Colbert Landfill Remediation Project Annual Report 2016

Progress Report for

July 2015 through April 2016

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Contents

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, the landfill was place on the National Priorities List (NPL) by EPA. In 1989, a consent decree 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; and upper aquifer compliance groundwater monitoring (includes 1-4,dioxane monitoring' and MFS monitoring of the upper aquifer); residential well monitoring (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	Quarterly
Upper Aquifer Compliance	Upper	VOC's	Annual (Extraction wells Quarterly)
1,4-Dioxane Sampling	Upper	1,4-Dioxane	Annual
MFS Monitoring	Upper	Cl/NH3/NO2/NH3 /SO4/Fe/Mn/Zn/T OC/COD	Annual
Residential Monitoring	Lower /Upper	VOC's	Monthly/Quarterly/SemiAnnual /Annual/BiAnnual

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			
	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			ug/L
RESIDENTIAL										
Monthly sampling initiated, evaluated in 12 months	Action Level	130	4.55	2632	3.25	0.5	1.63			
Exeedance requires alternative drinking w ater 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

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) process, 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.

1.2 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 compliance, Post Closure (MFS), and 1,4-dioxane sampling programs and are not included in the Shut-down test work plan.

1.3 Upper Aquifer Monitoring

1.3.1 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 implementation of the lower aquifer system Shut-down Test, the compliance monitoring will only apply to the upper aquifer. Per conditions set forth 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.

1.3.2 1, 4-Dioxane Sampling

During the 2005 (3rd) Five Year Site Review, 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. The selected upper aquifer well locations are sampled for 1,4-dioxane according to the *1,4-Dioxane Work Plan for the Colbert Landfill (December 2007)*.

1.3.3 Minimal Functional Standards 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 continue according to the *Colbert Landfill Operations and Maintenance Manual, 1998*., and the *MFS Groundwater Monitoring Plan, 1996* .

1.4 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.

1.5 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*.

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 from the shut-down locations 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. Compliance monitoring well CD-48C2 experienced pump failure during the sample round. The pump was replaced the following week and a sample was obtained at that time. There were no other problems/issues associated with sampling during the reporting period.

2.2.1 Groundwater Elevations

Groundwater elevations for the reporting period are shown in Table 2-2 and in Figure 2-2. Estimated groundwater contours and flow are shown in Figure 2-3. Elevations in the lower aquifer 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 anticipated increase in groundwater levels at the immediate vicinity of those wells in April 2014 when the system was 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 seen in the east system extraction wells. Conductivity values in monitoring wells ranged from 267 to 512 umhos/cm. Measurements of pH ranged from 7.97 to 6.8, with the lowest pH values 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 Table 2-4. Concentrations versus time for Shut-down locations are presented in Figure 2-4. All detected concentrations found in the shut-down test compliance wells were well below any applicable criteria. Criteria are shown in Table 3-2. The COC's found in the shut-down program criteria dependent wells were TCA and DCE and at low concentrations. Although concentrations found at

this well are far below any criteria, monitoring well CD-49 was kept on a quarterly sampling schedule to better evaluate the increasing TCA concentrations found in this well. See Figure 2-9 for the estimated TCA plume boundaries in the lower aquifer.

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 well sampling are shown in Table 2-5. Time versus concentrations are found in Figure 2-5 through Figure 2-8. In general, concentrations of COC's increased in east system wells and CP-W3, while CP-W2 showed a significant decrease in concentrations three months after the wells were inactivated.

2.3 Data Evaluation

Data indicates a slight shift in plume concentrations toward the western edge of landfill, evident by the emerging concentrations of TCA and DCE found in CD-49, decreasing concentrations found in CP-W2 and increasing concentrations (rebound) found in CP-W3.

2.4 Program Changes or Modifications

No criteria were exceeded during the reporting period. As stated in the work plan, sampling at the lower aquifer compliance monitoring wells will now move to an annual schedule and will be sampled again in April 2017. The exception to this is monitoring well CD-49. Quarterly sampling will continue at CD-49 to observe the increasing trend in concentrations. If concentrations continue to increase at a steady rate, the sampling frequency at well clusters CD-43 and CD-42 will be re-evaluated.

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.

2.5 Cost Savings

Typical electrical costs associated with operating the pump and treat system for the lower aquifer on a continual basis for a period of one year were approximately $59,000. From May 2015 through April 2016 the cost for electricity at the facility during the second year of the shut-down test was $14,712.

Increases in lab costs were minimal when compared to the savings in electricity. The estimated lab cost for the additional sampling rounds was $6,200. Labor costs for additional sampling rounds were estimated to be approximately $4,000.

Typical Annual Electrical Costs		**$60,000**
Electrical Costs for First Year of Shut-down Test		-$14,712
Additional Lab Cost Associated with Shut-down Test		- $6,200
Estimated labor costs for additional sample rounds		-$4,000
Estimated Total Cost Savings		$35,088

Figure 2-1 Shut-down Test Locations

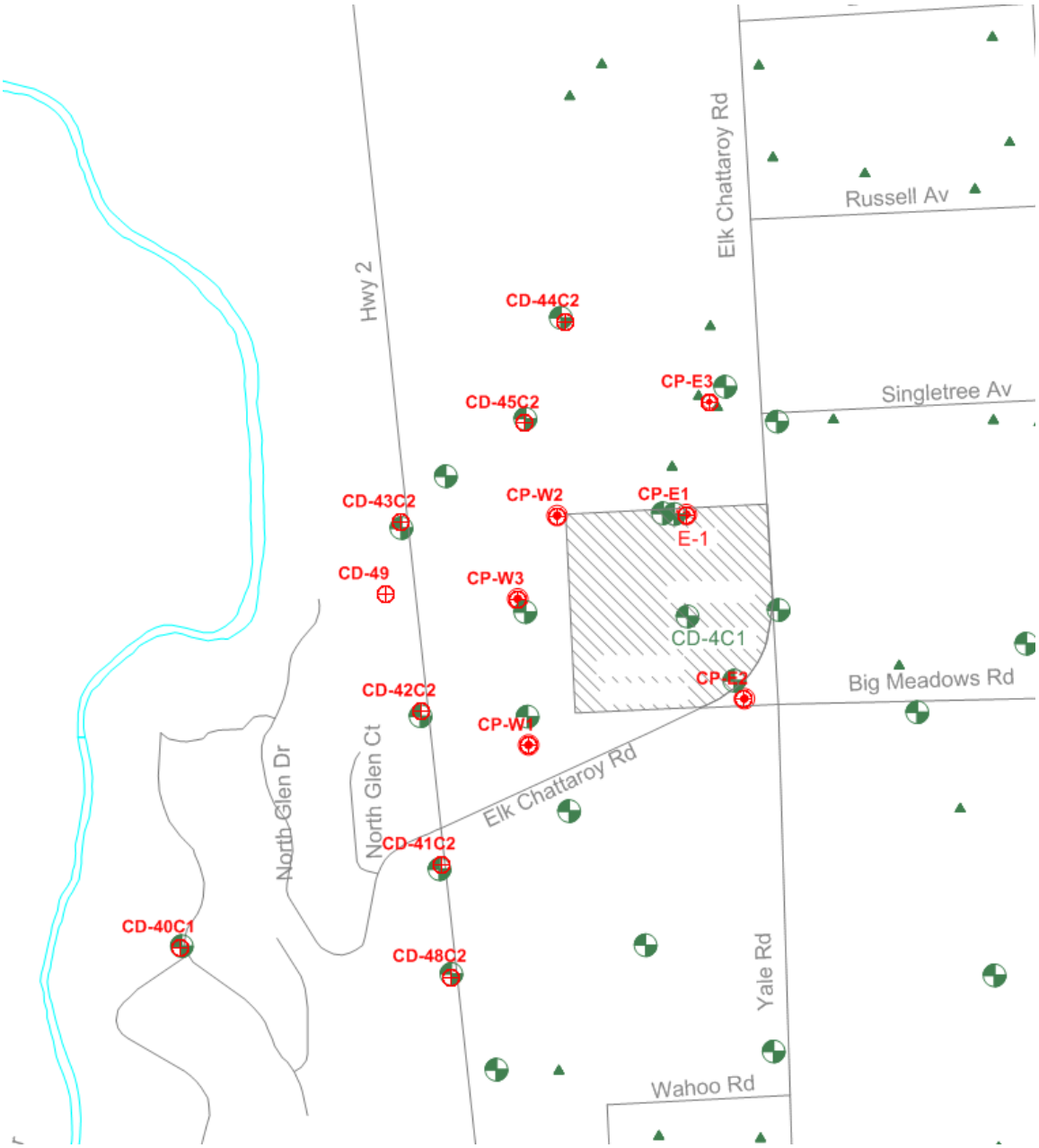
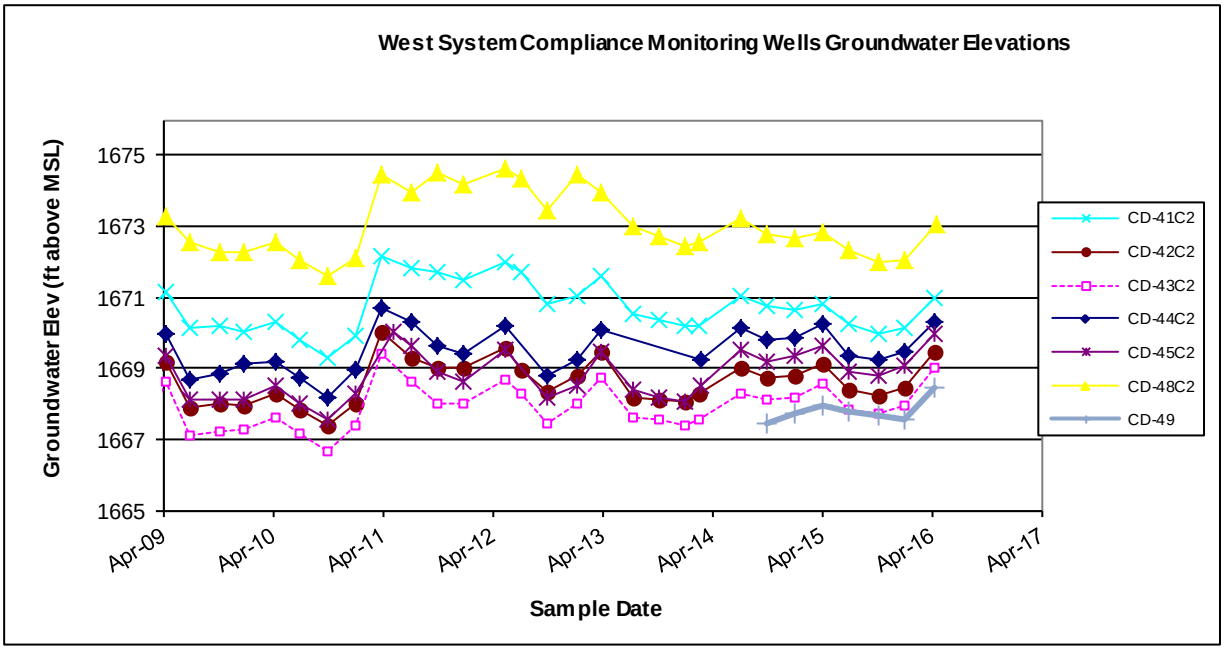


Table 2-1 Colbert Landfill Shut-down Test Sampling Schedule Year 2 (May 2015 through April 2016)

System	Well ID	Monitoring Frequency		Shut-down Criteria Applies?
		Water Levels	Sampling	
West	CD-41C1	Quarterly	Semi-Annual	Yes
	CD-41C2	Quarterly	Semi-Annual	
	CD-41C3	Quarterly	Semi-Annual	
	CD-42C1	Quarterly	Semi-Annual	Yes
	CD-42C2	Quarterly	Semi-Annual	
	CD-42C3	Quarterly	Semi-Annual	
	CD-43C1	Quarterly	Semi-Annual	Yes
	CD-43C2	Quarterly	Semi-Annual	
	CD-43C3	Quarterly	Semi-Annual	
	CD-44C1	Quarterly	Semi-Annual	Yes
	CD-44C2	Quarterly	Semi-Annual	
	CD-44C3	Quarterly	Semi-Annual	
	CD-45C1	Quarterly	Semi-Annual	Yes
	CD-45C2	Quarterly	Semi-Annual	
	CD-45C3	Quarterly	Semi-Annual	
	CD-48C1	Quarterly	Semi-Annual	Yes
	CD-48C2	Quarterly	Semi-Annual	
	CD-48C3	Quarterly	Semi-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	

Figure 2-2 Lower Aquifer Groundwater Elevations



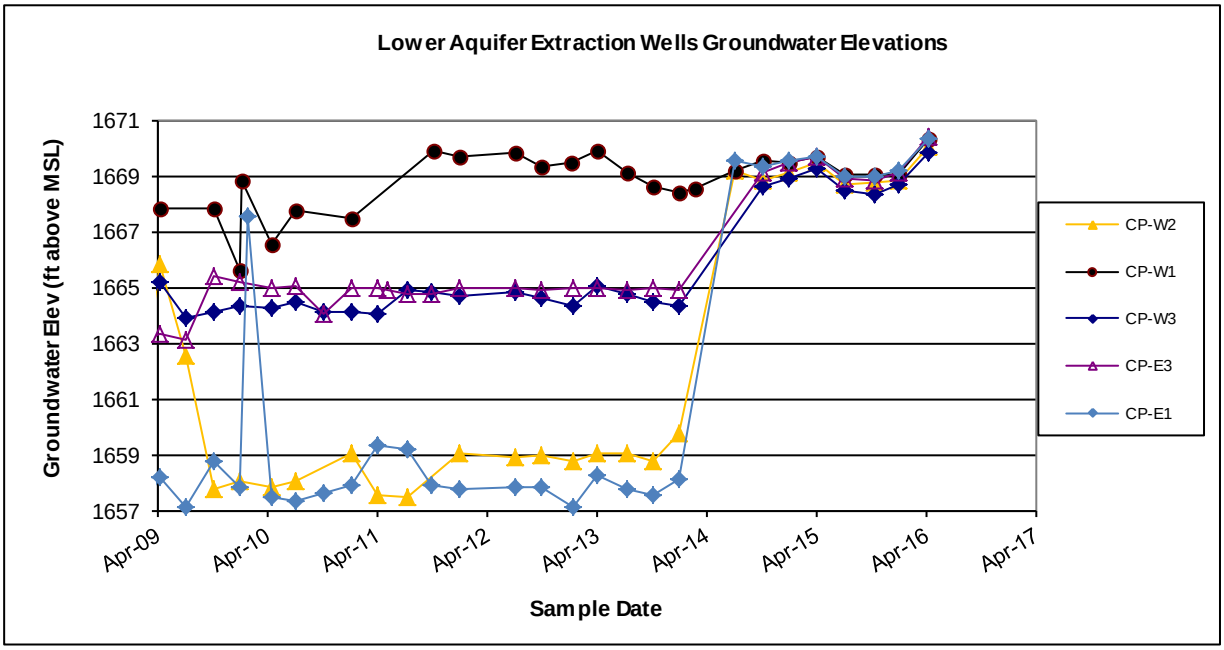


Figure 2-3 Lower Aquifer Groundwater Contours

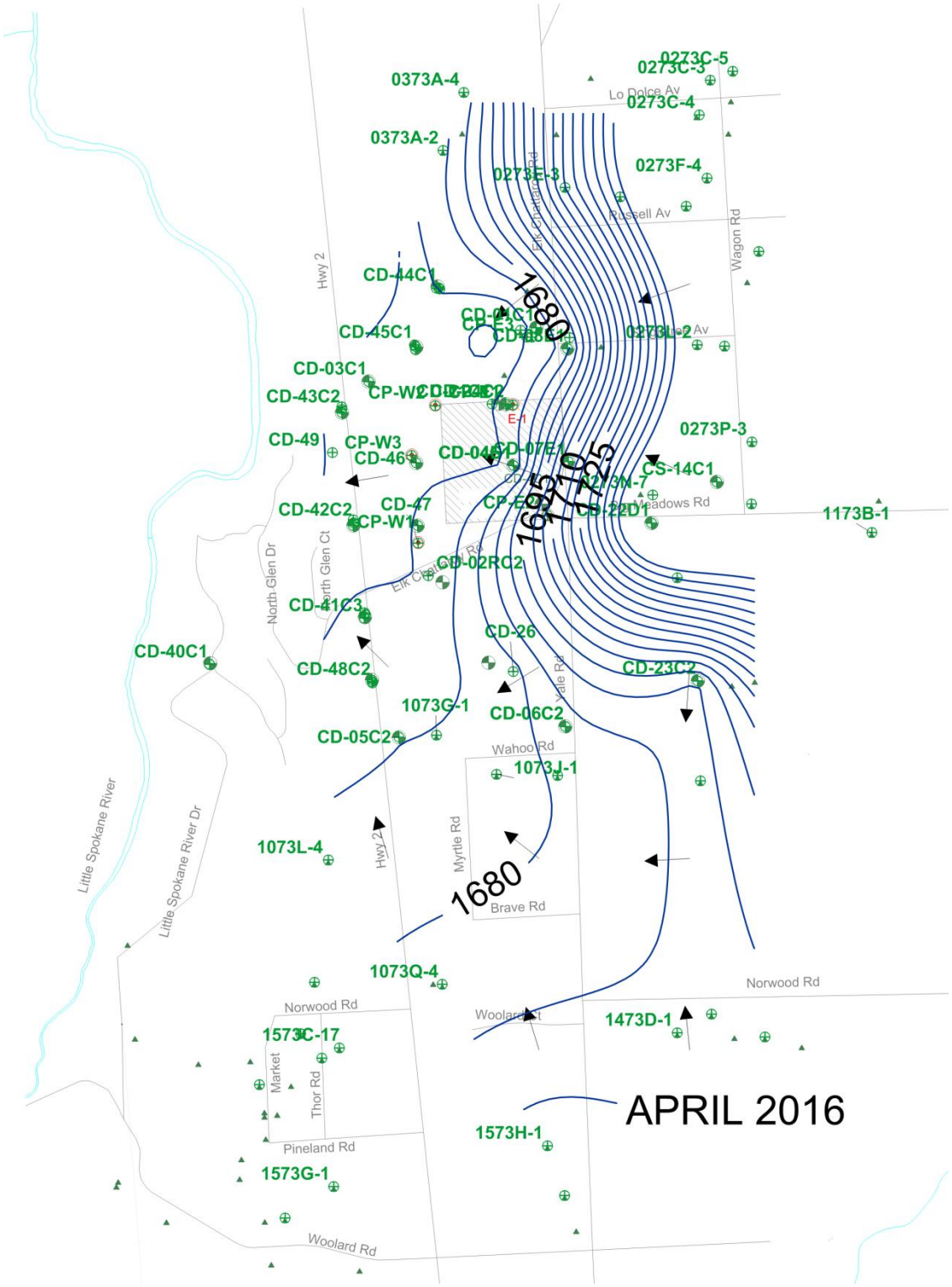


Table 2-2 Shut-down Test Location Field Parameters

StationID	SampleDate	WtrElev	FieldTemp	FieldPH	FieldConduct	FieldTurbidity	Aquifer
CD-40C1	10/15/2015	1661.39	10.7	7.85	512	0.19	lower
CD-40C1	4/13/2016	1662.76	10.1	7.97	490	0.11	lower
CD-41C1	10/13/2015	1669.83	12.5	7.85	416	0.24	lower
CD-41C1	4/12/2016	1671.19	11.9	7.49	359	0.27	lower
CD-41C2	10/13/2015	1669.97	12.2	7.96	445	0.09	lower
CD-41C2	4/12/2016	1670.97	11.9	7.6	385	0.07	lower
CD-41C3	10/13/2015	1670	13.2	7.82	470	0.1	lower
CD-41C3	4/12/2016	1671.29	12.8	7.45	417	0.1	lower
CD-42C1	10/13/2015	1668.31	12.3	7.81	484	0.54	lower
CD-42C1	4/12/2016	1669.64	12.4	7.48	420	0.08	lower
CD-42C2	10/14/2015	1668.2	11.9	7.63	461	0.11	lower
CD-42C2	4/12/2016	1669.47	12.3	7.54	421	0.08	lower
CD-42C3	10/13/2015	1668.26	12.9	7.88	416	1.21	lower
CD-42C3	4/12/2016	1669.53	12.8	7.5	364	0.66	lower
CD-43C1	10/13/2015	1667.19	10.2	7.96	329	0.3	lower
CD-43C1	4/12/2016	1668.39	9.9	7.61	352	0.11	lower
CD-43C2	10/13/2015	1667.7	10.9	7.94	384	0.41	lower
CD-43C2	4/12/2016	1669.01	11.1	7.64	340	0.09	lower
CD-43C3	10/13/2015	1668.51	11.6	7.83	307	1.15	lower
CD-43C3	4/12/2016	1669.22	11.3	7.46	267	0.18	lower
CD-44C1	10/14/2015	1669.52	16.6	7.39	472	0.12	lower
CD-44C1	4/13/2016	1670.43	14.5	7.26	493	0.18	lower
CD-44C2	10/14/2015	1669.24	11.7	7.31	453	0.09	lower
CD-44C2	4/13/2016	1670.28	12.1	7.25	460	0.07	lower
CD-44C3	10/14/2015	1669.26	12.2	7.4	450	0.5	lower
CD-44C3	4/13/2016	1670.1	11.9	7.33	461	0.46	lower
CD-45C1	10/14/2015	1668.91	10.2	7.51	449	0.13	lower
CD-45C1	4/13/2016	1669.8	9.9	7.43	480	0.09	lower
CD-45C2	10/14/2015	1668.79	10.3	7.53	454	0.11	lower
CD-45C2	4/13/2016	1669.95	10.2	7.43	416	0.12	lower
CD-45C3	10/14/2015	1668.9	10.4	7.75	347	0.18	lower
CD-45C3	4/13/2016	1670.14	10.1	7.68	347	0.14	lower
CD-48C1	10/13/2015	1671.94	12.2	7.78	495	0.41	lower
CD-48C1	4/12/2016	1672.65	11.9	7.42	428	0.1	lower
CD-48C2	10/13/2015	1671.96	12.5	7.8	509	0.5	lower
CD-48C2	4/21/2016	1673.07	12.4	7.72	512	0.26	lower
CD-48C3	10/13/2015	1671.99	12.3	7.84	468	0.53	lower
CD-48C3	4/12/2016	1674	12.2	7.46	405	0.09	lower
CD-49	10/13/2015	1667.69	13.3	7.8	499	0.1	lower
CD-49	1/6/2016	1667.54	12.3	7.51	465	0.1	lower
CD-49	4/13/2016	1668.44	12.6	7.51	499	0.04	lower

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

Table 2-2(continued)

StationID	SampleDate	WtrElev	FieldTemp	FieldPH	FieldConduct	FieldTurbidity	Aquifer
CP-E1	7/8/2015	1668.95	12.9	6.98	1002	1.21	lower
CP-E1	10/14/2015	1668.97	12.5	6.8	1103	0.62	lower
CP-E1	1/6/2016	1669.16	11.5	6.9	1183	2.16	lower
CP-E1	4/13/2016	1670.29	11.9	6.85	1155	1.79	lower
CP-E2	7/8/2015	1707.08	14.6	7.1	1019	2.01	lower
CP-E2	10/14/2015	1707.11	13.1	7.03	1117	0.7	lower
CP-E2	1/6/2016	1708.89	12	6.98	1184	0.72	lower
CP-E2	4/13/2016	1707.66	12.3	7.01	1146	0.68	lower
CP-E3	7/8/2015	1668.88	11.9	7.15	707	0.51	lower
CP-E3	10/14/2015	1668.83	11.7	7.11	799	0.29	lower
CP-E3	1/6/2016	1669.08	11	7.15	798	0.94	lower
CP-E3	4/13/2016	1670.41	11.5	7.15	789	0.69	lower
CP-W1	7/8/2015	1669.03	12.3	7.81	452	0.52	lower
CP-W1	10/14/2015	1669.02	12.1	7.75	514	0.63	lower
CP-W1	1/6/2016	1669.04	11.3	7.78	528	0.45	lower
CP-W1	4/13/2016	1670.29	11.4	7.72	513	0.31	lower

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

Table 2-3 Colbert Landfill Shut-down Test Criteria

	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**

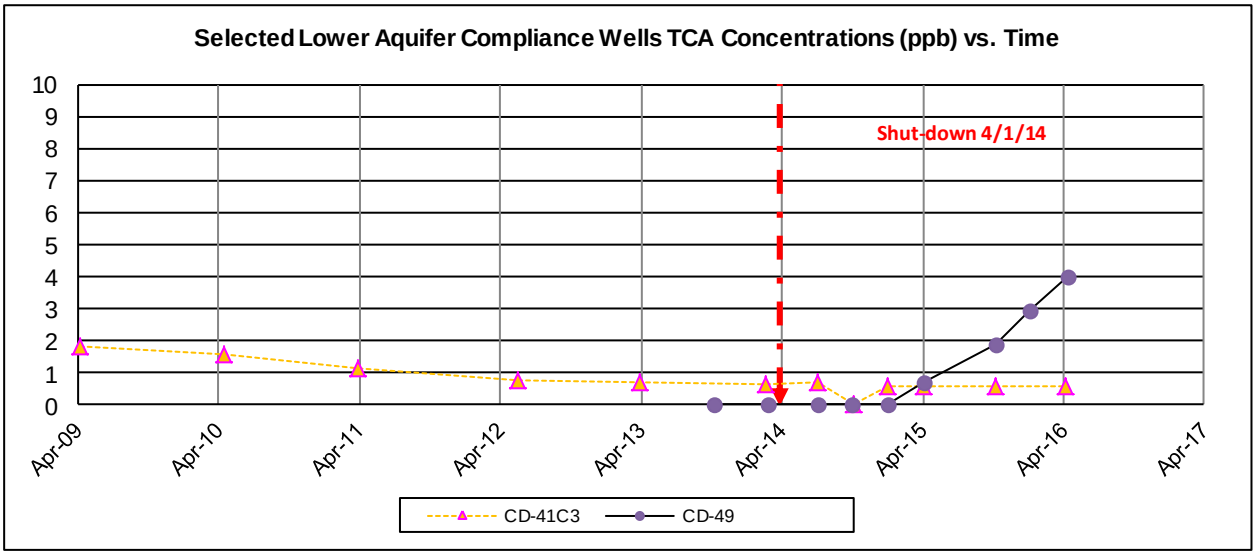
Table 2-4 Shut-down Test Compliance Well Analytical Results

StationID	Date	DCA	DCE	MC	PCE	TCA	TCE
CD-40C1	10-2015	**1.67**	**1.19**	<0.5	<0.5	**2.07**	<0.5
CD-40C1	4-2016	**4.05**	**2.41**	<0.5	<0.5	**6.75**	<0.5
CD-41C1	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C1	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C2	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C2	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-41C3	10-2015	<0.5	<0.5	<0.5	<0.5	**0.58**	<0.5
CD-41C3	4-2016	<0.5	<0.5	<0.5	<0.5	**0.61**	<0.5
CD-42C1	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C1	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C2	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C2	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C3	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-42C3	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C1	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C1	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C2	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C2	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C3	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-43C3	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C1	10-2015	<0.5	<0.5	<0.5	<0.5	**3.3**	<0.5
CD-44C1	4-2016	<0.5	<0.5	<0.5	<0.5	**2.28**	<0.5
CD-44C2	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C2	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C3	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-44C3	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C1	10-2015	<0.5	<0.5	<0.5	<0.5	**1.11**	<0.5
CD-45C1	4-2016	<0.5	<0.5	<0.5	<0.5	**0.98**	<0.5
CD-45C2	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C2	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C3	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-45C3	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C1	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C1	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C2	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C2	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C3	10-2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-48C3	4-2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CD-49	10-2015	<0.5	**0.68**	<0.5	<0.5	**1.87**	<0.5
CD-49	1-2016	<0.5	**1.04**	<0.5	<0.5	**2.92**	<0.5
CD-49	4-2016	<0.5	**1.34**	<0.5	<0.5	**4.03**	<0.5

Table 2-5 Lower Aquifer Extraction Well Analytical Results

StationID	Date	DCA	DCE	MC	PCE	TCA	TCE
CP-E1	10-2015	8.03	10.8	<0.5	1.75	8.12	6.17
CP-E1	1-2016	9.31	13.6	<0.5	1.99	9.3	7.32
CP-E1	4-2016	7.55	11.9	<0.5	1.84	7	6.41
CP-E2	10-2015	27.2	100	<0.5	0.82	61.9	83.5
CP-E2	1-2016	33.1	109	<0.5	0.83	72.3	101
CP-E2	4-2016	27.5	95.4	<0.5	0.9	56	91.7
CP-E3	10-2015	3.19	15.6	<0.5	<0.5	16.5	1.28
CP-E3	1-2016	3.39	18.1	<0.5	<0.5	17.7	1.37
CP-E3	4-2016	2.89	17.4	<0.5	<0.5	15.6	1.63
CP-W1	10-2015	0.52	4.86	<0.5	<0.5	7.65	<0.5
CP-W1	1-2016	0.57	6.11	<0.5	<0.5	8.77	<0.5
CP-W1	4-2016	<0.5	5.65	<0.5	<0.5	6.88	<0.5
CP-W2	10-2015	<0.5	<0.5	<0.5	<0.5	1.26	<0.5
CP-W2	1-2016	<0.5	<0.5	<0.5	<0.5	1.75	<0.5
CP-W2	4-2016	<0.5	<0.5	<0.5	<0.5	1.29	<0.5
CP-W3	10-2015	20.7	36.6	<0.5	<0.5	70.3	32.2
CP-W3	1-2016	27.7	49.2	<0.5	<0.5	85.8	31.5
CP-W3	4-2016	28.5	56.6	<0.5	<0.5	92.1	29.9

Figure 2-4 Lower Aquifer Monitoring Well COC Concentrations



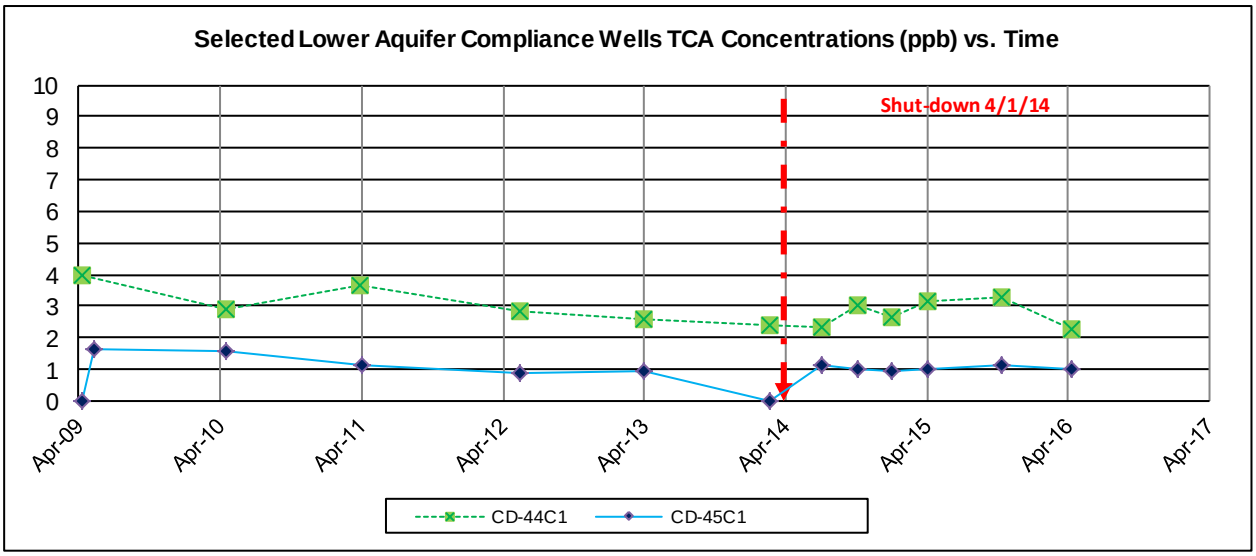
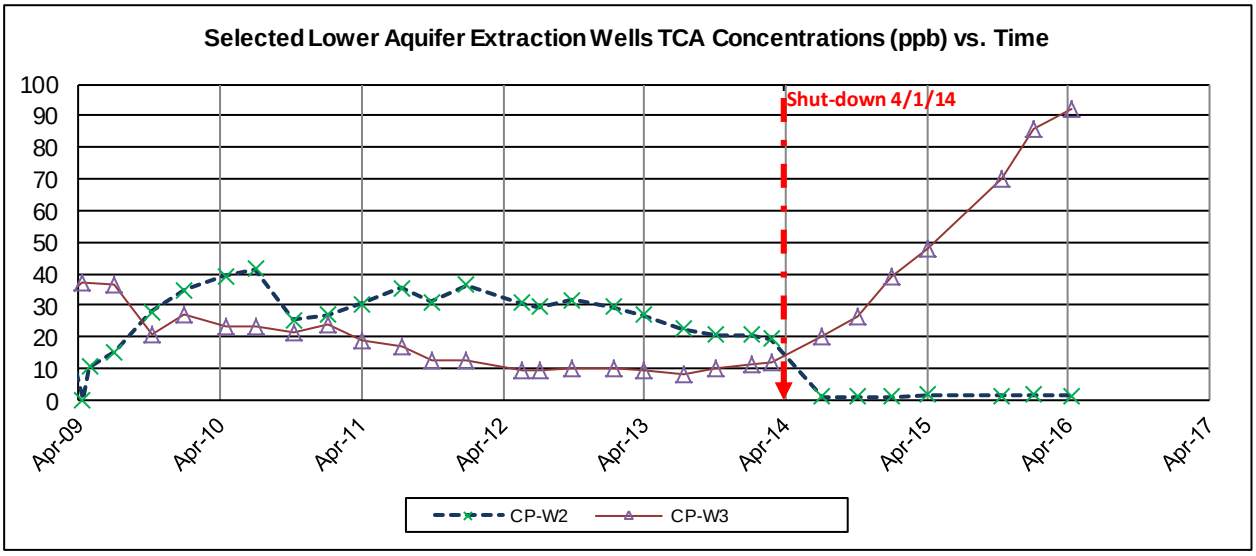


Figure 2-5 Lower Aquifer Extraction Well COC Concentrations



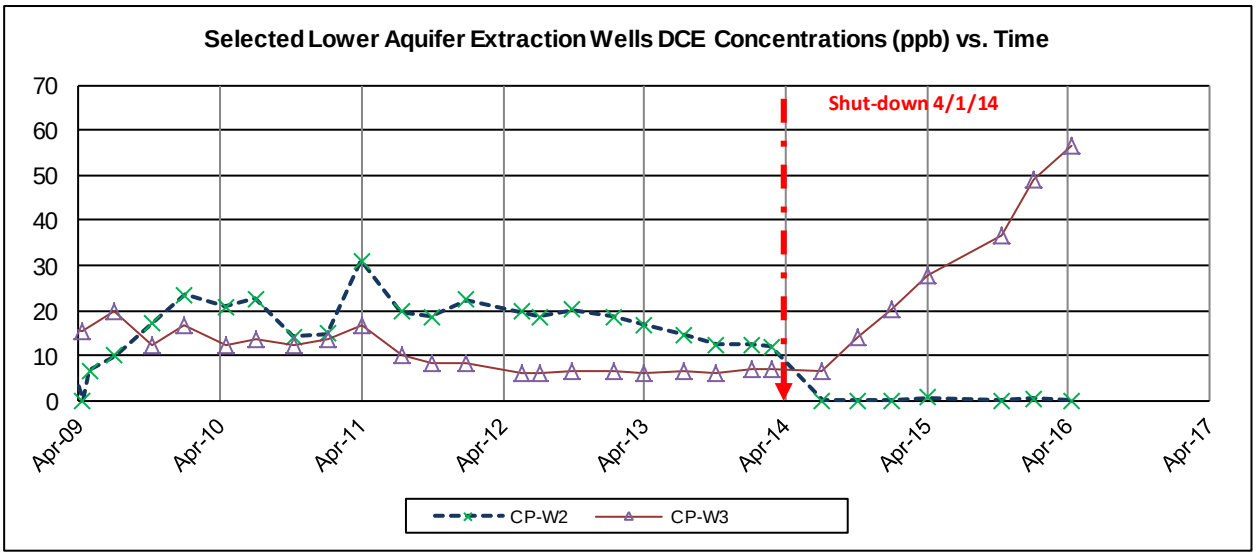
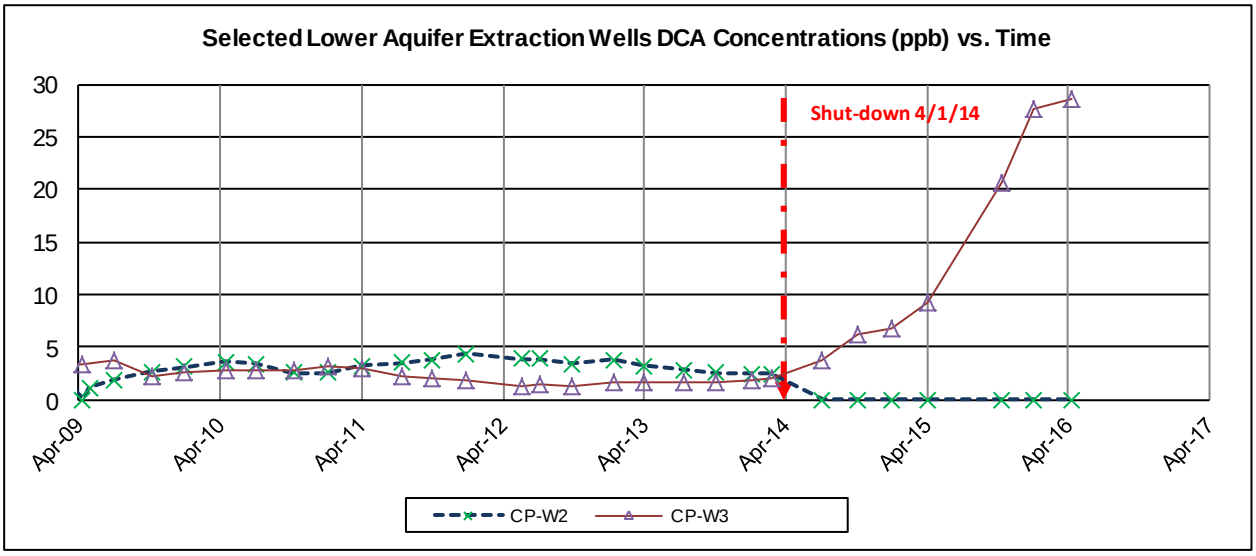


Figure 2-6 Lower Aquifer Extraction Well COC Concentrations



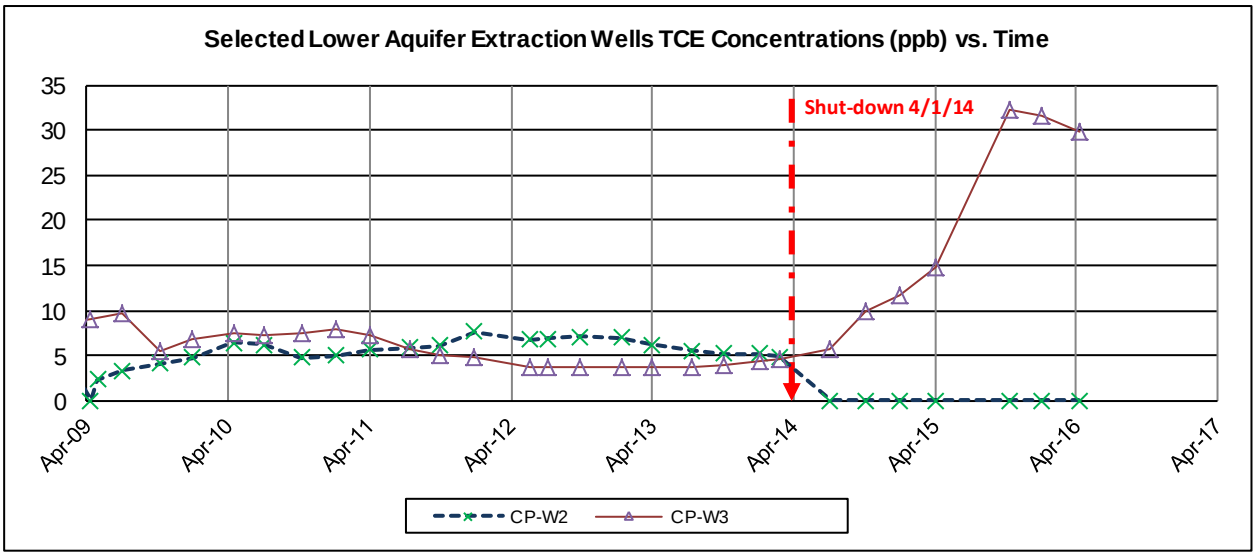
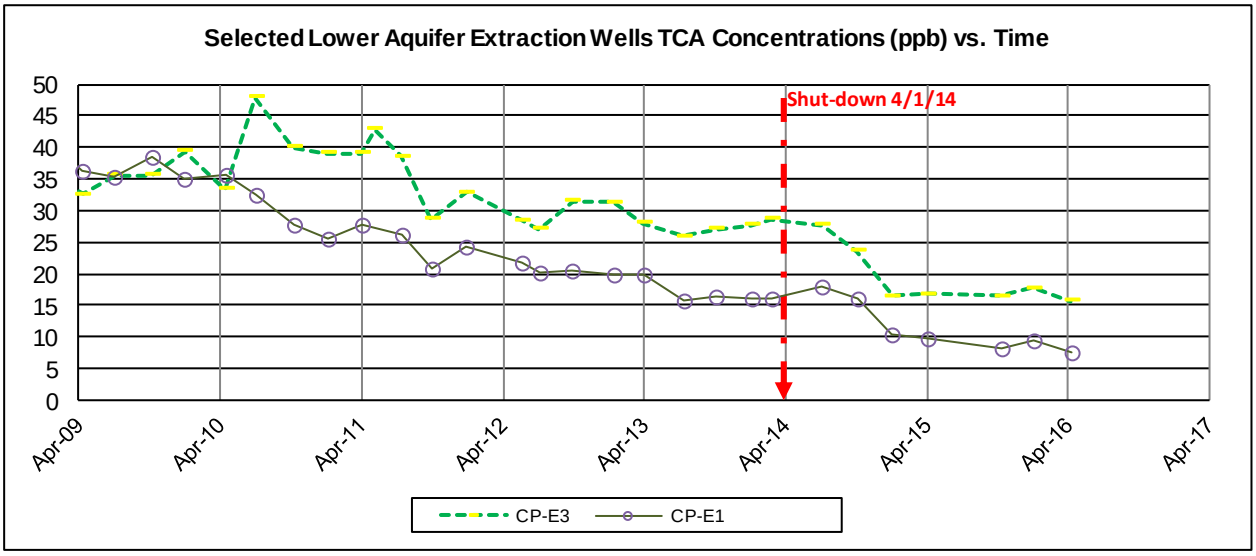


Figure 2-7 Lower Aquifer Extraction Well COC Concentrations



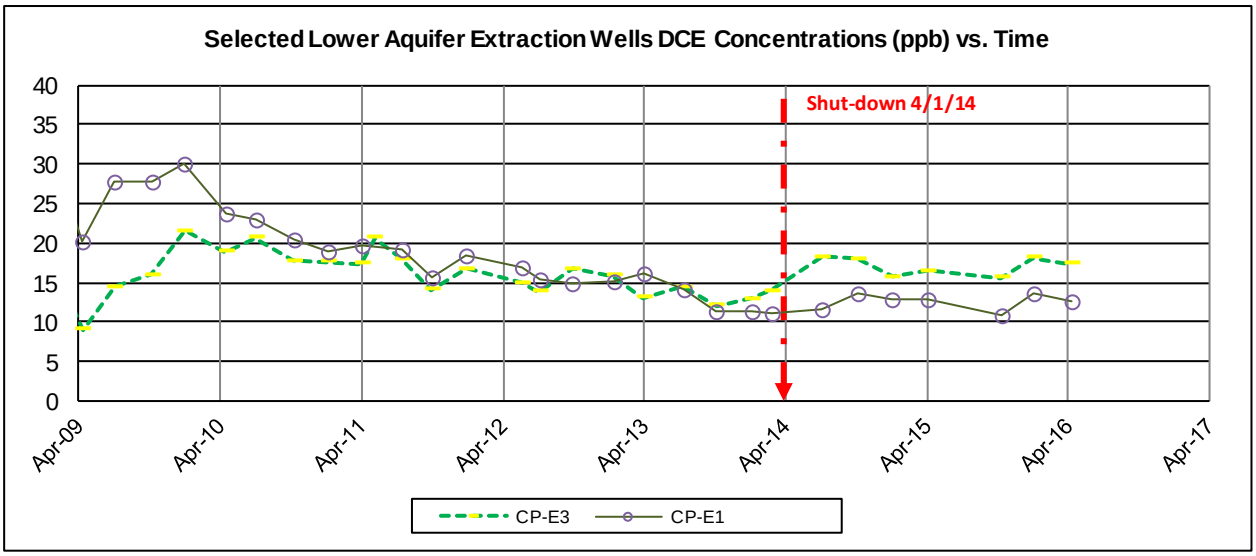
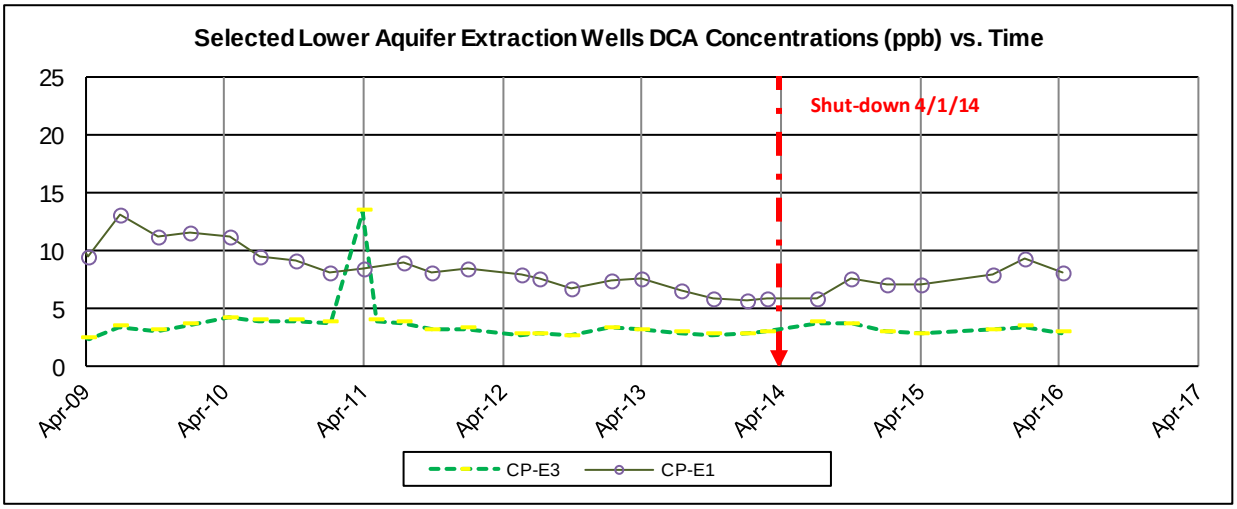
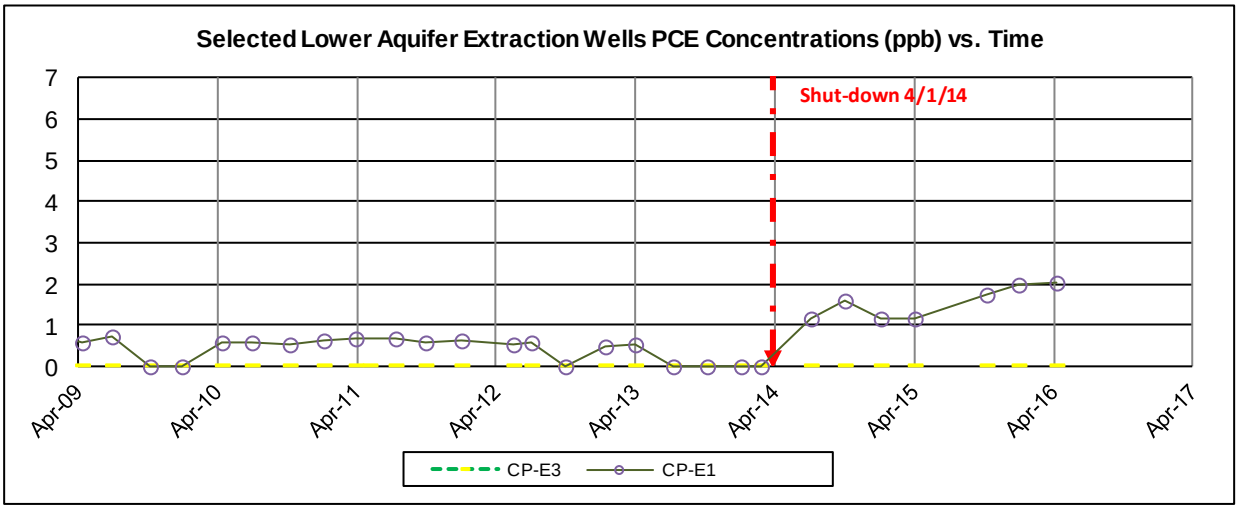


Figure 2-8 Lower Aquifer Extraction Well Concentrations





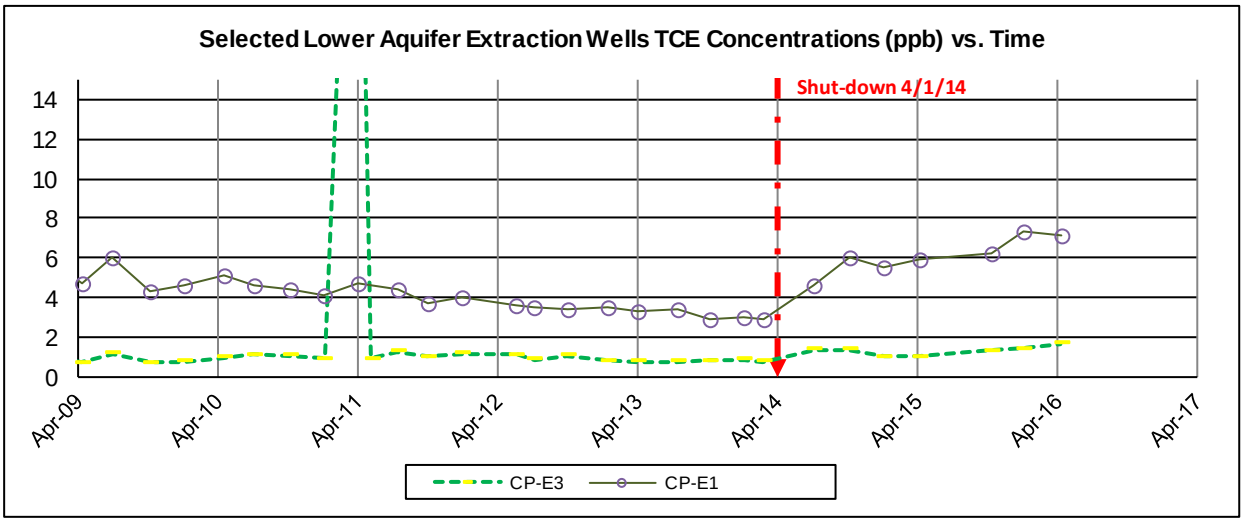


Figure 2-9 Lower Aquifer Estimated TCA Plume

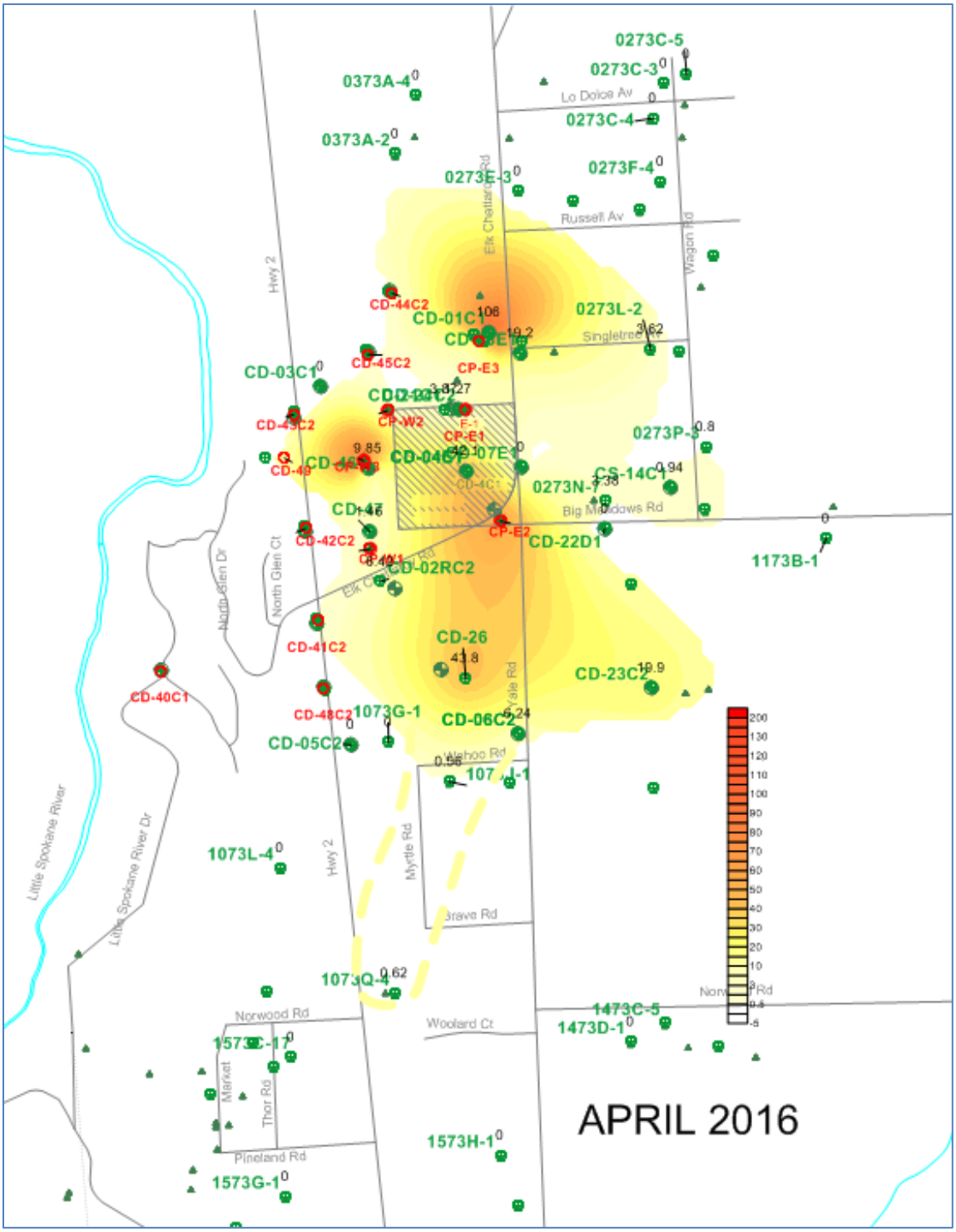


Table 2-6 Shut-down Test Location Monitoring Schedule Changes for Year 3 (May 2016 through April 2017)

System	Well ID	Monitoring Frequency for Year 3		Shut-down Criteria Applies?
		Water Levels	Sampling	
West	CD-41C1	Semi-Annual	Annual	Yes
	CD-41C2	Quarterly	Annual	
	CD-41C3	Semi-Annual	Annual	
	CD-42C1	Semi-Annual	Annual	Yes
	CD-42C2	Quarterly	Annual	
	CD-42C3	Semi-Annual	Annual	
	CD-43C1	Semi-Annual	Annual	Yes
	CD-43C2	Quarterly	Annual	
	CD-43C3	Semi-Annual	Annual	
	CD-44C1	Semi-Annual	Annual	Yes
	CD-44C2	Quarterly	Annual	
	CD-44C3	Semi-Annual	Annual	
	CD-45C1	Semi-Annual	Annual	Yes
	CD-45C2	Quarterly	Annual	
	CD-45C3	Semi-Annual	Annual	
	CD-48C1	Semi-Annual	Annual	Yes
	CD-48C2	Quarterly	Annual	
	CD-48C3	Semi-Annual	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 program schedule shown in RED

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 anlayses 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 extraction wells, 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 366 to 773 umhos/cm. Field pH values ranged from 6.5 to 7.98. Upper aquifer groundwater elevation contours and flow paths are presented in Figure 3-3.

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

Constituent of concern concentrations at the south system extraction wells were consistent with previous quarters (see Table 3-4). Selected upper aquifer wells TCA concentrations versus time are presented in Figure 3-4. Upper aquifer TCA plume boundaries are shown in Figure 3-5.

3.2.2 Criteria

Criteria for the upper aquifer programs are presented in Table 3-2. There were no criteria exceeded in any of the upper aquifer compliance monitoring wells or extraction wells during this reporting period.

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 one year of Quarterly 1,4-dioxane sampling to further evaluate the extent of this analyte as well as protect residential wells at the Colbert Landfill site (see Table 3-1). In April 2009, that sample event concluded the year of quarterly sampling at these locations. Since then, Spokane County has continued sampling these wells on an annual basis. The 2016 1,4-dioxane sampling was performed during the month of April.

3.3.1 Chemical Data

The results for April 2016 1,4-dioxane sampling are shown in Table 3-5. Concentrations versus time are presented Figure 3-6.

3.4 Upper Aquifer MFS Monitoring

Upper aquifer locations designated in the MFS groundwater monitoring program were sampled in April 2016.

3.4.1 Chemical Data

Concentrations of analytes tested for under MFS monitoring were consistent with previous results (see Figure 3-7 and Figure 3-8). Zinc was not detected in the MFS wells 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 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 3-9.

The third statistical method required is the Mann-Whitney nonparametric significance test. The summary results for this test are presented in Table 2-6 . 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, 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 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

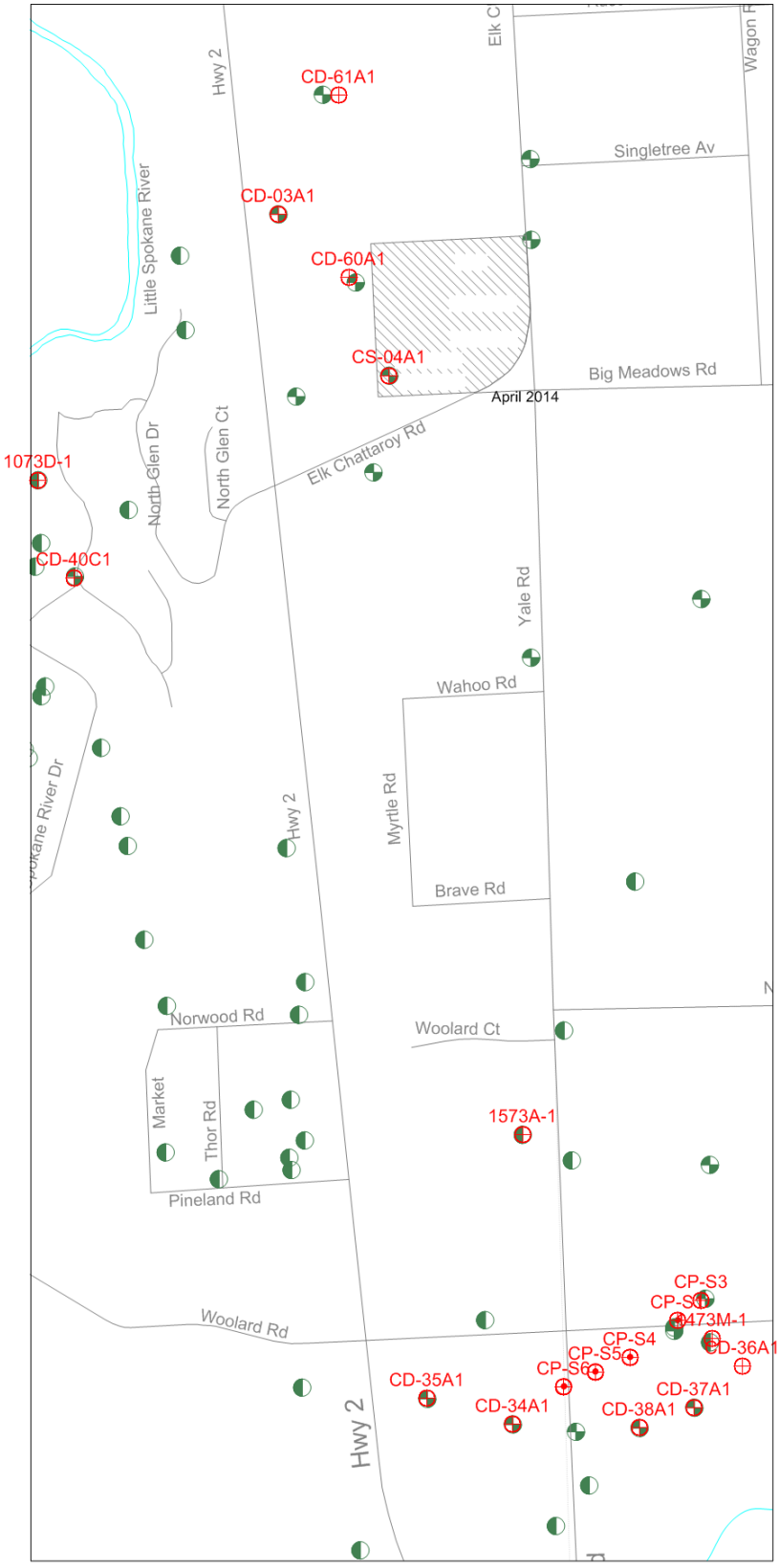
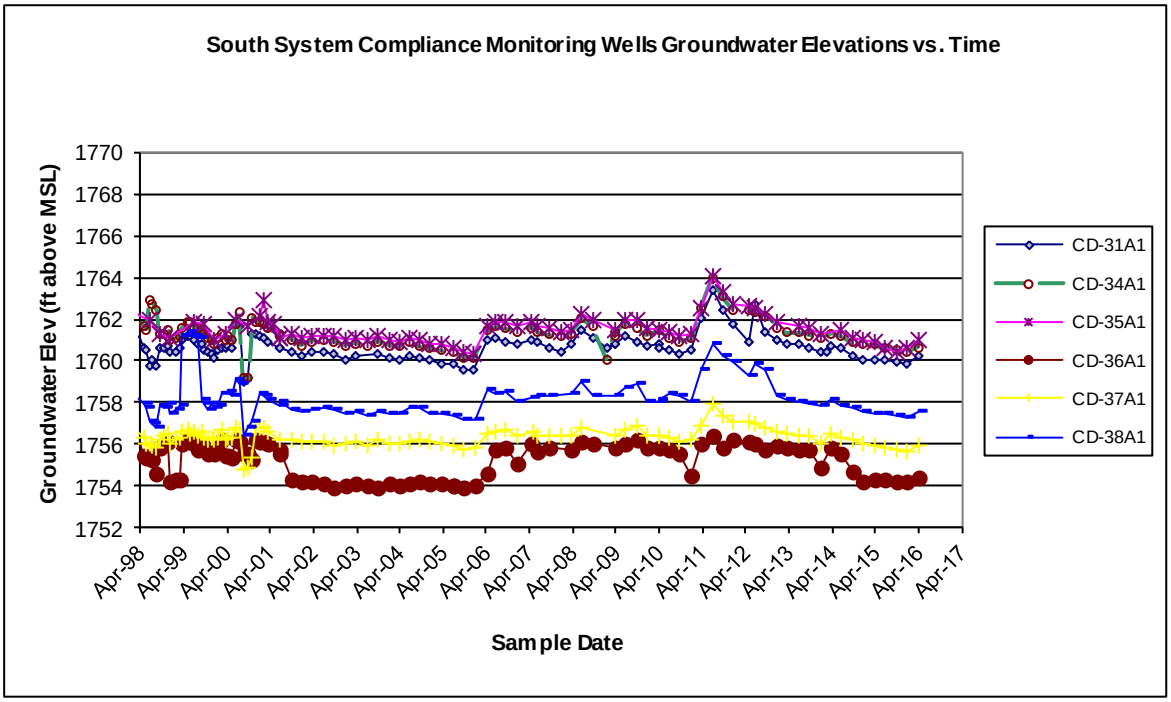


Table 3-3 Upper Aquifer Field Parameters

StationID	SampleDate	WtrElev	FieldTemp	FieldPH	FieldConductivity	FieldTurbidity	Aquifer
1073D-1	4/13/16		10.3	7.98	477	0.21	upper
1573A-1	4/14/16		11.2	7.49	471	0.42	upper
CD-03A1	4/14/16	1773.46	9.1	7.56	366	0.72	upper
CD-31A1	4/12/16	1760.21	10.4	7.53	603	0.42	upper
CD-34A1	4/12/16	1760.66	10.4	7.52	603	0.79	upper
CD-36A1	4/12/16	1754.4	10.5	7.67	640	0.39	upper
CD-37A1	4/12/16	1755.93	10.6	7.39	706	0.37	upper
CD-38A1	4/12/16	1757.52	11.6	7.65	560	0.89	upper
CD-60A1	4/14/16	1773.11	9.9	6.6	593	0.17	upper
CD-61A1	4/14/16	1773.86	10.3	7.13	425	0.13	upper
CP-S1	7/8/15	1758.94	11.7	7.34	496	0.54	upper
CP-S1	10/14/15	1758.91	10.7	7.34	587	0.37	upper
CP-S1	1/6/16	1758.84	10.4	7.29	616	2.52	upper
CP-S1	4/13/16	1759.09	10.6	7.27	607	1.17	upper
CP-S3	4/12/16	1760.02	10.9	7.44	612	1.1	upper
CP-S4	7/8/15	1760.43	10.9	7.24	671	0.65	upper
CP-S4	10/14/15	1760.35	10.9	7.22	724	0.69	upper
CP-S4	1/6/16	1759.64	10.3	7.21	773	0.55	upper
CP-S4	4/13/16	1759.64	10.3	7.26	760	5.84	upper
CP-S5	7/8/15		10.8	7.25	622	1.01	upper
CP-S5	10/14/15		10.7	7.24	698	1.94	upper
CP-S5	1/6/16		9.9	7.23	721	0.46	upper
CP-S5	4/13/16		10.1	7.3	711	0.75	upper
CP-S6	7/8/15	1760.47	10.7	7.27	677	0.76	upper
CP-S6	10/14/15	1760.51	10.4	7.22	743	1.17	upper
CP-S6	1/6/16	1760.35	9.9	7.39	752	3.01	upper
CP-S6	4/13/16	1761.01	10.2	7.16	739	2.11	upper
CS-04A1	4/14/16	1774.04	9.8	6.5	755	3.22	upper

Figure 3-2 Upper Aquifer Groundwater Elevations vs. Time



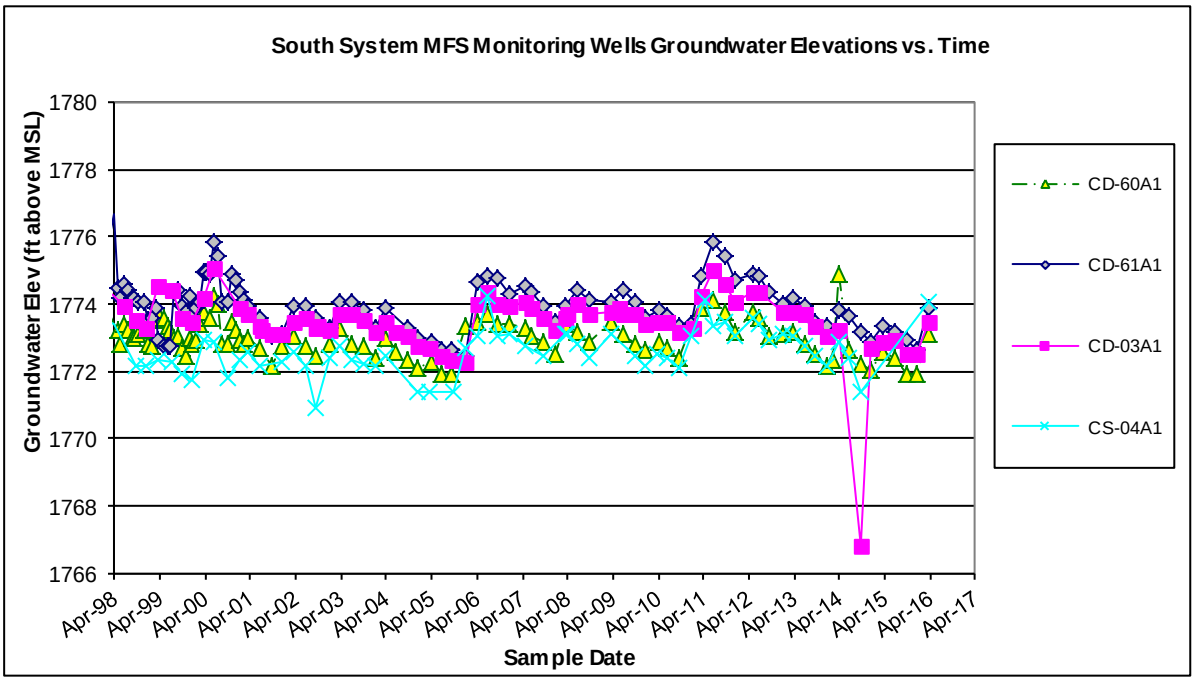


Figure 3-3 Upper Aquifer Estimated Groundwater Elevation Contours

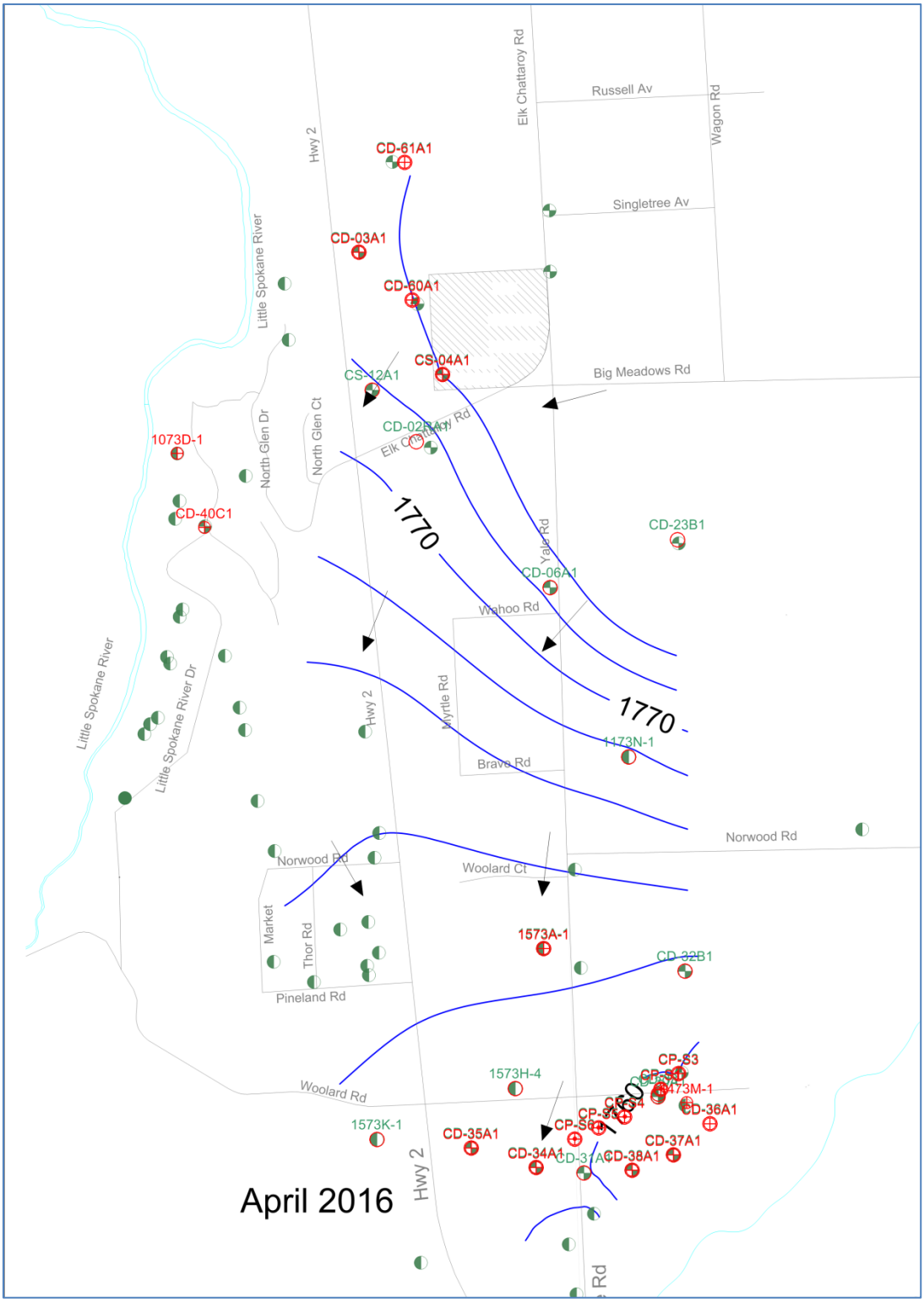


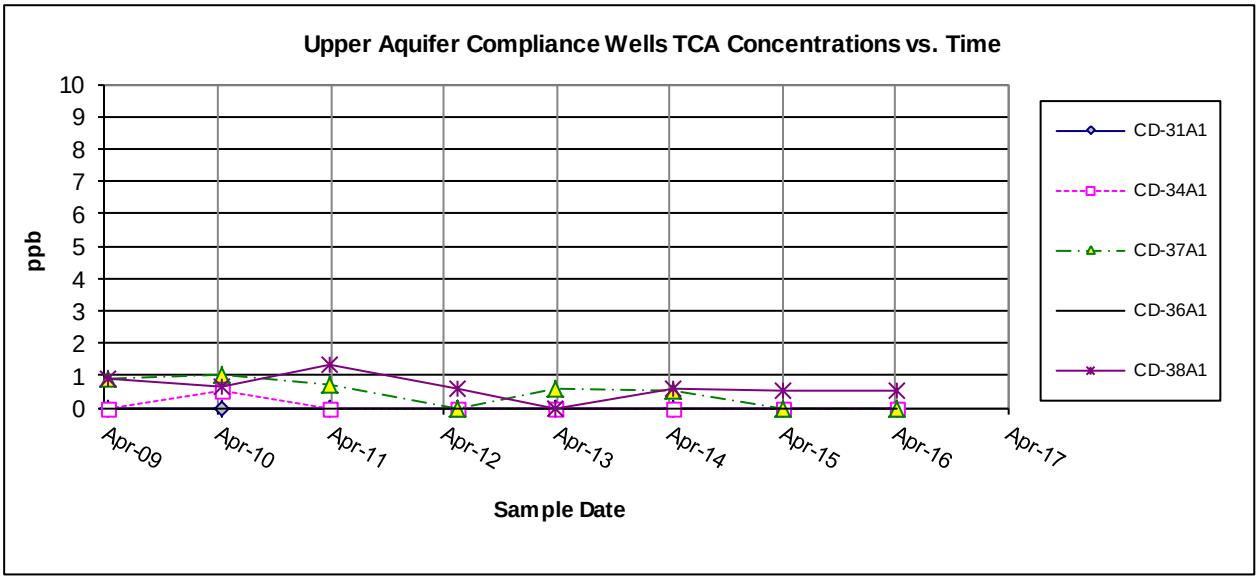
Table 3-4 Upper Aquifer Groundwater Monitoring Results

StationID	SampleDate	DCA	DCE	MC	PCE	TCA	TCE	Cl	COD	Fe	Mn	N-NH3	N-NO3	SO4	TOC	Zn
1573A-1	4/14/2016	1.33	0.8	<0.5	<0.5	1.99	0.74									
CD-03A1	4/14/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.69	<5	<0.06	<0.004	<0.03	0.353	5.56	<1	<0.01
CD-31A1	4/12/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CD-34A1	4/12/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CD-36A1	4/12/2016	14.9	1.42	<0.5	<0.5	<0.5	<0.5									
CD-37A1	4/12/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CD-38A1	4/12/2016	<0.5	<0.5	<0.5	<0.5	0.54	<0.5									
CD-60A1	4/14/2016	<0.5	<0.5	<0.5	0.82	<0.5	<0.5	3.27	<5	<0.06	<0.004	<0.03	1.71	6.62	1.16	<0.01
CD-61A1	4/14/2016	<0.5	<0.5	<0.5	<0.5	3.19	<0.5	0.77	<5	<0.06	<0.004	0.044	0.115	11.7	<1	<0.01
CP-S1	10/14/2015	1.86	0.7	<0.5	<0.5	1.29	1.46									
CP-S1	1/6/2016	2.32	0.77	<0.5	<0.5	1.38	1.43									
CP-S1	4/13/2016	2.00	0.60	<0.5	<0.5	1.20	1.32									
CP-S3	4/12/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CP-S4	10/14/2015	2.12	0.58	<0.5	0.67	1.12	2.2									
CP-S4	1/6/2016	2.12	0.64	<0.5	0.79	1.09	2.63									
CP-S4	4/13/2016	1.78	0.52	<0.5	0.77	0.96	2.25									
CP-S5	10/14/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CP-S5	1/6/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CP-S5	4/13/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CP-S6	10/14/2015	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CP-S6	1/6/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CP-S6	4/13/2016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5									
CS-04A1	4/14/2016	0.9	<0.5	<0.5	<0.5	<0.5	0.74	1.15	<5	<0.06	<0.004	0.048	0.543	5.24	1.89	<0.01

Table 3-5 1,4-Dioxane Monitoring Results

Aquifer	StationID	SampleDate	Analyte	Result	Qualifier	Units
upper	1073D-1	4/13/2016	1,4-Dioxane		U	ug/L
upper	1473M-1	4/13/2016	1,4-Dioxane		U	ug/L
lower	CD-40C1	4/13/2016	1,4-Dioxane	7.7		ug/L
lower	CD-40C1	4/13/2016	1,4-Dioxane	7.1		ug/L
upper	CP-S1	4/13/2016	1,4-Dioxane	5.8		ug/L

Figure 3-4 Upper Aquifer COC Concentrations vs Time



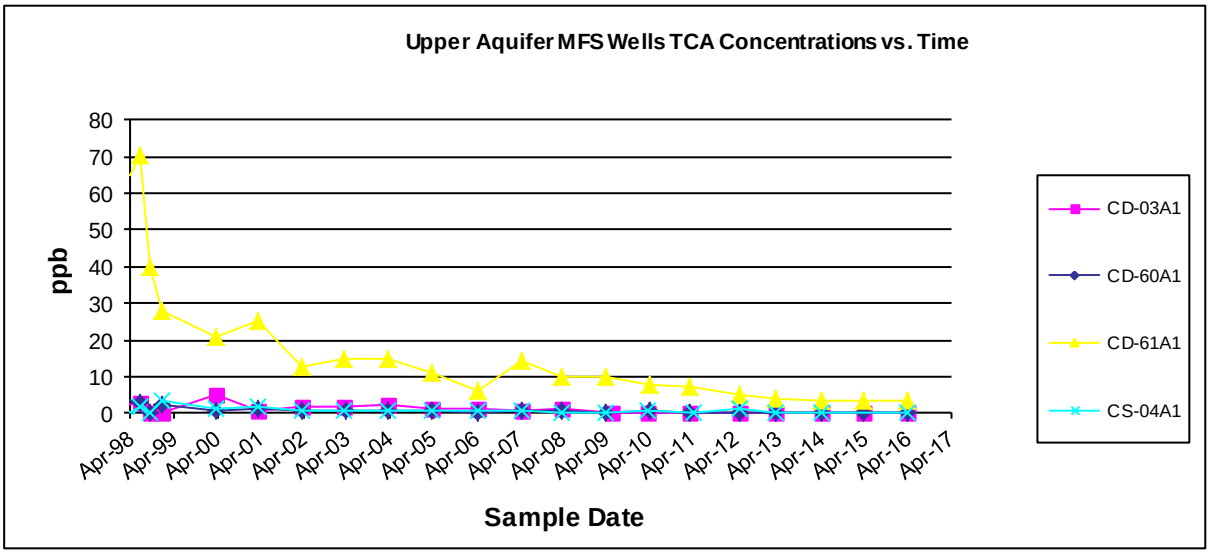


Figure 3-5 Upper Aquifer Estimated TCA Plume Boundaries

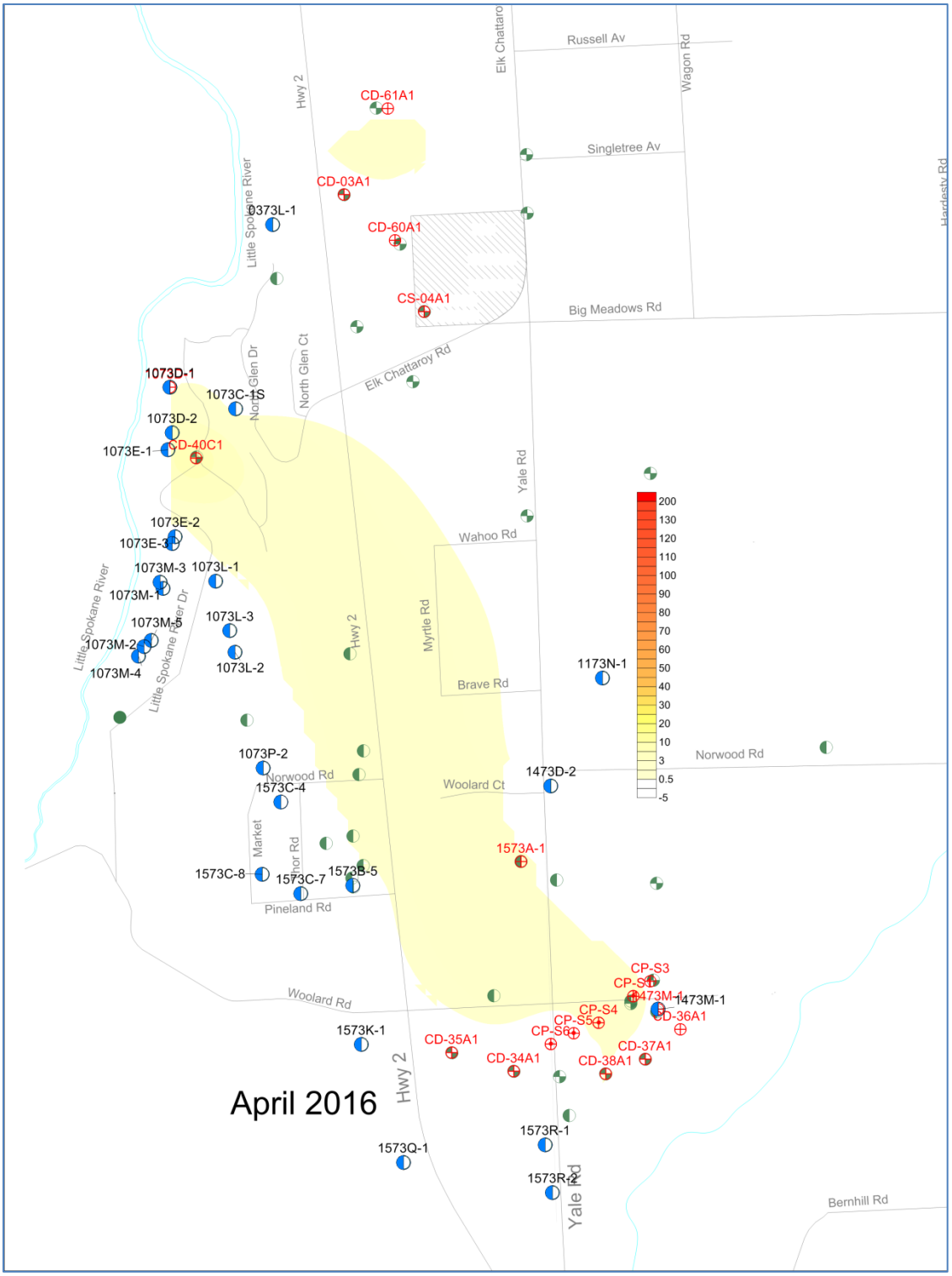
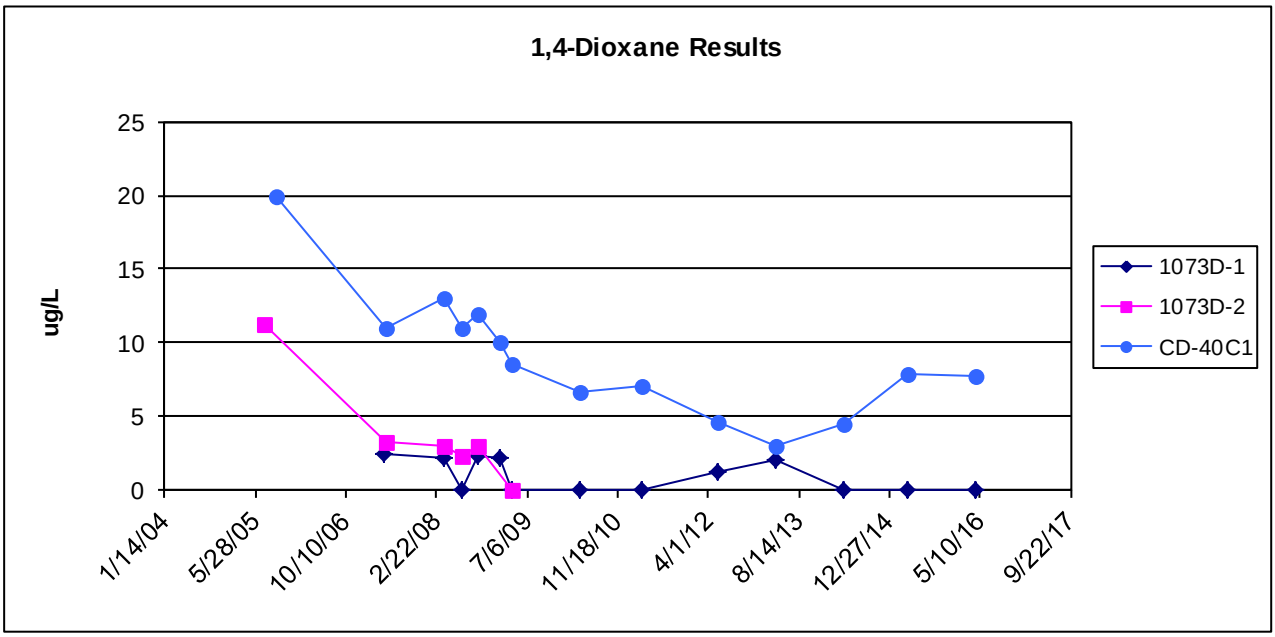


Figure 3-6 1,4-Dioxane Concentrations vs Time



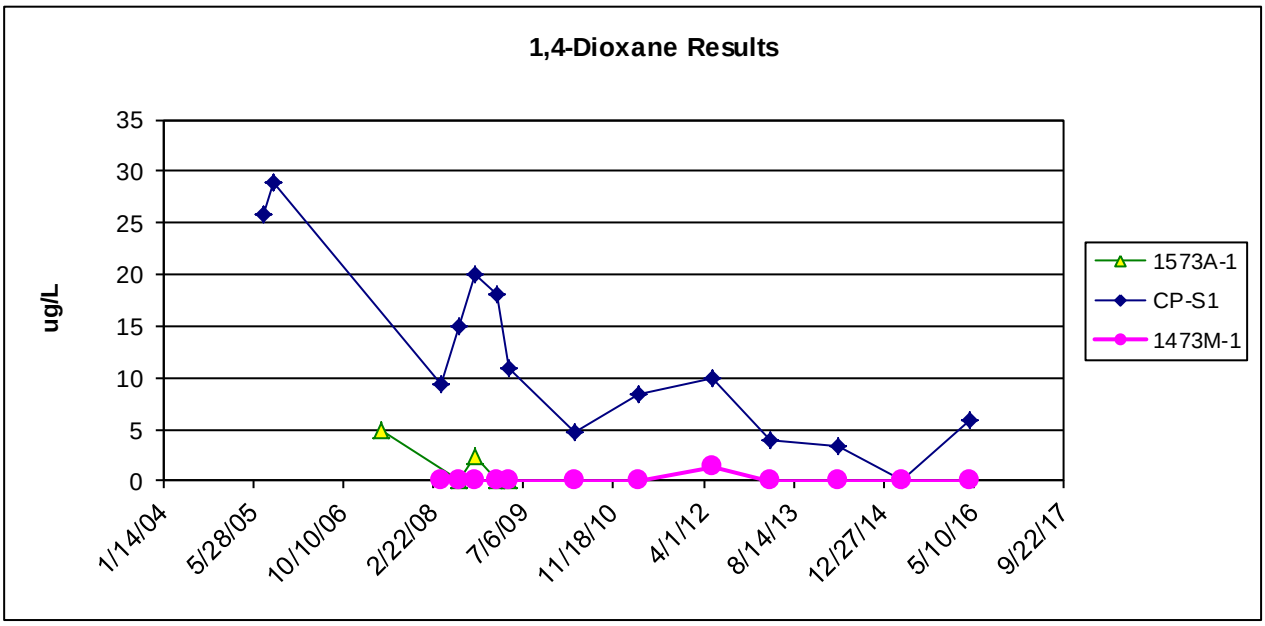
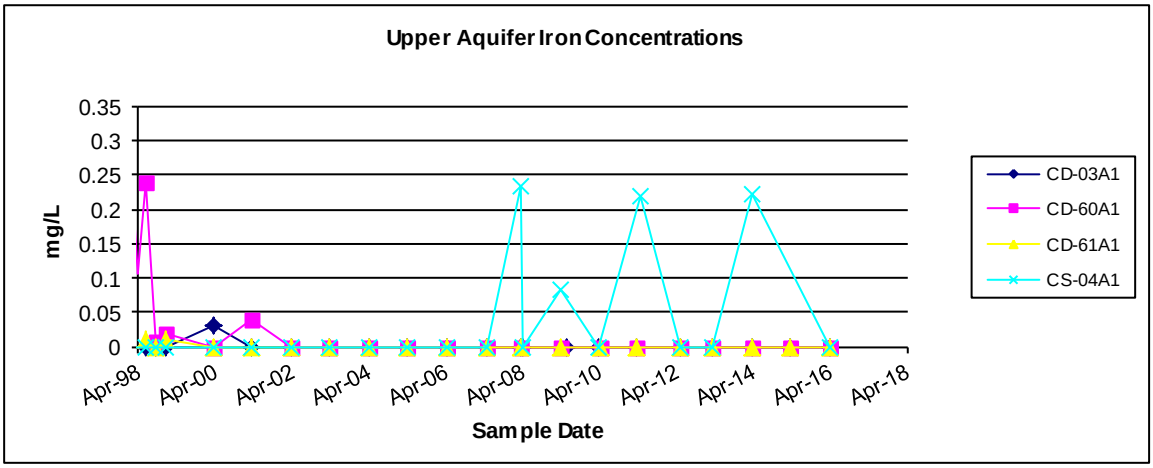
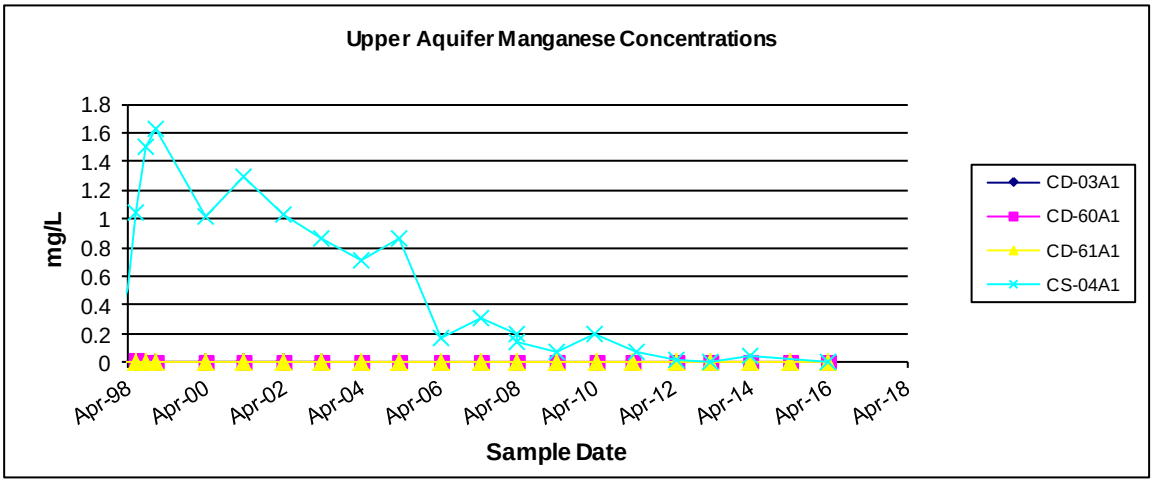


Figure 3-7 Upper Aquifer MFS Parameters vs Time





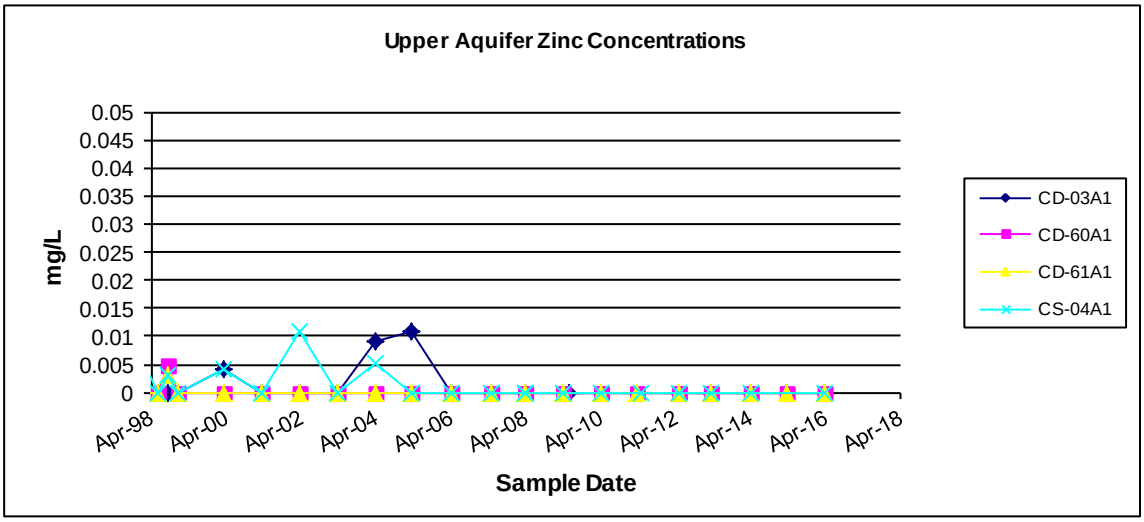
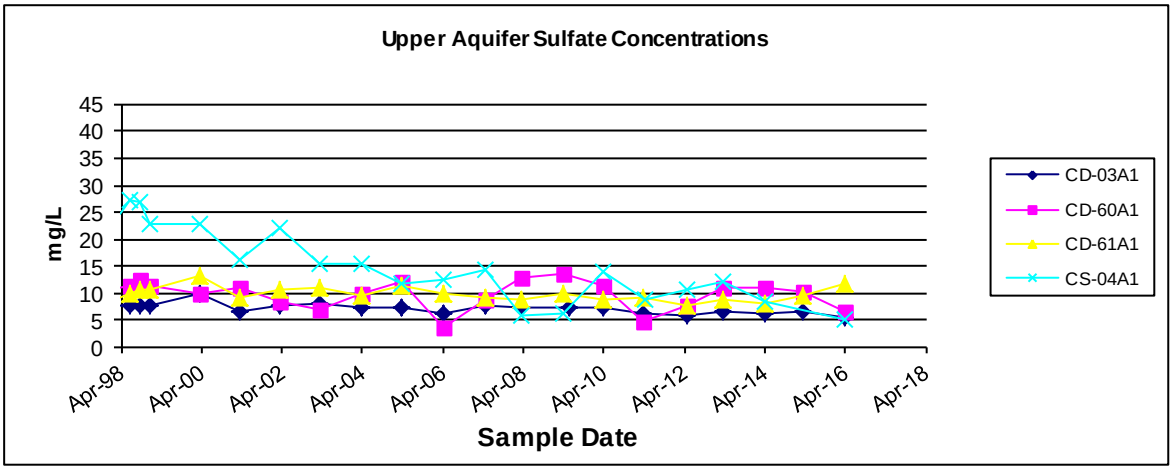
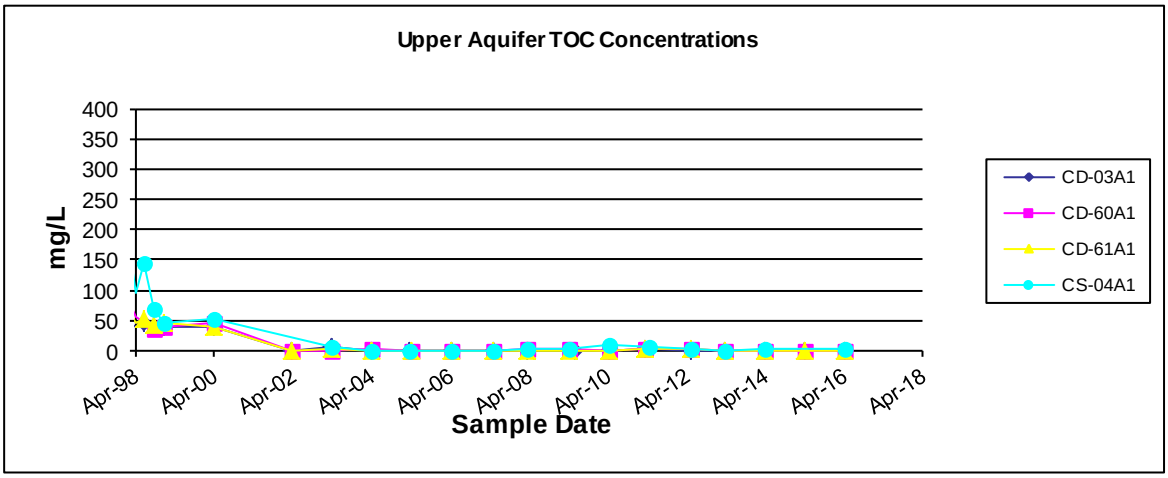


Figure 3-8 Upper Aquifer MFS Parameters vs Time





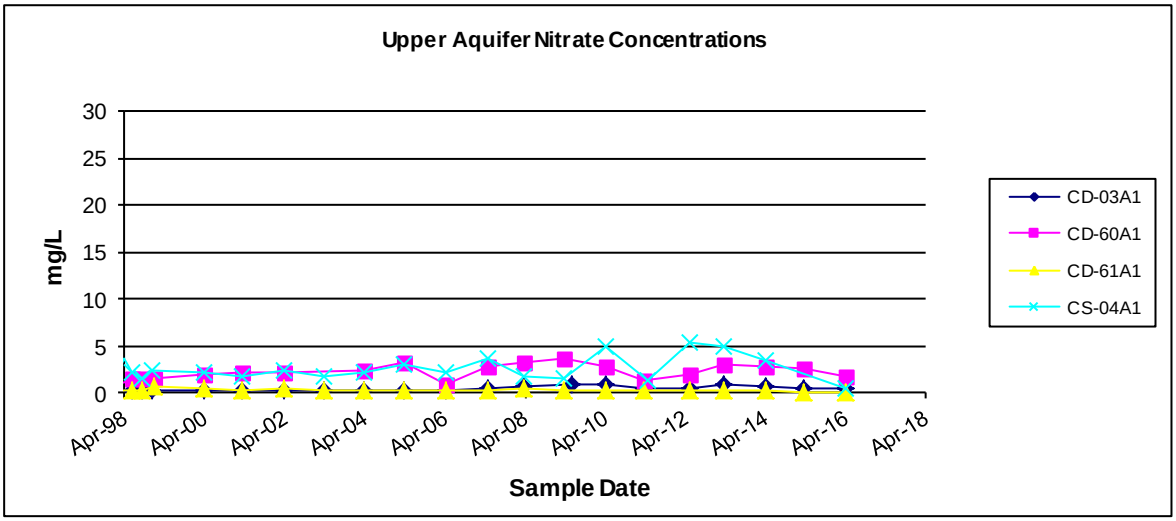


Table 3-6 Summary Results for the Mann-Whitney Nonparametric Significance Test (2016)

	Level of Significance (p)	
Constituent	**Upper Aquifer**	***Lower Aquifer (1999)**
Chloride	**0.0002**	**0.006**
Chemical Oxygen Demand	0.740	0.48
Iron	0.271	0.17
Manganese	0.102	0.86
Ammonia	0.581	0.42
Nitrite	0.844	1.13
Nitrate	**0.00002**	0.08
Sulfate	0.725	**0.0006**
Total Organic Carbon	0.781	0.32
Zinc	0.235	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 3-9 Box Plots for Background and Downgradient MFS Wells (2016)

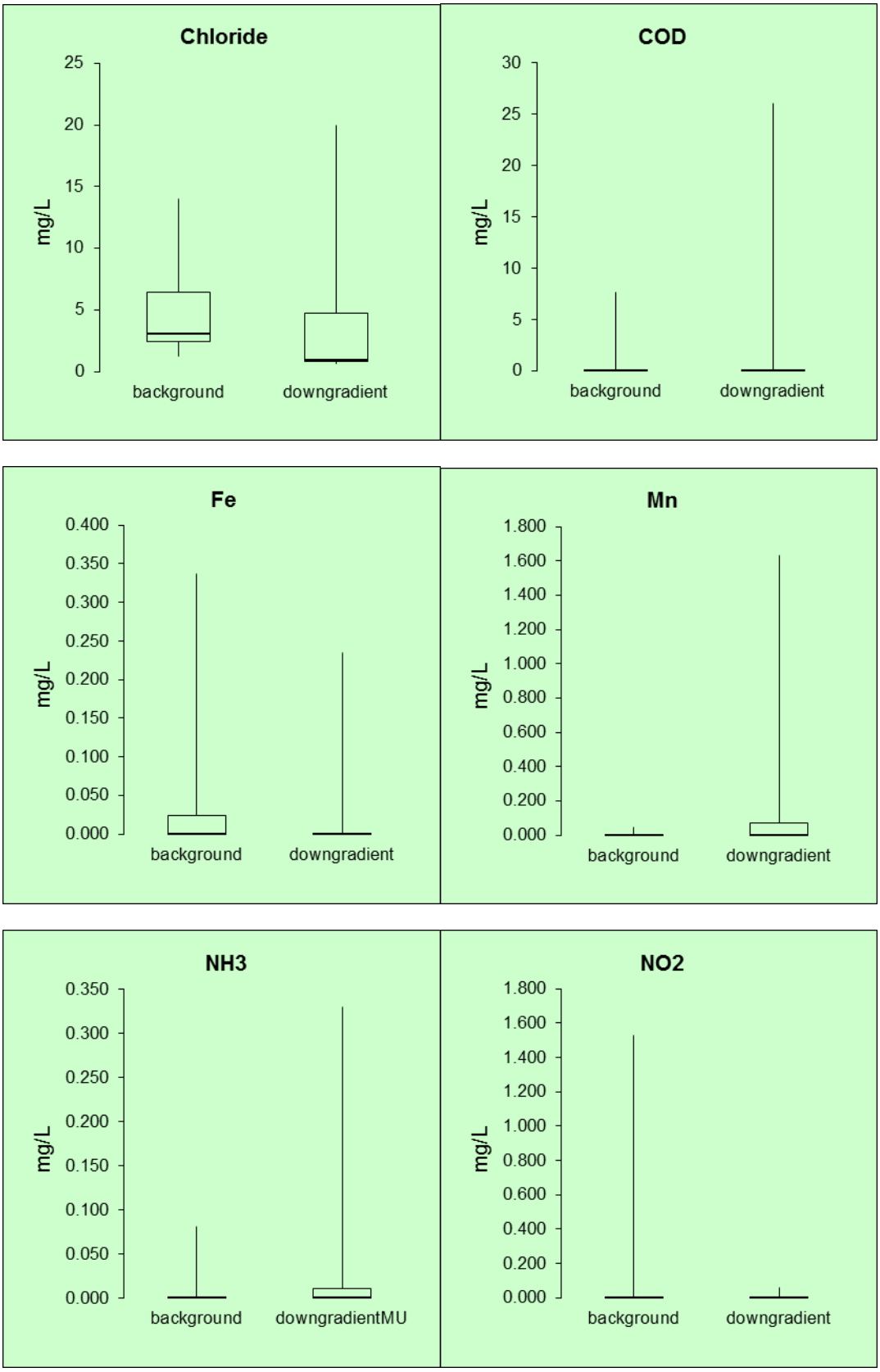
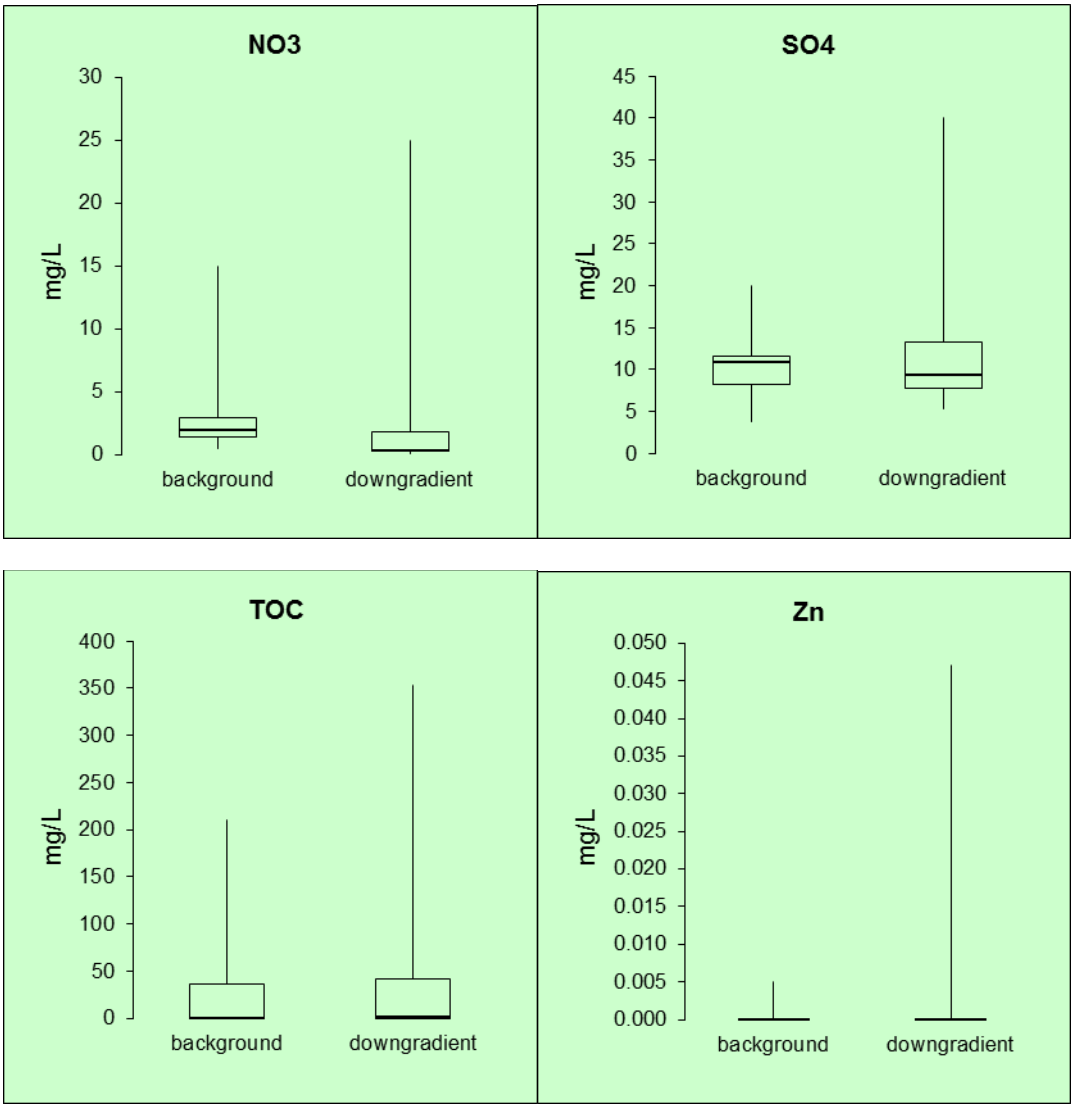


Figure 4-9 continued



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 a 12 month period, 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.

4.3 Data Evaluation

There were no concentrations found that exceeded any criteria and concentrations that were found are just above the method detection limits. A low concentration of TCE was found in well 1073D-1. There were also some DCA concentrations showing up at levels just above method detection limits in an area just west of the landfill near the Little Spokane River.

4.4 Program Modifications

Some minor adjustments were made to the schedule to temporarily increase monitoring in the area just west of the landfill near the Little Spokane River. The temporary adjustments were due to some very low concentration changes in DCA and a detection of TCE in one of the residential wells (1073D-1) and were not required by any documentation or work plan. The concentrations decreased below method detection limits and regular scheduled sampling ensued

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 with regard to public health.

The 2016 residential well sampling schedule is presented in Table 4-3.

Figure 4-1 Residential Well Sampling Locations

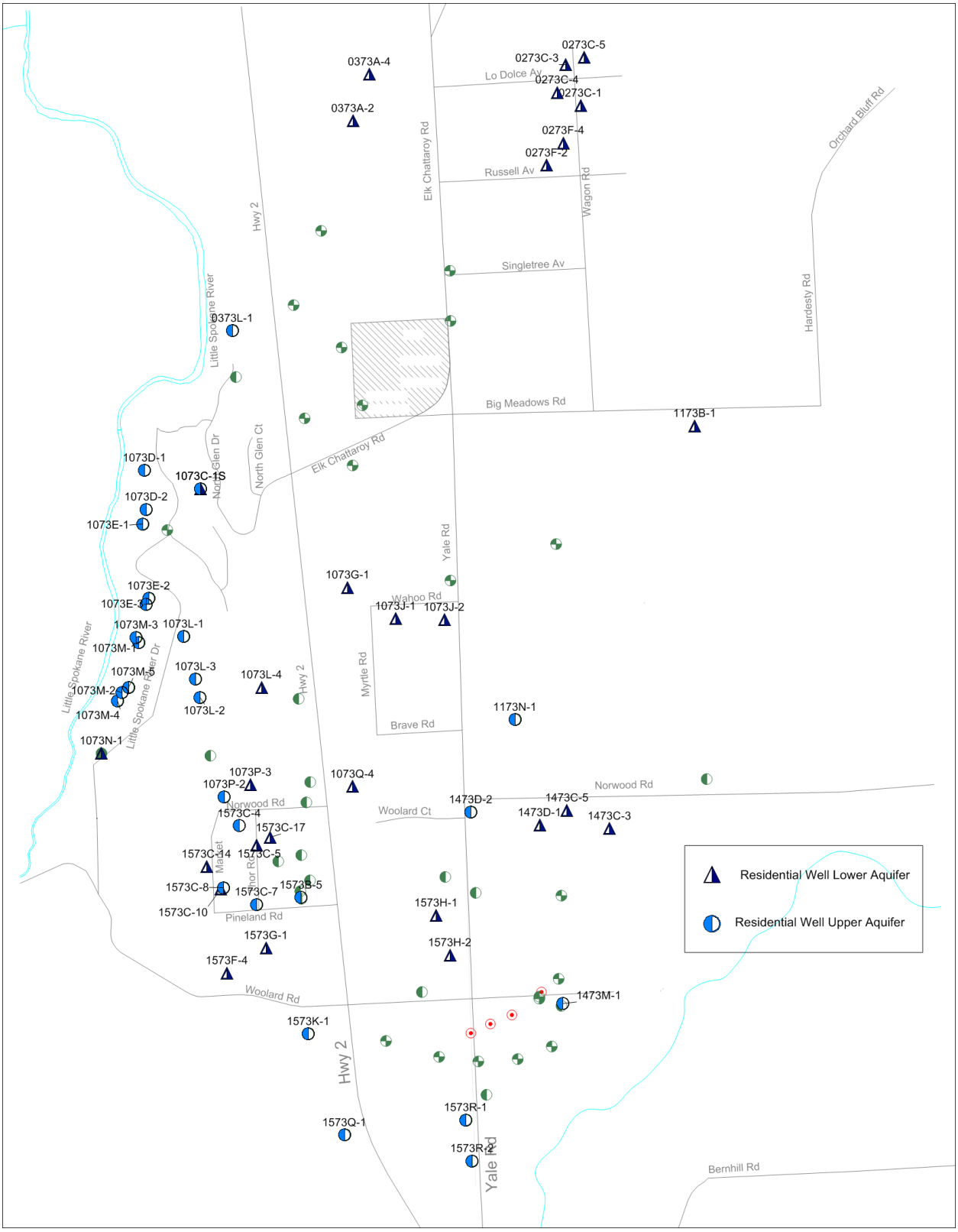


Table 4-1 Residential Well Sampling Schedule for Reporting Period

StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sched Comments
0273C-2	Vannatter	☐	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐	☐	
0273C-3	Kramer	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	BiAnnual 10'
0273C-4	McQuesten	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	
0273C-5	Hogan	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	many years no detects, wells btwn this and plume
0273D-6	Thornton	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
0273F-4	Gander	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	
0373A-2	Resseman	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
0373A-4	Vansickel	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
0373J-3	Golding	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	
0373L-1	Sterling	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	
1073D-1	Coats	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	☑	☐	
1073E-2	Pullen	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	Alt w/1073E-3
1073E-3	Clark	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	Alt w/1073E-2
1073E-4	Carpenter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
1073E-4	Carpenter	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	
1073G-1	Rux	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073J-1	Moreno	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073L-1	Halpin	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073L-2	Countryman	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	Alt w/1073L-3
1073L-3	Anderson	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	Alt w/1073L-2
1073L-4	Crabb	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	
1073M-1	Bertholf	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	Alt w/1073M-3
1073M-3	Lane	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	Alt w/1073M-1
1073P-1	Ringo	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1073P-2	Petrelli	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	

StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sched Comments
1073Q-4	NORTH MEADOWS W	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1173B-1	Bise	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	
1473C-5	Overmyer	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	BiAnnual (11) Alt w/1473D-1
1473D-1	Farris	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Alt w/1473C-5
1473D-2	Wardian	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	Alt w/1473C
1473M-1	Ennis	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1573C-10	Lake	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	
1573C-17	RESIDENT	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1573C-5	Nelson	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
1573C-7	Brown	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1573C-8	Williams	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	BiAnnual (10)
1573G-1	SHAI	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	BiAnnual (11)
1573H-1	Hunter	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	
1573K-1	Tender	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1573Q-1	Saunder	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	
1573R-2	Hunter	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	
3483M-1	Campbell	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	

Table 4-2 Residential Groundwater Monitoring Program Results

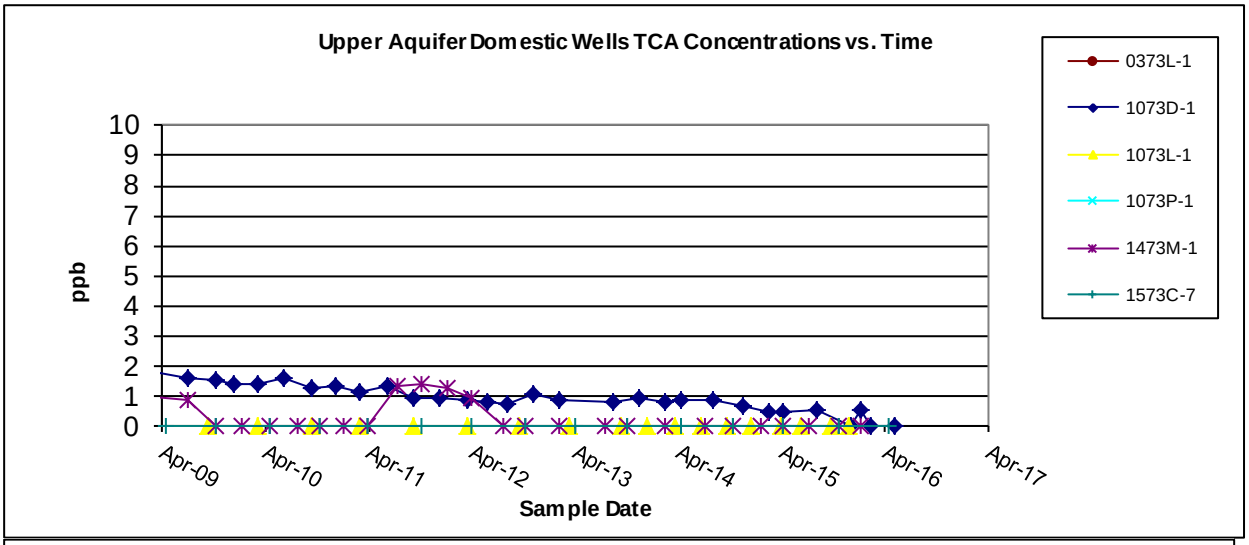
(May 2015 through April 2016)

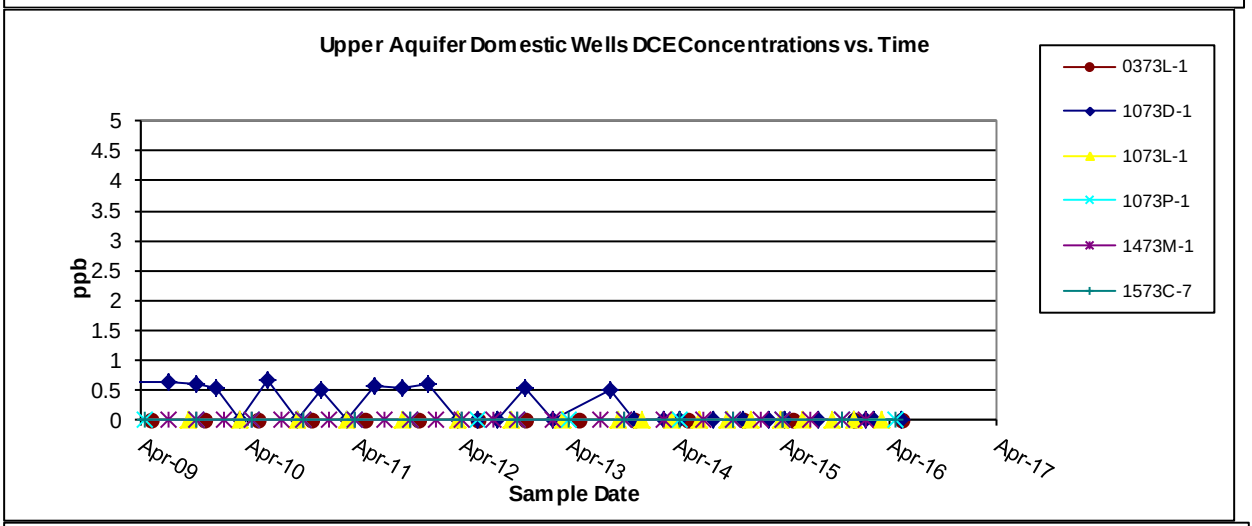
StationID	Aquifer	SampleDate	LastName	TCA	DCA	DCE	MC	PCE	TCE
0273C-2	lower	10/21/2015	Vannatter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273C-2	lower	3/8/2016	Vannatter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273C-3	lower	6/10/2015	Kramer	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273C-4	lower	12/2/2015	McQuesten	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273C-5	lower	3/8/2016	Hogan	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273D-6	lower	8/5/2015	Thornton	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273D-6	lower	2/10/2016	Thornton	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273F-4	lower	6/10/2015	Gander	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0273F-4	lower	12/2/2015	Gander	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	6/10/2015	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	9/24/2015	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	12/1/2015	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-2	lower	3/8/2016	Resseman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-4	lower	5/7/2015	Vansickel	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-4	lower	8/5/2015	Vansickel	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373A-4	lower	2/10/2016	Vansickel	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	9/24/2015	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	12/2/2015	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073G-1	lower	3/8/2016	Rux	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	5/7/2015	Moreno	0.54	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	7/8/2015	Moreno	0.58	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	10/22/2015	Moreno	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	1/12/2016	Moreno	0.55	<0.5	<0.5	<0.5	<0.5	<0.5
1073J-1	lower	4/20/2016	Moreno	0.56	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-4	lower	9/23/2015	Crabb	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073Q-4	lower	6/10/2015	NORTH MEADOWS WATER	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073Q-4	lower	9/23/2015	NORTH MEADOWS WATER	0.54	0.51	<0.5	<0.5	<0.5	<0.5
1073Q-4	lower	12/1/2015	NORTH MEADOWS WATER	0.53	0.51	<0.5	<0.5	<0.5	<0.5
1073Q-4	lower	3/9/2016	NORTH MEADOWS WATER	0.62	0.59	<0.5	<0.5	<0.5	<0.5
1173B-1	lower	12/2/2015	Bise	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473C-5	lower	8/6/2015	Overmyer	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-1	lower	2/10/2016	Farris	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-10	lower	6/11/2015	Lake	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-17	lower	10/22/2015	RESIDENT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-17	lower	4/20/2016	RESIDENT	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-5	lower	8/6/2015	Nelson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573G-1	lower	5/6/2015	Gano	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573H-1	lower	5/6/2015	Hunter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373L-1	upper	5/7/2015	Sterling	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
0373L-1	upper	12/1/2015	Sterling	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	8/6/2015	Coats	0.55	<0.5	<0.5	<0.5	<0.5	<0.5
1073D-1	upper	12/2/2015	Coats	<0.5	<0.5	<0.5	<0.5	<0.5	0.76
1073D-1	upper	1/12/2016	Coats	0.53	<0.5	<0.5	<0.5	<0.5	0.7
1073D-1	upper	2/11/2016	Coats	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	7/8/2015	Pullen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	10/21/2015	Pullen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	1/12/2016	Pullen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-2	upper	4/20/2016	Pullen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	10/21/2015	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073E-3	upper	2/11/2016	Clark	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Table 3-2 Continued..

StationID	Aquifer	SampleDate	LastName	TCA	DCA	DCE	MC	PCE	TCE
1073L-1	upper	6/10/2015	Halpin	<0.5	0.55	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	9/23/2015	Halpin	<0.5	0.92	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	12/1/2015	Halpin	<0.5	1.29	<0.5	<0.5	<0.5	<0.5
1073L-1	upper	3/9/2016	Halpin	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	5/6/2015	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	10/21/2015	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-2	upper	4/20/2016	Countryman	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-3	upper	5/6/2015	Anderson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-3	upper	8/5/2015	Anderson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073L-3	upper	12/1/2015	Anderson	<0.5	1.29	<0.5	<0.5	<0.5	<0.5
1073L-3	upper	2/11/2016	Anderson	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073M-1	upper	12/1/2015	Bertholf	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073M-1	upper	4/20/2016	Bertholf	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073M-3	upper	9/23/2015	Lane	<0.5	0.97	<0.5	<0.5	<0.5	<0.5
1073M-3	upper	12/1/2015	Lane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073M-3	upper	3/9/2016	Lane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-1	upper	10/21/2015	Greenen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-1	upper	4/20/2016	Greenen	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-2	upper	8/6/2015	Petrelli	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1073P-2	upper	2/11/2016	Petrelli	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	5/7/2015	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	12/2/2015	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473D-2	upper	2/10/2016	Wardian	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	7/8/2015	Ennis	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	10/22/2015	Ennis	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1473M-1	upper	1/12/2016	Ennis	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-7	upper	10/22/2015	Brown	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-7	upper	4/20/2016	Brown	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573C-8	upper	2/10/2016	Williams	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573K-1	upper	10/22/2015	Tender	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573K-1	upper	4/20/2016	Tender	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573Q-1	upper	7/8/2015	Saunder	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573R-2	upper	5/6/2015	Hunter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1573R-2	upper	1/12/2016	Hunter	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Figure 4-2 Upper Aquifer Residential Wells Concentrations vs Time





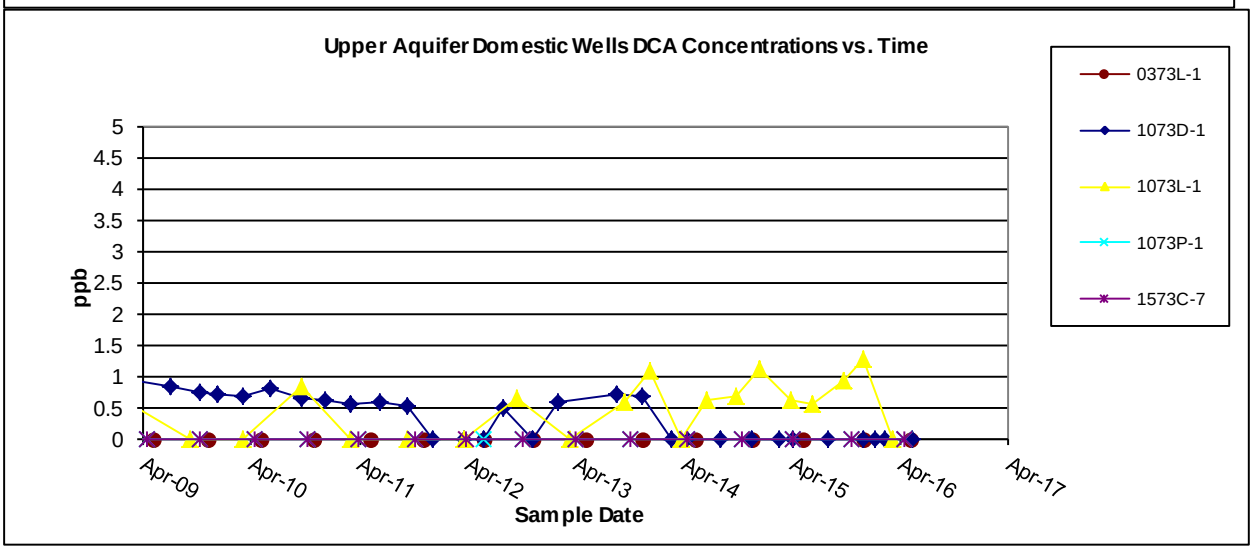
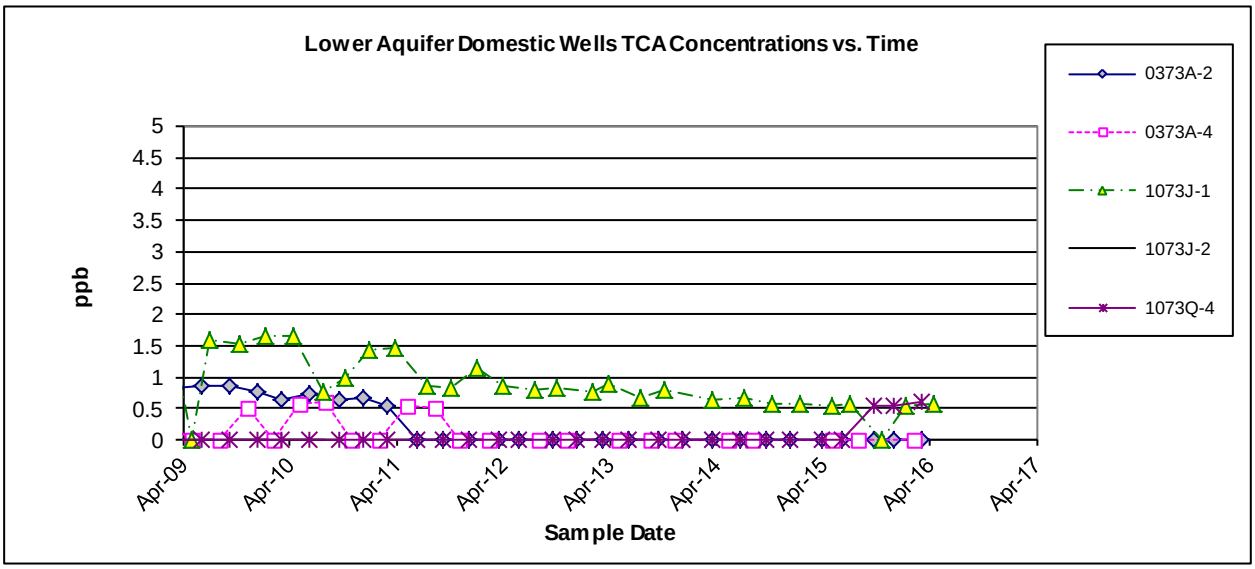


Figure 4-3 Lower Aquifer Residential Wells Concentrations vs Time



Colbert Residential Sampling Plan 2016

StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sched Comments
0273C-2	Vannatter	☐	☐	☑	☐	☐	☐	☐	☐	☐	☑	☐	☐	
0273C-3	Kramer	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	BiAnnual 10'
0273C-4	McQuesten	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	
0273C-5	Hogan	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	many years no detects, wells btwn this and plume
0273D-6	Thornton	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
0273F-4	Gander	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	
0373A-2	Resseman	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
0373A-4	Vansickel	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
0373J-3	Golding	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	
0373L-1	Sterling	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	
1073D-1	Coats	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	
1073E-2	Pullen	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	Alt w/1073E-3
1073E-3	Clark	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	Alt w/1073E-2
1073E-4	Carpenter	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
1073G-1	Rux	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073J-1	Moreno	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1073L-1	Halpin	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1073L-2	Countryman	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	Alt w/1073L-3
1073L-3	Anderson	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	Alt w/1073L-2
1073L-4	Crabb	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	
1073M-1	Bertholf	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	Alt w/1073M-3
1073M-3	Lane	☐	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐	☐	Alt w/1073M-1
1073M-5	Swenson	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
1073P-1	Greenen	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1073P-2	Petrelli	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	

StationID	LastName	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Sched Comments
1073Q-4	NORTH MEADOWS W	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	
1173B-1	Bise	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	
1473C-5	Overmyer	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	BiAnnual (11) Alt w/1473D-1
1473D-1	Farris	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Alt w/1473C-5
1473D-2	Wardian	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	Alt w/1473C
1473M-1	Ennis	☑	☐	☐	☑	☐	☐	☑	☐	☐	☑	☐	☐	
1573C-10	Lake	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	
1573C-17	RESIDENT	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1573C-5	Nelson	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	
1573C-7	Brown	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1573C-8	Williams	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	BiAnnual (10)
1573G-1	Gano	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	BiAnnual (11)
1573H-1	Hunter	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	
1573K-1	Tender	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	☐	
1573Q-1	Saunder	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	
1573R-2	Hunter	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☑	☐	
3483M-1	Campbell	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	

5.0 Landfill Operations and Maintenance

From May 1, 2014 through April, 2016 the following routine landfill cover and gas system monitoring and maintenance was accomplished at the Colbert Landfill. Data collected is included in this section.

- Monthly monitoring at gas probes and exhaust system
- Monthly condensate tank levels
- Monthly gas fan maintenance (greasing, belt tension adjustments, etc.)
- Landfill gas sampling and analysis (Method TO-15) was performed in April 2016.
- Quarterly monitoring of trench risers (June, October, February and April).

Other notable items include:

- Cover and ditch weed control was ongoing throughout the growing season.
- Carbon tub change outs were performed in November 2015 and April 2016.

Landfill Operations and Maintenance Field Data

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.06

Tech MT

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, calibrated to 20.9% AB air

FanFlow: 51

Weather Clear and warm Mid-70's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0001L	4/18/2016		0	2.4	16.7	80.9	0	0	
CGP0001L	3/7/2016		0	2.3	17	80.7	0	-0.01	
CGP0001L	2/17/2016		0	2.2	17.9	79.9	0	-0.01	
CGP0001L	1/20/2016		0	1.9	18	80.1	0	-0.02	
CGP0001L	12/11/2015		0	2.8	17.1	81	0	0	
CGP0001L	8/31/2015		0	3.4	15.6	81	0	0	
CGP0001L	7/24/2015		0	3.4	15.7	80.9	0	-0.01	
CGP0001L	6/17/2015		0	2.5	16.3	81.2	0	0	
CGP0001L	5/26/2015		0	2.5	16.7	80.8	0	-0.02	
CGP0001L	11/18/2015		0	2.9	17	80.1	0	0	
CGP0001L	10/28/2015		0	2.9	16.8	80.3	0	0	
CGP0001U	6/17/2015		0	5.6	12.7	81.7	0	-0.01	
CGP0001U	11/18/2015		0	7	7.1	85.9	0	0	
CGP0001U	2/17/2016		0	5.7	13.6	80.7	0	-0.02	
CGP0001U	7/24/2015		0	6.1	6.6	87.3	0	-0.01	
CGP0001U	8/31/2015		0	6.6	6.6	86.8	0	0	
CGP0001U	4/18/2016		0	5.6	13.8	80.6	0	0	
CGP0001U	5/26/2015		0	5.7	12.2	82.1	0	0	
CGP0001U	10/28/2015		0	6.6	6.6	86.8	0	0	
CGP0001U	12/11/2015		0	6.9	7.2	85.9	0	-0.02	
CGP0001U	1/20/2016		0	5.1	13.7	81.2	0	-0.02	
CGP0001U	3/7/2016		0	6	6.9	87.1	0	-0.02	
CGP0002L	1/20/2016		0	7.2	6.8	86	0	-0.01	
CGP0002L	5/26/2015		0	5.9	13.4	80.7	0	0	
CGP0002L	6/17/2015		0	5.5	14.7	79.8	0	-0.01	
CGP0002L	7/24/2015		0	6.1	14.1	79.8	0	0	
CGP0002L	4/18/2016		0	7	6.6	86.4	0	0	
CGP0002L	8/31/2015		0	6.6	13.3	80.1	0	0	
CGP0002L	9/23/2015		0	6.7	13.5	79.8	0	0	
CGP0002L	3/7/2016		0	6.5	7.3	86.2	0	-0.03	
CGP0002L	12/11/2015		0	7.1	7.1	85.8	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.5

Tech MT **Calibration:** Zeroed CH4 to AB air; GASCAL CH4 raeding 14.7, calibrated to 15.0%; CO reading 14.9, calibrated to 15.0%; Zeroed O2 to CALGAS, O2 reading 20.5 to AB air. **FanFlow:** 51 **Weather** Cloudy mid 40's light wind

Equipment: GEM 500 SN 410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0002L	2/17/2016		0	7.1	6.9	86	0	0	
CGP0002L	11/18/2015		0	7.5	6.7	85.8	0	-0.02	
CGP0002L	10/28/2015		0	7.1	7	85.9	0	-0.01	
CGP0002U	4/18/2016		0	1.9	18.3	79.8	0	-0.02	
CGP0002U	5/26/2015		0	1.7	18.1	80.2	0	0	
CGP0002U	9/23/2015		0	1.4	19.7	78.9	0	0	
CGP0002U	11/18/2015		0	1.4	19.5	79.1	0	0	
CGP0002U	3/7/2016		0	1.7	18.2	80.1	0	-0.03	
CGP0002U	6/17/2015		0	1.6	19	79.4	0	0	
CGP0002U	7/24/2015		0	1.4	18.1	79.8	0	0	
CGP0002U	10/28/2015		0	1.2	19.4	79.4	0	-0.01	
CGP0002U	12/11/2015		0	1.6	19.3	79.1	0	0	
CGP0002U	1/20/2016		0	1.4	18.7	79.9	0	0	
CGP0002U	2/17/2016		0	1.6	18.9	80.5	0	0	
CGP0002U	8/31/2015		0	1.4	19.1	79.5	0	0	
CGP0003L	5/26/2015		0	9.7	4.7	85.6	0	-0.02	
CGP0003L	12/11/2015		0	9.4	5.6	85	0	0	
CGP0003L	10/28/2015		0	9.4	5.5	85.1	0	-0.03	
CGP0003L	9/23/2015		0	9.4	6	84.6	0	0	
CGP0003L	8/31/2015		0	8.7	6.1	85.2	0	0	
CGP0003L	4/18/2016		0	9.8	4.7	85.5	0	0	
CGP0003L	11/18/2015		0	9.3	5.7	85	0	-0.01	
CGP0003L	6/17/2015		0	9	6	85	0	-0.01	
CGP0003L	2/17/2016		0	9.9	5.3	84.8	0	0	
CGP0003L	3/7/2016		0	7	6.9	86.1	0	-0.02	
CGP0003L	7/24/2015		0	9.2	5.9	84.9	0	0	
CGP0003L	1/20/2016		0	9.6	5.4	85	0	-0.04	
CGP0003U	10/28/2015		0	1.5	19.3	79.2	0	0	
CGP0003U	3/7/2016		0	1.3	18.6	80.1	0	-0.01	
CGP0003U	2/17/2016		0	1.4	19.3	79.3	0	-0.01	
CGP0003U	12/11/2015		0	1.4	19.9	79.2	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.02

Tech MT/B **Calibration:** Zeroed CH4 to AB air, CALGAS->CH4 reads 15.2%, calibrated to 15.0%; CO2 reads 15.1%, calibrated to 15.0%: Zeroed O2 to CALGAS, calibrated to AB air 20.9% **FanFlow:** 47 **Weather** Sli Cloudy 60's AM 70's PM

Equipment: GEM 500 SN510

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0003U	9/23/2015		0	1.9	19.2	78.9	0	0	
CGP0003U	8/31/2015		0	2.1	18.2	79.7	0	0	
CGP0003U	4/18/2016		0	1.5	17.6	80.9	0	-0.01	
CGP0003U	7/24/2015		0	1.6	18.1	80.3	0	0	
CGP0003U	6/17/2015		0	1.3	18.6	80.1	0	0	
CGP0003U	5/26/2015		0	1.7	13.4	84.9	0	0	
CGP0003U	11/18/2015		0	1.5	19.3	79.2	0	0	
CGP0003U	1/20/2016		0	1	19.6	79.4	0	-0.03	
CGP0004L	3/7/2016		0	4.5	15.1	80.4	0	-0.01	
CGP0004L	9/23/2015		0	4.6	15.3	80.1	0	0	
CGP0004L	11/18/2015		0	4.5	16	79.5	0	-0.01	
CGP0004L	5/26/2015		0	5.9	10.2	83.9	0	-0.02	
CGP0004L	6/17/2015		0	4.9	14.4	80.7	0	-0.02	
CGP0004L	7/24/2015		0	5.2	13.8	81	0	-0.02	
CGP0004L	4/18/2016		0	6.2	6.5	87.3	0	-0.02	
CGP0004L	8/31/2015		0	5	14.5	80.5	0	0	
CGP0004L	10/28/2015		0	3.9	16.2	79.9	0	-0.02	
CGP0004L	12/11/2015		0	4.7	15.8	79.5	0	-0.02	
CGP0004L	1/20/2016		0	2.8	17.7	79.5	0	-0.03	
CGP0004L	2/17/2016		0	3.1	17.6	79.3	0	-0.02	
CGP0004U	10/28/2015		0	3.5	17	79.5	0	-0.01	
CGP0004U	7/24/2015		0	4.1	14.7	81.2	0	-0.01	
CGP0004U	11/18/2015		0	3.8	16	80.2	0	-0.02	
CGP0004U	4/18/2016		0	3.4	14.1	82.5	0	-0.02	
CGP0004U	8/31/2015		0	3.4	16.1	80.5	0	0	
CGP0004U	9/23/2015		0	3.6	16.4	80	0	0	
CGP0004U	6/17/2015		0	3.3	16	80.7	0	0	
CGP0004U	1/20/2016		0	3.7	15.7	80.6	0	-0.04	
CGP0004U	2/17/2016		0	4.1	15.4	80.5	0	-0.02	
CGP0004U	3/7/2016		0	4	14.6	81.4	0	-0.01	
CGP0004U	5/26/2015		0	4.1	14.1	81.8	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.01

Tech MT

Calibration: Zeroed CH4 to AB air; CalGas CH4 reads 15.2% calibrated to 15.0%; CO2 reading 14.9% calibrated to 15.0%: zeroed O2 to CalGas. calibrated to 20.9%

FanFlow: 46

Weather Cloudy Mid 40's lite SW wind

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0004U	12/11/2015		0	3.6	16.2	80.2	0	-0.02	
CGP0005L	8/31/2015		0	5.1	13.8	81.1	0	-0.02	
CGP0005L	3/7/2016		0	5	6.6	88.4	0	-0.01	
CGP0005L	2/17/2016		0	5.6	6.9	87.5	0	0	
CGP0005L	1/20/2016		0	5	7	88	0	-0.03	
CGP0005L	12/11/2015		0	6.9	6.6	86.6	0	0	
CGP0005L	9/23/2015		0	5	14.3	80.6	0	0	
CGP0005L	4/18/2016		0	5.4	6	88.6	0	-0.04	
CGP0005L	11/18/2015		0	6.5	6.9	86.6	0	-0.01	
CGP0005L	5/26/2015		0	5.4	11.9	82.7	0	-0.01	
CGP0005L	7/24/2015		0	5.5	13	81.5	0	-0.01	
CGP0005L	6/17/2015		0	4.2	14.3	81.5	0	0	
CGP0005L	10/28/2015		0	6.6	6.9	86.5	0	0	
CGP0005U	6/17/2015		0	1.1	18.5	80.4	0	0	
CGP0005U	2/17/2016		0	1.4	19.1	79.5	0	-0.01	
CGP0005U	9/23/2015		0	1	19.5	79.5	0	0	
CGP0005U	3/7/2016		0	1.1	18.2	80.7	0	-0.04	
CGP0005U	1/20/2016		0	0.6	19.4	80	0	-0.02	
CGP0005U	12/11/2015		0	1.1	19.8	79.1	0	-0.01	
CGP0005U	10/28/2015		0	1.7	18.4	79.9	0	-0.01	
CGP0005U	7/24/2015		0	1.4	17.5	81.1	0	-0.01	
CGP0005U	11/18/2015		0	1	19.9	79.1	0	0	
CGP0005U	5/26/2015		0	1.7	17.7	80.6	0	0	
CGP0005U	8/31/2015		0	1.1	19	79.9	0	0	
CGP0005U	4/18/2016		0	2.9	6.9	90.2	0	-0.02	
CGP0007L	12/11/2015		0	0.8	20.3	78.9	0	0	
CGP0007L	5/26/2015		0	0.9	14.7	84.4	0	0	
CGP0007L	6/17/2015		0	0.7	19.3	80	0	0	
CGP0007L	7/24/2015		0	1.4	18.4	80.2	0	-0.01	
CGP0007L	8/31/2015		0	0.4	20.3	79.3	0	0	
CGP0007L	10/28/2015		0	0.9	19.8	79.3	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.87

Tech MT

Calibration: Zeroed CH4 to AB air -> CALGAS-> CH4 reading 15.0%, no calibration needed; CO2 reading 15.6%, calibrated to 15.0%; O2 reading 0.2% Zeroed O2 with calgas.

FanFlow: 0

Weather Partly cloudy 40's LT wind 5-10

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0007L	11/18/2015		0	0.6	20.5	78.9	0	0	
CGP0007L	4/18/2016		0	1	18.8	80.2	0	0	
CGP0007L	3/7/2016		0	0.8	19.6	79.6	0	-0.02	
CGP0007L	2/17/2016		0	1.1	19.9	79	0	0	
CGP0007L	1/20/2016		0	0.7	19.7	79.6	0	-0.01	
CGP0007L	9/23/2015		0	0.6	20.1	79.1	0	-0.03	
CGP0007U	9/23/2015		0	2.9	17	80	0	0	
CGP0007U	7/24/2015		0	3.4	16.1	80.5	0	-0.01	
CGP0007U	12/11/2015		0	3.6	15.2	81.2	0	-0.01	
CGP0007U	4/18/2016		0	0.8	18.2	81	0	-0.01	
CGP0007U	6/17/2015		0	0.3	19.1	80.6	0	-0.02	
CGP0007U	11/18/2015		0	3.5	15.3	81.2	0	-0.01	
CGP0007U	8/31/2015		0	0.4	19.9	79.7	0	0	
CGP0007U	8/31/2015		0	1.5	18.9	79.6	0	0	
CGP0007U	10/28/2015		0	3.7	15.5	80.8	0	0	
CGP0007U	1/20/2016		0	4.8	13.9	81.3	0	-0.05	
CGP0007U	2/17/2016		0	4.7	13.8	81.5	0	0	
CGP0007U	3/7/2016		0	1	19.3	79.7	0	-0.02	
CGP0007U	5/26/2015		0	3.2	14.1	82.7	0	-0.01	
CGP0010L	5/26/2015		0	4.1	14.1	81.8	0	-0.01	
CGP0010L	6/17/2015		0	4.5	13.4	82.1	0	0	
CGP0010L	7/24/2015		0	5.7	12.2	82.1	0	0	
CGP0010L	8/31/2015		0	6.4	6.5	87.1	0	-0.01	
CGP0010L	9/23/2015		0	5.6	7	87.2	0	-0.01	
CGP0010L	12/11/2015		0	6.3	7	86.7	0	0	
CGP0010L	11/18/2015		0	6.4	6.9	86.7	0	-0.01	
CGP0010L	3/7/2016		0	5.2	7.1	87.7	0	0	
CGP0010L	10/28/2015		0	6	6.6	87.4	0	-0.01	
CGP0010L	2/17/2016		0	5.3	14.1	80.6	0	0	
CGP0010L	4/18/2016		0	1.8	16.8	81.4	0	0	
CGP0010L	1/20/2016		0	5.2	14	80.8	0	-0.03	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.5

Tech MT **Calibration:** Zeroed CH4 to AB air; GASCAL CH4 raeding 14.7, calibrated to 15.0%; CO reading 14.9, calibrated to 15.0%; Zeroed O2 to CALGAS, O2 reading 20.5 to AB air. **FanFlow:** 51 **Weather** Cloudy mid 40's light wind

Equipment: GEM 500 SN 410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0010U	2/17/2016		0	1.6	18.2	80.2	0	-0.01	
CGP0010U	5/26/2015		0	1.8	16.3	81.9	0	0	
CGP0010U	6/17/2015		0	1.8	17.4	80.8	0	-0.03	
CGP0010U	7/24/2015		0	2.4	16.9	80.7	0	-0.01	
CGP0010U	8/31/2015		0	1.7	18.3	80	0	0	
CGP0010U	10/28/2015		0	2.3	18.1	79.6	0	0	
CGP0010U	12/11/2015		0	2.1	17.4	80.5	0	-0.01	
CGP0010U	1/20/2016		0	1.5	18.2	80.3	0	-0.04	
CGP0010U	4/18/2016		0	0.7	18.4	80.9	0	0	
CGP0010U	3/7/2016		0	1.7	17.2	81.1	0	-0.01	
CGP0010U	9/23/2015		0	2.2	17.6	80	0	0	
CGP0010U	11/18/2015		0	2	17.5	80.5	0	-0.01	
CGP0011L	5/26/2015		0	0.2	19.1	80.7	0	0	
CGP0011L	12/11/2015		0	0.4	20.3	79.3	0	-0.01	
CGP0011L	10/28/2015		0	0.7	18.6	80.7	0	0	
CGP0011L	9/23/2015		0	0.1	20.7	79	0	-0.02	
CGP0011L	8/31/2015		0	0.3	20.2	79.5	0	-0.01	
CGP0011L	6/17/2015		0	0.1	19.8	80.1	0	-0.01	
CGP0011L	11/18/2015		0	0.2	20.5	79.3	0	-0.01	
CGP0011L	3/7/2016		0	0.1	20.6	79.3	0	-0.01	
CGP0011L	7/24/2015		0	0.9	18.7	80.4	0	-0.01	
CGP0011L	4/18/2016		0	0.3	18.9	80.8	0	0	
CGP0011L	2/17/2016		0	0.6	20.1	79.3	0	-0.01	
CGP0011L	1/20/2016		0	0.2	20.4	79.4	0	0	
CGP0011U	3/7/2016		0	2.9	17.1	80	0	0	
CGP0011U	5/26/2015		0	2.2	12.7	85.1	0	0	
CGP0011U	6/17/2015		0	3.2	14.8	82	0	0	
CGP0011U	7/24/2015		0	4.1	14.4	81.5	0	0	
CGP0011U	8/31/2015		0	4.7	14.2	81.1	0	0	
CGP0011U	9/23/2015		0	4	15	80.8	0	-0.03	
CGP0011U	10/28/2015		0	4.9	14.7	80.4	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.01

Tech MT

Calibration: Zeroed CH4 to AB air; CalGas CH4 reads 15.2% calibrated to 15.0%; CO2 reading 14.9% calibrated to 15.0%: zeroed O2 to CalGas. calibrated to 20.9%

FanFlow: 46

Weather Cloudy Mid 40's lite SW wind

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0011U	12/11/2015		0	5.1	14.5	80.4	0	0	
CGP0011U	2/17/2016		0	3.4	17.4	79.2	0	0	
CGP0011U	4/18/2016		0	2.7	15.7	81.6	0	0	
CGP0011U	11/18/2015		0	4.7	14.9	80.4	0	-0.02	
CGP0011U	1/20/2016		0	3.5	17.5	79	0	-0.01	
CTS00001	4/18/2016		0	2.5	6.3	91.2	0	0	
CTS00002	4/18/2016		0	2.2	14.7	83.1	0	0	
CTS00003	4/18/2016		0	5.7	5.7	88.6	0	0	
CTS00004	4/18/2016		0	1.5	16.7	81.8	0	0	
CTS00005	4/18/2016		0	8.6	4.9	86.5	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.06

Tech MT

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, calibrated to 20.9% AB air

FanFlow: 51

Weather Clear and warm Mid-70's

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0001L	4/18/2016		0	2.4	16.7	80.9	0	0	
CGP0001L	3/7/2016		0	2.3	17	80.7	0	-0.01	
CGP0001L	2/17/2016		0	2.2	17.9	79.9	0	-0.01	
CGP0001L	1/20/2016		0	1.9	18	80.1	0	-0.02	
CGP0001L	12/11/2015		0	2.8	17.1	81	0	0	
CGP0001L	8/31/2015		0	3.4	15.6	81	0	0	
CGP0001L	7/24/2015		0	3.4	15.7	80.9	0	-0.01	
CGP0001L	6/17/2015		0	2.5	16.3	81.2	0	0	
CGP0001L	5/26/2015		0	2.5	16.7	80.8	0	-0.02	
CGP0001L	11/18/2015		0	2.9	17	80.1	0	0	
CGP0001L	10/28/2015		0	2.9	16.8	80.3	0	0	
CGP0001U	6/17/2015		0	5.6	12.7	81.7	0	-0.01	
CGP0001U	11/18/2015		0	7	7.1	85.9	0	0	
CGP0001U	2/17/2016		0	5.7	13.6	80.7	0	-0.02	
CGP0001U	7/24/2015		0	6.1	6.6	87.3	0	-0.01	
CGP0001U	8/31/2015		0	6.6	6.6	86.8	0	0	
CGP0001U	4/18/2016		0	5.6	13.8	80.6	0	0	
CGP0001U	5/26/2015		0	5.7	12.2	82.1	0	0	
CGP0001U	10/28/2015		0	6.6	6.6	86.8	0	0	
CGP0001U	12/11/2015		0	6.9	7.2	85.9	0	-0.02	
CGP0001U	1/20/2016		0	5.1	13.7	81.2	0	-0.02	
CGP0001U	3/7/2016		0	6	6.9	87.1	0	-0.02	
CGP0002L	1/20/2016		0	7.2	6.8	86	0	-0.01	
CGP0002L	5/26/2015		0	5.9	13.4	80.7	0	0	
CGP0002L	6/17/2015		0	5.5	14.7	79.8	0	-0.01	
CGP0002L	7/24/2015		0	6.1	14.1	79.8	0	0	
CGP0002L	4/18/2016		0	7	6.6	86.4	0	0	
CGP0002L	8/31/2015		0	6.6	13.3	80.1	0	0	
CGP0002L	9/23/2015		0	6.7	13.5	79.8	0	0	
CGP0002L	3/7/2016		0	6.5	7.3	86.2	0	-0.03	
CGP0002L	12/11/2015		0	7.1	7.1	85.8	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.5

Tech MT **Calibration:** Zeroed CH4 to AB air; GASCAL CH4 raeding 14.7, calibrated to 15.0%; CO reading 14.9, calibrated to 15.0%; Zeroed O2 to CALGAS, O2 reading 20.5 to AB air. **FanFlow:** 51 **Weather** Cloudy mid 40's light wind

Equipment: GEM 500 SN 410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0002L	2/17/2016		0	7.1	6.9	86	0	0	
CGP0002L	11/18/2015		0	7.5	6.7	85.8	0	-0.02	
CGP0002L	10/28/2015		0	7.1	7	85.9	0	-0.01	
CGP0002U	4/18/2016		0	1.9	18.3	79.8	0	-0.02	
CGP0002U	5/26/2015		0	1.7	18.1	80.2	0	0	
CGP0002U	9/23/2015		0	1.4	19.7	78.9	0	0	
CGP0002U	11/18/2015		0	1.4	19.5	79.1	0	0	
CGP0002U	3/7/2016		0	1.7	18.2	80.1	0	-0.03	
CGP0002U	6/17/2015		0	1.6	19	79.4	0	0	
CGP0002U	7/24/2015		0	1.4	18.1	79.8	0	0	
CGP0002U	10/28/2015		0	1.2	19.4	79.4	0	-0.01	
CGP0002U	12/11/2015		0	1.6	19.3	79.1	0	0	
CGP0002U	1/20/2016		0	1.4	18.7	79.9	0	0	
CGP0002U	2/17/2016		0	1.6	18.9	80.5	0	0	
CGP0002U	8/31/2015		0	1.4	19.1	79.5	0	0	
CGP0003L	5/26/2015		0	9.7	4.7	85.6	0	-0.02	
CGP0003L	12/11/2015		0	9.4	5.6	85	0	0	
CGP0003L	10/28/2015		0	9.4	5.5	85.1	0	-0.03	
CGP0003L	9/23/2015		0	9.4	6	84.6	0	0	
CGP0003L	8/31/2015		0	8.7	6.1	85.2	0	0	
CGP0003L	4/18/2016		0	9.8	4.7	85.5	0	0	
CGP0003L	11/18/2015		0	9.3	5.7	85	0	-0.01	
CGP0003L	6/17/2015		0	9	6	85	0	-0.01	
CGP0003L	2/17/2016		0	9.9	5.3	84.8	0	0	
CGP0003L	3/7/2016		0	7	6.9	86.1	0	-0.02	
CGP0003L	7/24/2015		0	9.2	5.9	84.9	0	0	
CGP0003L	1/20/2016		0	9.6	5.4	85	0	-0.04	
CGP0003U	10/28/2015		0	1.5	19.3	79.2	0	0	
CGP0003U	3/7/2016		0	1.3	18.6	80.1	0	-0.01	
CGP0003U	2/17/2016		0	1.4	19.3	79.3	0	-0.01	
CGP0003U	12/11/2015		0	1.4	19.9	79.2	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.02

Tech MT/B **Calibration:** Zeroed CH4 to AB air, CALGAS->CH4 reads 15.2%, calibrated to 15.0%; CO2 reads 15.1%, calibrated to 15.0%: Zeroed O2 to CALGAS, calibrated to AB air 20.9% **FanFlow:** 47 **Weather** Sli Cloudy 60's AM 70's PM

Equipment: GEM 500 SN510

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0003U	9/23/2015		0	1.9	19.2	78.9	0	0	
CGP0003U	8/31/2015		0	2.1	18.2	79.7	0	0	
CGP0003U	4/18/2016		0	1.5	17.6	80.9	0	-0.01	
CGP0003U	7/24/2015		0	1.6	18.1	80.3	0	0	
CGP0003U	6/17/2015		0	1.3	18.6	80.1	0	0	
CGP0003U	5/26/2015		0	1.7	13.4	84.9	0	0	
CGP0003U	11/18/2015		0	1.5	19.3	79.2	0	0	
CGP0003U	1/20/2016		0	1	19.6	79.4	0	-0.03	
CGP0004L	3/7/2016		0	4.5	15.1	80.4	0	-0.01	
CGP0004L	9/23/2015		0	4.6	15.3	80.1	0	0	
CGP0004L	11/18/2015		0	4.5	16	79.5	0	-0.01	
CGP0004L	5/26/2015		0	5.9	10.2	83.9	0	-0.02	
CGP0004L	6/17/2015		0	4.9	14.4	80.7	0	-0.02	
CGP0004L	7/24/2015		0	5.2	13.8	81	0	-0.02	
CGP0004L	4/18/2016		0	6.2	6.5	87.3	0	-0.02	
CGP0004L	8/31/2015		0	5	14.5	80.5	0	0	
CGP0004L	10/28/2015		0	3.9	16.2	79.9	0	-0.02	
CGP0004L	12/11/2015		0	4.7	15.8	79.5	0	-0.02	
CGP0004L	1/20/2016		0	2.8	17.7	79.5	0	-0.03	
CGP0004L	2/17/2016		0	3.1	17.6	79.3	0	-0.02	
CGP0004U	10/28/2015		0	3.5	17	79.5	0	-0.01	
CGP0004U	7/24/2015		0	4.1	14.7	81.2	0	-0.01	
CGP0004U	11/18/2015		0	3.8	16	80.2	0	-0.02	
CGP0004U	4/18/2016		0	3.4	14.1	82.5	0	-0.02	
CGP0004U	8/31/2015		0	3.4	16.1	80.5	0	0	
CGP0004U	9/23/2015		0	3.6	16.4	80	0	0	
CGP0004U	6/17/2015		0	3.3	16	80.7	0	0	
CGP0004U	1/20/2016		0	3.7	15.7	80.6	0	-0.04	
CGP0004U	2/17/2016		0	4.1	15.4	80.5	0	-0.02	
CGP0004U	3/7/2016		0	4	14.6	81.4	0	-0.01	
CGP0004U	5/26/2015		0	4.1	14.1	81.8	0	0	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.01

Tech MT

Calibration: Zeroed CH4 to AB air; CalGas CH4 reads 15.2% calibrated to 15.0%; CO2 reading 14.9% calibrated to 15.0%: zeroed O2 to CalGas. calibrated to 20.9%

FanFlow: 46

Weather Cloudy Mid 40's lite SW wind

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0004U	12/11/2015		0	3.6	16.2	80.2	0	-0.02	
CGP0005L	8/31/2015		0	5.1	13.8	81.1	0	-0.02	
CGP0005L	3/7/2016		0	5	6.6	88.4	0	-0.01	
CGP0005L	2/17/2016		0	5.6	6.9	87.5	0	0	
CGP0005L	1/20/2016		0	5	7	88	0	-0.03	
CGP0005L	12/11/2015		0	6.9	6.6	86.6	0	0	
CGP0005L	9/23/2015		0	5	14.3	80.6	0	0	
CGP0005L	4/18/2016		0	5.4	6	88.6	0	-0.04	
CGP0005L	11/18/2015		0	6.5	6.9	86.6	0	-0.01	
CGP0005L	5/26/2015		0	5.4	11.9	82.7	0	-0.01	
CGP0005L	7/24/2015		0	5.5	13	81.5	0	-0.01	
CGP0005L	6/17/2015		0	4.2	14.3	81.5	0	0	
CGP0005L	10/28/2015		0	6.6	6.9	86.5	0	0	
CGP0005U	6/17/2015		0	1.1	18.5	80.4	0	0	
CGP0005U	2/17/2016		0	1.4	19.1	79.5	0	-0.01	
CGP0005U	9/23/2015		0	1	19.5	79.5	0	0	
CGP0005U	3/7/2016		0	1.1	18.2	80.7	0	-0.04	
CGP0005U	1/20/2016		0	0.6	19.4	80	0	-0.02	
CGP0005U	12/11/2015		0	1.1	19.8	79.1	0	-0.01	
CGP0005U	10/28/2015		0	1.7	18.4	79.9	0	-0.01	
CGP0005U	7/24/2015		0	1.4	17.5	81.1	0	-0.01	
CGP0005U	11/18/2015		0	1	19.9	79.1	0	0	
CGP0005U	5/26/2015		0	1.7	17.7	80.6	0	0	
CGP0005U	8/31/2015		0	1.1	19	79.9	0	0	
CGP0005U	4/18/2016		0	2.9	6.9	90.2	0	-0.02	
CGP0007L	12/11/2015		0	0.8	20.3	78.9	0	0	
CGP0007L	5/26/2015		0	0.9	14.7	84.4	0	0	
CGP0007L	6/17/2015		0	0.7	19.3	80	0	0	
CGP0007L	7/24/2015		0	1.4	18.4	80.2	0	-0.01	
CGP0007L	8/31/2015		0	0.4	20.3	79.3	0	0	
CGP0007L	10/28/2015		0	0.9	19.8	79.3	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.87

Tech MT

Calibration: Zeroed CH4 to AB air -> CALGAS-> CH4 reading 15.0%, no calibration needed; CO2 reading 15.6%, calibrated to 15.0%; O2 reading 0.2% Zeroed O2 with calgas.

FanFlow: 0

Weather Partly cloudy 40's LT wind 5-10

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0007L	11/18/2015		0	0.6	20.5	78.9	0	0	
CGP0007L	4/18/2016		0	1	18.8	80.2	0	0	
CGP0007L	3/7/2016		0	0.8	19.6	79.6	0	-0.02	
CGP0007L	2/17/2016		0	1.1	19.9	79	0	0	
CGP0007L	1/20/2016		0	0.7	19.7	79.6	0	-0.01	
CGP0007L	9/23/2015		0	0.6	20.1	79.1	0	-0.03	
CGP0007U	9/23/2015		0	2.9	17	80	0	0	
CGP0007U	7/24/2015		0	3.4	16.1	80.5	0	-0.01	
CGP0007U	12/11/2015		0	3.6	15.2	81.2	0	-0.01	
CGP0007U	4/18/2016		0	0.8	18.2	81	0	-0.01	
CGP0007U	6/17/2015		0	0.3	19.1	80.6	0	-0.02	
CGP0007U	11/18/2015		0	3.5	15.3	81.2	0	-0.01	
CGP0007U	8/31/2015		0	0.4	19.9	79.7	0	0	
CGP0007U	8/31/2015		0	1.5	18.9	79.6	0	0	
CGP0007U	10/28/2015		0	3.7	15.5	80.8	0	0	
CGP0007U	1/20/2016		0	4.8	13.9	81.3	0	-0.05	
CGP0007U	2/17/2016		0	4.7	13.8	81.5	0	0	
CGP0007U	3/7/2016		0	1	19.3	79.7	0	-0.02	
CGP0007U	5/26/2015		0	3.2	14.1	82.7	0	-0.01	
CGP0010L	5/26/2015		0	4.1	14.1	81.8	0	-0.01	
CGP0010L	6/17/2015		0	4.5	13.4	82.1	0	0	
CGP0010L	7/24/2015		0	5.7	12.2	82.1	0	0	
CGP0010L	8/31/2015		0	6.4	6.5	87.1	0	-0.01	
CGP0010L	9/23/2015		0	5.6	7	87.2	0	-0.01	
CGP0010L	12/11/2015		0	6.3	7	86.7	0	0	
CGP0010L	11/18/2015		0	6.4	6.9	86.7	0	-0.01	
CGP0010L	3/7/2016		0	5.2	7.1	87.7	0	0	
CGP0010L	10/28/2015		0	6	6.6	87.4	0	-0.01	
CGP0010L	2/17/2016		0	5.3	14.1	80.6	0	0	
CGP0010L	4/18/2016		0	1.8	16.8	81.4	0	0	
CGP0010L	1/20/2016		0	5.2	14	80.8	0	-0.03	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 29.5

Tech MT **Calibration:** Zeroed CH4 to AB air; GASCAL CH4 raeding 14.7, calibrated to 15.0%; CO reading 14.9, calibrated to 15.0%; Zeroed O2 to CALGAS, O2 reading 20.5 to AB air. **FanFlow:** 51 **Weather** Cloudy mid 40's light wind

Equipment: GEM 500 SN 410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0010U	2/17/2016		0	1.6	18.2	80.2	0	-0.01	
CGP0010U	5/26/2015		0	1.8	16.3	81.9	0	0	
CGP0010U	6/17/2015		0	1.8	17.4	80.8	0	-0.03	
CGP0010U	7/24/2015		0	2.4	16.9	80.7	0	-0.01	
CGP0010U	8/31/2015		0	1.7	18.3	80	0	0	
CGP0010U	10/28/2015		0	2.3	18.1	79.6	0	0	
CGP0010U	12/11/2015		0	2.1	17.4	80.5	0	-0.01	
CGP0010U	1/20/2016		0	1.5	18.2	80.3	0	-0.04	
CGP0010U	4/18/2016		0	0.7	18.4	80.9	0	0	
CGP0010U	3/7/2016		0	1.7	17.2	81.1	0	-0.01	
CGP0010U	9/23/2015		0	2.2	17.6	80	0	0	
CGP0010U	11/18/2015		0	2	17.5	80.5	0	-0.01	
CGP0011L	5/26/2015		0	0.2	19.1	80.7	0	0	
CGP0011L	12/11/2015		0	0.4	20.3	79.3	0	-0.01	
CGP0011L	10/28/2015		0	0.7	18.6	80.7	0	0	
CGP0011L	9/23/2015		0	0.1	20.7	79	0	-0.02	
CGP0011L	8/31/2015		0	0.3	20.2	79.5	0	-0.01	
CGP0011L	6/17/2015		0	0.1	19.8	80.1	0	-0.01	
CGP0011L	11/18/2015		0	0.2	20.5	79.3	0	-0.01	
CGP0011L	3/7/2016		0	0.1	20.6	79.3	0	-0.01	
CGP0011L	7/24/2015		0	0.9	18.7	80.4	0	-0.01	
CGP0011L	4/18/2016		0	0.3	18.9	80.8	0	0	
CGP0011L	2/17/2016		0	0.6	20.1	79.3	0	-0.01	
CGP0011L	1/20/2016		0	0.2	20.4	79.4	0	0	
CGP0011U	3/7/2016		0	2.9	17.1	80	0	0	
CGP0011U	5/26/2015		0	2.2	12.7	85.1	0	0	
CGP0011U	6/17/2015		0	3.2	14.8	82	0	0	
CGP0011U	7/24/2015		0	4.1	14.4	81.5	0	0	
CGP0011U	8/31/2015		0	4.7	14.2	81.1	0	0	
CGP0011U	9/23/2015		0	4	15	80.8	0	-0.03	
CGP0011U	10/28/2015		0	4.9	14.7	80.4	0	-0.01	

COLBERT PERIMETER GAS MONITORING REPORT

Barometer: 30.01

Tech MT

Calibration: Zeroed CH4 to AB air; CalGas CH4 reads 15.2% calibrated to 15.0%; CO2 reading 14.9% calibrated to 15.0%: zeroed O2 to CalGas. calibrated to 20.9%

FanFlow: 46

Weather Cloudy Mid 40's lite SW wind

Equipment: Gem 500 #410

Location	Date	Time	CH4	CO2	O2	Balance	Static Pres	Diff. Press.	Comments
CGP0011U	12/11/2015		0	5.1	14.5	80.4	0	0	
CGP0011U	2/17/2016		0	3.4	17.4	79.2	0	0	
CGP0011U	4/18/2016		0	2.7	15.7	81.6	0	0	
CGP0011U	11/18/2015		0	4.7	14.9	80.4	0	-0.02	
CGP0011U	1/20/2016		0	3.5	17.5	79	0	-0.01	
CTS00001	4/18/2016		0	2.5	6.3	91.2	0	0	
CTS00002	4/18/2016		0	2.2	14.7	83.1	0	0	
CTS00003	4/18/2016		0	5.7	5.7	88.6	0	0	
CTS00004	4/18/2016		0	1.5	16.7	81.8	0	0	
CTS00005	4/18/2016		0	8.6	4.9	86.5	0	-0.01	

COLBERT MONTHLY GP

5/26/2015 (TUES) TECH: M. TERRIS
WEATHER: P. CLOUDY COOL MID-60S BP @ 29.92V
GAS FLOW 51 CFM GAS TEMP 21.6°C FAN HR 00058
(TURNED OVER)

GEM 500 #410 FILENAME CP150526

GAS CALIBRATION:
ZEROED CH_4 TO AB AIR → GAS CAL 14.7% CALIB TO 15.0%; CO_2 READING 15.1% CALIB. TO 15.0%; ZEROED O_2 TO CAL GAS → O_2 AB AIR @ 20.6% CAL. TO AB AIR OF 20.9%.

MT SAMPLED ALL 21 GP LOCATIONS & 4 GAS EXTRACTION LOCATIONS RECORDED %CH_4, %CO_2, %O_2 & PRESSURE, ALL READINGS ARE IN NORMAL RANGE SO NO ADJUSTMENTS WERE MADE. NOTHING OUT OF ORDINARY OBSERVED.

- FAN HR METER TURNED OVER NOW READING 00058 BUT IT REALLY READS 100,058.

- FAN MAINT BELT TENSION 5 LBS, GREASED BOTH FRONT/REAR BEARINGS 4 SHOT EACH

- NO CONDENSATE IN EFF LINE (GAS)

- COUNTER @ Ø NO PUMP (IN BEING REPAIRED)

- TANK READINGS 1.25" WITH 9.25" HEADSPACE

6/4/2015

- GAS FLOW 50 CFM @ 22.1°C Ø COND

6/12/2015

- GAS FLOW 53CFM @ 22.5°C Ø COND.

6/16/2015

- CLEANED OUT KNOCKOUT SUMP PUMP CONTAINMENT AREA FOR REINSTLATION NEXT WEEK

6/17/2015 COLBENT MONTHLY GP & MAINT.
WEATHER. P.CLOUDY WARM 70S/80S' B.P. 29.91 T
TECH: M. TERRIS GAS FLOW: 45CFM GASTEMP 24.7°C
FAN HR 584 HRS. FILE NAME: CP150617

GAS CALIBRATION: 0.5% CH_4 ZEROED TO AB AIR;
CAL GAS → METER READ: 14.7% CH_4 CALIB. TO 15.0%; CO_2 READS 14.7% CALIB TO 15.0%.
O_2 READS 21.0% CAL. 20.9 AB AIR.

MT SAMPLED ALL 21 GAS PROBE POINT LOCATION AND 4 GAS EXTRACTION LOCATIONS RECORDED FOR %CH_4, %CO_2, %O_2 & PRESSURE. ALL READING ARE WITHIN NORMAL RANGE, NO ADJUSTMENTS WERE MADE, NOTHING OUT OF THE ORDINARY OBSERVED

- FAN TENSION ON BELT 5 lbs GREASED BOTH FRONT/REAR BEARINGS 4 SHOTS OF GREASE EACH
- NO CONDENSATE IN GAS EFF LINE
- TANK READING REAR OF ~~NE~~ NE CORNER 1.25" TANK 9.25 IS SPACE

6/24/2015

- WEEKLY GAS FLOW READING 52 CFM @ 27.8°C

6/23/15 (TUES)

- GF ONSITE TO REINSTALL KNOCKOUT PUMP. GF/BU HAD TROUBLE GETTING PUMP TO RUN. FOUND PUMP TO BE FROZEN UP SO GF HAD TO TAKE PUMP BACK IN FOR REPAIRS.

- GF ALSO FOUND A PROBLEM WITH THE BREAKER IN THE BREAKER BOX CIF THE BREAKER HAS TRIPED IT MIGHT BE RUNNING ON 2 LEGS NOT ALL 4 SO MAKE SURE BREAKER IS ATTACHED AND IN FULL POSITION.

6/30/2015

- WEEKLY GAS FLOW READING 52 CFM @ 30.1°C

- ✓ GAS FAN BELT TENSION 4.5-5.0 lbs. BELT HAS ALITTLE CHAPPING

- GF OUT TO REINSTALL KNOCK OUT PUMP. ALL IS WELL, PUMP WORKING HAD A LITTLE LEAK PUT FIXED HAVE TO ADD FOAM INSULATION.

7/10/15

WEEKLY GAS FLOW READING 50-51 CFM @ 29.7°C

7-16-15-

GAS FLOW READING: 50CFM @ 27.7°C

COLBERT MONTHLY GP's / MAINT

7-23-15 THURS

TECH: M-TERRIS FILE NAME CP150724.XLS

WEATHER: CLEAR LOW 70S BP 29.81 S

GAS FLOW 39 CFM FAN HRS 01468 GAS TEMP 23.3°C

GAS CALIBRATION: ZEROED CH4 TO AB AIR → GAS CAL READING 14.7% CH4 CALIB TO 15.0%; CO_2 READS 14.8% CALIB. TO 15.0% CO_2; ZEROED O_2 TO CAL GAS, O_2 READING 20.7% CALIB TO AB AIR 20.9%

- MT SAMPLED ALL 21 GP LOCATIONS AND 4 EXTRACTION LOCATION PER REQUIREMENT FOR %CH_4, %CO_2, % O_2 & PRESSURE ALL READINGS ARE IN NORMAL RANGE SO NO ADJUSTMENTS WERE MADE. NOTHING OUT OF THE ORDINARY WAS OBSERVED WITH DRIVE AROUND LANDFILL.

MONTHLY GAS MAINT PERFORMED:

- FAN MAINT TENSION ON BELT IS 5 LBS (OK) 4-5 SHOTS OF GREASE IN EACH BEARING.
- NO CONDENSATE IN EFF GAS LINE
- TANK READING NE CORNER 1.25" TANK 9.25 IS (NEED TO REHOOK MEASURING STICK TO FENCE)

WEEK OF 7/27/15 ON VACATION NO WEEKLY READING

8/7/15 (FRI) 47 CFM @ 23.7°C Ø COND
MID 70S @ 1000

8/12/15 WEEKLY FLOW READ @ 1500
44 CFM @ 29.9°C HAZY/P.CLOUDY MID-90'S

8/20/15 Weekly flow 51 CFM @ 1400
29°C

8/27/15 (THURS) WEEKLY FLOW 50 CFM @ 1530
29.2°C SMOKE IN AIR

8/31/15 (MON) COLBERT GAS PROBES
TECH: M. TERRIS
FILE NAME CP150831.XLS B.P 29.96 S
GAS FLOW 47 CFM FAN HR: 2382 GASTEMP: 21.9°C

GAS CALIBRATION: ZEROED CH4 TO ~~CAL~~ AB AIR →
GASCAL READING 15.2% CALIB. TO 15.0%; (O2
READING 14.8% CALIBRATED TO 15.0%; O2 ZEROED)
TO CALGAS CALIB AB AIR 20.9%

MT SAMPLED ALL 21 GAS PROBE LOCATIONS ON SITE + 4 EXTRACTION LOCATIONS FOR %CH4, %CO2, %O2 & PRESSURE. ALL READINGS ARE IN NORMAL RANGE, SO NO ADJUSTMENTS WERE MADE. NOTHING OUT OF THE ORDINARY WAS OBSERVED OTHER THAN DG. CUTTING SAPPLINGS ON LANDFILL.

- KNOCKOUT COUNTER IS @ 2 RESET TO 0
- MT CLEANED GAS FAN OF EXCESS GREASE.
- FAN MAINT. 4 ~~STICS~~ SHOTS OF FRESH GREASE IN EACH BEARING. BELT TENSION @ 5 LBS WITH LITTLE WEAR ON BELT
- NO COND IN EFF LINE
- TANK LEVEL @ 1.50" IS @ 9.50"
- PLACED 1" FOAM IN KNOCKOUT PUMP VAULT ~~FOR~~ FOR INSULATION DURING WINTER TO KEEP FROM FREEZING.

9/10/15 - WEEKLY GAS FLOW 49 CFM @ 25.6°C
WARM OUTSIDE IN THE 80's

9/18/15 - WEEKLY GAS FLOW 47 CFM @ 21.4°C
60-70S

MONTHLY GAS MONITORING

9/23/15 (WED)
WEATHER: SLI CLOUDY 60S AM 70S PM B.P. 30.02S
TECH: BU/MT FAN HR: 02934 GAS FLOW 47 CFM
GAS TEMP 19.5°C FILE NAME CP150923.XLS
1/2 GAL OF COND. EFF LINE GAS LINE
GAS CALIBRATION: ZEROED CH4 TO AB AIR → GASCAL READING 15.2% CALIB. TO 15.0%; CO2 READING 15.1% CALIB TO 15.0%; ZEROED O2 TO CALGAS, CALIB TO 20.9% AB AIR. GEM 500 #410

MT SHOWED BU HOW TO DO GP. SAMPLED ALL 21 GAS PROBE LOCATION FOR %CH4, %CO2 %O2 & PRESSURE. ALL READING ARE IN NORMAL RANGE, SO NO ADJUSTMENTS WERE MADE. NOTHING OUT OF THE ORDINARY WAS OBSERVED

- KNOCKOUT COUNTER WAS @ Ø NO ADJUSTMENTS
- MT DID FAN MAINT 3 SHOTS OF BEARINGS OF FRESH GREASE. BELT TENSION @ 5 LBS
- 1/2 GAL OF COND IN LINE
- TANK LEVEL IS 1.50" IS 9.50"

10/2/15 - FLOW 46 CFM @ 20.1°C 1/2 GAL COND

10/8/15 - FLOW 44 CFM @ 16.9°C 1 GAL COND

10/16/15 FLOW 41 CFM @ 13.8°C
4 GAL OF COND IN EFF GAS LINE
(START: DOUBLE V

10/22/15 FLOW 42 CFM @ 14.2°C 1 GAL COND

COLBERT GAS ROUND
"10/2015"

10/28/2015 (WED)
TECH: M. TERRIS
WEATHER: P. CLOUDY 50'S LT SW WIND 5-10
BP. 29.92 FAN HR: 3781
FLOW: 47 CFM @ 15.1°C

GAS CALIBRATION: ZEROED CH4 TO AB AIR, GAS CALIBRATION; READING 15.0% (NO CAL NEEDED); CO_2 READS 15.3% (CALIB. TO 15.0% CO_2); ZEROED O_2 TO CAL GAS; CALIBRATED TO AB AIR 20.9% O_2.

MT SAMPLE THE FOLLOWING LOCATIONS:

LOCATION	CH4	CO_2	O_2	PRESS	TEMP	FLOW
13 TRENCH RISERS	X	X	X	X	X	X
21 GP. LOCATIONS	X	X	X	X		
4 EXTRACTION	X	X	X	X		

- ALL READING ARE WITHIN NORMAL RANGE, NOTHING OUT OF THE ORDINARY WAS OBSERVED NO ADJUSTMENT WERE MADE.

- 4 GALS OF CONDESATE IN EFF GAS LINE
- KNOCKOUT @ Ø
- MONTHLY GAS FAN, MAINTENCE DONE 4 SHOTS OF GREASE IN EACH BEARING BELT TENSION @ 5 LBS PER SPAN
- TANK LEVELS IN NE CORNER @ 1" TANK 9.5' IS
- HEAT TRACE IN TURNED ON

11/4/2015

- GAS FLOW 41 CFM @ 8.6°C 5 GAL OF COND.
  * TURNED HEAT TRACE ON TO GAS EXTRACTION

11/13/2015

- GAS FLOW 42 CFM @ 12.7°C 1 GAL COND.
  WARM DAY MID. TO UPPER 50S

MONTHLY GP

DATE: 11/18/15 (WED)
TECH: M. TERRIS FILE NAME: GP151118.XLS
WEATHER: P. CLOUDY 40S LT SW WIND 5-10
B.P. 29.87 FAN HR ~~45~~ 4257 FLOW Ø (NO POWER)

- DUE TO ~~SET~~ DAMAGING WIND LAST NIGHT 70-80 MPH HAVE NO POWER.

GAS CALIBRATION: ZEROED CH4 TO AB AIR; GAS CAL → READING 15.0% (NO CAL NEEDED); CO2 READING 15.6% CALIB. TO 15.0%; O2 READING 0.2% ZEROED O2; CALIB. TO AB AIR 20.9%

MT SAMPLED ALL 21 GP LOCATION AND 4 EXTRACTION LOCATIONS FOR %CH4, %CO2, %O2 & PRESSURE. ALL READING ARE IN NORMAL RANGE, NOTHING OUT OF THE ORDINARY OBSERVED, NO ADJUSTMENTS WERE MADE

- 4 GAL OF CONDSATION IN EFF GAS LINE
- KNOCKOUT @ 1 RESET TO Ø
- MONTHLY GAS FAN MAINTENANCE 4.5 lbs SPAN 4 ~~SHOOTS~~ SHOT OF GREASE EACH BEARING
- TANK LEVELS 1.25" 9.5"S
- [redacted] MT
- ~~HEAT~~ HEAT TRACE IS OFF NEED TO BE BACK ON

11/23/15 - GAS FLOW @ 37 CFM @ 8.0°C TRACE OF CONDENSATE IN EFF GAS EXHAUST

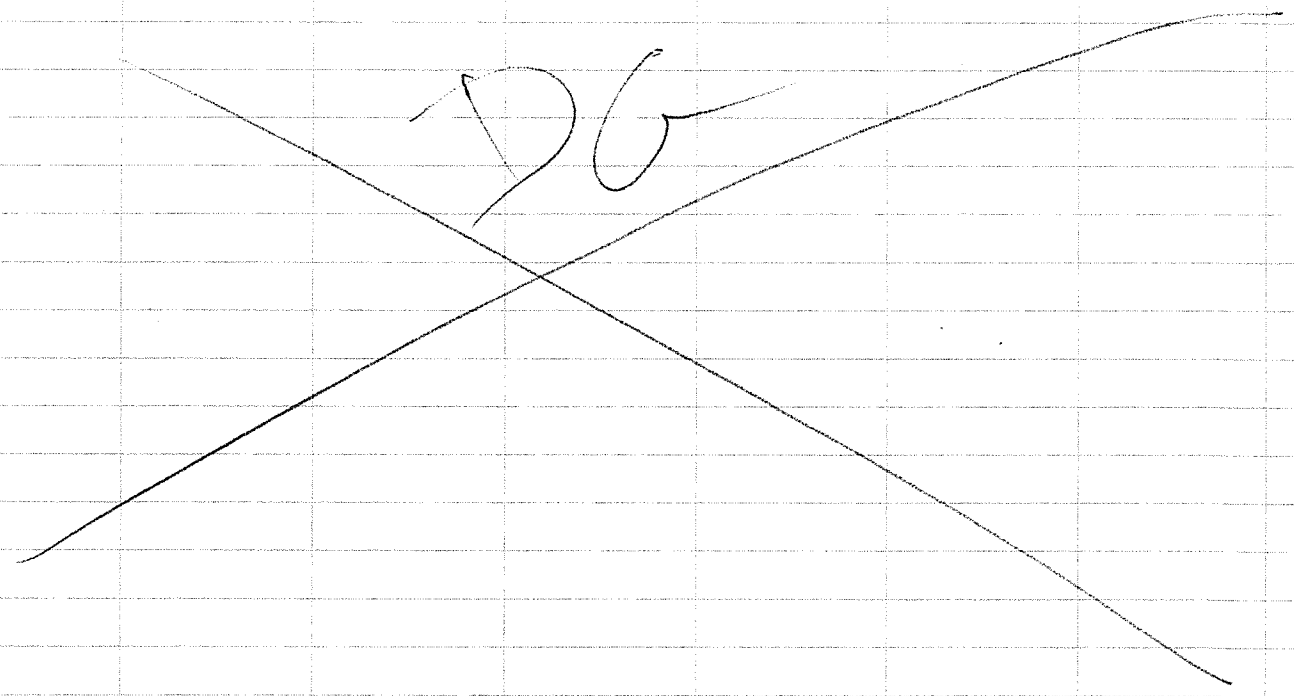
11/19/15 (THURS)

- EVOQUA WATER TECHNOLOGIES, LLC ON SITE THIS AM TO CHANGE OUT THE ~~MEDIA~~ MEDIA IN EACH OF OUR 4 CARBON UNITS.

LEFT UNITS ~~ON~~ #2 & #4 ON LINE WITH ~~VALVES~~ VALVES OPEN ON #4 AND VALVES CLOSED ON #2. CARBON UNITS #1 & #3 ARE CLEAN BUT OFF LINE.

12/4/15 (FRI)

- GAS FLOW 45CFM @ 14.9°C W/ 3 GAL COND



COLBERT MONTHLY GP/MAINT.

DATE: 12/11/2015 (FRI)
WEATHER: CLOUDY LT SHOWERS 40S BP 30.01↓
TECH: M. TERRIS FAN HR 4771 FILE: CP151211
FLOW: 46SCFM @ 15.2°C GAS TEMP
[redacted]

GAS CALIBRATION: ZEROED CH_4 TO AB AIR; GAS CAL, READING 15.2 CALIBRATED TO 15.0% CH_4;
CO_2 READING 14.9%, CALIB TO 15.0% CO_2;
ZEROED O_2 TO CALGAS, CALIB. TO 20.9% O_2

MT SAMPLE THE FOLLOWING LOCATIONS ON LANDFILL:

LOCATION	% CH_4	% CO_2	% O_2	PRESSURE
~~13 TR~~ 21 GP	X	X	X	X
4 EXTRACTION	X	X	X	X

- ALL READING ABOVE READINGS READING ARE IN NORMAL RANGE NO ADJUSTMENTS MADE LOOKED AND FOUND NOTHING OUT OF THE ORDINARY WAS OBSERVED.

THE FOLLOWING MONTHLY GAS MAINT PERFORMED
- GAS FAN 4 SHOTS OF GREESE BOTH FRONT/REAR BEARING BELT TENSION 45 lbs.
- NO CONDENSATE IN EFF LINE OF GAS LINE
- COUNTER ON KO TANK @ 1 RESET TO Ø
- TANK 1.25" @ 9.5 IS

12/17/15 WEEKLY READING FLOW 47CFM
14.7°C Ø COND

12/23/15 30S LOW
WEEKLY FLOW READING 49CFM
@ 13.6°C Ø COND

12/31/15 DK AM
GAS FLOW 49 CFM @ 12.1°C 1 GAL COND

1/8/16 GAS FLOW 51 CFM @ 11.4°C 4 GAL COND.

1/14/16 GAS FLOW 46 CFM @ 12.6°C 9 COND

DATE: 1/20/2016 (WED) TECH: M. TERRIS
WEATHER: CLOUDY TO P. CLOUDY MID 30S
FLOW 47 CFM @ 12.1°C TEMP B.P. 30.24
FAN HRS: 5738 FILE CP160120
* GAS CALIB.: ZEROED CH4 TO AB AIR; GASCAL, CH4 READING 15.0% NO CALIBRATION; CO_2 READING 15.1% CALIBRATED TO 15.0%; ZEROED O_2 TO CALGAS, O_2 READING 21.1% CALIB. TO 20.9% AB AIR.

MT SAMPLED THE FOLLOWING GAS PORT LOCATIONS:

LOCATION	%CH_4	%CO_2	%O_2	PRESSURE
21 GP	X	X	X	X
4 EXT.	X	X	X	X

- ALL READINGS ARE IN NORMAL RANGE NO ADJUSTMENTS WERE MADE LOOKED AND NOTHING OUT OF THE ORDINARY WAS OBSERVED; GROUND IS SATURATED LEFT 4-WHEELER TRACKS IN A FEW LOCATIONS MIGHT HAVE TO REGRAVEL LATER THIS SPRING

FOLLOW MONTHLY GAS MAINT.
- GAS FAN MAINT. 4 SHOTS OF GREASE BOTH FRONT/REAR BEARING; BELT TENSION @ 4.5 LBS SHOWING WEAR.
- NO CONDSATION IN EFF GAS LINE
- COUNTER ON KNOCKOUT WAS @ 1 RESET TO Ø
- TANK READINGS 1.25" @ 9.5 I/S.

1/28/16 GAS FLOW 46 CFM @ 13.1°C Ø CONE

2/5/16 GAS FLOW 49 CFM @ 13.9°C Ø CONE

2/10/16 GAS FLOW 47 CFM @ 14.1°C Ø CONE

2/16/2016 (TUES)

- CHANGED OUT THE BELT ON GAS FAN, OLD BELT VERY WORN OUT.

  TENSION ON NEW BELT IS 7 LBS
  GF TOLD ME TO RECHECK TOMORROW
  TENSION SHOULD BE AT 6 LBS OR BELOW
- MAINT ON FAN ~~CH~~ CLEANED BEARINGS / GREASED

2/17/2016 (WED)

- VD BELT TENSION @ ~~7~~ 6-7 LBS
  NORMAL IS 6.7 ~~SEW~~ SO WE ARE OK
  FOR NEW BELT.

COLGAS

2/17/2016 (WED)
TECH: M. TERRIS
WEATHER: CLOUDY MID 40S LT WIND
B.P 29.50↓ FILE: CP160217 GAS FLOW 51 CFM
GAS TEMP 14.1°C FAN HR 6405

GAS CALIBRATION: ZEROED CH4 TO AB AIR; GASCAL READING 14.7 CALIB TO 150%, CO2 READING 14.9 CALIB TO 15.0% ZEROED O2 TO CALGAS; O2 READING 20.5% CAL. TO AB AIR 20.9%

MT SAMPLED THE FOLLOWING GAS LOCATIONS:

LOCATION	%CH4	%CO2	%O2	PRESSURE
21 GP	X	X	X	X
4 EXTRACTION	X	X	X	X

- ALL READINGS TAKEN ABOVE ARE IN THE NORMAL RANGE, SO NO ADJUSTMENTS WERE MADE TO GAS SYSTEM. NOTHING OUT OF THE ORDINARY WAS OBSERVED.

MONTHLY MAINT.

- GAS FAN MAINT (3/16) CHANGED BELT
- NO CONDENSATION IN EFF LINE.
- KNOCKOUT COUNTER @ Ø
- TANK 1.50" @ 9.5 IS SPACE

2/23/16 (TUES)
- FLOW 49 CFM @ 14.8°C Ø CLEAR MID 40S 1544

3/4/16 (FRI)
- FLOW ~~44~~ 51 CFM @ 14.9°C Ø COND.

COLBERT GAS PROBES

3/7/2016 (MON) B.P. 27.58
WEATHER: CLOUDY LT SW WIND 40's
TECH: M. TERRIS FILE NAME CP160307.~~XLS~~
GAS FLOW 51 CFM @ 16.9°C TEMP FAN HR 6865

GAS CALIBRATION: ZEROED CH_4 TO AB AIR; GAS CAL. READING 14.9% CALIB. TO 15.0% CH_4; CO_2 READS 14.5%, CALIB. TO 15.0% ZEROED O_2 TO CAL GAS; CALIB TO AB AIR 20.9% O_2

MT SAMPLE @ THE FOLLOWING LOCATIONS

LOCATIONS	%CH_4	%CO_2	%O_2	PRESSURE
21 GP	X	X	X	X
4 EXTRACTION	X	X	X	X

- ALL READINGS TAKEN ABOVE ARE WITHIN NORMAL RANGE, NO ADJUSTMENT WERE MADE TO GAS SYSTEM NOTHING OUT OF THE ORDINARY WAS OBSERVED.

MONTHLY GAS MAINT.
GAS FAN MAINT: GREASED BEARINGS ✓ TENSION ON BELT @ 5.5 lbs
KNOCK OUT VESSEL Ø
NO CONDENSATION IN EFF GAS LINE.
CONDENSATION TANK @ 1.5" IS @ 9.5"
POLLED ALL SAPLINGS OFF LANDFILL
COLLECTED ALL & TRASH OFF LANDFILL

3/18/16 (FRIDAY)

GAS FLOW 51 CFM @ 16.1°C Ø COND

3/24/16 (THURS)

GAS FLOW 50 CFM @ 16.3°C Ø COND

4/1/16 (FRIDAY)

- WEEKLY GAS FLOW 52 CFM 16.5°C Ø

4-~~8~~7-16 (THURS)

- WEEKLY GAS FLOW 51 CFM @ 16.1°C Ø

4-15-16 (FRI)

- WEEKLY GAS FLOW 51 CFM @ 16.7°C Ø

COLBERT ANNUAL GAS
"4/2016"

DATE: 4/18/2016 (MON)

WEATHER: CLEAR WARM MID-70S B.P 30.06 S

TECH: M. TERRIS FILE NAME: ~~CR~~ CA160418.XLS

GAS FLOW 51 CFM TEMP 17.1°C FAN HTR 785

THE FOLLOWING LOCATION WERE SAMPLED FOR OUR ANNUAL GAS ROUND @ COLBERT

LOCATION	%CH4	%CO2	%O2	TEMP	PRESSURE	FLOW
TRENCH RISER	X	X	X	X	X	X
MANIFOLD STATION	X	X	X		X	
MANIFOLD VALVE	X	X	X		X	
TS	X	X	X		X	
GAS PROBES	X	X	X		X	
EXTRACTION	X	X	X		X	X

- ALL READINGS TAKEN ABOVE ARE WITHIN NORMAL RANGE. NO ADJUSTMENTS WERE MADE TO GAS SYSTEM. NOTHING OUT OF THE ORDINARY OBSERVED

MONTHLY MAINT:

- KNOCKOUT VESSEL @ Ø
- Ø COND IN EFF LINE
- COND TANK STILL @ 1.5" IS @ 9.5"
- GREASED FAN 4 STROKES BELT@

4/19/2016 (TUES) WEATHER: CLEAR/WARM 80S

SAMPLED AIR TOXICS TODAY:

LOCATION	TIME	TO-15
CGE-003-160419	1330	X
CGD-001-160419	1400	X

* SHIPPED TODAY UPS 2 DAY OVERNIGHT

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Collected by: (Print and Sign) MIKE S. TERRIS
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Address: 22515 N ELK-CHATTAROY City: COLBERT State: WA Zip: 99005 MET
Phone: 509-238-6607 Fax: 509-238-6913

Project Info:
P.O. #: MT404C
Project #: COLBERT
Project Name:

Turn Around Time:
☒ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psig)
	CGE-003-160419	351166	4/19/16	1330	TO-15				
	CGD-001-160419	94611	4/19/16	1400	TO-15				

Relinquished by: (signature) Date/Time: 4/19/16 1500
Received by: (signature) Date/Time
Notes:
Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time
Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time

Lab Use Only: Shipper Name | Air Bill # | Temp (°C) | Condition | Custody Seals Intact? Yes No None | Work Order #

Form 1293 rev.11

- CHANGED OUT CARBON UNIT AFTER SAMPLING TO-15
UNIT 4 SPENT VALVES CLOSED BUT STILL ON LINE VALVES FOR UNIT 2 OPEN.

-

4/19/2016
WEATHER: CLEAR WARM
MID-80S
TECH: MT

CARBON TUB INFORMATION

DATE:	4/19/16
FAN HOURS:	7880
FAN FLOW:	53 CFM
GAS TEMP:	19.7°C
INLET TUBE READ:	—

DIRECTIONS
- CURRENTLY ACTIVE
- SPENT
- WAS ACTIVE, NOW SPENT AND TAKEN OFFLINE
- NEWLY ACTIVE
- CLEAN

	TUB 1	TUB 2	TUB 3	TUB 4
TATUS BEFORE CHANGES:	○	○	○	●
TUBE READINGS: PRESSURE:				

	TUB 1	TUB 2	TUB 3	TUB 4
STATUS AFTER CHANGES:	○	↷	○	● ↷
TUBE READINGS: PRESSURE:	OFF LINE CLEAN	VALVES OPEN	OFF LINE (CLEAN)	ON LINE VALVES CLOSED

COMMENTS: TUB 4 SPENT LEFT ON LINE CLOSED VALVES; OPEN VALVES ON TUB #2

4-29-16 (FRI)

GAS FLOW 54 CFM @ 17.1°C Ø COND

7.0 References

Landau Associates. 1992. Phase II Remedial Design Remedial Action Colbert Landfill Spokane, Washington *Final Groundwater Monitoring Plan.* August 7.

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Landau Associates. 1991. Colbert Landfill Remedial Design Remedial Action Spokane County, Washington *Final Phase I Engineering Report.* December 30.

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*

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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.