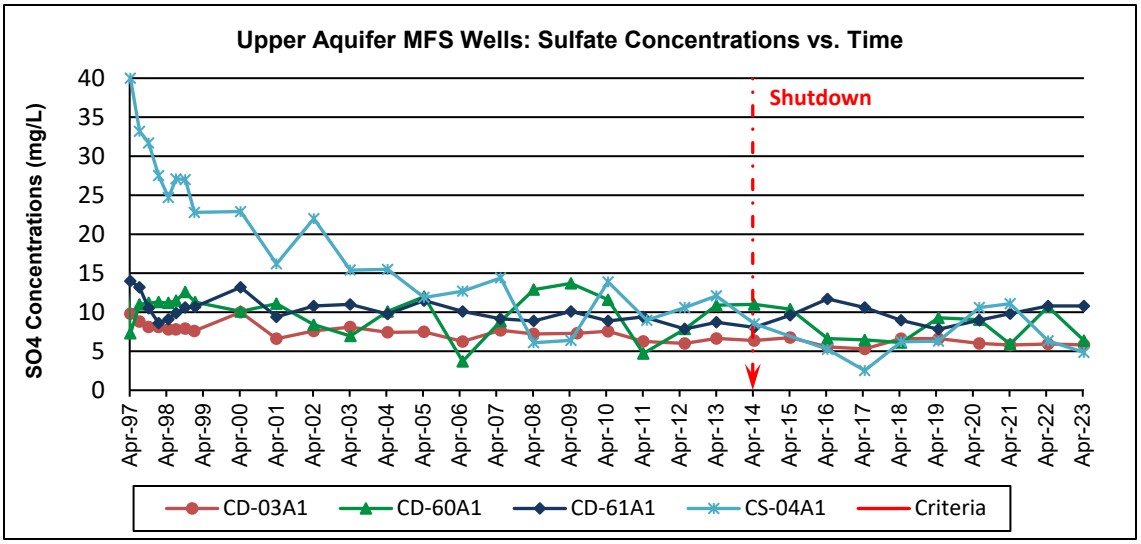
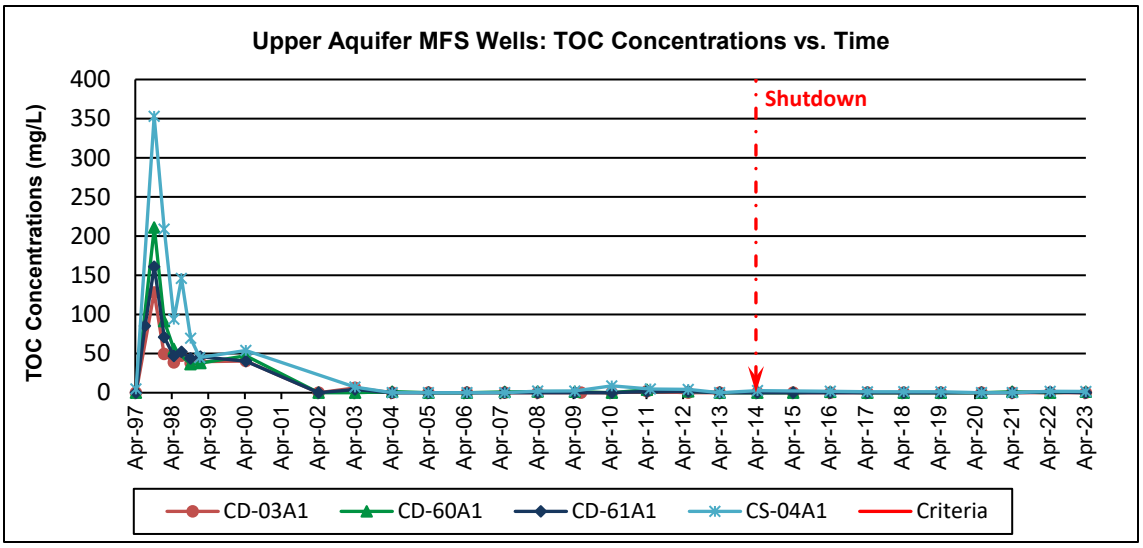


Figure 3-26 Upper Aquifer MFS Parameters vs Time





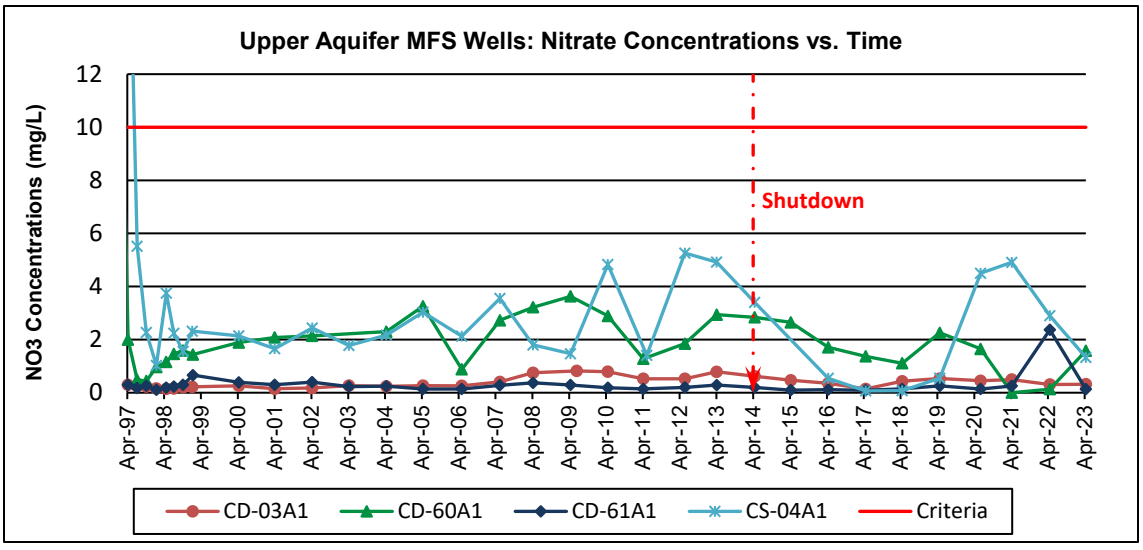


Table 3-9 Summary Results for the Mann-Whitney Nonparametric Significance Test (2023)

	Level of Significance (p)	
Constituent	**Upper Aquifer**	***Lower Aquifer (1999)**
Chloride (Cl)	**1.84E-05**	**0.006**
Chemical Oxygen Demand (COD)	0.4196	0.48
Iron (FE)	0.1537	0.17
Manganese (MN)	0.08632	0.86
Ammonia (NH3)	0.4861	0.42
Nitrite (NO2)	0.4277	1.13
Nitrate (NO3)	**8.14E-05**	0.08
Sulfate	0.6175	**0.0006**
Total Organic Carbon	0.849	0.32
Zinc	0.06559	0.06

* Lower aquifer results from January 1999 using CP-E2 and CD-48C2 analytical results for calculations.

Bold number indicates a level of significance under 0.05, test run as two-tailed method.

Figure 3-27 Box Plots for Background and Downgradient MFS Wells (2023)

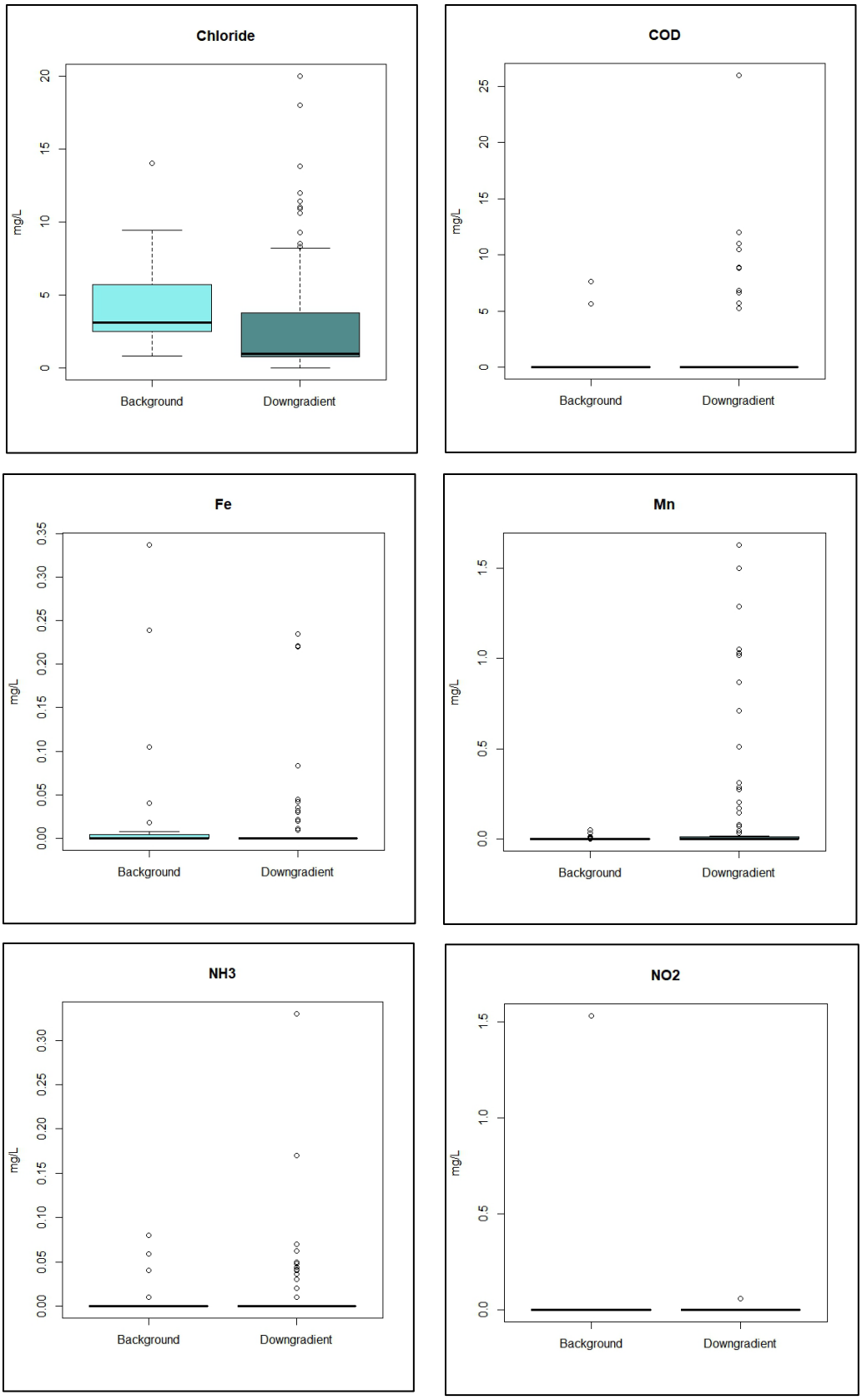
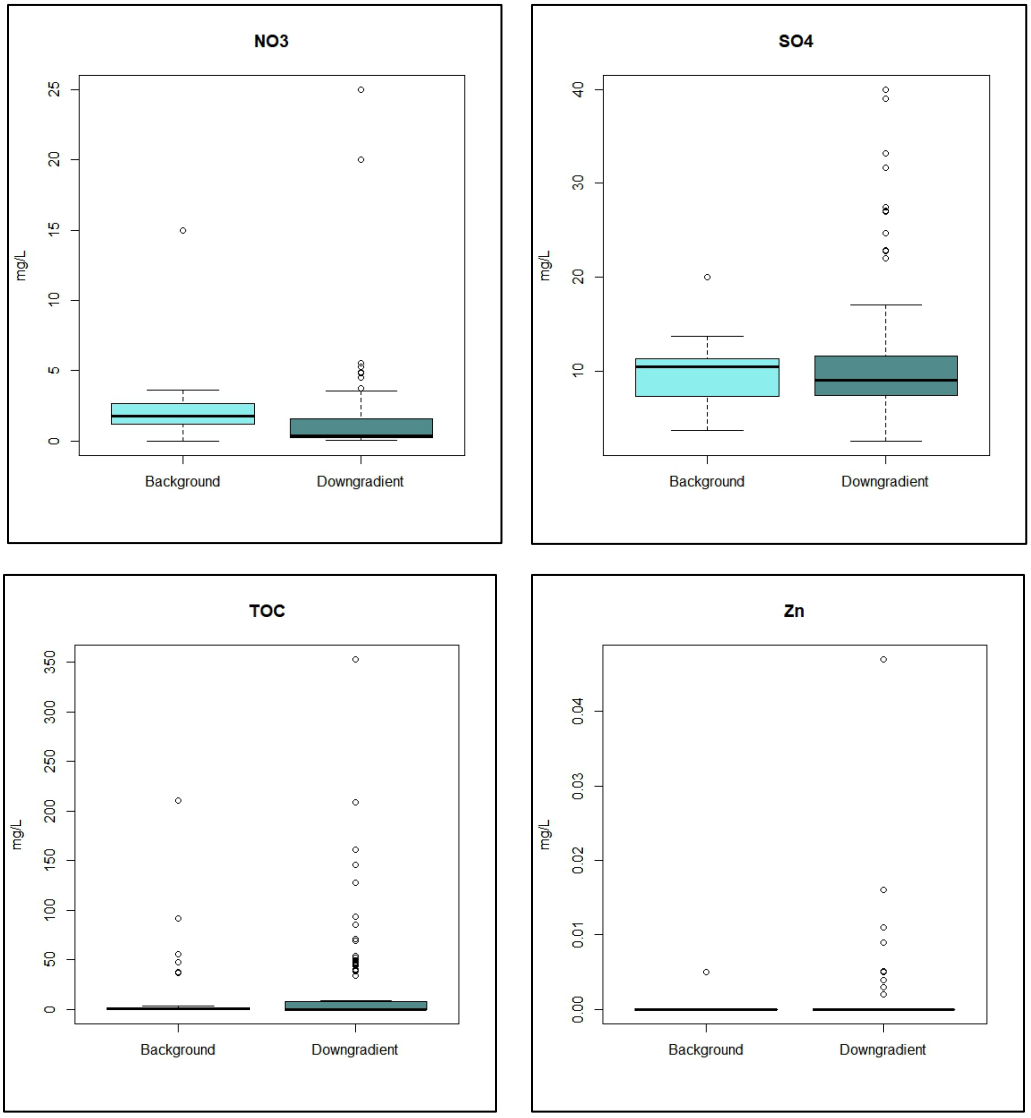


Figure 3-23 continued



4.0 Residential Program

4.1 Locations and Schedule

Current residential well sampling locations can be found in Figure 4-1. The residential sampling schedule is included in Table 4-1.

4.2 Monitoring Results and Criteria

Criteria for residential use wells were established in the Consent Decree. The Consent Decree states that if any residential well with a concentration over the evaluation criteria OR any residential well that has an average concentration over 65% of the evaluation criteria over 12 months, the county shall supply that residence with an alternative water source.

All residential well results were well below established criteria. Results from sampling are presented in Table 4-2. Time-series plots for wells with COC detections are shown in Figure 4-2 through Figure 4-4.

4.3 Data Evaluation

Only 1 residential well measured concentrations above the method detection limits for the 2022-2023 sampling year. Residential well 1073L-1 exhibited low detections of DCA (0.91 ppb to 0.95 ppb) during this reporting period.

4.4 Program Modifications

On a regular basis, the program schedule is re-evaluated to determine if any changes are needed. With the initiation of the Shut-down test, a re-evaluation was performed comparing plume maps and well locations as well as a list of residences connected to a public water supply. Some modifications to increase sampling in specific areas were made to the schedule to ensure a conservative approach concerning public health.

11 changes have been made to the schedule for the upcoming 2022-2023 sampling year. There were 6 decreases in the sampling schedule (several decreases from biennial to supplemental sampling), 2 increases from biennial sampling to annual sampling, and several changes in the sampling months for several wells to better distribute the amount sampled per month. Changes are not required by any documentation or work plan.

The 2023 residential well sampling schedule and changes to the program are presented in Table 4-1.

Figure 4-1 Residential Well Sampling Locations

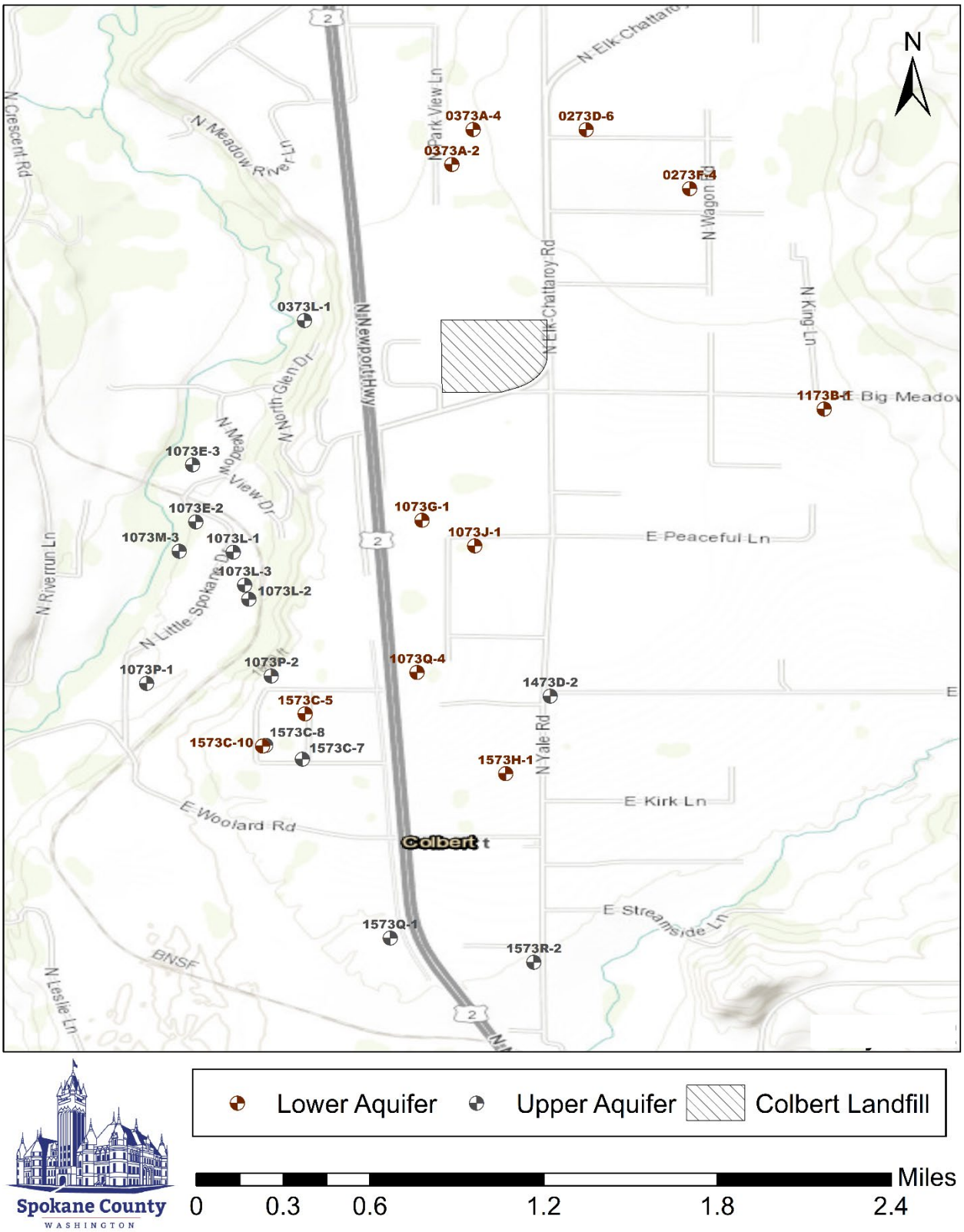


Table 4-1 Residential Well Sampling Schedule for Reporting Period

Colbert Residential Sampling Plan 2023

StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Select Comments
0273C-2	Jones/Schmidt	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
0273C-3	Warden	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
0273C-4	McQuesten	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
0273D-6	Thornton	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	
0273F-4	Gander	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	
0373A-2	Resseman	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	Continue quarterly sampling.
0373A-4	Walker	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	
0373L-1	Sterling	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Decreased to annual sampling (July).
1073D-1	Nerren	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
1073E-2	Muglia	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073E-3	Clark	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
1073E-4	Carpenter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	
1073G-1	Rux	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073J-1	Moreno	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073L-1	Halpin	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073L-2	Countryman	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073L-3	Anderson	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
1073L-4	Thomas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
1073M-1	Bertholf	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
1073M-3	Lane	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	
1073P-1	Greenen	☐	☐	☐	☐	☑	☐	☐	☐	☐	☑	☐	☐	
1073P-2	Petrelli	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	
1073Q-4	NORTH MEADOWS W	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Decreased to annual sampling - January.
1173B-1	Bise	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	Decreased to annual (December).
1473C-5	Overmyer	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.

StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Select Comments
1473D-2	Wardian	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
1473M-1	Richard	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1573C-10	Lake	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	Increased to annual sampling - June.
1573C-17	RESIDENT	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	Decreased to Supplemental Sampling.
1573C-5	Shelp	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
1573C-7	Kirby	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
1573C-8	Williams	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
1573H-1	Hunter	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	
1573Q-1	Saunder	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Increased to annual sampling - July.
1573R-2	Bell	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	Decreased to annual sampling.

Changes made to the Colbert Residential Sampling Schedule

StationID	Still active?	Comments/changes - ColRes review on 2/22/2022
1073E-4	Yes	Moved from October to November - kept on annual.
0273C-2	Yes	Decreased to Supplemental Sampling.
0273C-3	Yes	Decreased to Supplemental Sampling.
0273C-4	Yes	Decreased to Supplemental Sampling.
0273D-6	Yes	Moved Thornton from August to September - kept on annual.
1073M-1	Yes	Decreased to Supplemental Sampling.
1073P-2	Yes	Moved Petrelli to September - annual.
1073Q-4	Yes	Increased to Annual in January.
1473C-5	Yes	Decreased to supplemental, assess/remove if non-detect. Moving Overmeyer to September sampling.
1573C-10	Yes	Increased to annual sampling on the month of June.
1573C-17	Yes	Decreased to Supplemental Sampling.
1573C-5	Yes	No change - continue with the annual sampling in August.
1573H-1	Yes	Moved Hunter from May to March - kept on annual.
1573Q-1	Yes	Increased to annual sampling on the month of July.

Table 4-2 Residential Groundwater Monitoring Program Results

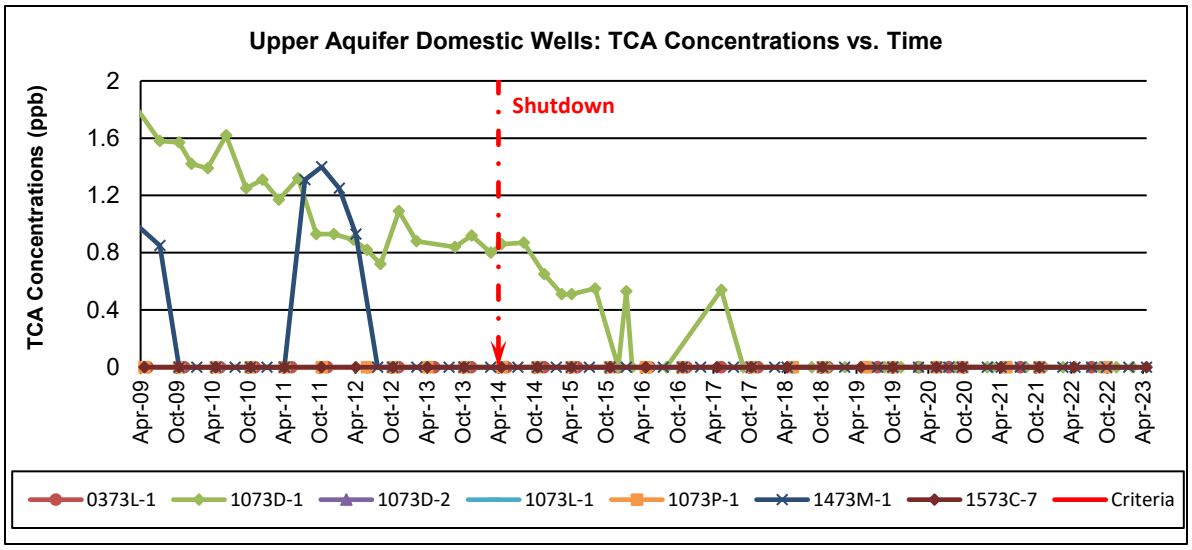
(June 2022 through May 2023)

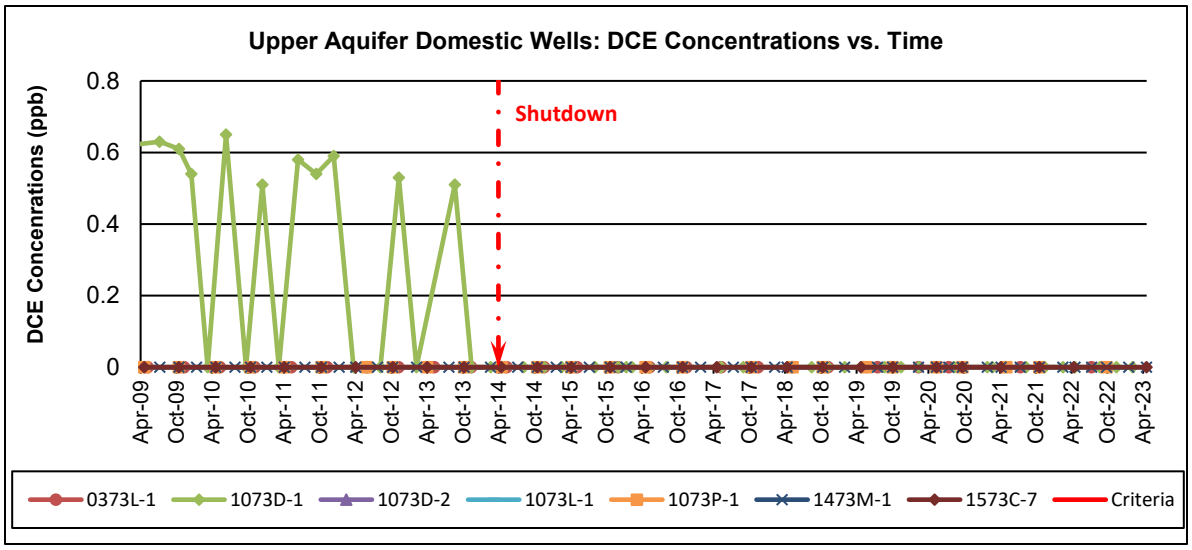
StationID	Aquifer	SampleDate	LastName	DCA	DCE	MC	PCE	TCA	TCE	VC
0273D-6	lower	9/28/2022	Thornton	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273F-4	lower	1/18/2023	Gander	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	9/28/2022	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	11/16/2022	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	1/18/2023	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373L-1	upper	7/12/2022	Sterling	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	8/24/2022	Nerren	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	11/16/2022	Nerren	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	2/7/2023	Nerren	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	7/12/2022	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	9/27/2022	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	1/18/2023	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	4/19/2023	Muglia	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	8/24/2022	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	11/16/2022	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	2/7/2023	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-4		11/16/2022	Carpenter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	9/28/2022	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	1/18/2023	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	7/13/2022	Moreno	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	9/28/2022	Moreno	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	9/27/2022	Halpin	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	1/18/2023	Halpin	**0.95**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	9/27/2022	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	1/18/2023	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	4/19/2023	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

StationID	Aquifer	SampleDate	LastName	DCA	DCE	MC	PCE	TCA	TCE	VC
1073L-3	upper	8/24/2022	Anderson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-3	upper	2/7/2023	Anderson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073M-1	upper	1/18/2023	Bertholf	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-1	upper	9/27/2022	Greenen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-2	upper	9/28/2022	Petrelli	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073Q-4	lower	2/7/2023	NORTH MEADOWS WATER	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1173B-1	lower	2/7/2023	Bise	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	8/24/2022	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	11/16/2022	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	2/7/2023	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	7/13/2022	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	9/27/2022	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	1/18/2023	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	4/19/2023	Richard	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-17	lower	4/19/2023	RESIDENT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-5	lower	8/24/2022	Shelp	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-7	upper	4/19/2023	Kirby	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573H-1	lower	2/8/2023	Hunter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573Q-1	upper	7/12/2022	Saunder	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

***Bold** indicates a value greater than non-detection.

Figure 4-2 Upper Aquifer Residential Wells Concentrations vs Time





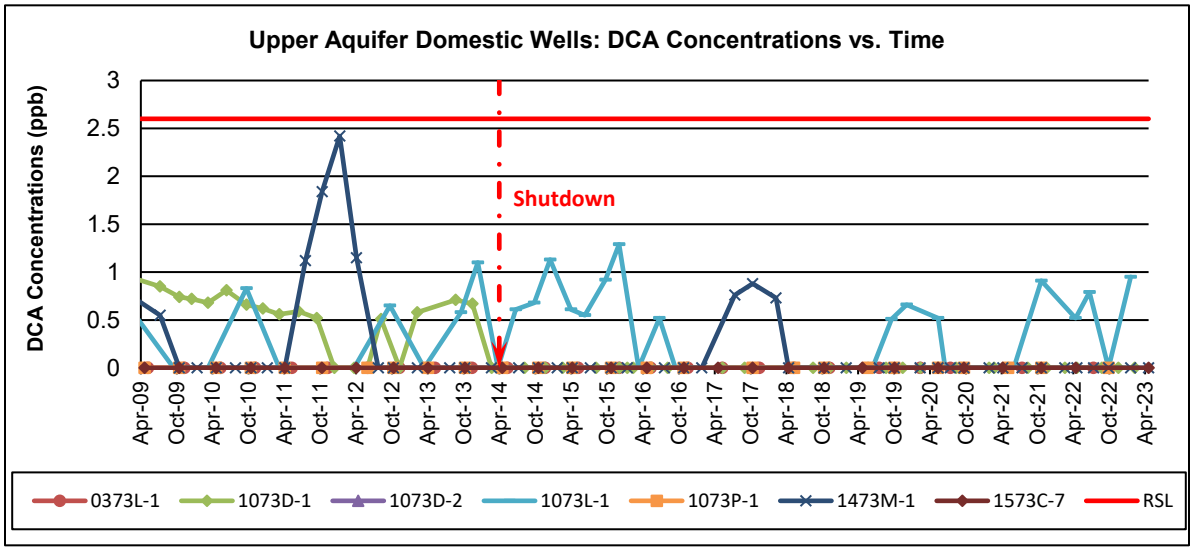
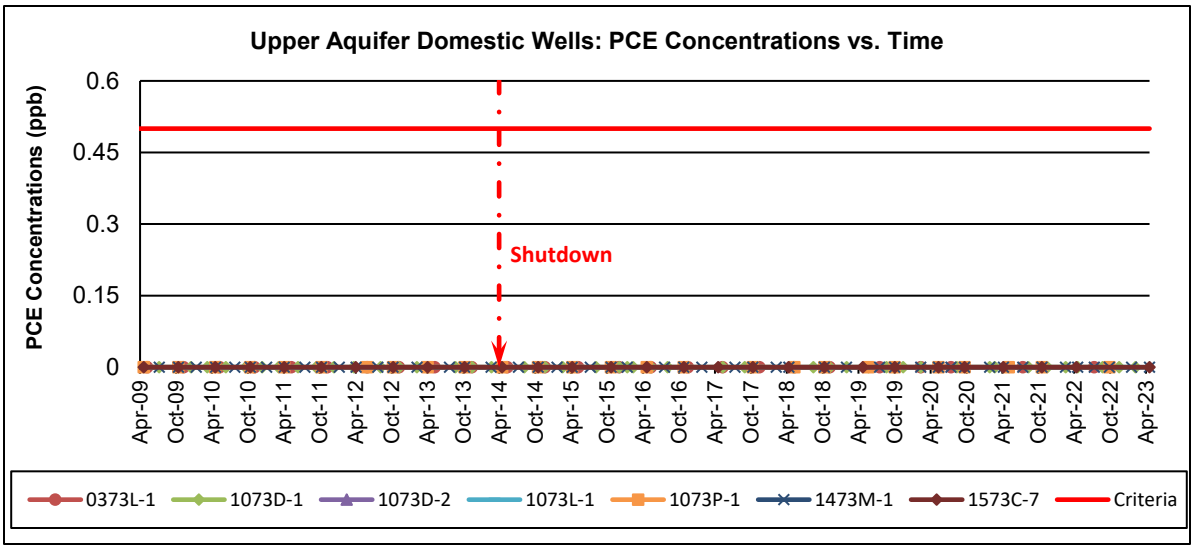


Figure 4-3 Upper Aquifer Residential Wells Concentrations vs Time



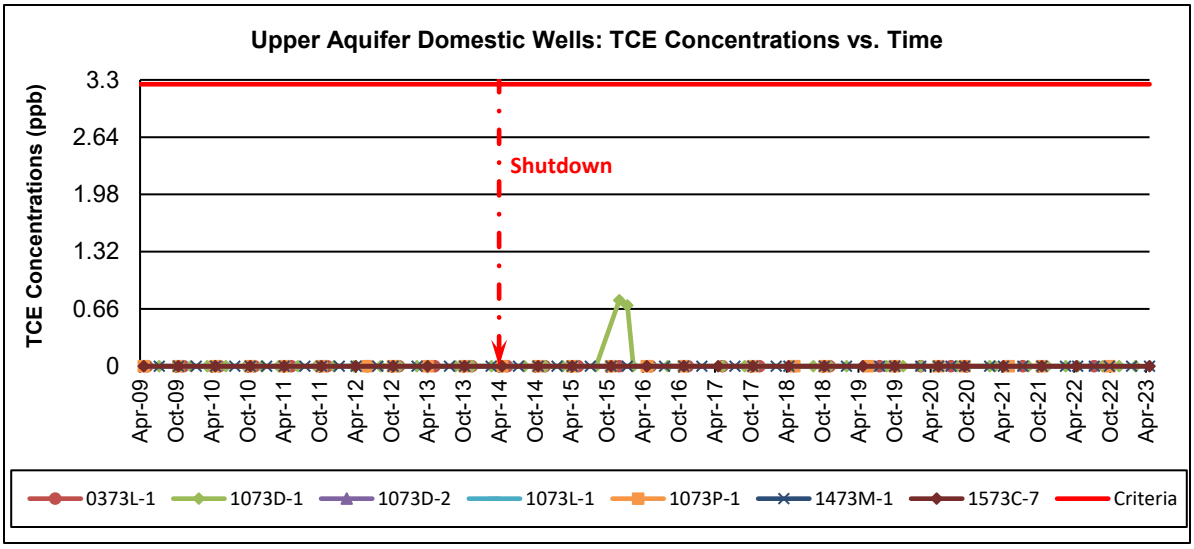
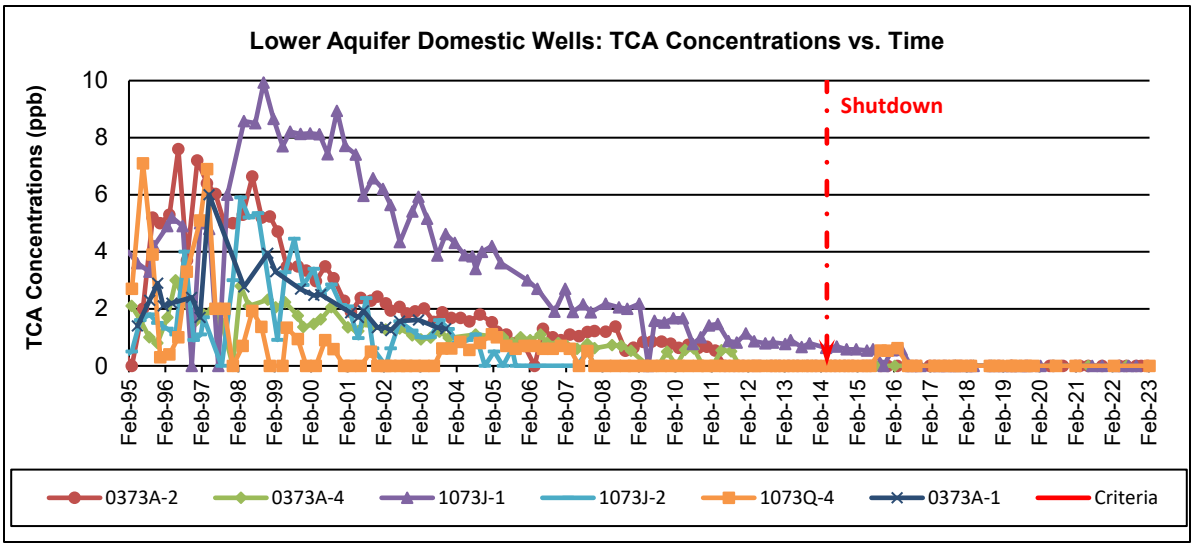
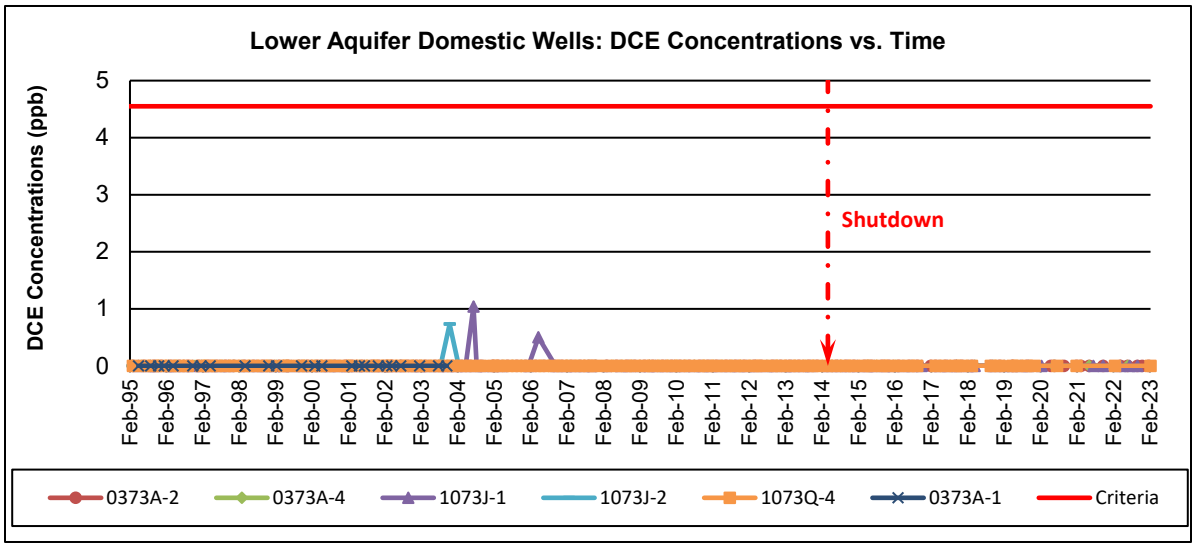


Figure 4-4 Lower Aquifer Residential Wells Concentrations vs Time





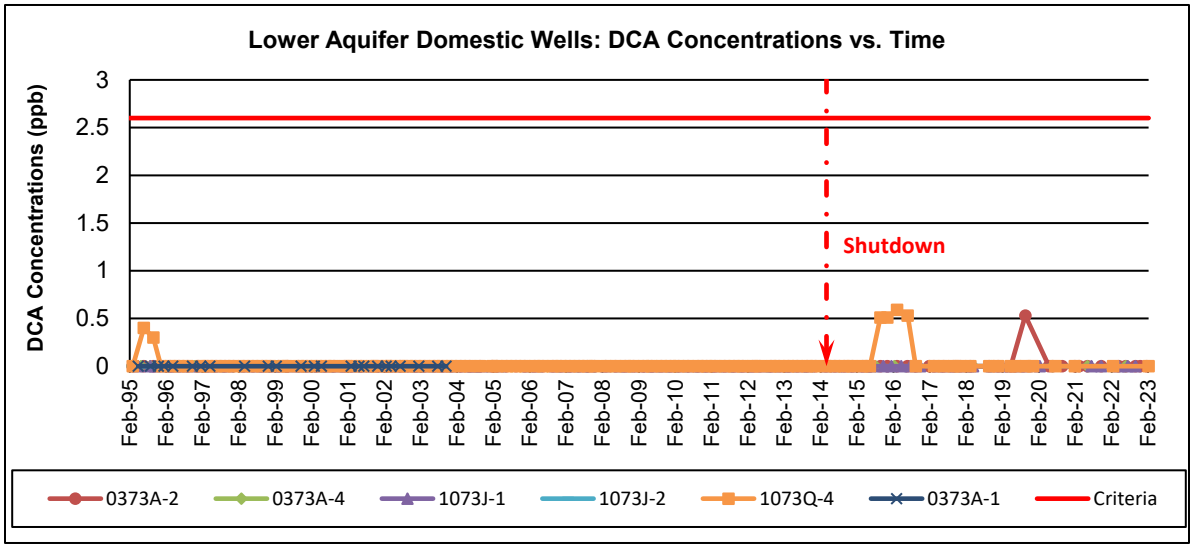
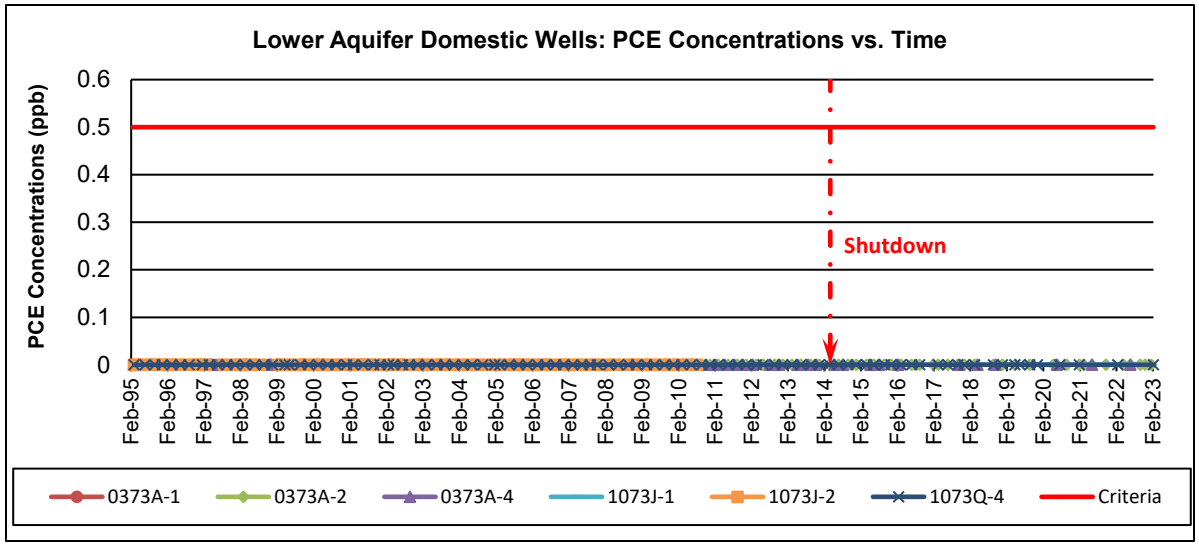
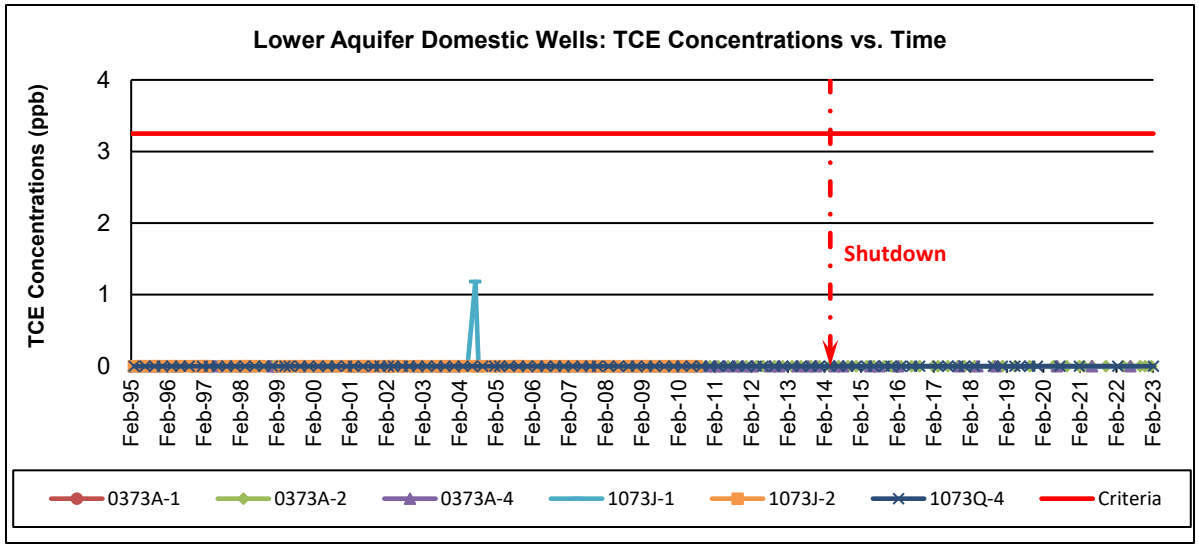


Figure 4-5 Lower Aquifer Residential Wells Concentrations vs Time





5.0 Colbert Landfill 1,4-Dioxane Sampling

During the Colbert Landfill 2019 EPA Five-Year Site Review, the EPA recommended that, "*Sampling for 1,4-Dioxane should be performed across a broader network of monitoring wells, including residential wells for at least two sampling events*" to evaluate the presence and extent of 1,4-Dioxane in post-shutdown conditions. The monitoring wells that are sampled annually for 1,4-Dioxane were selected prior to the P&T system shutdown based on sampling events conducted from 2005 – 2008, and contaminant transport/groundwater flow conditions may have changed. To evaluate the presence and extent of 1,4-Dioxane in post-shutdown conditions, Spokane County applied for a Remedial Action Grant through the Department of Ecology, and the 1,4-Dioxane sampling through the grant began in October 2021. From October 2021 to June 2023, approximately 259 1,4-Dioxane samples were collected across over 95+ wells, which will allow Spokane County to update the Colbert Landfill 1,4-Dioxane sampling plan.

5.1 Lower Aquifer 1,4-Dioxane Results

The distribution of 1,4-Dioxane in the lower aquifer appears to be more dispersed than the 1,4-Dioxane evaluation conducted from 2005 - 2008. While the increase in 1,4-Dioxane prevalence present in the lower aquifer could have been influenced by post-shutdown groundwater movement and/or contaminant transport, utilizing lower detection/quantitation limits for the 1,4-Dioxane laboratory analyses (0.01 ug/L) compared to the analyses conducted from 2005 - 2008 (up to 5 ug/L) is most likely a prominent factor. 1,4-Dioxane concentrations ranged from 0.0206 ug/l (CP-E3) to 2.54 ug/l (CP-W3) in the lower aquifer wells. 1,4-Dioxane analytical results for this reporting period are presented in Table 5-1, and Figure 5-1 shows the geospatial distribution and concentrations of 1,4-Dioxane in the lower aquifer wells. No lower aquifer wells exhibited 1,4-Dioxane concentrations that exceeded the consent decree criteria during this reporting period.

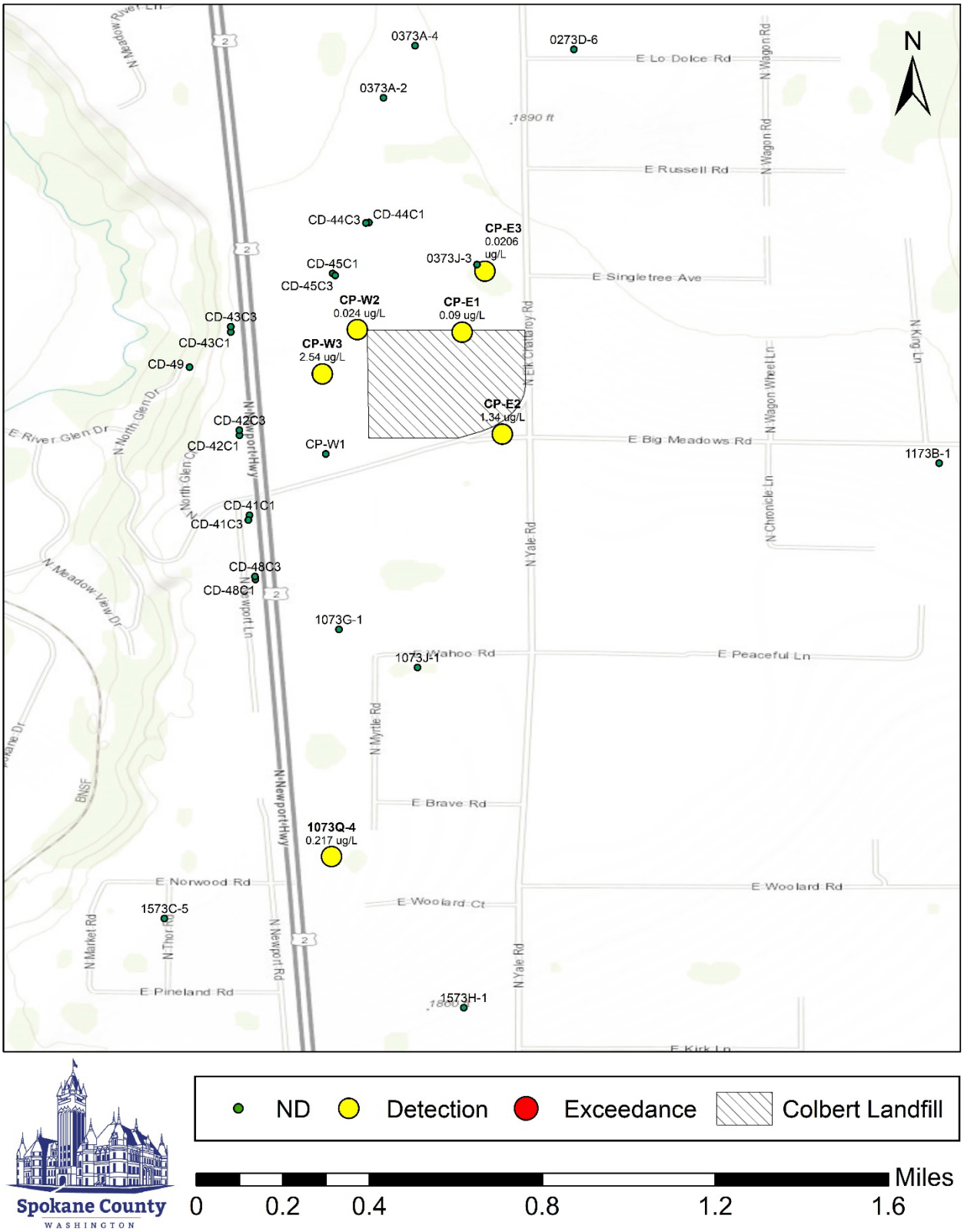
Table 5-1: Lower Aquifer 1,4-Dioxane Evaluation Results Comparison

StationID	Aquifer	SampleDate	AnalyteAbbrev	Conc	Units	Qualifier	Reporting Limit
0273D-6	lower	9/28/2022	1,4-Dioxane	0	ug/L	U	0.01
0373A-2	lower	9/28/2022	1,4-Dioxane	0	ug/L	U	0.01
0373A-4	lower	6/22/2022	1,4-Dioxane	0	ug/L	U	0.01
0373J-3	lower	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
1073G-1	lower	6/22/2022	1,4-Dioxane	0	ug/L	U	0.01
1073J-1	lower	7/13/2022	1,4-Dioxane	0	ug/L	U	0.01
1073Q-4	lower	2/7/2023	1,4-Dioxane	**0.217**	ug/L		0.01
1173B-1	lower	2/7/2023	1,4-Dioxane	0	ug/L	U	0.01

StationID	Aquifer	SampleDate	AnalyteAbbrev	Conc	Units	Qualifier	Reporting Limit
1573C-5	lower	8/24/2022	1,4-Dioxane	0	ug/L	U	0.01
1573H-1	lower	2/8/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-41C1	lower	4/11/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-41C3	lower	4/11/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-42C1	lower	4/11/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-42C3	lower	4/11/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-43C1	lower	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
CD-43C3	lower	4/11/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-44C1	lower	4/12/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-44C3	lower	4/12/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-45C1	lower	4/12/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-45C3	lower	4/12/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-48C1	lower	4/11/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-48C3	lower	4/11/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-49	lower	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
CP-E1	lower	7/12/2022	1,4-Dioxane	**0.09**	ug/L		0.01
CP-E2	lower	1/11/2023	1,4-Dioxane	**1.34**	ug/L		0.01
CP-E3	lower	7/12/2022	1,4-Dioxane	**0.0206**	ug/L		0.01
CP-W1	lower	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
CP-W2	lower	4/12/2023	1,4-Dioxane	**0.024**	ug/L		0.01
CP-W3	lower	4/12/2023	1,4-Dioxane	**2.54**	ug/L		0.01

Analytes that exceeded clean-up criteria this reporting period are displayed in **ORANGE**.

Figure 5-1: Geospatial Distribution/1,4-Dioxane Concentrations – Lower Aquifer



5.2 Upper Aquifer 1,4-Dioxane Results

As mentioned above in Section 5.1, while the increase in 1,4-Dioxane concentrations/prevalence could have been influenced by post-shutdown groundwater movement and/or contaminant transport, utilizing lower detection/quantitation limits for the 1,4-Dioxane laboratory analyses (0.01 ug/L) compared to the analyses conducted from 2005 - 2008 (up to 5 ug/L) is most likely a prominent factor.

All 5 annually sampled wells that are currently on the 1,4-Dioxane sampling plan remained consistent with their designated trends (increasing or plateauing), with the exception of the increasing trend in CP-S1 that began in April 2022. County personnel will collect additional samples to confirm 1,4-Dioxane concentrations found at these wells. 11,4-Dioxane concentrations ranged from 0.127 ug/l (1573A-1) to 10.5 ug/l (CD-36A1) in the upper aquifer wells. The only residential/monitoring well in the upper aquifer that exceeded the 1,4-Dioxane concentrations during this reporting period was CD-36A1 at 10.5 ppb. CD-36A1 has been placed on a quarterly sampling schedule to confirm concentrations and monitor COC trends. 1,4-Dioxane analytical results for the upper aquifer compliance/extraction wells are presented in Table 5-2, and Figure 5-2 shows the geospatial distribution/concentrations of 1,4-Dioxane in the lower aquifer wells.

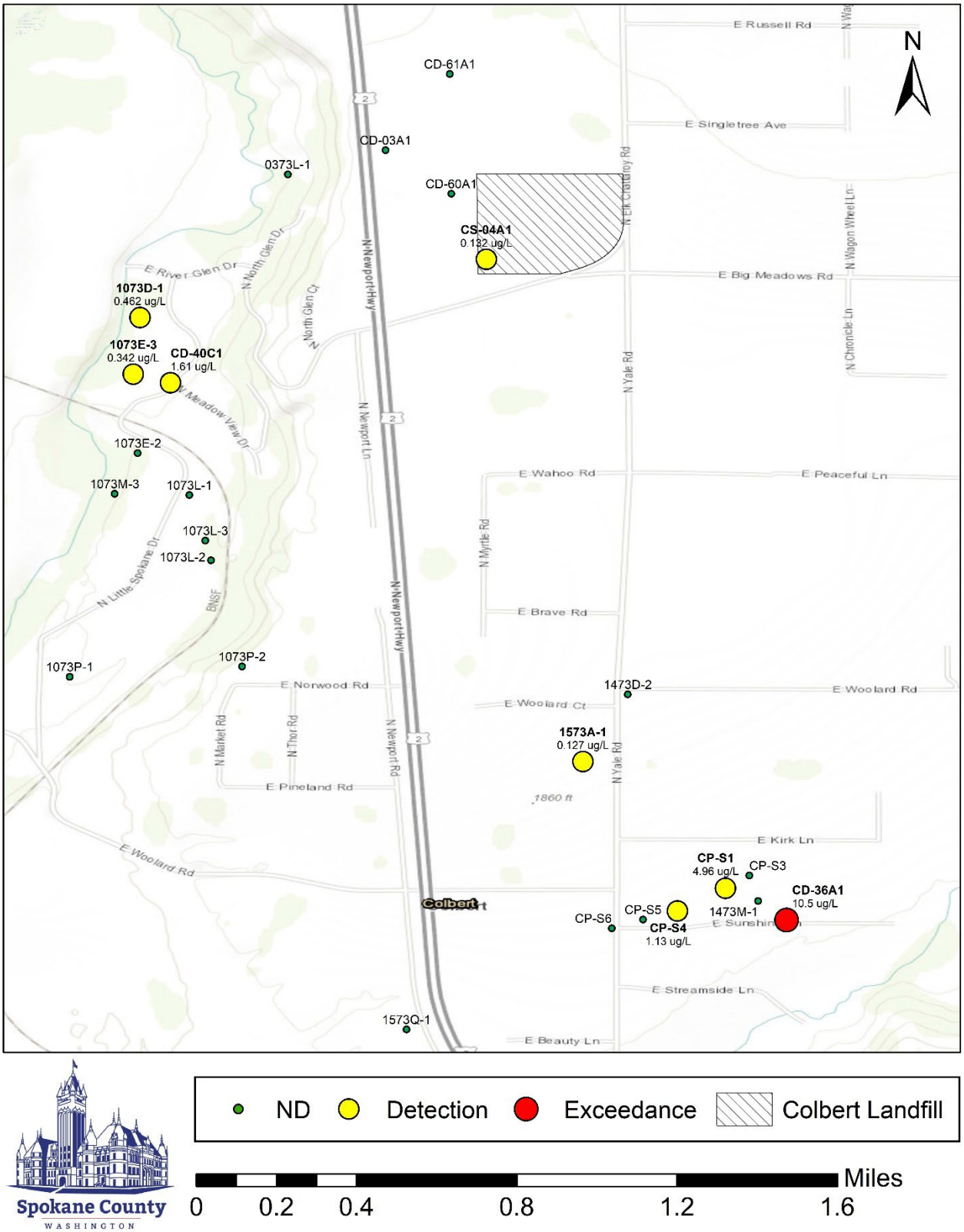
Table 5-2 Upper Aquifer 1,4-Dioxane Evaluation Results Comparison

StationID	Aquifer	SampleDate	AnalyteAbbrev	Conc	Units	Qualifier	Reporting Limit
1073E-3	upper	11/16/2022	1,4-Dioxane	**0.342**	ug/L		0.01
1073E-2	upper	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
0373L-1	upper	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
1073D-1	upper	8/24/2022	1,4-Dioxane	**0.462**	ug/L		0.01
1073L-1	upper	9/27/2022	1,4-Dioxane	0	ug/L	U	0.01
1073L-2	upper	9/27/2022	1,4-Dioxane	0	ug/L	U	0.01
1073L-3	upper	8/24/2022	1,4-Dioxane	0	ug/L	U	0.01
1073M-3	upper	6/22/2022	1,4-Dioxane	0	ug/L	U	0.01
1073P-1	upper	9/27/2022	1,4-Dioxane	0	ug/L	U	0.01
1073P-2	upper	9/28/2022	1,4-Dioxane	0	ug/L	U	0.01

StationID	Aquifer	SampleDate	AnalyteAbbrev	Conc	Units	Qualifier	Reporting Limit
1473D-2	upper	8/24/2022	1,4-Dioxane	0	ug/L	U	0.01
1473M-1	upper	7/13/2022	1,4-Dioxane	0	ug/L	U	0.01
1573A-1	upper	11/15/2022	1,4-Dioxane	**0.127**	ug/L		0.01
1573Q-1	upper	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
CD-03A1	upper	4/13/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-36A1	upper	7/12/2022	1,4-Dioxane	**10.5**	ug/L		0.01
CD-40C1	upper	11/15/2022	1,4-Dioxane	**1.61**	ug/L		0.01
CD-60A1	upper	4/13/2023	1,4-Dioxane	0	ug/L	U	0.01
CD-61A1	upper	4/13/2023	1,4-Dioxane	0	ug/L	U	0.01
CP-S1	upper	4/12/2023	1,4-Dioxane	**4.96**	ug/L		0.01
CP-S3	upper	4/12/2023	1,4-Dioxane	0	ug/L	U	0.01
CP-S4	upper	1/11/2023	1,4-Dioxane	**1.13**	ug/L		0.01
CP-S5	upper	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
CP-S6	upper	7/12/2022	1,4-Dioxane	0	ug/L	U	0.01
CS-04A1	upper	4/13/2023	1,4-Dioxane	**0.132**	ug/L		0.01

Analytes that exceeded clean-up criteria this reporting period are displayed in **ORANGE**.

Figure 5-2 Geospatial Distribution/1,4-Dioxane Concentrations – Upper Aquifer



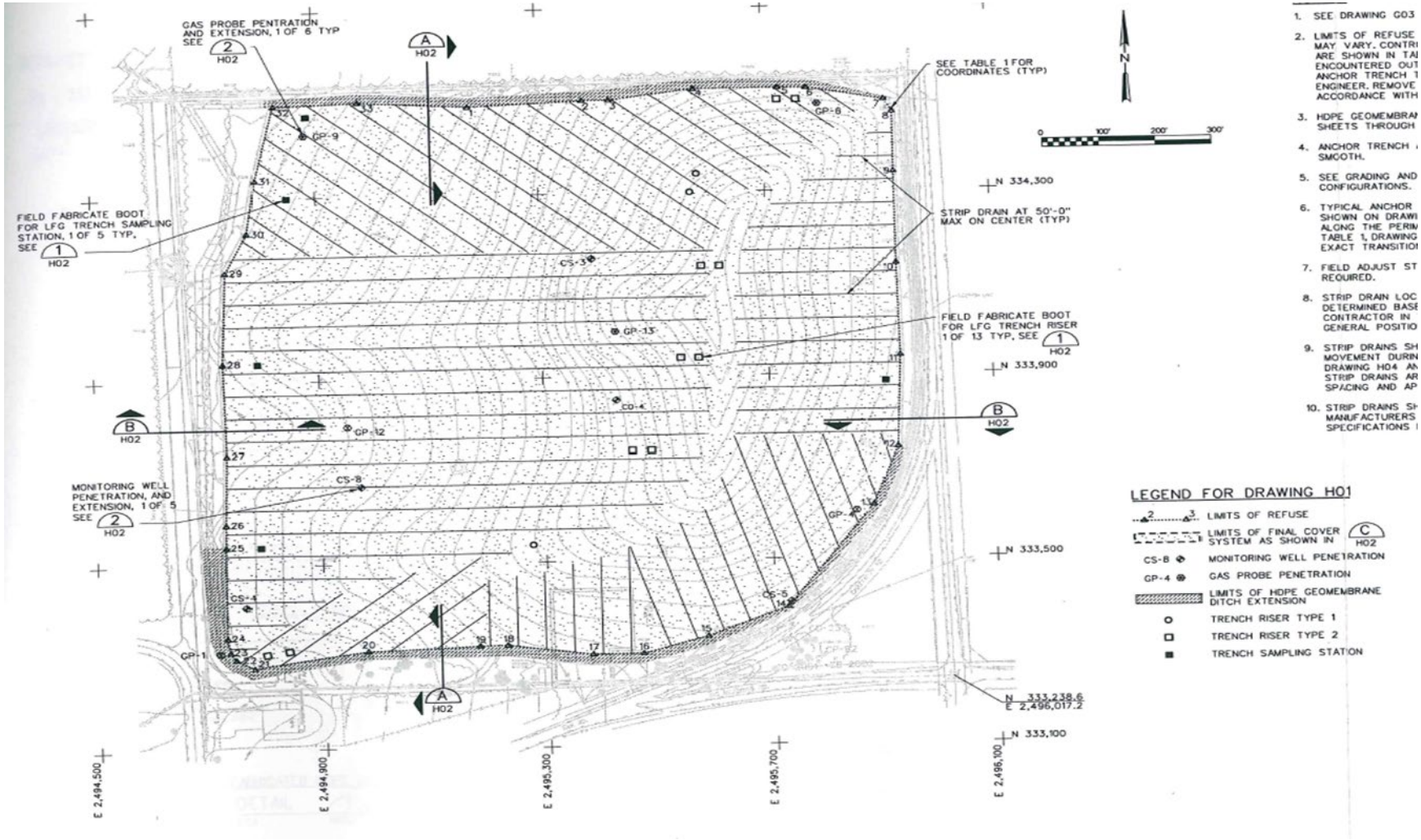
6.0 Colbert Landfill Gas System

6.1 Colbert Landfill Gas Collection System Summary

The landfill gas (LFG) system was installed to prevent off-site gas migration and to prevent build-up of gas pressure. The Colbert Landfill gas collection system uses a combination of interior and perimeter gas collection trenches connected through a main gas manifold. The Colbert Landfill gas collection system is presented in Figure 6-1.

The gas is moved toward the control system with the use of a 15-hp blower (no VFD) at the main facility. Landfill condensate is collected in both an underground storage tank and an above-ground storage tank. The amount of gas collected from each area of the interior and perimeter system is controlled through valve adjustments in the trench riser wellhead assemblies installed in each of the gas collection trenches. The overall amount of vacuum available for gas collection in the manifold is controlled by valve adjustments at the main facility. The gas collection station includes a condensate knockout vessel, a gas exhauster, several carbon adsorber vessels, and an exhaust stack. The landfill gas is passed through the carbon adsorber (granular activated carbon, or GAC) vessels to remove VOC's and is then exhausted out of the stack. Monitoring is performed at sample ports before and after the carbon vessels, at each trench riser, and at interior and perimeter gas probes.

Figure 6-1 Colbert Landfill Gas Collection System



6.2 Colbert Landfill Gas Monitoring

Monitoring for gas at the Colbert Landfill is performed at sample ports before and after the carbon vessels, at each trench riser, and at interior and perimeter gas probes. Spokane County personnel perform monthly monitoring of the gas probes and exhaust system, monthly condensate tank level checks, monthly gas fan maintenance (greasing, belt tension adjustments, etc.), and VOC analyses on an annual basis (Method TO-15). TO-15 sampling is typically conducted in the months of July or August during the reporting period. TO-15 results and the Colbert Landfill Perimeter Gas Probe results/summary are presented in Appendix A. In summary, there are only non-detections or very low concentrations of landfill gas at the perimeter gas probes.

The most recent Carbon vessel change-out was conducted on 9/1/2021, and the following landfill gas monitoring activities were conducted during this reporting period:

- Landfill gas sampling and analysis (Method TO-15) will be performed in July 2023.
- Monthly monitoring of gas probes and exhaust system.
- Monthly gas fan maintenance (greasing, belt tension adjustments, etc.)
- Quarterly monitoring of trench risers (June, October, February, and April).

<u>Other notable items include:</u>

From 2016 to 2018, County personnel collected TO-15 samples every 3 months to assess for signs of "break-out" to determine the necessary recharge intervals for the Granular Activated Carbon (GAC) units. County personnel found that changing/recharging the GAC units every 1.5 years was sufficient in ensuring effective landfill gas treatment and decreasing costs for maintaining the units. Spokane County is currently conducting an evaluation to determine if changing/recharging the units for longer periods of time (every 2 years+) would continue to ensure effective landfill gas treatment while further decreasing costs.

7.0 Landfill Operations and Maintenance

Spokane County personnel conduct O&M activities in accordance with the Colbert Landfill 1999 O&M Plan. From May 2022 through April 2023, the following O&M activities were conducted at the Colbert Landfill:

- Monthly inspections of the gas probes and exhaust system
- Monthly condensate tank levels/inspections
- Monthly gas fan maintenance (greasing, belt tension adjustments, etc.)
- Quarterly inspections of trench risers (June, October, February, and April).
- Cover and ditch weed control was ongoing throughout the growing season.

Additional O&M activities were conducted for the Colbert landfill gas system and the groundwater extraction system/extraction wells. The Colbert Landfill gas system monitoring and maintenance is described above in section 7.2. The landfill cover assessments/settlement marker surveying occur every 2 years, and are described below in section 8.1. Inspections for the P&T extraction wells are conducted on a quarterly basis. Extraction well inspection reports can be found in Appendix C and include (but are not limited to) the following:

- Sump evaluation: Hi-Float Alarm, cleaning, and pertinent notes.
- VFD evaluation: cleaning the filters, and inspecting wiring and components.
- Piping evaluation: exercising gate valves, inspect piping, inspect air/vac valve.
- Pit evaluation: inspection for leaks, checking for zero reading(s).
- PCP evaluation: inspecting wiring/relays/comp, checking indicator lights, clean filters.
- Vault evaluation: inspecting ladder bolts/rungs/lower and upper lid bolts.
- Final inspections and other pertinent notes.

All additional relevant operations and maintenance documentation (field notes summarizing field activities and results, field sheets for sampling events within the reporting period, etc.) is presented in Appendix B.

7.1 Colbert Landfill Settlement

- Spokane County installed 10 new settlement markers (CSM10 – CSM19) in June 2019 across several known areas of concern to monitor settlement on the landfill. These settlement markers will be surveyed every 2 years, and will be monitored for any additional settling that might occur on the Colbert landfill.

Figure 7-1: Colbert Landfill Settlement Marker Locations

The last settlement survey that was conducted for the Colbert landfill settlement markers occurred on 5/25/2021. The next landfill settlement survey will occur in 2024. County personnel will be attending settlement survey training during the fall of 2023 to learn how to survey the settlement markers in-house. The following table shows the difference in elevation for each settlement marker from 2019 to 2021:

Table 8-1: Settlement Elevation Summary

Settlement Marker ID	Elevation - 2021	Difference in Elevation from 2019		Difference in Elevation from 1999
CSM1	**1863.85**	**-0.020**	▼	-0.093
CSM2	**1865.26**	**-0.011**	▼	-0.063
CSM3	**1875.50**	**-0.034**	▼	-0.184
CSM4	**1869.07**	**-0.024**	▼	-0.252
CSM5	**1856.76**	**-0.012**	▼	-0.101
CSM6	**1857.11**	**-0.008**	▼	-0.328
CSM10	**1860.76**	**-0.053**	▼	N/A
CSM11	**1860.87**	**-0.107**	▼	N/A
CSM12	**1863.12**	**-0.073**	▼	N/A
CSM13	**1860.50**	**-0.148**	▼	N/A
CSM14	**1861.48**	**-0.120**	▼	N/A
CSM15	**1863.34**	**-0.121**	▼	N/A
CSM16	**1684.59**	**-0.062**	▼	N/A
CSM17	**1860.65**	**-0.043**	▼	N/A
CSM18	**1858.08**	**-0.029**	▼	N/A
CSM19	**1856.56**	**-0.024**	▼	N/A

8.0 Institutional Controls

The goal of Spokane County's Institutional Control (IC) Program is to ensure the protection of public health and the environment in the Colbert Landfill Superfund Site vicinity. Institutional Controls are defined as non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human and ecological exposure to contamination and/or protect the integrity of the remedy. Although Spokane County's IC program has proven effective since its implementation, the County created an Institutional Control Implementation and Assurance Plan (ICIAP) in March 2021 to describe the process for recordable and enforceable controls, along with the key strategies to ensure the protection of public health and the environment in the area surrounding the Colbert Landfill. The ICIAP document can be found on the Spokane County Solid Waste website. The County will conduct the following activities to ensure the success of the Institutional Controls program:

- Generate Constituent of Concern (COC) plume maps using geospatial analysis to define plume boundaries/areas of concern.

- Report plume maps/boundaries to the SRHD to establish boundaries and areas of concern regarding potential well drilling. This will ensure that if an individual/organization is interested in drilling a new well or planning a well use change, the SRHD will have boundaries/areas of concern to reference.

- Coordinate with the Spokane Regional Health District (SRHD) to investigate any individuals/ interested in drilling wells or changing a well use in any areas of concern within the annual reporting period timeframe.

- Report plume maps/boundaries to the Washington Department of Ecology (Ecology) to establish boundaries and areas of concern regarding potential well drilling. This will ensure that if an individual/organization applies for a permit to drill a new well or change an established well's use, Ecology will have boundaries/areas of concern to reference.

- Coordinate with Ecology to investigate any individuals/organizations interested in drilling wells or changing a well use in any areas of concern within the annual reporting period timeframe.

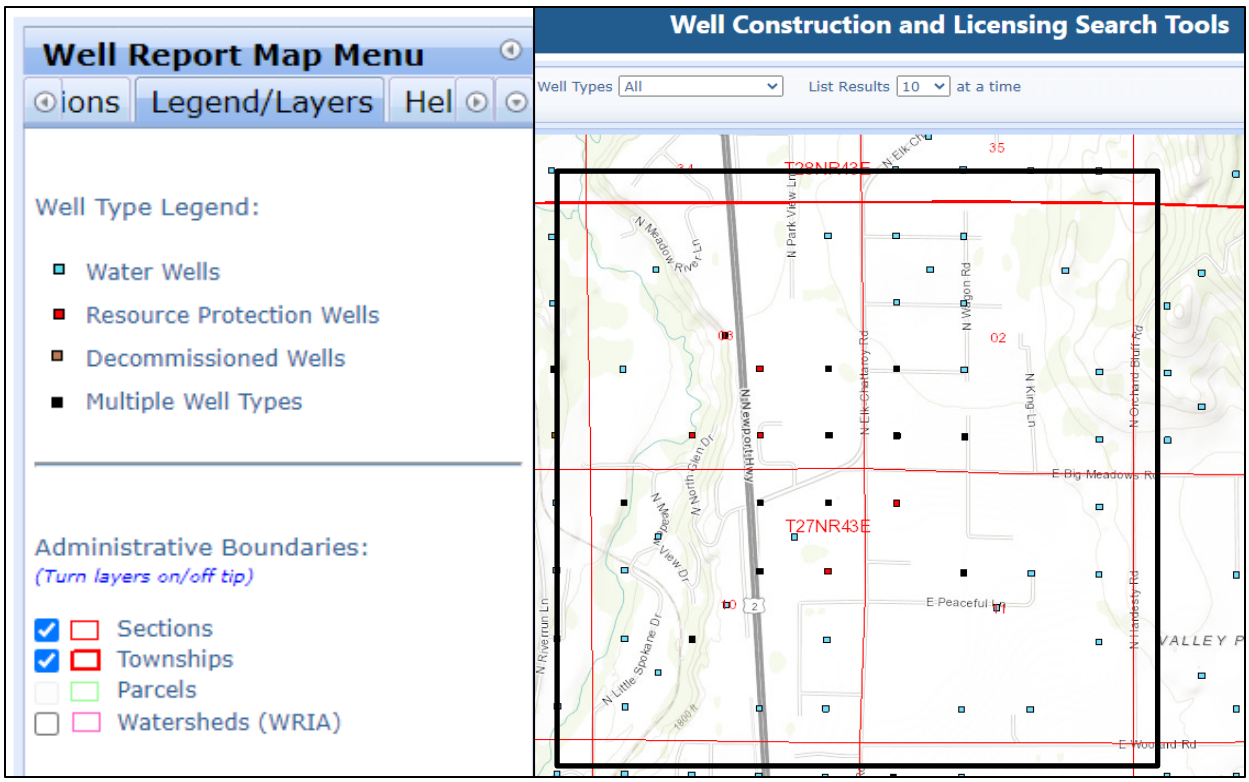
- Utilize the Well Construction and Licensing Search Tools to account for any new or unknown well construction that may have occurred near any areas of concern.

Records of IC Evaluation Activities for 2023

The following activities have been conducted/completed by Spokane County, Washington Department of Ecology, and Spokane Regional Health District personnel:

- Completed the Colbert Landfill ICIAP on March 2021/EPA fully approved the ICIAP document in June 2021.

- Spokane County personnel consulted the contamination plume maps created for 2023 and used the Washington Department of Ecology's Well Construction and Licensing Search Tools to define a search area to evaluate for new well installs/well use changes:



Spokane County personnel reviewed the most recent well data based on the listed well completion date(s), the well report received date, and well type/proximity to the plumes/landfill. Using the same search boundaries that were used in 2021/2022, County personnel did not find any new domestic wells/well reports that were added to the Department of Ecology's Well Construction and Licensing Database since investigating in 2022. All of the domestic well locations were evaluated in relation to the upper and lower aquifer plume boundaries, and all of the domestic wells were outside of the contamination plume areas of concern.

The well reports that had "blank" well completion dates/well report received dates were also investigated, and included wells with the Well Report IDs: 209225 through 209232,

209885, 209896, 209897, 209898, 209899, 294656 through 294669, 294712, and 294713. All of these wells are either Spokane County-owned wells, wells on the Colbert Landfill residential monitoring program, or decommissioned.

- Spokane County personnel sent the 2023 contamination plume maps to the Washington Department of Ecology and the Spokane Regional Health District on 6/30/2023 and inquired about their findings regarding an evaluation for new well requests/well use changes in the Colbert Landfill vicinity. The Washington Department of Ecology evaluated the wells in the area and consulted the Well Drilling Coordinator, and found no new domestic well requests. The Spokane Regional Health District also evaluated the wells in the area and consulted with the Well Inspection and Liquid Waste program, and found no recent well construction activities within the vicinity of the Colbert Landfill.

Download all 179 images | Download all 179 data records | Print this page | Need Help

Displaying well reports 176 → 179 of 179 | Sort results by: Well Completion Date | Results Per Page: 25

#	Well Details	Location Details
176. View PDF	Well Owner: **James Patterson** Well Tag ID: BJG578 Notice of Intent Number: WE25230 Group Number: Not Applicable Well Report ID: 1595068 Well Diameter: 6 in. Well Depth: 340 ft.	Tax Parcel Number: 370139029 Well Address: 22826 N Orchard Bluff Rd County: SPOKANE Public Land Survey: NW-SW / S-01 / T-27-N / R-43-E Well Type: Water / Subtype: Water Well Completion Date: 08-31-2016 Well Report Received Date: 11-10-2016
177. View PDF	Well Owner: **Lisa Burnett** Well Tag ID: BKW128 Notice of Intent Number: WE31303 Group Number: Not Applicable Well Report ID: 1785203 Well Diameter: 6 in. Well Depth: 301 ft.	Tax Parcel Number: 370139039 Well Address: N. Orchard Bluff Rd. County: SPOKANE Public Land Survey: NW-SW / S-01 / T-27-N / R-43-E Well Type: Water / Subtype: Water Well Completion Date: 07-05-2018 Well Report Received Date: 09-17-2018
178. View PDF	Well Owner: **Jeffrey Cummings** Well Tag ID: BLG858 Notice of Intent Number: WE33093 Group Number: Not Applicable Well Report ID: 1856274 Well Diameter: 6 in. Well Depth: 320 ft.	Tax Parcel Number: 383539029 Well Address: TBD County: SPOKANE Public Land Survey: SW-SW / S-35 / T-28-N / R-43-E Well Type: Water / Subtype: Water Well Completion Date: 10-09-2018 Well Report Received Date: 11-14-2018
179. View PDF	Well Owner: **Jeff and Lynn Edison** Well Tag ID: BMH798 Notice of Intent Number: WE39611 Group Number: Not Applicable Well Report ID: 1970299 Well Diameter: 6 in. Well Depth: 79 ft.	Tax Parcel Number: 383450502 Well Address: 24910 N Crescent Road County: SPOKANE Public Land Survey: SE-SW / S-34 / T-28-N / R-43-E Well Type: Water / Subtype: Water Well Completion Date: 06-26-2020 Well Report Received Date: 08-03-2020

1 2 3 4 5 6 7 **8**

Total Result Pages: 8

9.0 References

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Landau Associates. 1992. *Quality Assurance Project Plan - Phase II Remedial Design/Remedial Action - Colbert Landfill - Spokane, WA*. February 28.

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EPA. 2011. Colbert Landfill Superfund Site Spokane County, Washington. *Remediation System Evaluation*. U.S. Environmental Protection Agency. October 14.

Landau Associates. 1998. *Colbert Landfill Operations and Maintenance Manual*.

Landau Associates. 1996. *MFS Groundwater Monitoring Plan*

Spokane County Utilities/ Landau Assoc. 2013. *Final Work Plan, Groundwater Pump and Treat System Shut-down Test, Colbert Landfill CERCLA Site.*

Spokane County Utilities. 2007.*1,4-Dioxane Work Plan for the Colbert Landfill*

Spokane County Utilities. 1991*. Quality Assurance and Field Sampling Plan-Colbert Residential Well Sampling*

CH2MHill. May 1997*. Operations and Maintenance Manual for Colbert Landfill Closure*

U.S District Court, Eastern District of Washington. 1988. Consent Decree No. C-89-033-RJM. The Washington State Department of Ecology and The United States of America on behalf of the U.S. Environmental Protection Agency (plaintiffs) v. County of Spokane and Key Tronic Corporation (defendants). February 28.

Appendix A

Colbert Landfill Perimeter Gas Probe and TO-15 Results

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.74

Tech: MT **Calibration:** Zeroed CH4 to AB air CALGAS-> CH4 reading 14.8% cal to 15.0%; CO2 reading 15.8% cal to 15.0%; zeroed O2 to CALGAS-> O2 reading 20.8% AB air cal to 20.9% **FanFlow:** 42 **Weather** Cloudy 50's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0001L	10/21/2022		0	3.4	17	79.6	0	-0.02	
CGP0001L	5/4/2023		0	2.4	17.2	80.4	0	0	
CGP0001L	3/6/2023		0	2.3	17.9	79.8	0	0	
CGP0001L	4/5/2023		0	2.2	17.7	80	0	0	
CGP0001L	1/19/2023		0	2.6	17.1	80.3	0	0.1	
CGP0001L	11/9/2022		0	2.7	18.2	79.1	0	0	
CGP0001L	8/18/2022		0	2.7	16.5	80.8	0	0	
CGP0001L	7/27/2022		0	2.9	15.8	81.3	0	-0.01	
CGP0001L	6/1/2022		0	2.3	16.8	80.9	0	0	
CGP0001L	2/6/2023		0	2.4	17.6	80	0	0.34	
CGP0001U	8/18/2022		0	5.7	5.9	88.4	0	0	
CGP0001U	7/27/2022		0	5.3	12.1	82.6	0	-0.03	
CGP0001U	5/4/2023		0	5.5	6.2	88.3	0	0	
CGP0001U	10/21/2022		0	6.6	13.3	80.1	0	-0.02	
CGP0001U	11/9/2022		0	0.1	21.1	78.8	0	0	
CGP0001U	2/6/2023		0	5.7	6.3	88	0	0.08	
CGP0001U	1/19/2023		0	6	13.5	80.5	0	-0.01	
CGP0001U	4/5/2023		0	5.6	6.2	88.2	0	0	
CGP0001U	3/6/2023		0	5.6	6.3	88.1	0	-0.02	
CGP0001U	6/1/2022		0	5.2	13.3	81.5	0	0	
CGP0002L	1/19/2023		0	6.7	12.9	80.4	0	-0.01	
CGP0002L	6/1/2022		0	6	13.2	80.8	0	0	
CGP0002L	5/4/2023		0	6.6	5.7	87.7	0	-0.01	
CGP0002L	4/5/2023		0	6.7	5.8	87.5	0	0	
CGP0002L	2/6/2023		0	6.6	5.9	87.5	0	0	
CGP0002L	12/7/2022		0	7	11.9	81.1	0	-0.06	
CGP0002L	11/9/2022		0	7	12.9	80.1	0	-0.06	
CGP0002L	10/21/2022		0	6.6	13.3	80.1	0	0	
CGP0002L	8/18/2022		0	5.2	6.8	88	0	0	
CGP0002L	7/27/2022		0	4.9	13.9	81.2	0	-0.02	
CGP0002L	3/6/2023		0	6.7	5.8	87.5	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.1

Tech: MT **Calibration:** Zeroed CH4 to AB air CALGAS -> CH4 reading 14.9, cal to 15.0%; CO2 reading 15.1 cal to 15.0%; Zeroed O2 to CALGAS -> O2 reading 20.8 cal to 20.9% AB air **FanFlow:** 56 **Weather** Clear hot 90's

Equipment: GEM 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0002U	7/27/2022		0	1.8	18.2	80	0	-0.01	
CGP0002U	5/4/2023		0	1.9	18	80.1	0	0	
CGP0002U	4/5/2023		0	1.5	18.7	79.8	0	0	
CGP0002U	1/19/2023		0	1.3	19.1	79.6	0	0	
CGP0002U	2/6/2023		0	1.2	19.2	79.6	0	0	
CGP0002U	12/7/2022		0	1.6	18.8	79.6	0	0	
CGP0002U	11/9/2022		0	1.7	19.1	79.2	0	0	
CGP0002U	10/21/2022		0	1.7	19	79.3	0	-0.01	
CGP0002U	8/18/2022		0	1.4	18.9	79.7	0	0	
CGP0002U	3/6/2023		0	1.2	19.3	79.5	-0.1	0.02	
CGP0002U	6/1/2022		0	1.6	18.2	80.2	0	-0.01	
CGP0003L	7/27/2022		0	7.5	10.6	81.9	0	-0.01	
CGP0003L	10/21/2022		0	9.3	10.5	80.2	0	-0.01	
CGP0003L	11/9/2022		0	9.9	10.1	80	0	-0.03	
CGP0003L	12/7/2022		0	10.2	7	82.8	0	-0.12	
CGP0003L	2/6/2023		0	9.4	4.4	86.2	0	0	
CGP0003L	1/19/2023		0	9.5	9.8	80.7	0	0.02	
CGP0003L	3/6/2023		0	9.7	4.2	86.1	0	0.07	
CGP0003L	6/1/2022		0	8.8	9.7	81.5	0	-0.03	
CGP0003L	4/5/2023		0	9.6	4.2	86.2	0	0	
CGP0003L	5/4/2023		0	9.4	4.2	86.3	0	0	
CGP0003L	8/18/2022		0	7.9	5.4	86.7	0	0	
CGP0003U	4/5/2023		0	1	19.2	79.8	0	0	
CGP0003U	6/1/2022		0	1.3	18.2	80.5	0	0	
CGP0003U	7/27/2022		0	1.7	17.4	80.9	0	0	
CGP0003U	8/18/2022		0	2.5	17.8	79.7	0	0	
CGP0003U	10/21/2022		0	2.1	18.5	79.4	0	0	
CGP0003U	3/6/2023		0	0.9	19.7	79.4	0	0	
CGP0003U	12/7/2022		0	1.1	19.4	79.5	0	-0.01	
CGP0003U	2/6/2023		0	1	19.4	79.6	0	0.08	
CGP0003U	1/19/2023		0	1	19.5	79.5	0	-0.02	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.29

Tech: CC **Calibration:** Zeroed CH4 to AB air CALGAS-> CH4 reading 14.7% calib 15.0%; CO2 reading 14.9% calib to 15.0%; Zeroed O2 to CALGAS-> O2 reading 20.6% AB air cal to 20.9% **FanFlow:** 37 **Weather** PC 50's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0003U	5/4/2023		0	1.5	18.3	80.1	0	0	
CGP0003U	11/9/2022		0	1.8	19.5	78.7	0	-0.01	
CGP0004L	7/27/2022		0	4.1	14.3	81.6	0	-0.01	
CGP0004L	8/18/2022		0	4.1	6.9	89	0	-0.02	
CGP0004L	10/21/2022		0	5.8	13.4	80.8	0	-0.02	
CGP0004L	11/9/2022		0	4.7	15.7	79.6	0	-0.02	
CGP0004L	12/7/2022		0	7.7	11.2	81.1	0	0	
CGP0004L	2/6/2023		0	5.4	6.5	88.1	0	-0.01	
CGP0004L	1/19/2023		0	5.4	14.1	80.5	0	0	
CGP0004L	3/6/2023		0	4.7	6.8	88.5	0	-0.03	
CGP0004L	6/1/2022		0	5.2	13.3	81.5	0	-0.01	
CGP0004L	5/4/2023		0	6.9	5.3	87.8	0	0	
CGP0004L	4/5/2023		0	6.4	5.7	87.9	0	0	
CGP0004U	10/21/2022		0	3.5	16.4	80.1	0	-0.01	
CGP0004U	11/9/2022		0	3.6	16.7	79.7	0	0	
CGP0004U	7/27/2022		0	2.6	16	81.4	0	0	
CGP0004U	2/6/2023		0	3.4	7.2	89.4	0	0.16	
CGP0004U	8/18/2022		0	3.5	16	80.5	0	0	
CGP0004U	4/5/2023		0	3.5	6.9	89.6	0	0	
CGP0004U	3/6/2023		0	3.7	6.9	89.4	0	0.07	
CGP0004U	5/4/2023		0	3.7	6.9	89.4	0	0	
CGP0004U	1/19/2023		0	3.4	16.1	80.5	0	0	
CGP0004U	6/1/2022		0	3	15.8	81.2	0	0	
CGP0005L	6/1/2022		0	5.6	11.3	83.1	0	-0.03	
CGP0005L	5/4/2023		0	7.2	4.2	88.6	0	-0.01	
CGP0005L	3/6/2023		0	7.5	4	88.5	-0.1	0.13	
CGP0005L	4/5/2023		0	6.7	4.3	89	0	0	
CGP0005L	1/19/2023		0	0.7	19.3	80	0	-0.01	
CGP0005L	2/6/2023		0	8.2	3.2	88.6	0	0	
CGP0005L	12/7/2022		0	10.7	4.2	85.1	0	0	
CGP0005L	11/9/2022		0	7.9	10.4	81.7	0	-0.06	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.74

Tech: MT **Calibration:** Zeroed CH4 to AB air CALGAS-> CH4 reading 14.8% cal to 15.0%; CO2 reading 15.8% cal to 15.0%; zeroed O2 to CALGAS-> O2 reading 20.8% AB air cal to 20.9% **FanFlow:** 42 **Weather** Cloudy 50's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0005L	10/21/2022		0	7.8	9.9	82.3	0	-0.04	
CGP0005L	7/27/2022		0	4.1	13	82.9	0	-0.02	
CGP0005L	8/18/2022		0	5.1	16.5	78.4	0	-0.01	
CGP0005U	8/18/2022		0	1.5	18.4	80.1	0	0	
CGP0005U	6/1/2022		0	1.2	17.9	80.9	0.1	-0.01	
CGP0005U	7/27/2022		0	1.2	17.3	81.5	0	0	
CGP0005U	3/6/2023		0	1.2	19.1	79.7	0	0	
CGP0005U	10/21/2022		0	2.5	16.4	81.1	0	-0.03	
CGP0005U	11/9/2022		0	2	18.7	79.3	0	-0.02	
CGP0005U	12/7/2022		0	2.3	16.9	80.8	0	0.01	
CGP0005U	2/6/2023		0	1.2	18.2	80.6	0	-0.01	
CGP0005U	1/19/2023		0	7.3	7.9	84.8	0	-0.03	
CGP0005U	4/5/2023		0	1.3	18.7	80	0	0.01	
CGP0005U	5/4/2023		0	2.1	16.9	81	0	0	
CGP0007L	6/1/2022		0	0.6	19.5	79.9	0	-0.02	
CGP0007L	2/6/2023		0	1	19.6	79.4	0	0	
CGP0007L	5/4/2023		0	0.9	19.5	79.5	0	0	
CGP0007L	1/19/2023		0	0.8	19.9	79.3	0	-0.01	
CGP0007L	12/7/2022		0	1.3	19.1	79.6	0	-0.19	
CGP0007L	11/9/2022		0	1.1	20	78.9	0	-0.01	
CGP0007L	10/21/2022		0	1.1	19.6	79.3	0	0	
CGP0007L	8/18/2022		0	1.8	19.2	79	0	-0.02	
CGP0007L	7/27/2022		0	0.6	18.8	80.6	0	0	
CGP0007L	3/6/2023		0	0.9	19.8	79.3	0	-0.01	
CGP0007L	4/5/2023		0	0.8	19.9	79.3	0	0	
CGP0007U	7/27/2022		0	2.1	16.5	81.4	0	-0.03	
CGP0007U	3/6/2023		0	5	6.5	88.5	0	0.1	
CGP0007U	6/1/2022		0	2.7	16.2	81.1	0	-0.02	
CGP0007U	8/18/2022		0	1.1	20.2	78.7	0	-0.01	
CGP0007U	10/21/2022		0	4	15.3	80.7	0	-0.02	
CGP0007U	11/9/2022		0	4.2	15.6	80.2	0	-0.07	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.98

Tech: CC **Calibration:** Zeroed CH4 to AB air -> CALGAS CH4 reading 14.8% calibrated to 15.0%; CO2 reading 14.9% calibrated to 15.0%;zeroed O2 to CALGAS -> O2 reading 20.8% to AB **FanFlow:** 41 **Weather** Cloudy Low 30's

Equipment: GEM 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0007U	12/7/2022		0	5.6	13.1	81.3	0	0	
CGP0007U	2/6/2023		0	5.1	6.5	88.4	0	0	
CGP0007U	1/19/2023		0	4.9	14.5	80.6	0	-0.01	
CGP0007U	4/5/2023		0	4.4	6.7	88.9	0	0	
CGP0007U	5/4/2023		0	4.2	6.7	89	0	0	
CGP0010L	10/21/2022		0	6.4	12.1	81.5	0	0	
CGP0010L	6/1/2022		0	4.4	13.2	82.4	0	-0.02	
CGP0010L	3/6/2023		0	4.9	6.4	88.7	-0.2	0.27	
CGP0010L	4/5/2023		0	4.9	6.1	89	0	0	
CGP0010L	12/7/2022		0	6.5	12.5	81	0	0	
CGP0010L	11/9/2022		0	6.5	12.8	80.7	0	-0.02	
CGP0010L	8/18/2022		0	5.7	5.1	89.2	0	-0.02	
CGP0010L	7/27/2022		0	4.3	12.5	83.2	0	-0.03	
CGP0010L	5/4/2023		0	5.1	5.8	89.1	0	0	
CGP0010L	2/6/2023		0	5.2	6.3	88.5	0	0.14	
CGP0010L	1/19/2023		0	5.1	13.9	81	0	-0.01	
CGP0010U	8/18/2022		0	2.1	17.7	80.2	0	0	
CGP0010U	3/6/2023		0	1.1	19.3	79.6	0	0	
CGP0010U	7/27/2022		0	2.2	16.1	81.7	0	-0.02	
CGP0010U	10/21/2022		0	3	16.7	80.3	0	0	
CGP0010U	11/9/2022		0	2.7	17.7	79.6	0	-0.05	
CGP0010U	12/7/2022		0	2.5	17.5	80	0	-0.05	
CGP0010U	1/19/2023		0	1.5	18.5	80	0	0	
CGP0010U	4/5/2023		0	1.4	18.3	80.3	0	0	
CGP0010U	2/6/2023		0	1.6	18.4	80	0	0	
CGP0010U	5/4/2023		0	2.2	7.4	90.4	0	0	
CGP0010U	6/1/2022		0	1.8	16.8	81.4	0	0	
CGP0011L	4/5/2023		0	0.2	20.5	79.3	0	0	
CGP0011L	6/1/2022		0	0.3	19.5	80.2	0	-0.03	
CGP0011L	7/27/2022		0	0.2	19.3	80.5	0	0	
CGP0011L	8/18/2022		0	1.1	19.2	79.7	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.74

Tech: MT **Calibration:** Zeroed CH4 to AB air CALGAS-> CH4 reading 14.8% cal to 15.0%; CO2 reading 15.8% cal to 15.0%; zeroed O2 to CALGAS-> O2 reading 20.8% AB air cal to 20.9% **FanFlow:** 42 **Weather** Cloudy 50's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Press	Diff. Press.	Comments
CGP0011L	10/21/2022		0	1.2	19	79.8	0	0	
CGP0011L	11/9/2022		0	0.3	20.9	78.8	0	-0.04	
CGP0011L	3/6/2023		0	0.2	20.6	79.2	0	0	
CGP0011L	5/4/2023		0	0.7	19.4	79.9	0	0	
CGP0011L	2/6/2023		0	0.3	20.6	79.1	0	0	
CGP0011L	12/7/2022		0	0.5	20.4	79.1	0	-0.02	
CGP0011L	1/19/2023		0	0.2	20.7	79.1	0	0.08	
CGP0011U	3/6/2023		0	3.4	16.9	79.7	0	0	
CGP0011U	7/27/2022		0	3.1	14.3	82.6	0	0	
CGP0011U	8/18/2022		0	2.9	15.9	81.2	0	0	
CGP0011U	10/21/2022		0	1.9	15.7	82.4	0	0	
CGP0011U	11/9/2022		0	5.2	14.2	80.6	0	0	
CGP0011U	1/19/2023		0	3.6	16.4	80	0	0	
CGP0011U	4/5/2023		0	3	16.8	80.2	0	0	
CGP0011U	5/4/2023		0	3.2	7	89.7	0	0	
CGP0011U	2/6/2023		0	3.7	16.3	80	0	0	
CGP0011U	6/1/2022		0	2.9	15.2	81.9	0	-0.03	
CGP0011U	12/7/2022		0	4.9	15.2	79.9	0	0	

Appendix B

Colbert Annual Sampling Field Sheets/Paperwork

COC COLBERT ANNUAL GROUNDWATER SAMPLING
2022

LABORATORY:
SVL ANALYTICAL
ONE GOVERNMENT GULCH
KELLOGG, ID 83837-0929
(208) 784-1258

COLBERT LANDFILL
SPOKANE COUNTY ENVIROMENTAL
22515 N. ELK-CHATTAROY RD.
COLBERT , WA 99005
(509) 238-6607 FAX:(509)238-6812

Tracking #: K2672252565
Shipping Co.: UPS
No. Coolers: 1

DATE: 4/13/2023
PAGE 1 OF 1

PARAMETERS:			TOC / COD AMMONIA	CHLORIDE/NITRATE NITRITE/SULFATE	METALS Fe,Mn,Zn	SAMPLERS: Gordie Fisette, Craig Campbell		
CONTAINERS:			1-500 ml POLY BOTTLE	1-500 ml POLY BOTTLE	1-500 ml POLY BOTTLE			
PRESERVATION:			H2SO4 to pH<2	UNPRESERVED	HNO3 to pH < 2 field filtered			
HOLDING TIME:			28 days	28 days/48 hrs 48 hrs/28 days	6 months			
METHOD:			415.1 / 410.1 350.1	300.0 /300.0 354.1 /300.0	6010	COOLER NUMBER	# BOTTLES	COMMENTS:
Sample ID:	Date:	Time:						
CD-03A1-230413	4/13/2023	1011				4	3	
CS-04A1-230413	4/13/2023	1157				4	3	
CD-60A1-230413	4/13/2023	1023				4	3	
CD-61A1-230413	4/13/2023	843				4	9	MS/MSD
CD-51-230413	4/13/2023	1004				4	3	

RELINQUISHED BY:
Signature: Mike S Terris
Print Name: Mike S Terris
Spokane County Uitilites Landfill Closure
Date: 4/13/2023
Time: 1500

RECEIVED BY:
Signature:
Print Name:
Company:
Date:
Time:

COMMENTS: Please email a sample condition report to Mike and Austin ASAP; mterris@spokanecounty.org & astewart@spokanecounty.org

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: M. TERRIS
StationID: CD-31A1
Weather: CLOUDY LOW 40'S SW WIND
Sample ID: CD-31A1-230411
Purge Method: Disp. bailer, Ded. Grundfos, (Ded. Bladder), Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: -NA-

Well Depth: 110
Screens from: 103 To 108
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
(2.5)	(0.26)
4	0.66
6	1.5
8	2.6

Depth to Water: 93.97'
Water Column Depth: 16.03' x Gallons per linear foot: 5/~~8.16~~ 4.16 = Calc. Purge vol./casing vol.: 4.16 GAL x3 well volumes = Total Purge Vol. (gal): 15 GAL

Purge Rate:
Purge Begin Time: 0915

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0934	5 GAL	7.61	652	10.7		CLEAR
0959	10 GAL	7.60	654	10.4		CLEAR
1019	15 GAL	7.60	655	10.3		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.17	(must meet criteria within 3 consecutive measurements)

Sample Time: 1020
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 472990	S/N 24B	(S/N 940700005619)
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: M. TERRIS
StationID: CD-34A1
Weather: CLOUDY, SW WIND Low 40's
Sample ID: CD-34A1-230411
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: -NA-

Well Depth: 110
Screens from: 100 To 110
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 98.01
Water Column Depth: 11.99 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 3.11 = 35 GAL x3 well volumes = Total Purge Vol. (gal): 10.5 ~~11.0~~ GAL

Purge Rate:
Purge Begin Time: 0800

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0819	3.5GAL	7.52	612	10.9		CLEAR
0829	7.0GAL	7.49	613	10.8		CLEAR
0844	~~11.0GAL~~ 10.5G	7.51	612	10.		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		029	(must meet criteria within 3 consecutive measurements)

Sample Time: 0845
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 472990	S/N 248	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23 | Field Personnel: M. TERRIS

StationID: CD-36A1 | Weather: PCLOUDY LOW 50'S LTSW

Sample ID: CD-36A1-230411 | Purge Method: Disp. bailer, Ded. Grundfos, (Ded. Bladder), Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: NA

Well Depth: 102 | Screens from: | To | Casing Size (in): 2.5

Depth to Water: 90.42

= Water Column Depth: 11.58 x Gallons per linear foot: 2.5 = Calc. Purge vol./casing vol.: 3.5G / 3.018 x3 well volumes = Total Purge Vol. (gal): 11.0 GAL

Purge Rate: | Purge Begin Time: 1400

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1413	3.5G	7.53	580	12.1		BLACKISH
1426	7.0G	7.56	583	11.9		CLEAR
1439	10.5G	7.55	583	11.7		CLEAR
Stabilization Criteria:	✓OK	+/- 0.1 unit	+/- 5%		0.61	(must meet criteria within 3 consecutive measurements)

Sample Time: 1445 | QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 472990	S/N 24B	S/N 940700005619
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: M. TERRIS
StationID: CD-37A1
Weather: P. CLOUDY Low 50's SW WIND
Sample ID: CD-37A1-230411
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 104
Screens from: To
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 90.87'
= Water Column Depth: 13.13 -x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 3.50 / 3.41 x3 well volumes = Total Purge Vol. (gal): 10.50G

Purge Rate:
Purge Begin Time: 1220

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1234	3.5G	7.29	680	10.8		CLEAR
1252	7.0G	7.27	675	10.7		CLEAR
1307	10.5G	7.26	674	10.8		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.13	(must meet criteria within 3 consecutive measurements)

Sample Time: 1310
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 472990	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: M. TERRIS
StationID: CD-38A1
Weather: CLOUDY, LOW 40S SW WIND
Sample ID: CD-38A1-230411
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 111
Screens from: To
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 90.99'
Water Column Depth: 20.01 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 5 GAL / 4.99 x3 well volumes = Total Purge Vol. (gal): 15 GAL

Purge Rate:
Purge Begin Time: 1045

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1104	5 GAL	7.57	575	10.6		CLEAR
1133	10 GAL	7.56	574	10.5		CLEAR
1156	15 GAL	7.58	571	10.4		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.18	(must meet criteria within 3 consecutive measurements)

Sample Time: 1200
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH100	Meter: EcTestr	Hach 2100P
S/N 472990	S/N 11+	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: GF, CC
StationID: CD-41C1
Weather: Cloudy cc
Sample ID: CD-41C1-230411
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES ~~40, Port. Grundfos, Port. Bennet~~, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 233
Screens from: 214 To 233
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 177.51
Water Column Depth: 55.49 -x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 14.43 ↘ 15 x3 well volumes = Total Purge Vol. (gal): 45

Purge Rate: 2.6
Purge Begin Time: 1440

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1446	15	7.98	404	11.6		Clear
1452	30	7.98	407	11.5		Clear
1458	45	7.97	404	11.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.15	(must meet criteria within 3 consecutive measurements)

Sample Time: 1459
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr	Hach 2100P
S/N 476432	S/N 7816	S/N 940700005619/ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23

Field Personnel: GF, CC

StationID: CD-41C2

Weather: Cloudy

Sample ID: CD-41C2-230411

Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID:

Well Depth: 291 Screens from: 271 To 291 Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 177.98

= Water Column Depth: 113.02 -x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 29.39 ↘ 30 x3 well volumes = Total Purge Vol. (gal): 90

Purge Rate: 2.82.4

Purge Begin Time: 1355 1019

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1030	30	8.08 7.94	419 471	11.4 11.5		Clear
1041	60	8.07	417	11.6		Clear
1052	90	8.07	415	11.5		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.24	(must meet criteria within 3 consecutive measurements)

Sample Time: 1435

QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11	Hach 2100P
S/N 476432	S/N 7810	S/N 940700005619/ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23

Field Personnel: GF, CC

StationID: CD-41C3

Weather: Cloudy

Sample ID: CD-41C3 -230411

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ~~ES 40~~, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: N/A

Well Depth: 403

Screens from: 384 To 403

Casing Size (in): 2.5

Depth to Water: 178.09

Water Column Depth: 224.91 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 58.47 ↘ 60 x3 well volumes = Total Purge Vol. (gal): 180

Purge Rate: 2 ~~4~~ 2.6

Purge Begin Time: 1350 ~~1015~~

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1414 ~~1040~~	60	7.94	460	11.7		Clear
1438 ~~1105~~	120	7.94	464	11.8		Clear
1502 ~~1130~~	180	7.93	459	11.8		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.22	(must meet criteria within 3 consecutive measurements)

Sample Time: 1503

QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr 11	Hach 2100P
S/N 476432	S/N 7810	S/N 940700005619/ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: GF, CC
StationID: CD-42C1
Weather: Rain, on/off
Sample ID: CD-42C1-230411
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 227
Screens from: 208 To 227
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 174.51
Water Column Depth: 52.49 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 13.64 ↘ 15 x3 well volumes = Total Purge Vol. (gal): 45

Purge Rate: 2.5
Purge Begin Time: 1107

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1113	15	7.92	460	11.5*		Clear
1119	30	7.91	458	11.7*		Clear
1125	45	7.90	477	11.6*		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.72	(must meet criteria within 3 consecutive measurements)

Sample Time: 1126
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Tester	Hach 2100P
S/N 781476432	S/N 476432 7810	S/N 9407000056619/ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

* Temps approximated from CD-42C2, as unlisted. CC

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23

Field Personnel: GF, CC

StationID: CD-42C2

Weather: Rain, on/off

Sample ID: CD-42C2 ~~-Z~~30411

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: N/A

Well Depth: 312

Screens from: 293 To 312

Casing Size (in): 2.5

Depth to Water: 174.31

Water Column Depth: 137.69 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 35.79 ↘ 40 x3 well volumes = Total Purge Vol. (gal): 120

Purge Rate: 2-8

Purge Begin Time: 1019

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1030	30	7.94	471	11.5		Clear
1041	60	7.93	465	11.7		Clear
1052	90	7.95	464	11.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.66	(must meet criteria within 3 consecutive measurements)

Sample Time: 1053

QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr	Hach 2100P
S/N 476432	S/N 7810	S/N 23474 ~~940700006619~~/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: GF, CC
StationID: CD-42C3
Weather: Rain, on/off
Sample ID: CD-42C3-230411
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 402
Screens from: 383 To 402
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 174.01
Gallons per linear foot:
Calc. Purge vol./casing vol.:
Total Purge Vol. (gal)
= Water Column Depth: 227.99 x 0.26 = 59.28 x3 well volumes = 180

Purge Rate: 2-4
Purge Begin Time: 1015

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1040	60	7.94	384	12.3		Clear
1105	120	8.01	395	12.2		Clear
1130	180	8.02	407	12.4		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.48	(must meet criteria within 3 consecutive measurements)

Sample Time: 1131
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: ELTestr1	Hach 2100P
S/N 476432	S/N 7810	S/N 940700005619/23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23 **Field Personnel:** GF, CC

StationID: CD-43C1 **Weather:** Rain, on / off

Sample ID: CD-43C1-230411 **Purge Method:** Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: N/A

Well Depth: 230 **Screens from:** 211 **To** 230 **Casing Size (in)** 2.5

Depth to Water: 171.58

Water Column Depth: 58.42 x **Gallons per linear foot:** 0.26 = **Calc. Purge vol./casing vol.:** 15.19 ≈ 16 x3 well volumes = **Total Purge Vol. (gal)** 48

Purge Rate 2.5 **Purge Begin Time** 0905

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0912	16	7.98	461	10.6		Clear
0919	32	7.98	464	10.3		Clear
0926	48	7.98	469	10.3		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.67	(must meet criteria within 3 consecutive measurements)

Sample Time: 0927 **QAQC Sample Time:** N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr 11	Hach 2100P
S/N 476432	S/N 7810	S/N 940700005619/ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23

Field Personnel: GF, CC

StationID: CD-43C2

Weather: Rain, on/off

Sample ID: CD-43C2 - 230411

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: N/A

Well Depth: 299

Screens from: 280 To 299

Casing Size (in): 2.5

Depth to Water: 171.25

Water Column Depth: 127.75 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 33.22 → 35 x3 well volumes = Total Purge Vol. (gal): 105

Purge Rate: 3.2 gpm

Purge Begin Time: 0825

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0836	35	8.06	387	10.7		Clear
0847	70	8.08	380	10.8		Clear
0858	105	8.10	389	10.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.29	(must meet criteria within 3 consecutive measurements)

Sample Time: 0859

QAQC Sample Time:

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr 11	Hach 2100P
S/N 476432	S/N 7816	S/N ~~940700005619~~ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
StationID: CD-43C3
Sample ID: CD-43C3-230411
QA/QC Sample ID: N/A

Field Personnel: GF, CC
Weather: Rain, on/off
Purge Method: Disp. bailer, Ded. ~~Grundfos~~, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

Well Depth: 401
Screens from: 382 To 401
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 170.87
= Water Column Depth: 230.13 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 59.84 ↘ 60 x3 well volumes = Total Purge Vol. (gal): 180

Purge Rate: 2.9
Purge Begin Time: 0822

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0843	60	7.96	310	11.2		Clear
0905	120	7.98	308	11.3		Clear
0927	180	7.98	311	11.3		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.45	(must meet criteria within 3 consecutive measurements)

Sample Time: 0929
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr II	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619~~ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: CC, GF
StationID: CD-48C1
Weather: Cloudy
Sample ID: CD-48C1-230411
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES-40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 243
Screens from: 220.5 To 240.5
Casing Size (in): 2.5
− Depth to Water: 177.49
= Water Column Depth: 65.51 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 17.03 ↘ 18 x3 well volumes = Total Purge Vol. (gal): 54

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate: 2.0
Purge Begin Time: 1257

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1306	18	7.88	489	11.3		Clear
1315	36	7.86	470	11.6		Clear
1324	54	7.88	497	11.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		.40	(must meet criteria within 3 consecutive measurements)

Sample Time: 1325
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXtech	Meter: ECTestr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619~~ 23424
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Pump is getting old. May need replace this year.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23

Field Personnel: CC, GF

StationID: CD-48C2

Weather: Cloudy

Sample ID: CD-48C2-230411

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: NA -

Well Depth: 302

Screens from: 279.7 To 299.7

Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 177.21

Water Column Depth: 124.79 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 32.45 → 33 x3 well volumes = Total Purge Vol. (gal): 99

Purge Rate: 2.8

Purge Begin Time: 1214

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1226	33	7.95	463	11.1		Clear
1238	66	8.01	463	11.0		Clear
1250	99	7.98	458	11.2		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		.42	(must meet criteria within 3 consecutive measurements)

Sample Time: 1251

QAQC Sample Time: NA -

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619~~ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/11/23
Field Personnel: CC, GF
StationID: CD-48C3
Weather: Cloudy
Sample ID: CD-48C3-230411
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA -

Well Depth: 386
Screens from: 374 To 384
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 177.13
Water Column Depth: 208.87 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 54.3 → 55 x3 well volumes = Total Purge Vol. (gal): 165

Purge Rate: 2.9
Purge Begin Time: 1211

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1230	55	7.93	455	11.6		Clear
1245	110	7.94	456	11.5		clear
1308	165	7.96	454	11.6		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		042*	(must meet criteria within 3 consecutive measurements)

Sample Time: 1309
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: ECTestr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700095619~~ 23474
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

* Approximated NTU from CD-48C2, as utilized on FS

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23 | Field Personnel: M. TERRIS

StationID: 1573A-1 | Weather: CLEAR MID-UPPER 30S

Sample ID: 1573A-1-230412 | Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve (RES)

QA/QC Sample ID: NA

Well Depth: 105 | Screens from: | To | Casing Size (in): 6

Depth to Water: 94.39

Water Column Depth: 10.61 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 20 GAL = 16.1 x3 well volumes = Total Purge Vol. (gal): 60 GAL

2 MPWV

Purge Rate: 10 GPM | Purge Begin Time: 1030

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1033	20 GAL	7.71	510	10.3		CLEAR
1035	40 GAL	7.73	511	10.2		CLEAR
1037	60 GAL	7.74	511	10.1		CLEAR
Stabilization Criteria:	Vol	+/- 0.1 unit	+/- 5%		0.21	(must meet criteria within 3 consecutive measurements)

Sample Time: 1040 | QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 472990	S/N 248	S/N 940700005619
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

*SAMPLED @ YARD HYDRANT NEXT TO FENCE LINE WEST OF HOUSE

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date:	04/12/23	**Field Personnel:**	GF
StationID:	CD-44C1	**Weather:**	ptly cldy, 46°
Sample ID:	CD-44C1-230412	**Purge Method:**	Disp. bailer, Ded Grundfos, Ded Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID:	NA		

Well Depth:	200	**Screens from:**	187	**To**	197	**Casing Size (in)**	2.5	
Depth to Water:	174.27							
Water Column Depth:	25.73	**Gallons per linear foot:**	0.26	**Calc. Purge vol./casing vol.:**	6.68 ↘ 7	**x3 well volumes**	**Total Purge Vol. (gal)**	21

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate: Slow **Purge Begin Time:** 1057

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1128	3.5	7.70	491	14.4		Clear
1152	7.0	7.71	477	15.2		Clear
1219	10.5	7.68	467	16.2		Clear
1258	14.0	7.69	470	16.0		Clear
1333	17.5	7.65	460	16.3		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.30	(must meet criteria within 3 consecutive measurements)

Sample Time: 1335 **QAQC Sample Time:** NA

Meters:	**pH**	**Conductivity**	**Turbidity**
	Meter: Extech	Meter: EC Testr 11	Hach 2100P
	S/N 476432	S/N 7810	S/N ~~940700005619~~ 24957
	Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Very low recovery well

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23
Field Personnel: GF
StationID: CD-44C2
Weather: p+ly cldy, 45°
Sample ID: CD-44C2-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: -NA-

Well Depth: 247
Screens from: 228 To 247
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 173.80
= Water Column Depth: 73.2 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 19.03 → 20 x3 well volumes = Total Purge Vol. (gal): 60

Purge Rate: 2.7
Purge Begin Time: 1148

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1156	20	7.64	445	11.9		Clear
1204	40	7.65	453	11.3		clear
1212	60	7.62	457	11.7		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.22	(must meet criteria within 3 consecutive measurements)

Sample Time: 1213
QAQC Sample Time: -NA-

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: ECTestr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619~~ 24957
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23
Field Personnel: GF
StationID: CD-44C3
Weather: mstly clear
Sample ID: CD-44C3-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: ~~^~~ NA —

Well Depth: 292
Screens from: 282 To 292
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 173.71
Water Column Depth: 118.29 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 30.75 → 31 x3 well volumes = Total Purge Vol. (gal): 93

Purge Rate: 2.5
Purge Begin Time: 1101

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1114	31	7.73	472	10.4		Clear
1127	62	7.70	467	10.5		Clear
1140	93	7.68	461	10.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.66	(must meet criteria within 3 consecutive measurements)

Sample Time: 1141
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11+	Hach 2100P
S/N 467432	S/N 7810	S/N ~~940700005619~~ 24957
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23

Field Personnel: GF

StationID: CD-45C1

Weather: Clear, 32°

Sample ID: CD-45C1-230412

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: -NA-

Well Depth: 200

Screens from: 187 To 197

Casing Size (in): 2.5

Depth to Water: 170.87

Water Column Depth: 29.13 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 7.57 → 8 x3 well volumes = Total Purge Vol. (gal): 24

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate: 2.0

Purge Begin Time: 0955

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0959	8	7.77	525	10.2		Clear
1003	16	7.78	527	10.3		Clear
1007	24	7.75	529	10.2		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.1+	(must meet criteria within 3 consecutive measurements)

Sample Time: 1013

QAQC Sample Time: NA

Meters:

pH — Meter: Extech; S/N 476432; Calib. to 4.0, 7.0 and 10.0

Conductivity — Meter: ECTestr11+; S/N 7810; STD. to 700 umhos/cm

Turbidity — Hach 2100P; S/N ~~040700005619~~ 24957; STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23 | Field Personnel: GF

StationID: CD-45C2 | Weather: Clear, 32°

Sample ID: CD-45C2-230412 | Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: -NA-

Well Depth: 247 | Screens from: 222 To 246 | Casing Size (in): 2.5

Depth to Water: 171.42

Water Column Depth: 75.58 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 19.65 → 20 x3 well volumes = Total Purge Vol. (gal): 60

Purge Rate: 2.5 | Purge Begin Time: 0920

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0928	20	7.73	461	10.3		Clear
0936	40	7.73	476	10.5		Clear
0944	60	7.74	466	10.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%	~~0.15~~	0.15	(must meet criteria within 3 consecutive measurements)

Sample Time: 0946 | QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005610~~ 24957
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23
Field Personnel: GF
StationID: CD-45C3
Weather: clear, 32°
Sample ID: CD-45C3-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 339
Screens from: 325.2 To 335.2
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 171.96
Water Column Depth: 167.04 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 43.43 → 45 x3 well volumes = Total Purge Vol. (gal): 135

Purge Rate: 3.0
Purge Begin Time: 0922

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0937	45	8.10	461 *a	10.6		clear
0952	90	8.11	476 *a	10.5		clear
1008	135	8.11	466 *a	10.6		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.17	(must meet criteria within 3 consecutive measurements)

Sample Time: 1009
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619~~ 24957
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

* Approximated conductivity values from CD-45C2, as listed on FS. CC

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Dupe taken here.

Date: 04/12/23
Field Personnel: GF
StationID: CD-49
Weather: clear, 30°
Sample ID: CD-49-230412
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ~~ES-40, Port. Grundfos~~, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: CD-50-230412

Well Depth: 241.5
Screens from: 218 To 238
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: *167.52'
= Water Column Depth: 73.98' x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 19.2 ~~19.5~~ use 20.0 x3 well volumes = Total Purge Vol. (gal): 60

*assume swl taken 1-9-23

Purge Rate: 1.33 gpm
Purge Begin Time: 0802

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0818	20	7.81	538	11.8		clear
0834	40	7.82	529	12.3		clear
0850	60	7.80	532	12.0		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.22	(must meet criteria within 3 consecutive measurements)

Sample Time: 0851
QAQC Sample Time: 0929

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EC Testr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619~~ 024957
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

pump should be replaced

Comments:
Dupe taken here: CD-50-230412

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23
Field Personnel: M. TERRIS
StationID: CD-40C1
Weather: P.CLOUDY 50S
Sample ID: CD-40C1-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 46
Screens from: 36 To 46
Casing Size (in): 2.5

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 9.07
Water Column Depth: 36.93 x Gallons per linear foot: 0.26 = Calc. Purge vol./casing vol.: 9.6 x3 well volumes = Total Purge Vol. (gal): 28.8 → 30

Purge Rate: 1.5 GPM
Purge Begin Time: 1230

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1238	10 GAL	7.92	535	10.6		CLEAR
1246	20 GAL	7.92	537	10.5		CLEAR
1252	30 GAL	7.91	537	10.5		CLEAR
Stabilization Criteria:	√ VOL	+/- 0.1 unit	+/- 5%		0.23	(must meet criteria within 3 consecutive measurements)

Sample Time: 1255
QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH100	Meter: EcTestr11+	Hach 2100P
S/N 472990	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
√	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
√	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04-12-23
Field Personnel: CC
StationID: CP-S1
Weather: Sunny
Sample ID: CP-S1-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: MS/MSD

Well Depth: 103
Screens from: 104 To 109
Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 80.92
Water Column Depth: 22.08 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 35 x3 well volumes = Total Purge Vol. (gal): 105

Purge Rate: 65gpm
Purge Begin Time: 1239

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1241	130	7.42	491	10.7		Clear
1243	260	7.40	494	10.5		Clear
1245	390	7.38	494	10.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.69	(must meet criteria within 3 consecutive measurements)

Sample Time: 1247
QAQC Sample Time: 1249

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/13/23 cc

Field Personnel: M. TERRIS

StationID: CP-S3

Weather: CLEAR, COOL MID-30'S

Sample ID: CP-S3 - 230413 cc

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, ~~Hydrasleeve~~

QA/QC Sample ID: -NA-

Well Depth: 99

Screens from: To

Casing Size (in):

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 86.49'

Water Column Depth: 12.51' x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 20 GAL / 18.76 x3 well volumes = Total Purge Vol. (gal): ~~X~~ 60GAL

Purge Rate: 1.2GPM

Purge Begin Time: 0900

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0916	20GAL	7.47	633	12.1		RUSTY COLOR
0932	40GAL	7.46	635	12.0		CLEAR
0948	60GAL	7.46	636	11.9		CLEAR
Stabilization Criteria:	VOL	+/- 0.1 unit	+/- 5%		0.79	(must meet criteria within 3 consecutive measurements)

Sample Time: 0950

QAQC Sample Time: NA

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: Ec testr 11+	Hach 2100P
S/N 472990	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04-12-23
Field Personnel: CC
StationID: CP-S4
Weather: Sunny
Sample ID: CP-S4-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 109
Screens from: To
Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 83.75
= Water Column Depth: 25.25 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: →40 x3 well volumes = Total Purge Vol. (gal): 120

Purge Rate: 16gpm
Purge Begin Time: 1124

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1127	48	7.22	580	10.8		Clear
1130	96	7.20	584	10.5		Clear
1133	144	7.22	587	10.6		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		?	(must meet criteria within 3 consecutive measurements)

Sample Time: 1135
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr 11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04-12-23
Field Personnel: CC
StationID: CP-S5
Weather: Sunny
Sample ID: CP-S5-230412
Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 101
Screens from: To
Casing Size (in): 6
Depth to Water: *82
Water Column Depth: 19 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: →30 x3 well volumes = Total Purge Vol. (gal): 90

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate: 25gpm
Purge Begin Time: 1200

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1202	50	7.21	601	10.7		Clear
1204	100	7.20	604	10.6		Clear
1206	150	7.21	604	10.7		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.89	(must meet criteria within 3 consecutive measurements)

Sample Time: 1208
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

* Unable to get WL, use 82'

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23
Field Personnel: CC
StationID: CP-S6
Weather: Sunny
Sample ID: CP-S6-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 106
Screens from: To
Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 87.45
= Water Column Depth: 18.55 -x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: →30 x3 well volumes = Total Purge Vol. (gal): 90

Purge Rate: 50gpm
Purge Begin Time: 1340

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1342	100	7.20	647	10.5		Clear
1344	150	7.21	649	10.3		Clear
1346	200	7.20	649	10.1		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%	0.55		(must meet criteria within 3 consecutive measurements)

Sample Time: 1347
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/12/23
Field Personnel: M. TERRIS
StationID: CP-E1
Weather: P.C. 50's
Sample ID: CP-E1 -230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: CD-52-230412

Well Depth: 257
Screens from: 235 To 258
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 184.51'
Water Column Depth: 72.49 -x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 190G / 188.4 x3 well volumes = Total Purge Vol. (gal): 570G

Purge Rate: 140 GPM
Purge Begin Time: 1500

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1505	700G	7.33	1121	10.0		CLEAR
1510	1400G	7.34	1117	9.9		CLEAR
1515	2100G	7.34	1117	10.1		CLEAR
Stabilization Criteria:	Vol	+/- 0.1 unit	+/- 5%		0.51	(must meet criteria within 3 consecutive measurements)

Sample Time: 1515
QAQC Sample Time: 1500

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr 11+	Hach 2100P
S/N 47:2990	S/N 24B	S/N 940700005619
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
X	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
X	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

*DUPE TAKEN HERE

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04-12-23
Field Personnel: CC
StationID: CP-E2
Weather: Sunny
Sample ID: CP-E2-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 188
Screens from: To
Casing Size (in): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 151.09
Water Column Depth: 36.91 x Gallons per linear foot: 1.5 = Calc. Purge vol./casing vol.: 60 x3 well volumes = Total Purge Vol. (gal): 180

Purge Rate: 3.2
Purge Begin Time: 0840

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0936	180	6.98	879	12.1		Clear
1427	1111	7.02	846	12.3		Clear
1512	1255	6.98	848	12.4		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.37	(must meet criteria within 3 consecutive measurements)

Sample Time: 1514
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestrII	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23
Field Personnel: CC
StationID: CP-E3
Weather: Sunny
Sample ID: CP-E3-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID:

Well Depth: 267
Screens from: To
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 183.51
= Water Column Depth: 83.49 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 217.1 ↓ 220 x3 well volumes = Total Purge Vol. (gal): 660

Purge Rate: 150 gpm
Purge Begin Time: 0945

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0947	220	6.85	696	12		Clear
0949	440	6.86	705	11.9		Clear
0951	660	6.90	704	11.8		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		1.74*	(must meet criteria within 3 consecutive measurements)

Sample Time: 0955
QAQC Sample Time:

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

* Unable to stop glass frosting over during turbidity measurement due to low temperatures.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/12/23
StationID: CP-W1
Sample ID: CP-W1 - 230412
QA/QC Sample ID: NA

Field Personnel: M. TERRIS
Weather: P.C 50's

Purge Method: Disp. bailer, (Ded. Grundfos), Ded. Bladder, Ded. Bennett, Env. Tech ES ~~40, Port. Grundfos~~, Port. Bennet, PDB, Hydrasleeve

Well Depth: 300
Screens from: 280 To 300
Casing Size (in): 8

− Depth to Water: 175.13
= Water Column Depth: 124.87 -x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 325G / 324.7 x3 well volumes = Total Purge Vol. (gal): 975G

Purge Rate: 125GPM
Purge Begin Time: 1425

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
(8)	(2.6)

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1430	625G	8.01	462	10.7		CLEAR
1435	1250G	8.00	464	10.6		CLEAR
1440	1875G	7.99	463	10.6		CLEAR
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.19	(must meet criteria within 3 consecutive measurements)

Sample Time: 1440
QAQC Sample Time:

Meters:

pH	Conductivity	Turbidity
Meter: EXTECH 100	Meter: ECTestr11+	Hach 2100P
S/N 472990	S/N 24B	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
X	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
X	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 4/12/2023
StationID: CP-W2
Sample ID: CP-W2-230412
QA/QC Sample ID: NA

Field Personnel: M. TERRIS
Weather: P.C. 50's

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ~~ES 40, Port. Grundfos~~, Port. Bennet, PDB, Hydrasleeve

Well Depth: 280
Screens from: To
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 170.71'
Water Column Depth: 109.29 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 300GAL 284.15 x3 well volumes = Total Purge Vol. (gal): 900 GAL

Purge Rate: 225GPM
Purge Begin Time: 1530

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1535	1125G	7.71	521	10.1		CLEAR
1540	2250G	7.69	522	10.0		CLEAR
1545	3375G	7.70	522	10.0		CLEAR
Stabilization Criteria:	√ VOL	+/- 0.1 unit	+/- 5%		0.33	(must meet criteria within 3 consecutive measurements)

Sample Time: 1545
QAQC Sample Time:

Meters:

pH — Meter: EXTECH 100, S/N 472990, Calib. to 4.0, 7.0 and 10.0

Conductivity — Meter: ECTestr11+, S/N 24B, STD. to 700 umhos/cm

Turbidity — Hach 2100P, S/N 940700005619/, STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)		Bottle Batch #
X	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
X	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/12/23
Field Personnel: CC
StationID: CP-W3
Weather: Sunny
Sample ID: CP-W3-230412
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: NA

Well Depth: 281.5
Screens from: To
Casing Size (in): 8

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 172.33'
= Water Column Depth: 109.2 x Gallons per linear foot: 2.6 = Calc. Purge vol./casing vol.: 283.9 → 290 x3 well volumes = Total Purge Vol. (gal): 870

Purge Rate: 145 gpm
Purge Begin Time: 1441

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1443	290	7.26	607	11.7		Clear
1445	580	7.25	613	11.6		Clear
1447	870	7.23	614	11.4		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%	0.3Y		(must meet criteria within 3 consecutive measurements)

Sample Time: 1448
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/13/23
Field Personnel: GF
StationID: CD-60A1
Weather: mstly cldy, 37°
Sample ID: CD-60A1-230413
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: CD-51-230413

Well Depth: 96.2
Screens from: To
Casing Size (in)

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

− Depth to Water: 80.25'
= Water Column Depth: 15.95 x Gallons per linear foot: ~~0.26~~ 0.17 (2" casing not 2.5") = Calc. Purge vol./casing vol.: 2.7 use 3.0 x3 well volumes = Total Purge Vol. (gal): 9.0

Purge Rate: 0.5
Purge Begin Time: 1003

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1009	3	7.13	524	10.2		clear
1015	6	7.12	520	10.4		clear
1021	9	7.12	521	10.4		clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.16	(must meet criteria within 3 consecutive measurements)

Sample Time: 1023
QAQC Sample Time: 1004

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: Ectestr 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619/~~ 24957
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
✓	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
✓	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:
* DUPE TAKEN HERE
- purged @ 0.5 gpm. I can purge much faster but due to low overall purge volume it is best to slow it down.

MS/MSD Taken Here

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Dup Taken Here

Date: 04/13/23

Field Personnel: GF

StationID: CD-61A1

Weather: mstly clear, 32°

Sample ID: CD-61A1-230413

Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve

QA/QC Sample ID: MS/MSD/~~CD-61A1-230413~~

Well Depth: 75.9

Screens from: To

Casing Size (in):

Depth to Water: 69.49'

Water Column Depth: 6.41 x Gallons per linear foot: 0.17 = Calc. Purge vol./casing vol.: 1,1 use 2,0 x3 well volumes = Total Purge Vol. (gal): 6

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate: 0.5

Purge Begin Time: 0830

↳will easily purge faster - slowed down due to low purge volume needed. GF

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0834	2	7.57	439	9.8		Clear
0838	4	7.58	442	9.8		Clear
0842	6	7.60	438	9.9		Clear
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0,20	(must meet criteria within 3 consecutive measurements)

Sample Time: 0843

QAQC Sample Time: - NA -

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: Ectestor 11+	Hach 2100P
S/N 476432	S/N 7810	S/N ~~940700005619~~/ 24957
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis: (Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
✓	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
✓	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

Dup Taken Here CD-61A1-230413

MS/MSD Taken Here:

CD-61A1-230413

CD-61A1-230413MS

CD-61A1-230413MSD

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/13/23
Field Personnel: CC
StationID: CD-03A1
Weather: Sunny
Sample ID: CD-03A1-230413
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 98
Screens from: 70 To 90
Casing Size (in): 2

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Depth to Water: 71.74
Water Column Depth: 26.26 x Gallons per linear foot: 0.17 = Calc. Purge vol./casing vol.: 4.46 ≈ 5 x3 well volumes = Total Purge Vol. (gal): 15

Purge Rate: N/A*
Purge Begin Time: 0845

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
0910	5	7.76	361	8.8		Clear / odorless
0940	10	7.75	364	8.6		Clear / odorless
1009	15	7.73	364	8.7		Clear / odorless
Stabilization Criteria:		+/- 0.1 unit	+/- 5%	0.23		(must meet criteria within 3 consecutive measurements)

Sample Time: 1011
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr 11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
✓	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
✓	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

* Collected all production, and measured volume.

Comments:

COLBERT LANDFILL ANNUAL GROUNDWATER SAMPLING

Date: 04/13/23
Field Personnel: CC
StationID: CS-04A1
Weather: Sunny
Sample ID: CS-04A1-230413
Purge Method: Disp. bailer, Ded. Grundfos, Ded. Bladder, Ded. Bennett, Env. Tech ES 40, Port. Grundfos, Port. Bennet, PDB, Hydrasleeve
QA/QC Sample ID: N/A

Well Depth: 89.51
Screens from: To
Casing Size (in)
Depth to Water: * 85.0 ~~NA~~
Water Column Depth: 4.51 x Gallons per linear foot: 0.17 = Calc. Purge vol./casing vol.: 0.77 gal x3 well volumes = Total Purge Vol. (gal): 3 gal

CASING INFO

DIA.	VOL. (gal/ft)
1.25	0.08
2.0	0.17
2.5	0.26
4	0.66
6	1.5
8	2.6

Purge Rate: N/A **
Purge Begin Time: 1112

Field Parameters

Time	Purge Vol/gal	pH	Cond. (umhos/cm)	Temp. (C)	Turb.	Comments
1125	1 gal	6.69	682	10.0		Clear/odorless
1140	2 gal	6.65	689	9.8		clear/odorless
1156	3 gal	6.65	688	9.8		clear/odorless
Stabilization Criteria:		+/- 0.1 unit	+/- 5%		0.32	(must meet criteria within 3 consecutive measurements)

Sample Time: 1157
QAQC Sample Time: N/A

Meters:

pH	Conductivity	Turbidity
Meter: Extech	Meter: EcTestr11	Hach 2100P
S/N 476115	S/N 1312423	S/N 940700005619/
Calib. to 4.0, 7.0 and 10.0	STD. to 700 umhos/cm	STD. to 4.8, 43.8, 420

Lab Analysis:(Check parameters to be analyzed)

		Bottle Batch #
✓	3-40ml Glass w/ MA/AA - VOC's (524.3)	
✓	1-500mL Poly w/H2SO4- TOC/COD/Ammonia (415.1/410.1/350.1)	
✓	1-500mL Poly unpreserv.- Cl/NO3/NO2/SO4 (300.0/300.0/354.0/300.0)	
✓	1-500mL Poly w/HNO3 Field Filtered- Fe/Mn/Zn (6010)	
✓	2-60mL Amber glass w/ NaSO4 - 1,4-Dioxane (522)	

Comments:

* WL NOT ABLE TO GET USE 85' e A BENCH MARK

** - Collected all production, and measured volume.

COLBERT LANDFILL WATER LEVEL FIELD SHEET

QTR

Aquifer	Station ID	Other Name	Reference Elev.	Date	Depth to Water	Initials
lower	0273C-1	WAKEFIELD	1887.69	4/10/23	86.27	GF
lower	0273E-3	COSTELLO	1889.09		164.95'	GF water out for blackgoat
lower	0273F-4	Gander	1884.75		91.36'	GF
lower	0273P-3	Griffith	1863.53		79.02'	GF
lower	0373A-2	RESSEMAN	1837.21		168.89-5.08= 163.81'	GF
lower	0373J-5	Carter	1860.41		188.75'	GF
upper	1073K-1	BURGESS	1843.74		79.63'	GF
upper	1073P-2	PETRELLI	1838.67		74.54'	GF
upper	1573A-1	Johnson formerly Volk	1854.6		94.39'	GF
upper	1573F-3	CLARK	1840.58		160.15'	
upper	1573H-4	MOORE LNDSCP	1856.95		96.28'	GF
upper	1573R-1	BAKER	1851.75		91.50'	GF
lower	CD-01C1	CD-1	1863.75			
upper	CD-02RA1	CD-2A1 Repla	1852.57			
lower	CD-02RC2	CD-2C2 Repla	1853.28			
upper	CD-03A0	CD-3U	1845			
upper	CD-03A1	CD-3M	1844.7			
lower	CD-03C1	CD-3L	1845			
lower	CD-04C1	CD-4U	1872.13			
lower	CD-04E1	CD-4L	1872.11			
lower	CD-05C2	CD-5	1854.33			
upper	CD-06A1	CD-6U	1861.94			
lower	CD-06C2	CD-6L	1861.8			
lower	CD-07E1	CD-7L	1866.94			
lower	CD-08E1	CD-8M	1866.76			
lower	CD-08F1	CD-8L	1866.74			
lower	CD-20D1	Was CD-20E1	1864.62			
lower	CD-20D2	Was CD-20E2	1865.06			
lower	CD-21C1		1855.88			
lower	CD-21C3		1857.41			
lower	CD-22D1	Ackerman	1865.35			
upper	CD-23B1		1860.61			
lower	CD-23C2		1861.08			
lower	CD-24C2		1859.85			
lower	CD-25		1865			

COLBERT LANDFILL WATER LEVEL FIELD SHEET

QTR

Aquifer	Station ID	Other Name	Reference Elev.	Date	Depth to Water	Initials
lower	0273C-1	WAKEFIELD	1887.69			
lower	0273E-3	COSTELLO	1889.09			
lower	0273F-4	Gander	1884.75			
lower	0273P-3	Griffith	1863.53			
lower	0373A-2	RESSEMAN	1837.21			
lower	0373J-5	Carter	1860.41			
upper	1073K-1	BURGESS	1843.74			
upper	1073P-2	PETRELLI	1838.67			
upper	1573A-1	Johnson	1854.6			
upper	1573F-3	CLARK	1840.58			
upper	1573H-4	MOORE LNDSCP	1856.95			
upper	1573R-1	BAKER	1851.75			
lower	CD-01C1	CD-1	1863.75			
upper	CD-02RA1	CD-2A1 Repla	1852.57			
lower	CD-02RC2	CD-2C2 Repla	1853.28			
upper	CD-03A0	CD-3U	1845			
upper	CD-03A1	CD-3M	1844.7			
lower	CD-03C1	CD-3L	1845			
lower	CD-04C1	CD-4U	1872.13			
lower	CD-04E1	CD-4L	1872.11			
lower	CD-05C2	CD-5	1854.33		178.39'	
upper	CD-06A1	CD-6U	1861.94			
lower	CD-06C2	CD-6L	1861.8			
lower	CD-07E1	CD-7L	1866.94			
lower	CD-08E1	CD-8M	1866.76			
lower	CD-08F1	CD-8L	1866.74			
lower	CD-20D1	Was CD-20E1	1864.62			
lower	CD-20D2	Was CD-20E2	1865.06			
lower	CD-21C1		1855.88		186.03'	
lower	CD-21C3		1857.41		187.47	
lower	CD-22D1	Ackerman	1865.35			
upper	CD-23B1		1860.61			
lower	CD-23C2		1861.08		187.47	
lower	CD-24C2		1859.85		186 190.04'	
lower	CD-25		1865			

COLBERT LANDFILL WATER LEVEL FIELD SHEET

QTR

Aquifer	Station ID	Other Name	Reference Elev.	Date	Depth to Water	Initials
lower	CD-26		1860.79		178.09'	
upper	CD-30A1		1845.95		87.51'	
upper	CD-31A1		1853.6		93.97'	
upper	CD-32B1		1853.44		NT	
upper	CD-33		1846.57		88.07'	
upper	CD-34A1		1858.17		98.01'	
upper	CD-35A1		1855.01		94.54'	
upper	CD-36A1		1844.27		90.42'	
upper	CD-37A1		1846.4		90.87'	
upper	CD-38A1		1847.91		90.99'	
upper	CD-40C1		1671.67			
lower	CD-40C2		1671.84			
lower	CD-40C3		1672.29			
lower	CD-41C1		1848.64		177.51'	
lower	CD-41C2		1849.1		177.98'	
lower	CD-41C3		1849.41		178.09'	
lower	CD-42C1		1844		174.51'	
lower	CD-42C2		1843.72		174.31'	
lower	CD-42C3		1843.63		174.01'	
lower	CD-43C1		1839.98		171.58'	
lower	CD-43C2		1840.01		171.25'	
lower	CD-43C3		1840.52		170.87'	
lower	CD-44C1		1844.84		174.27'	
lower	CD-44C2		1844.28		173.80'	
lower	CD-44C3		1844.24		173.71'	
lower	CD-45C1		1840.75		170.87'	
lower	CD-45C2		1841.4		171.42'	
lower	CD-45C3		1841.89		171.96'	
lower	CD-46		1852.7			
lower	CD-47		1850.73			
lower	CD-48C1		1849.73		177.49'	
lower	CD-48C2		1850.42		177.21'	
lower	CD-48C3		1850.08		177.13'	
lower	CD-49		1835.41			
upper	CD-60A1		1852.82		80.25'	

COLBERT LANDFILL WATER LEVEL FIELD SHEET

MTH

Aquifer	Station ID	Other Name	Reference Elev.	Date	Depth to Water	Initials
upper	CD-61A1		1842.87		69.49'	
lower	CP-E1		1854.2		184.51'	
lower	CP-E2		1857.7		151.09'	
lower	CP-E3		1853.29		183.51'	
upper	CP-S1		1839.59		80.92'	
upper	CP-S3		1845.49		86.49'	
upper	CP-S4		1843.52		83.75'	
upper	CP-S5		1847.48		-NA-	
upper	CP-S6		1847.68		87.45'	
lower	CP-W1		1845.02		175.13'	
lower	CP-W2		1840.36		170.71'	
lower	CP-W3		1841.72		172.33'	
upper	CS-04A1	CS-4	1858.38			
upper	CS-12A1		1848.48			
lower	CS-14C1	CS-14U	1868.25			
lower	CS-14D1	CS-14L	1868.19			

COLBERT LANDFILL WATER LEVEL FIELD SHEET

2.4 2.45 24 4.85 +263 24.1

QTR

Aquifer	Station ID	Other Name	Reference Elev.	Date	Depth to Water	Initials
lower	CD-26		1860.79			
upper	CD-30A1		1845.95			
upper	CD-31A1		1853.6			
upper	CD-32B1		1853.44			
upper	CD-33		1846.57			
upper	CD-34A1		1858.17			
upper	CD-35A1		1855.01			
upper	CD-36A1		1844.27			
upper	CD-37A1		1846.4			
upper	CD-38A1		1847.91			
upper	CD-40C1		1671.67	04/10/23	9.07	CC
lower	CD-40C2		1671.84	04/10/23	2.82	CC
lower	CD-40C3		1672.29	04/10/23	7.68	CC
lower	CD-41C1		1848.64	04/10/23	177.51	
lower	CD-41C2		1849.1			
lower	CD-41C3		1849.41			
lower	CD-42C1		1844			
lower	CD-42C2		1843.72			
lower	CD-42C3		1843.63			
lower	CD-43C1		1839.98			
lower	CD-43C2		1840.01			
lower	CD-43C3		1840.52			
lower	CD-44C1		1844.84			
lower	CD-44C2		1844.28			
lower	CD-44C3		1844.24			
lower	CD-45C1		1840.75			
lower	CD-45C2		1841.4			
lower	CD-45C3		1841.89			
lower	CD-46		1852.7	04/10/23	183.02	CC
lower	CD-47		1850.73	04/10/23	180.68	CC
lower	CD-48C1		1849.73			
lower	CD-48C2		1850.42			
lower	CD-48C3		1850.08			
lower	CD-49		1835.41			
upper	CD-60A1		1852.82			

COLBERT LANDFILL WATER LEVEL FIELD SHEET

QTR

Aquifer	Station ID	Other Name	Reference Elev.	Date	Depth to Water	Initials
lower	0273C-1	WAKEFIELD	1887.69			
lower	0273E-3	COSTELLO	1889.09			
lower	0273F-4	Gander	1884.75			
lower	0273P-3	Griffith	1863.53			
lower	0373A-2	RESSEMAN	1837.21			
lower	0373J-5	Carter	1860.41			
upper	1073K-1	BURGESS	1843.74			
upper	1073P-2	PETRELLI	1838.67			
upper	1573A-1	Johnson	1854.6			
upper	1573F-3	CLARK	1840.58			
upper	1573H-4	MOORE LNDSCP	1856.95			
upper	1573R-1	BAKER	1851.75			
lower	CD-01C1	CD-1	1863.75	04|10|23	193.44	CC
upper	CD-02RA1	CD-2A1 Repla	1852.57	04|10|23	82.14	CC
lower	CD-02RC2	CD-2C2 Repla	1853.28	04|10|23	182.91	CC
upper	CD-03A0	CD-3U	1845	04|10|23	46.28	CC
upper	CD-03A1	CD-3M	1844.7	04|10|23	71.74	CC
lower	CD-03C1	CD-3L	1845	04|10|23	175.59	CC
lower	CD-04C1	CD-4U	1872.13	04|10|23	148.27	CC
lower	CD-04E1	CD-4L	1872.11	04|10|23	201.96	CC
lower	CD-05C2	CD-5	1854.33			
upper	CD-06A1	CD-6U	1861.94	04|10|23	89.58	CC
lower	CD-06C2	CD-6L	1861.8	04|10|23	177.67	CC
lower	CD-07E1	CD-7L	1866.94	04|10|23	156.91	CC
lower	CD-08E1	CD-8M	1866.76	04|10|23	188.59	CC
lower	CD-08F1	CD-8L	1866.74	04|10|23	189.87	CC
lower	CD-20D1	Was CD-20E1	1864.62	04|10|23	158.02	CC
lower	CD-20D2	Was CD-20E2	1865.06	04|10|23	158.39	CC
lower	CD-21C1		1855.88			
lower	CD-21C3		1857.41			
lower	CD-22D1	Ackerman	1865.35	04|10|23	94.39	CC
upper	CD-23B1		1860.61	04|10|23	78.92	CC
lower	CD-23C2		1861.08	04|10|23	171.32	CC
lower	CD-24C2		1859.85			
lower	CD-25		1865	04|10|23	159.09	CC

CHAIN OF CUSTODY FOR COLBERT LANDFILL
GROUNDWATER SAMPLING

LABORATORY:
Anatek Moscow
1282 Alturas DR
Moscow ID 83843
(208)883-2839
Attention: Sample Receiving

COLBERT LANDFILL
SPOKANE COUNTY UTILITIES
22515 N. ELK-CHATTAROY RD.
COLBERT , WA 99005
(509) 238-6607 FAX:(509)238-6812

Tracking #: Tracking: K309 046 2635
Shipping CO: UPS
No. Coolers: 1

DATE: 04/20/23
PAGE: 1 Of 1

PARAMETERS:			VOLATILES		SAMPLERS: Mike Terris, Craig Campbell		
CONTAINERS:			3-40 ml				
PRESERVATION:			MA/AA to pH<2				
HOLDING TIME:			14 days				
METHOD:			524.3		COOLER NUMBER	TOTAL NO. OF BOTTLES	COMMENTS:
Sample ID:	Date:	Time:					
1073E-2-230419	4/19/2023	1105	X		21	3	
1573C-7-230419	4/19/2023	1155	X		21	3	
1473M-1-230419	4/19/2023	1355	X		21	3	
2473M-1-230419	4/19/2023	1350	X		21	3	
1573C-17-230419	4/19/2023	1203	X		21	3	
1073L-2-230419	4/19/2023	1057	X		21	9	MS/MSD
Trip Blanks	4/19/2023	-	X		21	2	

RELINQUISHED BY:
Signature:
Print Name: Craig Campbell
SPOKANE COUNTY UTILITIES LANDFILL CLOSURE
Date: 04/20/23
Time: 1400

RECEIVED BY:
Signature:
Print Name:
Date:
Time:

COMMENTS: PLEASE FAX OR EMAIL A COPY OF THE SAMPLE CONDITION REPORT TO DEB GEIGER ASAP @ (509)238-6812 OR dgeiger@ptera.net

Colbert Residential Field Data Sheet

19-Apr-23

Well **1073J-1**

TC **TA**
R R Alfonso Moreno
E 4024 Wahoo Road

Colbert Wa 99005

Home Phone **Work Phone**
(509) 953-7215

Last Sample Date 9/28/2022 **Sample I.D.** 1073J-1-220928

FIELD PARAMETERS	Previous	Current		Sample Date	
				Sample Time	
pH	7.89			Start Purge	
Cond (uMhos)	461			End Purge	
Temp	11.4			Rate (gpm)	
SWL (Feet)				Purge Vol (gal)	

PURGE VOLUME CALCULATIONS				Casing Size	Gal/Foot
Total Depth (ft)	280	Casing Vol (gal)		2"	0.16
SWL (ft)		Casing Vol X 3		4"	0.65
Water Column (ft)		PT Vol (gal)	30	6"	1.47
Casing Size (in)	6	Total Vol (gal)		8"	2.61

Previous Sample Point Hose bib at front gate

Special Instructions TEFLON SPLITTER

Comment Daughter is selling house

House is still for sale. Door to pumphouse is locked, and water is shut off properly inside. No sample.

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 168'

Colbert Residential Field Data Sheet

19-Apr-23

Well **1073L-2**

TC **TA**
R R Steve Countryman
N 21202 Little Spokane River D

Colbert Wa 99005

Home Phone (509) 466-2232 **Work Phone**

Last Sample Date 1/18/2023 **Sample I.D.** 1073L-2-230118

FIELD PARAMETERS	Previous	Current	Sample Date	
			Sample Time	1057
pH	8.2	8.02	Start Purge	1030
Cond (uMhos)	310	315	End Purge	1054
Temp	8.8	10.1	Rate (gpm)	5/(20/60)=10gpm
SWL (Feet)	15		Purge Vol (gal)	240

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	67	Casing Vol (gal)	⇒ 80	2"	0.16
SWL (ft)	15	Casing Vol X 3	240	4"	0.65
Water Column (ft)	52	PT Vol (gal)	N/A** 100	6"	1.47
Casing Size (in)	6	Total Vol (gal)	240	8"	2.61

Previous Sample Point Hose bib west side of house

Special Instructions Splitter; Teflon tubing.

Comment * MS/MSD TAKEN Here FILLED 9 - 40 ml VOCs 5243 MA/AA

** Sampled from bypass hose bib in pump house.

SAMPLE ID 1073L-2-230419
1073L-2-230419MS
1073L-2-230419MSD

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 15'

Colbert Residential Field Data Sheet

19-Apr-23

Well **1573C-17**

TC **TA** **Home Phone** **Work Phone**

R R RESIDENT
20518 N. Thor Rd.

COLBERT Wa 99005

Last Sample Date 4/13/2022 **Sample I.D.** 1573C-17-220413

FIELD PARAMETERS	Previous	Current		Sample Date	
				Sample Time	1203
pH	7.91	8.08		Start Purge	1145
Cond (uMhos)	332	438		End Purge	1200
Temp	10.8	10.5		Rate (gpm)	7.5gpm
SWL (Feet)	160			Purge Vol (gal)	113gal

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	260	Casing Vol (gal)	⇒150	2"	0.16
SWL (ft)	160	Casing Vol X 3	450	4"	0.65
Water Column (ft)	100	PT Vol (gal)	+ 50	6"	1.47
Casing Size (in)	6	Total Vol (gal)	500	8"	2.61

Previous Sample Point Yard hydrant next to pump vault

Special Instructions YARD HYDRANT IN FRONT OF HOUSE.

Comment

* Active well, purged 15 min then sampled.

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 160'

Colbert Residential Field Data Sheet

19-Apr-23

Well **1573C-7**

TC **TA**
R R Kevin/Sandy Kirby
N 20303 Thor Road

Colbert Wa 99005

Home Phone **Work Phone**
(206) 794-0221

Last Sample Date 4/13/2022 **Sample I.D.** 1573C-7-220413

FIELD PARAMETERS	Previous	Current		
			Sample Date	4/19/23
			Sample Time	1155
pH	7.63	7.72	Start Purge	1130
Cond (uMhos)	562	549	End Purge	1200
Temp	10.9	10.7	Rate (gpm)	10GPM
SWL (Feet)	80.01	80.12'	Purge Vol (gal)	300 GAL

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	125	Casing Vol (gal)	65.9-70G	2"	0.16
SWL (ft)	80.12'	Casing Vol X 3	210 GAL	4"	0.65
Water Column (ft)	44.88'	PT Vol (gal)	20	6"	1.47
Casing Size (in)	6	Total Vol (gal)	230 GAL	8"	2.61

Previous Sample Point Hose bib in pump house

Special Instructions DO NOT TAKE WATER LEVEL HERE TO MANY WIRES IN WELL REQUE

Comment

* MT FILLED 3-40 ml VOC'S w/ MA-AA FOR 524.3 BY ANATEK LAB IN MOSCOW ID.

- NEW ID 1573C-7-230419

* SAMPLE @ PUMP HOUSE.

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE:

Colbert Residential Field Data Sheet

19-Apr-23

Well **1473M-1**

TC **TA**
R R Jonathan Richard
N 19826 Yale Road

Colbert Wa 99005

Home Phone **Work Phone**
(509) 954-3762

Last Sample Date 1/18/2023 **Sample I.D.** 1473M-1-230118

FIELD PARAMETERS	Previous	Current		Sample Date	4/19/23 DUPE
				Sample Time	1355 1330
pH	7.55	7.61		Start Purge	1330
Cond (uMhos)	554	549		End Purge	1400
Temp	9.6	10.7		Rate (gpm)	9 GPM
SWL (Feet)		NT		Purge Vol (gal)	270 GAL

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	105	Casing Vol (gal)	36.75:40	2"	0.16
SWL (ft)	80'	Casing Vol X 3	120 GAL	4"	0.65
Water Column (ft)	25'	PT Vol (gal)	100	6"	1.47
Casing Size (in)	6	Total Vol (gal)	220 GAL	8"	2.61

Previous Sample Point Hose bib front of house

Special Instructions TEFLON SPLITTER

Comment * DUPE TAKEN HERE W/ID 2473M-1-220419

* MT SAMPLED @ HOSE BIB FRONT OF HOUSE
FILLED 6-40ml VOC'S W/ MA-AA FOR 524.3
ANATEK MOSCOW ID

- NEW ID 1473M-1-230419
DUPE ID 2473M-1-230419

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 80'

Colbert Residential Field Data Sheet

19-Apr-23

Well **1073E-2**

TC **TA**

R R Gabe/Amanda Muglia
N 21611 Little Spokane Drive

Colbert Wa 99005

Home Phone (509) 724-9511 **Work Phone**

Last Sample Date 1/18/2023 **Sample I.D.** 1073E-2-230118

FIELD PARAMETERS	Previous	Current		
			Sample Date	4/19/23
			Sample Time	1105
pH	8	7.97	Start Purge	1030
Cond (uMhos)	371	359	End Purge	1110
Temp	9.9	10.6	Rate (gpm)	11 GPM
SWL (Feet)		13.17'	Purge Vol (gal)	440 GAL

PURGE VOLUME CALCULATIONS

				Casing Size	Gal/Foot
Total Depth (ft)	84	Casing Vol (gal)	104.1 = 105	2"	0.16
SWL (ft)	13.17'	Casing Vol X 3	315	4"	0.65
Water Column (ft)	70.83'	PT Vol (gal)	60	6"	1.47
Casing Size (in)	6	Total Vol (gal)	375	8"	2.61

Previous Sample Point Hose bib front of house

Special Instructions TEFLON SPLITTER

Comment New owners Mr. and Mrs. Muglia

* MT SAMPLED @ HOSE BIB FRONT OF HOUSE, FILLED 3-40 ml VOC's w/MA-AA FOR 5243. B1 ANATEK LAB IN MOSCOW ID.

- NEW ID 1073E-2-230419

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: *1*

Colbert Residential Field Data Sheet

19-Apr-23

Well **1573C-17**

TC **TA** **Home Phone** **Work Phone**

R R RESIDENT
20518 N. Thor Rd.

COLBERT Wa 99005

Last Sample Date 4/13/2022 **Sample I.D.** 1573C-17-220413

FIELD PARAMETERS	Previous	Current	Sample Date	
			Sample Time	1203
pH	7.91	8.08	Start Purge	1145
Cond (uMhos)	332	438	End Purge	1200
Temp	10.8	10.5	Rate (gpm)	7.5gpm
SWL (Feet)	160		Purge Vol (gal)	113gal

PURGE VOLUME CALCULATIONS				Casing Size	Gal/Foot
Total Depth (ft)	260	Casing Vol (gal)	⇒150	2"	0.16
SWL (ft)	160	Casing Vol X 3	450	4"	0.65
Water Column (ft)	100	PT Vol (gal)	+ 50	6"	1.47
Casing Size (in)	6	Total Vol (gal)	500	8"	2.61

Previous Sample Point Yard hydrant next to pump vault

Special Instructions YARD HYDRANT IN FRONT OF HOUSE.

Comment

* Active well, purged 15 min then sampled.

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 160'

Colbert Residential Field Data Sheet

19-Apr-23

Well **1073L-2**

TC **TA**

R R Steve Countryman
N 21202 Little Spokane River D

Colbert Wa 99005

Home Phone (509) 466-2232 **Work Phone**

Last Sample Date 1/18/2023 **Sample I.D.** 1073L-2-230118

FIELD PARAMETERS	Previous	Current	Sample Date	
			Sample Time	1057
pH	8.2	8.02	Start Purge	1030
Cond (uMhos)	310	315	End Purge	1054
Temp	8.8	10.1	Rate (gpm)	5/(30/60)=10gpm
SWL (Feet)	15		Purge Vol (gal)	240

PURGE VOLUME CALCULATIONS				Casing Size	Gal/Foot
Total Depth (ft)	67	Casing Vol (gal)	⇒ 80	2"	0.16
SWL (ft)	15	Casing Vol X 3	240	4"	0.65
Water Column (ft)	52	PT Vol (gal)	N/A** 100	6"	1.47
Casing Size (in)	6	Total Vol (gal)	240	8"	2.61

Previous Sample Point Hose bib west side of house

Special Instructions Splitter; Teflon tubing.

Comment * MS/MSD TAKEN HERE FILLED 9 - 40 ml VOCs 524.3 MA/AA

** Sampled from bypass hose bib in gvng house.

SAMPLE ID 1073L-2-220419
1073L-2-220419MS
1073L-2-220419MSD

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 15'

Colbert Residential Field Data Sheet

19-Apr-23

Well **1073J-1**

TC	TA		Home Phone	Work Phone
R	R	Alfonso Moreno E 4024 Wahoo Road Colbert Wa 99005	(509) 953-7215	

Last Sample Date 9/28/2022 **Sample I.D.** 1073J-1-220928

FIELD PARAMETERS	Previous	Current	Sample Date
			Sample Time
pH	7.89		Start Purge
Cond (uMhos)	461		End Purge
Temp	11.4		Rate (gpm)
SWL (Feet)			Purge Vol (gal)

PURGE VOLUME CALCULATIONS				Casing Size	Gal/Foot
Total Depth (ft)	280	Casing Vol (gal)		2"	0.16
SWL (ft)		Casing Vol X 3		4"	0.65
Water Column (ft)		PT Vol (gal)	30	6"	1.47
Casing Size (in)	6	Total Vol (gal)		8"	2.61

Previous Sample Point Hose bib at front gate

Special Instructions TEFLON SPLITTER

Comment Daughter is selling house

House is still for sale. Door to pumphouse is locked, and water is shut off property wide. No sample.

IF CANNOT TAKE WL, ENTER ASSUMED READING HERE: 168'

Appendix C

Extraction Well Inspections/Maintenance Checklists

TECHS: M.TERRIS
DATE(S): 4/13/22

EXTRACTION WELL MAINTENANCE

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
NOTES:	ALL SUMPS WERE CLEANED → NOT AVAILABLE TO VERIFY FLOAT ALARM										
VFD:											
	CLEAN FILTER	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
PIPING:											
	EXERCISE GATE VALVE (2X)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	SMALL LEAK IN AIR/VAC ON W-3 CLEANED SEAL WORK GREAT.										
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	A	A	A	A	A	A	N	A	A	A
NOTES:	ZERO READING ✓ ON ANNUAL MAINT										
PCP:											
	CLEAN (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/(COOL)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	(CHECK)/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	WORKING ON RADIO COMM EVERYTHING LOOK GREAT										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:	CONTROL FREAK ON SITE TO GET RADIOS WORKING										
	RESET RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	C	C	C	C	C	C	C	C	C	C

CONTROL FREAK OUT TO GET RADIO TO COMM W/PLANK

EXTRA NOTES:

TECHS: M. TERRIS **EXTRACTION WELL MAINTENANCE**
DATE(S): 7/7/2022 (THURS)

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	—	—	—	—	—	—	—	—	—	—
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	ALL LOOK GREAT!!										
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	GATE VALVE OPEN TO SAMPLE → PUT CLOSED WHEN NOT SAMPLING.										
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	A	A	A	A	A	A	A	A	~~N~~	A
NOTES:	A= ANNUAL MAINT.										
PCP:											
	CLEAN (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	PCP ALL LOOK IN GOOD SHAPE										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	PRESAMPLE CLEANING = ✓ GOOD										
FINAL:											
	RESET RADIO	—	—	—	—	—	—	—	—	—	—
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	C	C	C	C	C	C	C	C	C	C

EXTRA NOTES: QT ✓ & CLEANING OF EXTRACTION WELL PRE-SAMPLING (MT)

TECHS: M TERRIS

DATE(S): 11/10/2022

EXTRACTION WELL MAINTENANCE

QT MAINT/CLEANING

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM										
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	CLEAN OUT EACH SUMP FREE OF DEBRIS										
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	OPENED EACH VFD PUT NEW DESICCANT										
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	ALL VALVES LEFT OPEN EXCEPT SOUTH SYSTEM										
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	A	A	A	A	A	A	A	A	A	A
NOTES:											
PCP:											
	CLEAN (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK	✓	✓	✓	✓	✓	✓	✓	✓	NEW	✓
NOTES:	NEED TO CHANGE OUT UPS BATT 2-YEAR EACH LOCATION										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:	PRE SAMPLE CLEAN										
FINAL:											
	RESET RADIO	—	—	—	—	—	—	—	—	—	—
	RESET WELL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	C	C	C	C	O	O	O	O	O	O

QT- CLEANING PRE-INSPECTION

EXTRA NOTES:

TECHS: MT

DATE(S): 12/28/22

EXTRACTION WELL MAINTENANCE

QT FOR 01/2023

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
VFD:											
	CLEAN FILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:		PROJECT FOR ANNUAL MD (PIT)									
		NEED NEW A/C FAN SPRING 2023									
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:						CLEANED					
		RAN ALL WELL ALL MORNING ON 1/11/23									
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK ZERO READING	—	—	—	—	—	—	—	—	—	—
NOTES:											
PCP:											
	CLEAN (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CLEAN FILTERS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK	✓	✓	✗	✓	✓	✓	✓	✗	✓	✓
NOTES:		✗✓ BATT									
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:		RADIOS?									
	RESET RADIO	—	—	—	—	—	—	—	—	—	—
	RESET WELL	—	—	—	—	—	—	—	—	—	—
	IS PIT OPEN?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	IS GATE VALVE OPEN?	C	C	C	C	C	C	C	C	C	C

EXTRA NOTES: SPRING CLEANING BEFORE ANNUAL ROUND SEMI-ANNUAL CLEANING

TECHS: MT/CC
DATE(S): 4/5 & 4/6/23

EXTRACTION WELL MAINTENANCE

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM					NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)					✓	✓	✓	✓	✓	✓
NOTES:											
VFD:											
	CLEAN FILTER					✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS					✓	✓	✓	✓	✓	✓
NOTES:	NEED NEW FAN W1, E-1 E-3 FAN W-3 OK PUT NEW PLUMBING										
PIPING:											
	EXERCISE GATE VALVE (2X)					OV✓	OV✓	✓	OV✓	OV✓	OV✓
	INSPECT PIPING FOR LEAKS					✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE					✓	✓	✓	✓	✓	✓
NOTES:											
PIT:											
	INSPECT FOR LEAKS					✓	✓	✓	✓	✓	✓
	CHECK ZERO READING					NA	A (NA)	A (NA)	A (NA)	A (NA)	A (NA)
NOTES:											
PCP:											
	CLEAN (SHOPVAC)					✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP					✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE					✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT					✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL					✓	✓	✓	✓	✓	✓
	CLEAN FILTERS					✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO					✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT					✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK					✓	✓	✓	✓	✓	✓
NOTES:	ALL VFS & SLC Batteries changed + UPS										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)					✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS					✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER					✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID					✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:											
	RESET RADIO					NA	NA	NA	NA	NA	N/A
	RESET WELL					NA	Y	Y	Y	Y	Y
	IS PIT OPEN?					Y	Y	Y	Y	Y	Y
	IS GATE VALVE OPEN?					Y	Y	Y	Y	Y	Y

EXTRA NOTES:

TECHS: MT/CC
DATE(S): 4/5 & 4/6/25

EXTRACTION WELL MAINTENANCE

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
		X	X	X	X						
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA						
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓						
NOTES:											
VFD:											
	CLEAN FILTER	✓	✓	✓	✓						
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓						
NOTES:		*S5 - VFD in off position upon entry. VFD controller in remote. *S1 - VFD Case fans/hum on after power cycle.									
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓						
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓						
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓						
NOTES:		*S6 - check valve leaking, allowing back flow, slight. *S1 - Check valve leaking, allowing slight back flow (0.2gpm)									
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓						
	CHECK ZERO READING	✓	✓	✓	✓						
NOTES:											
PCP:		*S5 - UPS dead upon entry.									
S5 -	CLEAN (SHOPVAC)	✓	✓	✓	✓						
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓						
	CHECK INDICATOR LIGHTS/REPLACE	**	***	✓	*						
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓						
	TURN FAN TO WARM/COOL	✓	✓	✓	✓						
	CLEAN FILTERS	✓	✓	✓	✓						
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓						
	DESSICANT CHANGE OUT	✓	✓	✓	✓						
	UPS BATTERY CHECK	✓	✓	✓	✓						
NOTES:		*No lock on S4 All UPS & SLC Batteries Changed									
		*S6 - Power on, Fail lights out. **S1 - Power on light out. ***S4 - Power on light out									
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓						
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓						
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓						
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓						
NOTES:		No Vault fan in S6, No Vault Fan S4									
FINAL:											
	RESET RADIO	✓	✓	✓	✓						
	RESET WELL	✓	✓	✓	✓						
	IS PIT OPEN?	Y/N	Y/N	N	Y/N						
	IS GATE VALVE OPEN?	Y/N	Y/N	N	Y/N						

EXTRA NOTES:

WL's @ S-1 = 80.92 No WL @ S-4
S-5 =
S-6 = 87.45

TECHS: MT/CC
DATE(S): 4/5 & 4/6/23

EXTRACTION WELL MAINTENANCE

X X X X

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM	NA	NA	NA	NA						
	CLEAN AS NEEDED (SHOPVAC)	✓	✓	✓	✓						
NOTES:											
VFD:											
	CLEAN FILTER	✓	✓	✓	✓						
	INSPECT WIRING/COMPONENTS	✓	✓	✓	✓						
NOTES:		*S5 - VFD in off position upon entry. VFD controller in remote. *S1 - VFD Case fans/hum on after power cycle.									
PIPING:											
	EXERCISE GATE VALVE (2X)	✓	✓	✓	✓						
	INSPECT PIPING FOR LEAKS	✓	✓	✓	✓						
	INSPECT AIR/VAC VALVE	✓	✓	✓	✓						
NOTES:		*S6- check valve leaking, allowing back flow, slight. *S1- Check valve leaking, allowing slight back flow (0.2gpm)									
PIT:											
	INSPECT FOR LEAKS	✓	✓	✓	✓						
	CHECK ZERO READING	✓	✓	✓	✓						
NOTES:											
PCP:		*S5- UPS dead upon entry.									
S5-	CLEAN (SHOPVAC)	✓	✓	✓	✓						
	INSPECT ALL WIRING/RELAYS/COMP	✓	✓	✓	✓						
	CHECK INDICATOR LIGHTS/REPLACE	**	***	✓	*						
	CHECK SLC/KE CARD LIGHTS BATT	✓	✓	✓	✓						
	TURN FAN TO WARM/COOL	✓	✓	✓	✓						
	CLEAN FILTERS	✓	✓	✓	✓						
	CHECK/TIGHTEN ALL CABLES/RADIO	✓	✓	✓	✓						
	DESSICANT CHANGE OUT	✓	✓	✓	✓						
	UPS BATTERY CHECK	✓	✓	✓	✓						
NOTES:		*No lock on S4 All UPS & SLC Batteries changed									

*S6- Power on, Fail lights out.
**S1- Power on lights out
***S4- Power on lights out

VAULT:											
	CLEAN AND INSPECT (SHOPVAC)	✓	✓	✓	✓						
	INSPECT LADDER BOLTS/RUNGS	✓	✓	✓	✓						
	INSPECT LID BOLTS UPPER/LOWER	✓	✓	✓	✓						
	CHECK/TIGHTEN MAGNET WELL/LID	✓	✓	✓	✓						
NOTES:		No Vault fan in S6, No Vault Fan S4									
FINAL:											
	RESET RADIO	✓	✓	✓	✓						
	RESET WELL	✓	✓	✓	✓						
	IS PIT OPEN?	~~Y~~/N	~~Y~~/N	N	~~Y~~/N						
	IS GATE VALVE OPEN?	~~Y~~/N	~~Y~~/N	N	~~Y~~/N						

EXTRA NOTES:

WL's @ S-1 = 8092 No WL @ S-4
S-5 =
S-6 = 87.45

TECHS: MT/CC

DATE(S): 4/5 & 4/6/23

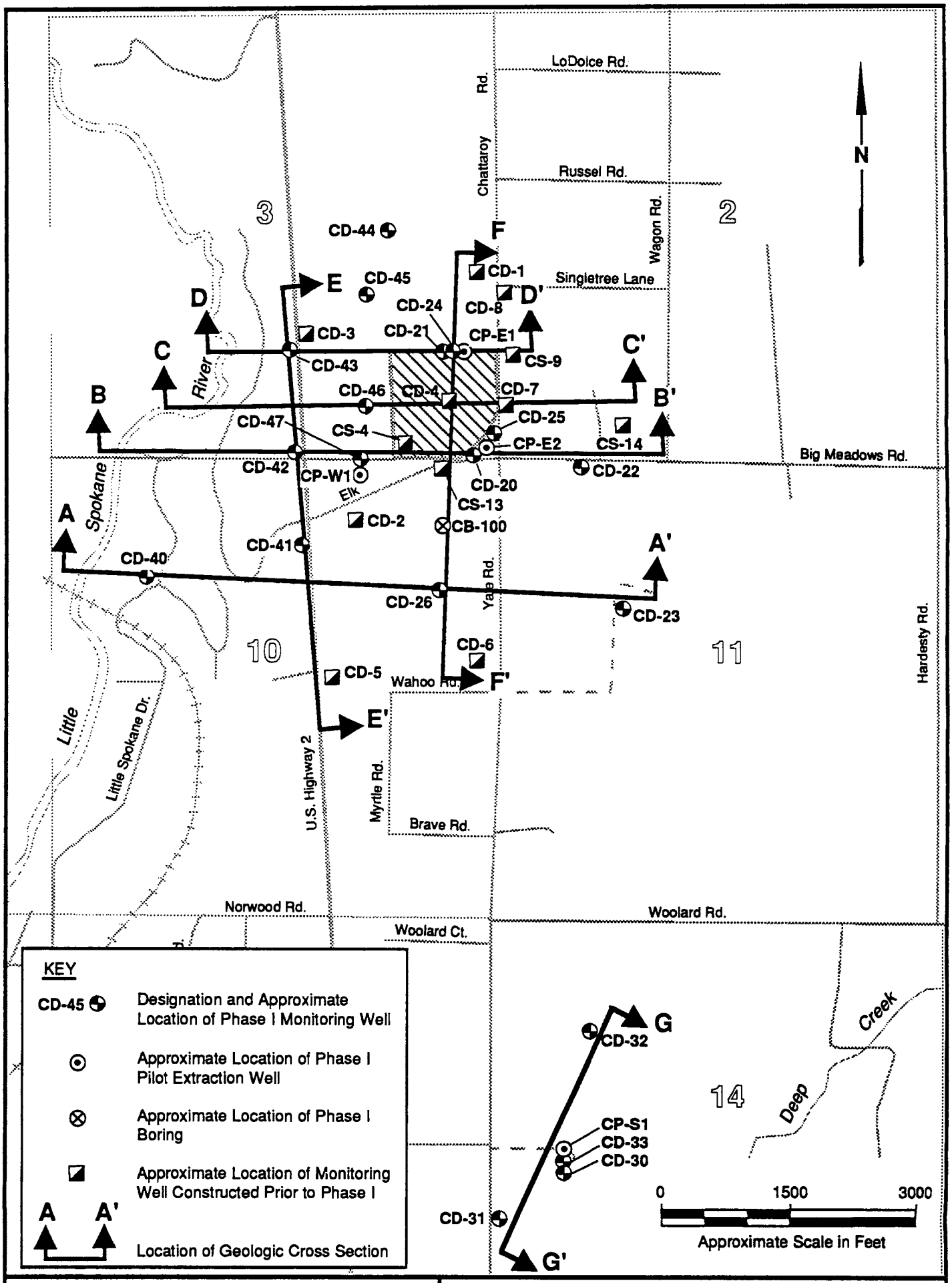
EXTRACTION WELL MAINTENANCE

TASK	MAINTENANCE	CP-S1	CP-S4	CP-S5	CP-S6	CP-E1	CP-E2	CP-E3	CP-W1	CP-W2	CP-W3
SUMP:											
	VERIFY HI FLOAT ALARM					NA	NA	NA	NA	NA	NA
	CLEAN AS NEEDED (SHOPVAC)					✓	✓	✓	✓	✓	✓
NOTES:											
VFD:											
	CLEAN FILTER					✓	✓	✓	✓	✓	✓
	INSPECT WIRING/COMPONENTS					✓	✓	✓	✓	✓	✓
NOTES:	NEED NEW FAN W1, E-1 E-3 FAN W-3 OK PUT NEW PLUMBING										
PIPING:											
	EXERCISE GATE VALVE (2X)					OV ✓	OV ✓	✓	OV ✓	OV ✓	OV ✓
	INSPECT PIPING FOR LEAKS					✓	✓	✓	✓	✓	✓
	INSPECT AIR/VAC VALVE					✓	✓	✓	✓	✓	✓
NOTES:											
PIT:											
	INSPECT FOR LEAKS					✓	✓	✓	✓	✓	✓
	CHECK ZERO READING					NA	A (NA)	A (NA)	A (NA)	A (NA)	A (NA)
NOTES:											
PCP:											
	CLEAN (SHOPVAC)					✓	✓	✓	✓	✓	✓
	INSPECT ALL WIRING/RELAYS/COMP					✓	✓	✓	✓	✓	✓
	CHECK INDICATOR LIGHTS/REPLACE					✓	✓	✓	✓	✓	✓
	CHECK SLC/KE CARD LIGHTS BATT					✓	✓	✓	✓	✓	✓
	TURN FAN TO WARM/COOL					✓	✓	✓	✓	✓	✓
	CLEAN FILTERS					✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN ALL CABLES/RADIO					✓	✓	✓	✓	✓	✓
	DESSICANT CHANGE OUT					✓	✓	✓	✓	✓	✓
	UPS BATTERY CHECK					✓	✓	✓	✓	✓	✓
NOTES:	ALL VFS & SLC Battery changed + UPS										
VAULT:											
	CLEAN AND INSPECT (SHOPVAC)					✓	✓	✓	✓	✓	✓
	INSPECT LADDER BOLTS/RUNGS					✓	✓	✓	✓	✓	✓
	INSPECT LID BOLTS UPPER/LOWER					✓	✓	✓	✓	✓	✓
	CHECK/TIGHTEN MAGNET WELL/LID					✓	✓	✓	✓	✓	✓
NOTES:											
FINAL:											
	RESET RADIO					NA ✓	NA	NA	NA	NA	N/A
	RESET WELL					MH Y	Y	Y	Y	Y	Y
	IS PIT OPEN?					Y	Y	Y	Y	Y	Y
	IS GATE VALVE OPEN?					Y	Y	Y	Y	Y	Y

EXTRA NOTES:

Appendix D

Colbert Landfill Hydrogeologic Cross-sections



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Geologic Cross Section Location Map

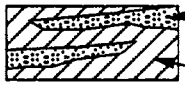
124-01.61 Spokane Co./Colbert Landfill/RD/RA Phase I /Final Engineering Report 12/91

Figure ER-4.1

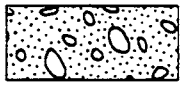
KEY TO GEOLOGIC CROSS SECTIONS

Fluvial sands, silts and gravels

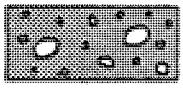
Upper Sand/Gravel Unit (Unit A), composed of gravelly, fine to coarse sand



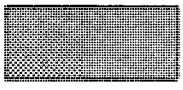
Lacustrine Unit (Unit B), composed of silt and clay with interbedded fine sand



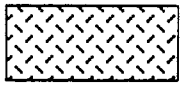
Lower Sand/Gravel Unit (Unit C), composed of gravelly, fine to coarse sand



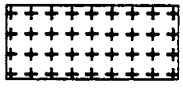
Weathered Latah Subunit (Unit D_1), composed of gravelly (basalt) silt and clayey silt



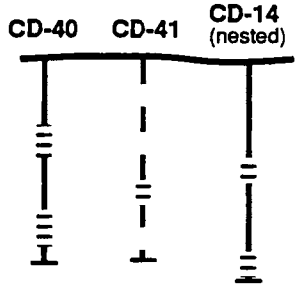
Latah Formation (Unit D), composed of silt, clayey silt and fine sand



Basalt Unit (Unit E), composed of highly fractured to massive Basalt rock

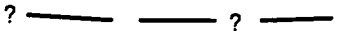


Granite Unit (Unit F), composed of Pre-Tertiary granitic rock, highly weathered with zones encountered during Phase I

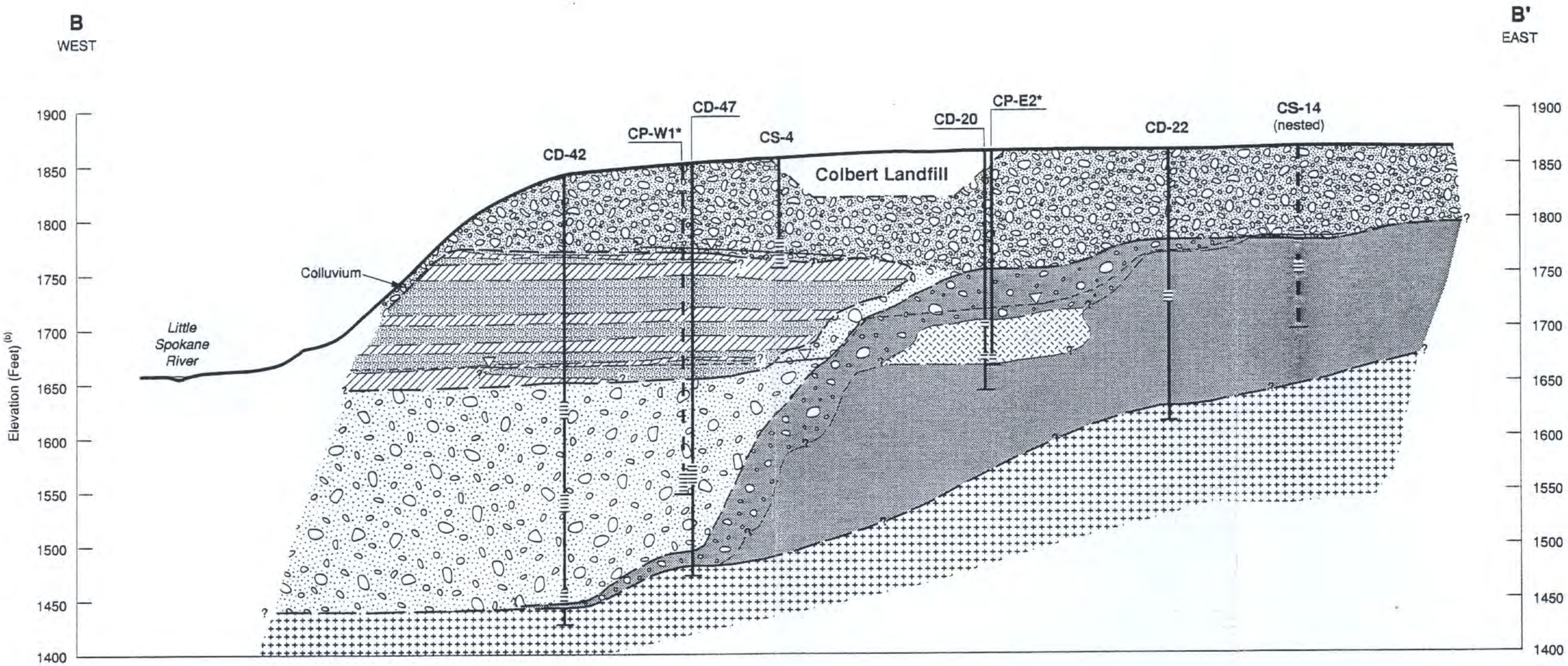


Approximate location and number of monitoring well cluster, with screen intervals shown for individual monitoring wells. Projected boring logs have dashed lines. Nested wells are noted, and screen intervals shown.

Ground water elevation line, dashed when representing a piezometric surface in a confined aquifer



Contact between stratigraphic units; question marks indicate contact projection based on limited data



Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

* Pilot Well included in cross section to show screen interval, geologic information is based on adjacent monitoring well boring data.

0 600 1200

Approximate Scale in Feet

Vertical Scale Exaggeration: 6x

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Geologic Cross Section B-B'

Figure ER-4.4

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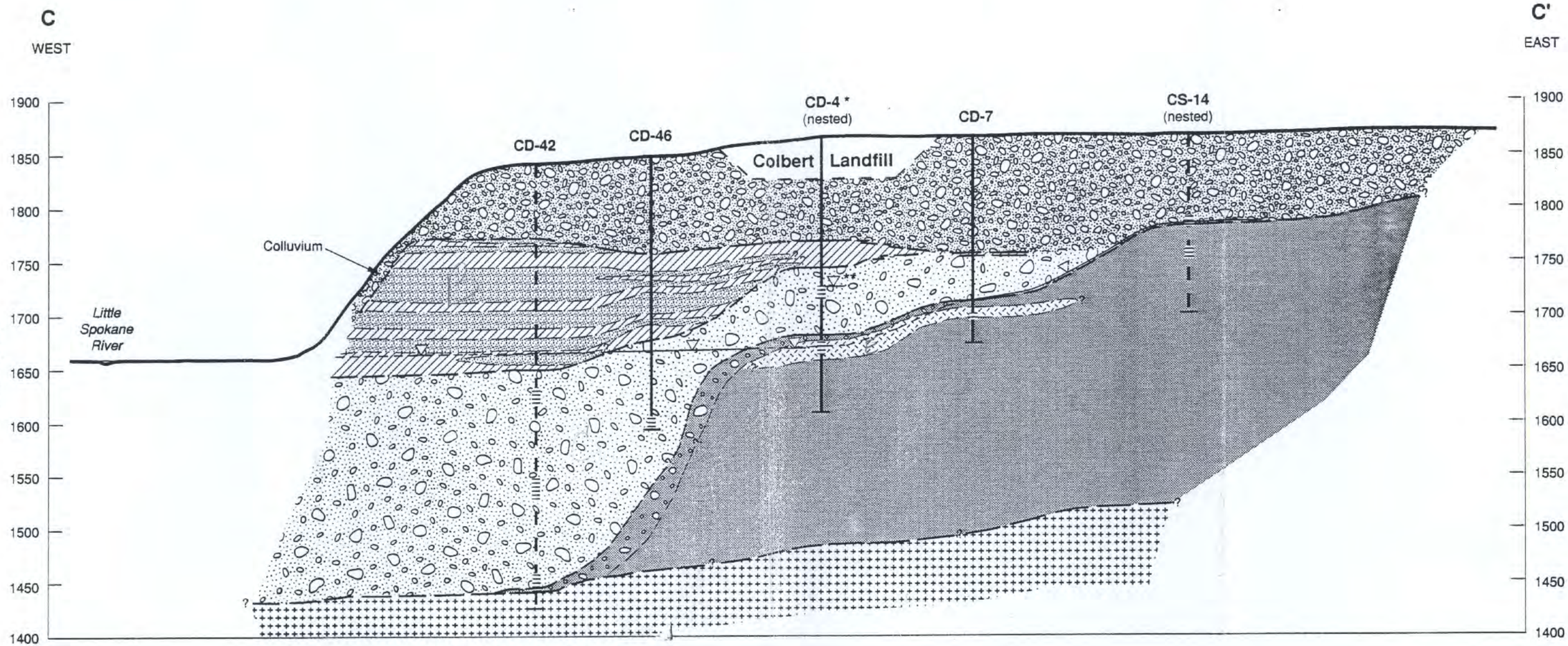

Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

* Well drilled by air rotary; detailed geology not identified in Lacustrine Aquitard Unit.
** Ground water in CD-4(U) appears to be perched. However, an underlying aquitard is not identified on the boring log.

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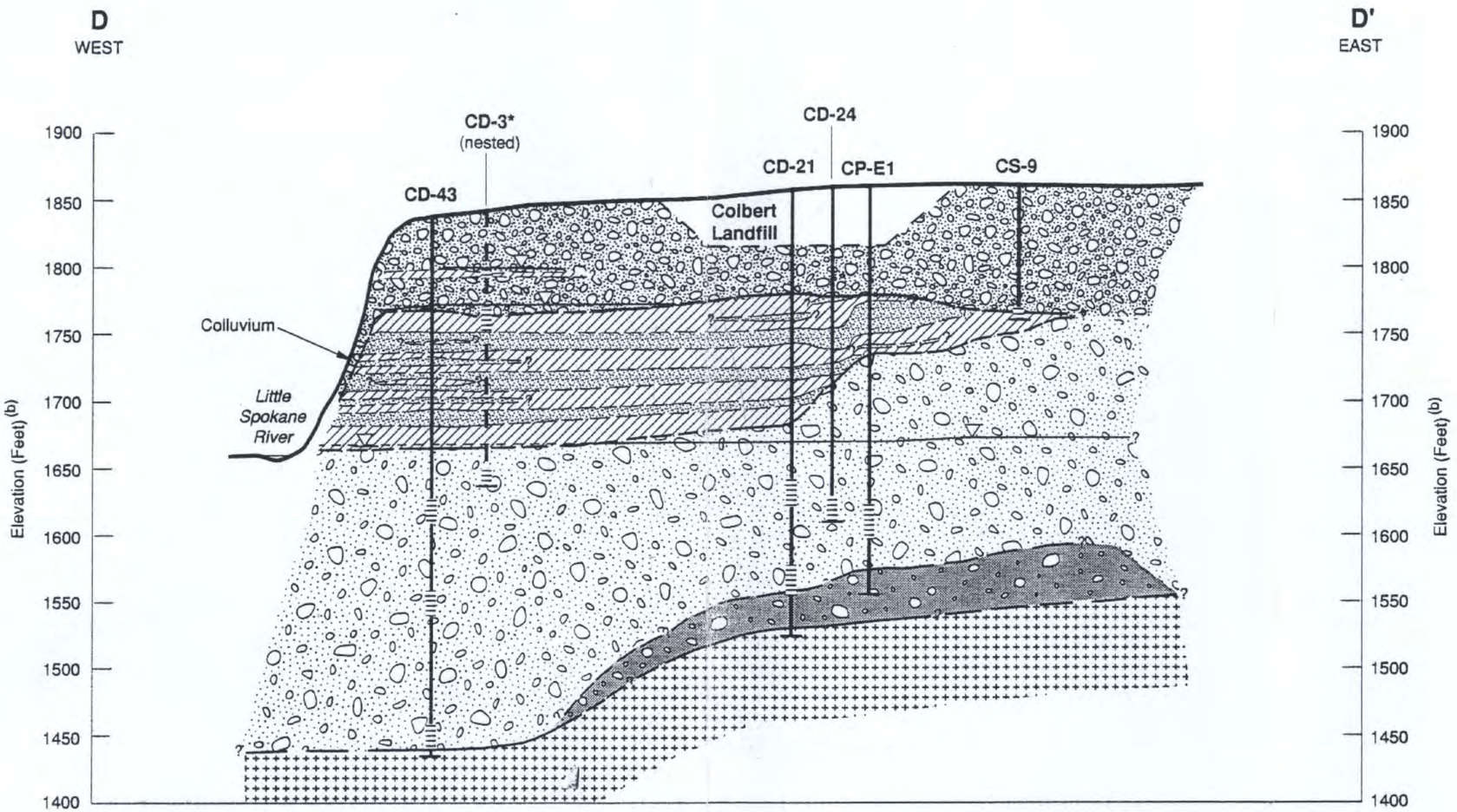
Geologic Cross Section C-C'

Figure ER-4.5



Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

0 600 1200
Approximate Scale in Feet
Vertical Scale Exaggeration: 6x

* Well drilled by air rotary; detailed geology in Lacustrine Aquitard Unit based on CD-43 boring data.

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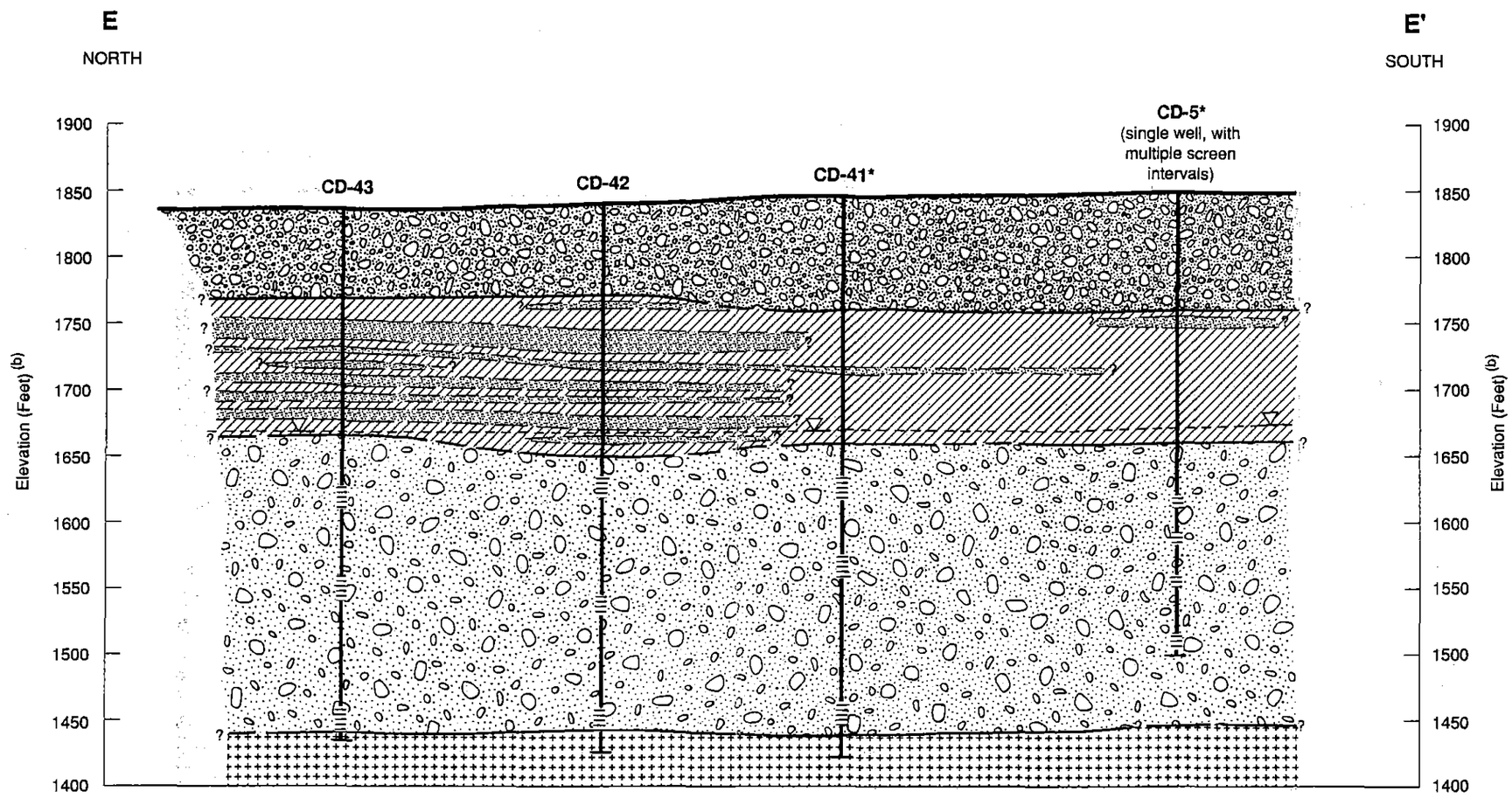
Geologic Cross Section D-D'

Figure ER-4.6



Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

0 600 1200
Approximate Scale in Feet
Vertical Scale Exaggeration: 6x

* Well drilled by air rotary; detailed geology not identified in Lacustrine Aquitard Unit.

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Geologic Cross Section E-E'

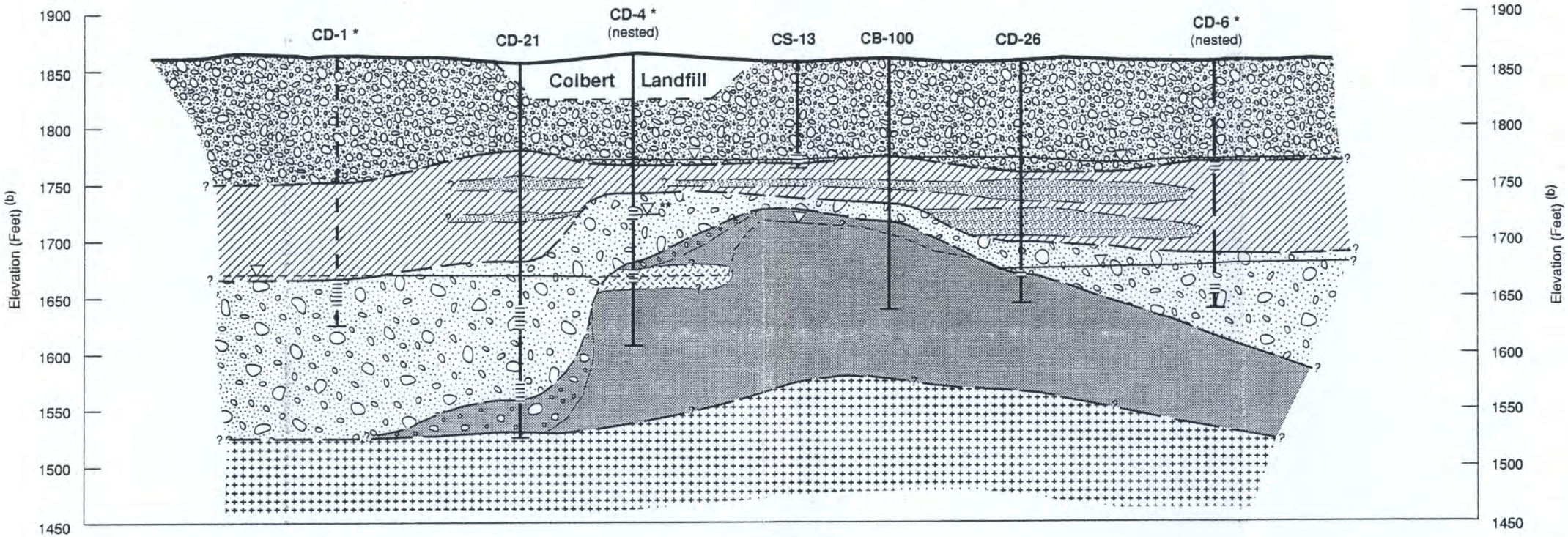
Figure ER-4.7

F

NORTH

F'

SOUTH



Notes: a) Subsurface profiles shown have been generalized from data obtained during Phase I and other Site investigations. Variations between this profile and the actual soil conditions may be encountered. The boring logs and the discussion in the text of this Report must be referenced for a proper understanding of the nature of subsurface materials.

b) All elevations in feet above mean sea level (MSL) based on 1929, National Geodetic Vertical Datum.

0 600 1200

Approximate Scale in Feet

Vertical Scale Exaggeration: 6x

* Well drilled by air rotary; detailed geology not identified in Lacustrine Aquitard Unit.

** Ground water in CD-4(U) appears to be perched. However, an underlying aquitard is not identified on the boring log.

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Geologic Cross Section F-F'

Figure ER-4.8