GREENACRES LANDFILL ANNUAL PROGRESS REPORT
NOVEMBER 2018

SPOKANE COUNTY

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1. INTRODUCTION

1.1 GREENACRES LANDFILL INFORMATION SUMMARY

SITE:	Greenacres Landfill Section 16, T 25N, R 45E in Spokane County, WA
REPORTING PERIOD:	December 1, 2017 through November 30, 2018.
REGULATORY AUTHORITY:	Washington State Department of Ecology, EPA Scope of work as stated in Consent Decree No. DE98TC-E105.
TECHNOLOGY:	Construction of landfill cover with negative pressure gas collection system to propane-assisted flare station.
CRITERIA:	Criteria were established as stated in the Consent Decree. See Table 1-1.
SAMPLING PROGRAMS:	Annual and semi-annual groundwater sampling program performed in accordance with the Greenacres Landfill SAP and the Final Cleanup Action Plan (CAP). Due to a variance between Spokane County and Ecology, the sampling schedule was switched from quarterly to semi-annual. Semi-annual sampling was performed in May 2018. Annual sampling was performed in November 2018. See Figure 1-1 for well locations, Table 1-2 for well summary, and Table 1-3 for sampling schedule.

Table 1-1 Greenacres Landfill Groundwater Clean-up Criteria

ANALYTE	ANALYTE ABBREVIATION	CLEAN-UP CRITERIA	UNITS
Volatile Organic Compounds			
1,2 Dichloroethane	1,2-DCA	5	ug/L
1,2-Dichloroethene (total)	1,2-DCE (total)	50	ug/L
Tetrachloroethene	PCE	5	ug/L
Trichloroethene	TCE	5	ug/L
Vinyl Chloride	VC	1	ug/L
Semi-Volatile Organics			
Bis(2-ethylhexyl)phthalate	BEHP	4	ug/L
Pentachlorophenol	PCP	1	ug/L
Metals			
Antimony	Sb	0.005	mg/L
Arsenic	As	0.005	mg/L
Lead	Pb	0.05	mg/L
Manganese	Mn	0.05	mg/L
Chromium	Cr	0.08	mg/L

Figure 1-1 Greenacres Landfill Site

Table 1-2 Greenacres Landfill Groundwater Monitoring Well Information Summary

Monitoring Well Number	Well Diameter (inches)	Well Head Elevation: Top PVC (ft MSL)	Total Boring Depth (ft)	Screened Interval Depth (ft)
Alluvial Aquifer				
SVA1	2	2054.47	127	114-124
WCC11A	2	2054.7	161	112-117
WCC11B	2	2055	161	129-139
WCC12	2	2093.2	106	90-100
WCC2	2	2059.3	123	113-123
WCC4A	2	2068.3	138	125-135
WCC6A	2	2093.9	99	85-95
Bedrock Aquifer				
MW2	4	2091.8	120	110-115
MW3 **(DECOMISSIONED)**	4	2305.64	57	49-54
MW4	2	2250.62	42	30-40
WCC1	2	2054.5	124	114-124
WCC10	2	2352.8	43	33-43
WCC13	2	2097.6	107	51-61
WCC14	2	2131.8	109	99-109
WCC3 **(DECOMISSIONED)**	2	2058.46	135	125-135
WCC5	2	2065.5	165	155-165
WCC6B	2	2093	136	126-136
WCC7	2	2105.4	86	76-86
WCC8	2	2162.5	111	100-110
WCC9	2	2204.8	45	35-45

Table 1-3 Greenacres Landfill Sampling Schedule

WELL NUMBER	FIELD PARAMETERS	VOC'S	PCP	BEHP	Metals I	Metals II	STATIC WATER LEVEL
SVA1	Semi-annually	Semi-annually	Annually	Annually	Semi-annually	Annually	Semi-annually
WCC-2	Semi-annually	Semi-annually	Annually	Annually	Semi-annually	Annually	Semi-annually
WCC-4A	Semi-annually	Semi-annually	Annually	Annually	Semi-annually	Annually	Semi-annually
WCC-11B	Semi-annually	Semi-annually	Annually	Semi-annually	Semi-annually	Annually	Semi-annually
WCC-12	Semi-annually	Semi-annually	Annually	Annually	Semi-annually	Annually	Semi-annually
WCC-1	Semi-annually	Semi-annually	Annually	Semi-annually	Semi-annually	Annually	Semi-annually
WCC-7	Semi-annually	Semi-annually	Semi-annually	Semi-annually	Semi-annually	Annually	Semi-annually
WCC-8	Semi-annually	Semi-annually	Semi-annually	Annually	Semi-annually	Annually	Semi-annually
WCC-9	Semi-annually	Semi-annually	Annually	Semi-annually	Semi-annually	Annually	Semi-annually
WCC-10	Annually	Annually	Annually	Annually	Annually	Annually	Semi-annually

Note: VOC's are PCE, 1,2-DCA, 1,2-DCE, TCE, and Vinyl Chloride

Metals I are arsenic and manganese

Metals II are antimony, chromium, and lead

Static water levels will be taken quarterly at all groundwater-monitoring wells on-site, where possible.

2. GROUNDWATER

2.1 FIELD DATA

Groundwater elevation measurements for this annual reporting period are presented in Table 2-1. Field parameters are shown in Table 2-2. Field sheets for the November 2018 sample event are presented in the Appendix. In general, groundwater levels were highest during May for both the alluvial and bedrock wells. The highest turbidity values were seen in wells WCC-10R and WCC-12. Highest conductivities found were present in WCC-12 and WCC-7.

2.2 CRITERIA EXCEEDANCES

All sample results exceeding the clean-up criteria are presented in Table 2-3. Concentrations exceeding clean-up criteria were found only in alluvial aquifer wells.

2.3 CHEMICAL DATA

Table 2-4 presents volatile organic analyses results for the annual reporting period. Semi-volatile organic results are shown in Table 2-5, and metals analyses results are present in Table 2-6. Figures 2-1 through 2-5 present time series plots for alluvial aquifer well analyte concentrations. Time series plots for bedrock well analyte concentrations are shown in Figures 2-6 through 2-11.
VOC's: The alluvial aquifer wells had detectable concentrations of all analyzed VOC constituents during the May sampling event, and detectable concentrations for almost all of the analyzed VOC constituents during the November sampling event, excluding acetone and Trichlorofluoromethane. Alluvial aquifer well WCC-11B was the only well with PCE concentrations remaining above the criteria. Low concentrations of PCE were detected in the bedrock aquifer well WCC-7, and the Alluvial aquifer well WCC4A. Low concentrations of cis-1, 2-Dichloroethene were detected in Alluvial wells WCC11B, WCC12 and WCC4A. Vinyl chloride concentrations in WCC-12 exceeded criteria, and a low detection was found at WCC-4A. There were detections for TCE found in Alluvial wells WCC11B and WCC4A, but the concentrations continue to remain under the criteria.
SVOC's: There were no concentrations found above detection limits for BEHP this reporting year, however, the concentrations found in WCC2 increased from non-detection in 2017 to 3.92 ug/L in the November sampling event. Low concentrations of 1,4-Dichlorobenzene were detected in the Alluvial aquifer well WCC12 during the May sampling event.
Metals: Alluvial aquifer well WCC-12 exhibited detectable concentrations of arsenic and Manganese over the cleanup criteria for both sampling events. Alluvial aquifer monitoring wells WCC-2 and WCC-4A had detectable concentrations of manganese during this reporting year, with WCC-2 concentrations exceeding criteria. Lead, antimony, and chromium were not found in any of the monitoring wells sampled during the November sampling event.

2.4 SUMMARY

In general, the alluvial unit monitoring wells had higher concentrations and more detections of most analytes than the bedrock unit wells. The highest concentrations of analytes tend to be near the northern edge of the landfill.

Table 2-1 Greenacres Landfill Groundwater Elevations (ft above MSL)

StationID	Unit	5-2018	11-2018
SVA1	Alluvial Aquifer	1965.57	1957.16
WCC11A	Alluvial Aquifer	1965.75	1957.26
WCC11B	Alluvial Aquifer	1965.82	1957.83
WCC12	Alluvial Aquifer	1996.49	1996.32
WCC2	Alluvial Aquifer	1966.36	1957.98
WCC4A	Alluvial Aquifer	1964.11	1964.48
WCC6A	Alluvial Aquifer	2000.80	2003.92
MW2	Bedrock Aquifer	2053.05	2051.30
WCC1	Bedrock Aquifer	1960.70	1961.35
WCC13	Bedrock Aquifer	2064.90	2336.79
WCC6B	Bedrock Aquifer	2031.60	2058.02
WCC7	Bedrock Aquifer	2034.59	2030.95
WCC8	Bedrock Aquifer	2111.59	2034.55
WCC9	Bedrock Aquifer	2184.83	2101.60
WCC9	Bedrock Aquifer	2184.83	2172.14

Table 2-2 Greenacres Landfill Annual Monitoring Well Field Parameters

StationID	Unit	SampleDate	FieldTemp	FieldPH	FieldConductivity	FieldTurbidity
SVA1	Alluvial Aquifer	5/2/2018	11	8	251	0.19
SVA1	Alluvial Aquifer	11/1/2018	11.3	7.88	266	0.17
WCC1	Bedrock Aquifer	5/2/2018	11.4	7.78	492	0.29
WCC1	Bedrock Aquifer	11/1/2018	12.7	7.67	489	0.8
WCC10R	Bedrock Aquifer	11/1/2018	11.3	7.86	187	14.3
WCC11B	Alluvial Aquifer	5/2/2018	12	7.48	690	0.16
WCC11B	Alluvial Aquifer	11/1/2018	11.3	7.45	741	0.57
WCC12	Alluvial Aquifer	5/2/2018	14.4	6.64	869	1.5
WCC12	Alluvial Aquifer	11/1/2018	14.1	6.59	998	1.11
WCC2	Alluvial Aquifer	5/2/2018	8.8	7.36	474	0.28
WCC2	Alluvial Aquifer	11/1/2018	10.6	7.25	466	0.32
WCC4A	Alluvial Aquifer	5/2/2018	10.8	6.88	738	0.38
WCC4A	Alluvial Aquifer	11/1/2018	10.9	6.88	740	0.4
WCC7	Bedrock Aquifer	5/2/2018	11.6	7.3	849	0.19
WCC7	Bedrock Aquifer	11/1/2018	12.4	7.3	845	0.18
WCC8	Bedrock Aquifer	5/2/2018	11.6	6.85	131	0.69
WCC8	Bedrock Aquifer	11/1/2018	11.5	6.53	132	0.33
WCC9	Bedrock Aquifer	5/2/2018	10.8	6.18	81	0.29
WCC9	Bedrock Aquifer	11/1/2018	11.2	6.16	100	0.29

Table 2-3 Clean-up Criteria Exceeded

StationID	Unit	SampleDate	Analyte Name	Concentration	Clean-up Criteria	AnalyteCat
WCC11B	Alluvial Aquifer	5/2/2018	PCE	9.17	5	V
WCC11B	Alluvial Aquifer	5/2/2018	PCE	9.42	5	V
WCC11B	Alluvial Aquifer	11/1/2018	PCE	9.58	5	V
WCC11B	Alluvial Aquifer	11/1/2018	PCE	9.08	5	V
WCC12	Alluvial Aquifer	5/2/2018	Mn	1.52	0.05	I
WCC12	Alluvial Aquifer	5/2/2018	As	0.0484	0.005	I
WCC12	Alluvial Aquifer	5/2/2018	VC	4.23	1	V
WCC12	Alluvial Aquifer	11/1/2018	Mn	1.82	0.05	I
WCC12	Alluvial Aquifer	11/1/2018	As	0.0423	0.005	I
WCC12	Alluvial Aquifer	11/1/2018	VC	3.76	1	V
WCC2	Alluvial Aquifer	5/2/2018	Mn	0.265	0.05	I
WCC2	Alluvial Aquifer	11/1/2018	Mn	0.125	0.05	I

Table 2-4 Greenacres Landfill Annual Volatile Organic Results (ug/L)

StationID	Unit	SampleDate	1,2-DCA	Acetone	CFC 12	CFC-11	cis-1,2-DCE	PCE	TCE	VC
WCC11B	Alluvial Aquifer	5/2/2018			1.78	0.54	0.54	**9.42**	1.10	
WCC11B	Alluvial Aquifer	11/1/2018			1.19		0.60	**9.58**	1.07	
WCC12	Alluvial Aquifer	5/2/2018	0.70	4.90			6.53			**4.23**
WCC12	Alluvial Aquifer	11/1/2018	1.35				4.03			**3.76**
WCC4A	Alluvial Aquifer	5/2/2018			0.73		3.55	1.64	0.51	0.87
WCC4A	Alluvial Aquifer	11/1/2018			0.53		3.59	1.56		0.74
WCC7	Bedrock Aquifer	5/2/2018						1.26		
WCC7	Bedrock Aquifer	11/1/2018						1.60		

*Criteria exceedances are in **RED**

Table 2-5 Greenacres Landfill Annual Semi-Volatile Organic Results (ug/L)

StationID	Unit	SampleDate	1,4-Dichlorobenzene	BEHP
WCC12	Alluvial Aquifer	5/2/2018	0.77	
WCC2	Alluvial Aquifer	11/1/2018		3.92

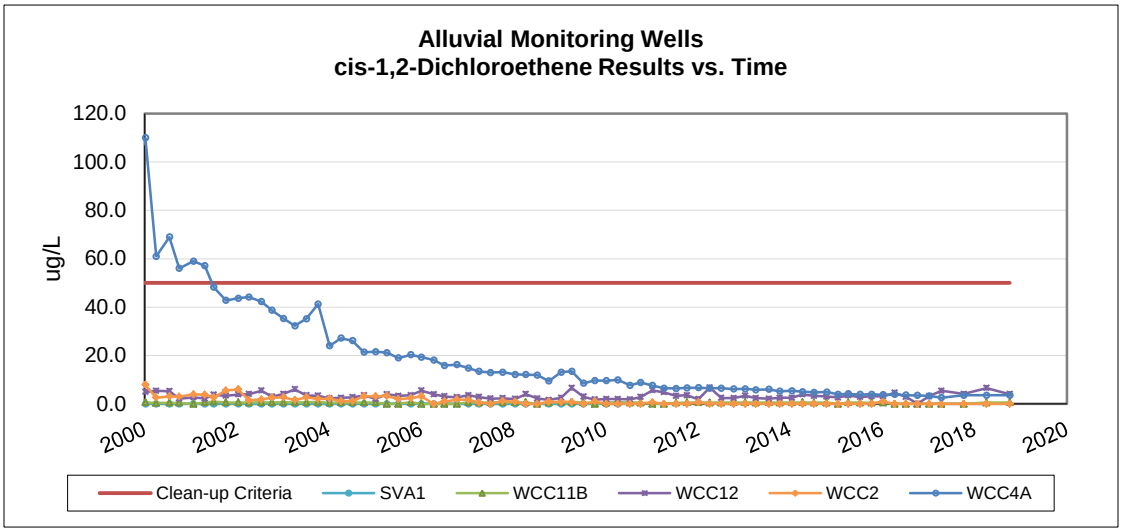
*Criteria exceedances are in **RED**

Table 2-6 Greenacres Landfill Annual Metals Results (mg/L)

StationID	Unit	SampleDate	As	Mn
WCC12	Alluvial Aquifer	5/2/2018	**0.0484**	**1.52**
WCC2	Alluvial Aquifer	5/2/2018		**0.265**
WCC4A	Alluvial Aquifer	5/2/2018		0.0232
WCC12	Alluvial Aquifer	11/1/2018	**0.0423**	**1.82**
WCC2	Alluvial Aquifer	11/1/2018		**0.125**
WCC4A	Alluvial Aquifer	11/1/2018		0.0273

*Criteria exceedances are in **RED**

Figure 2-1 Alluvial Monitoring Wells VOC Concentrations vs. Time



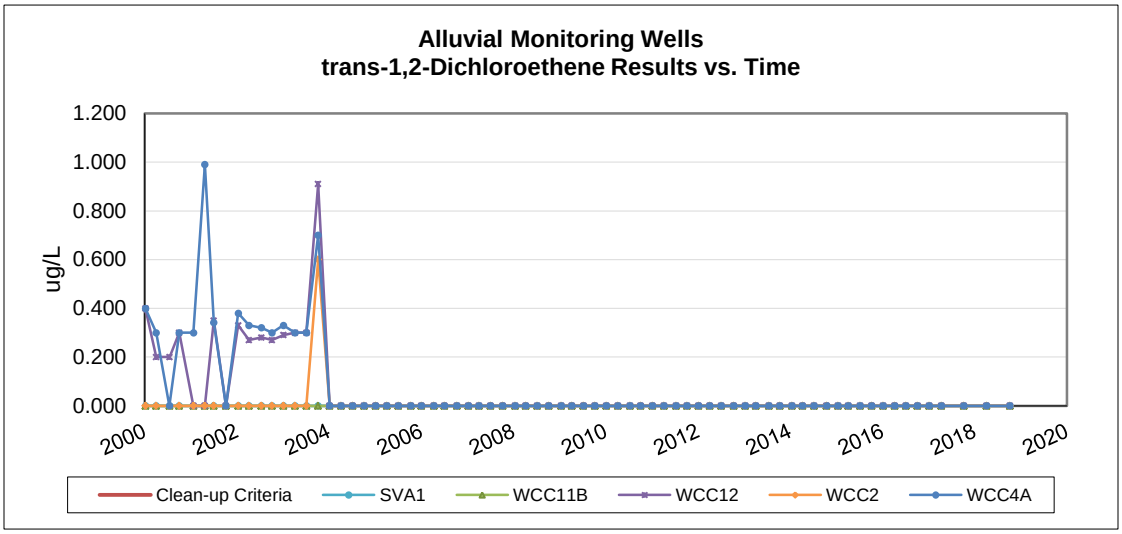
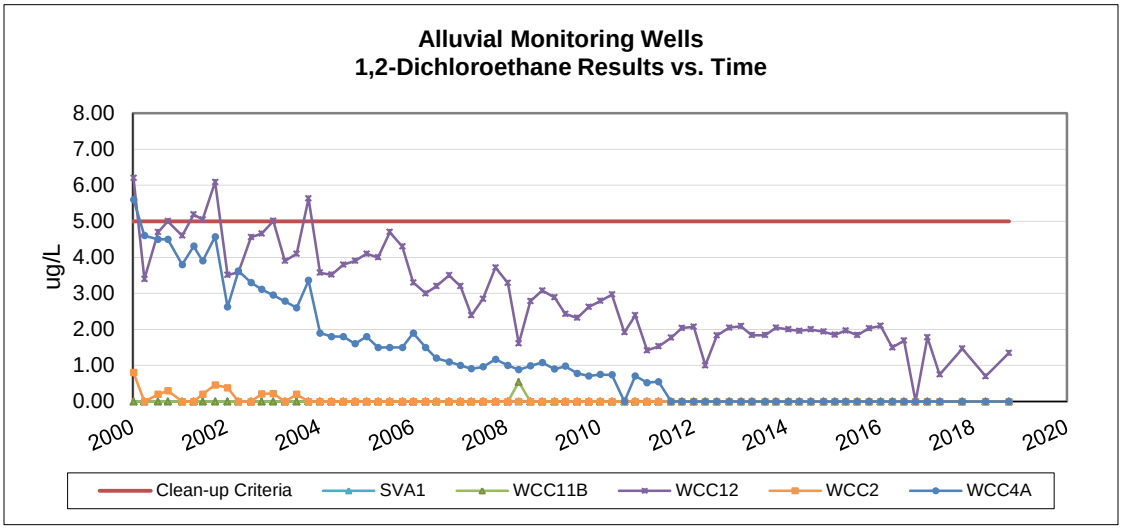
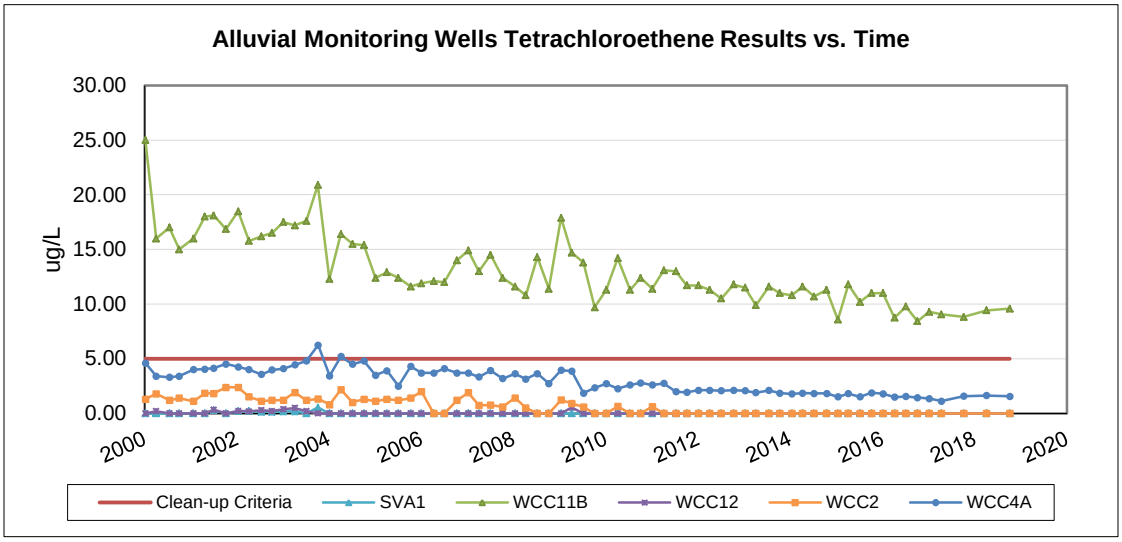


Figure 2-2 Alluvial Monitoring Wells VOC Concentrations vs. Time





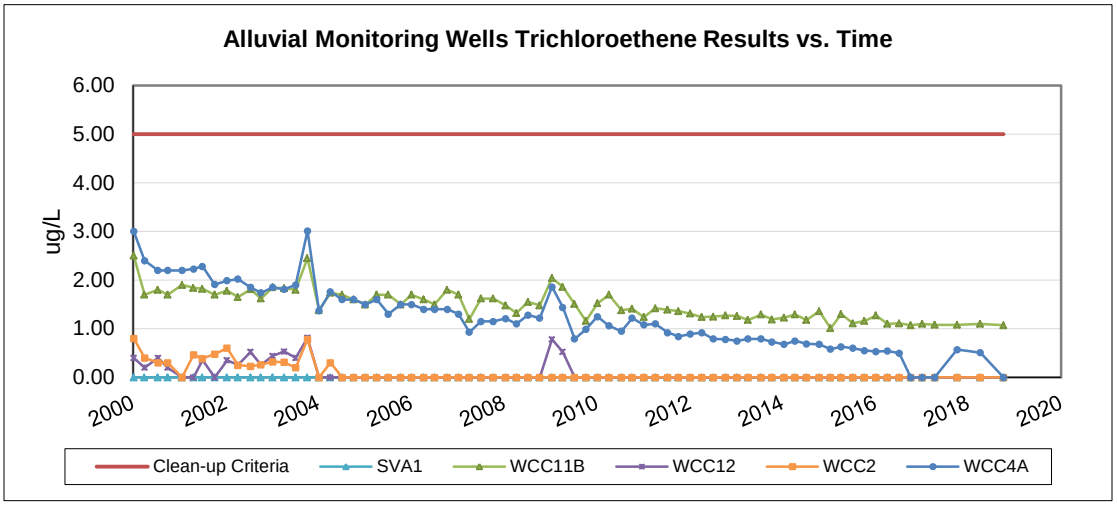


Figure 2-3 Alluvial Monitoring Wells VOC Concentrations vs. Time

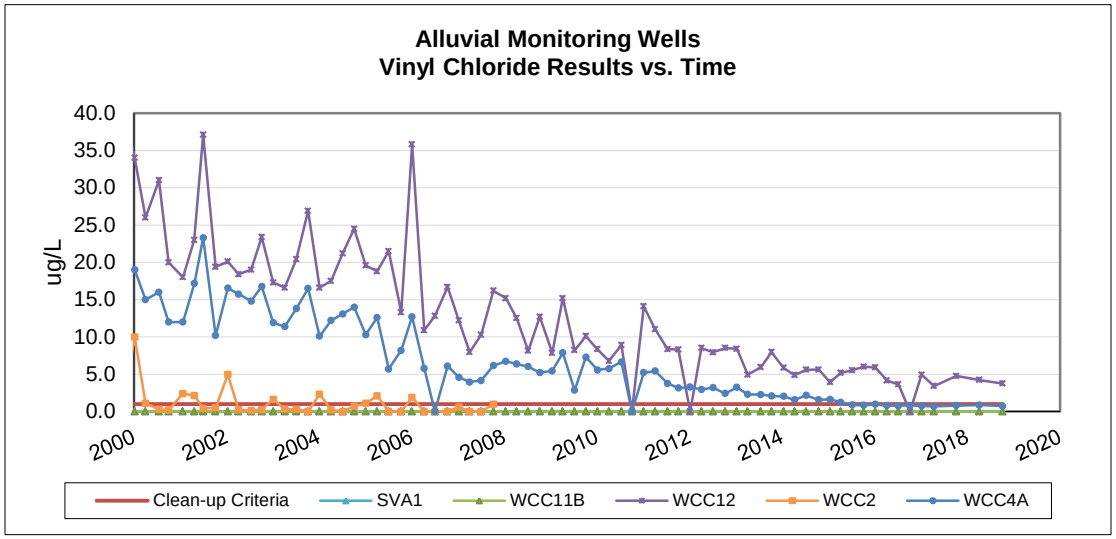
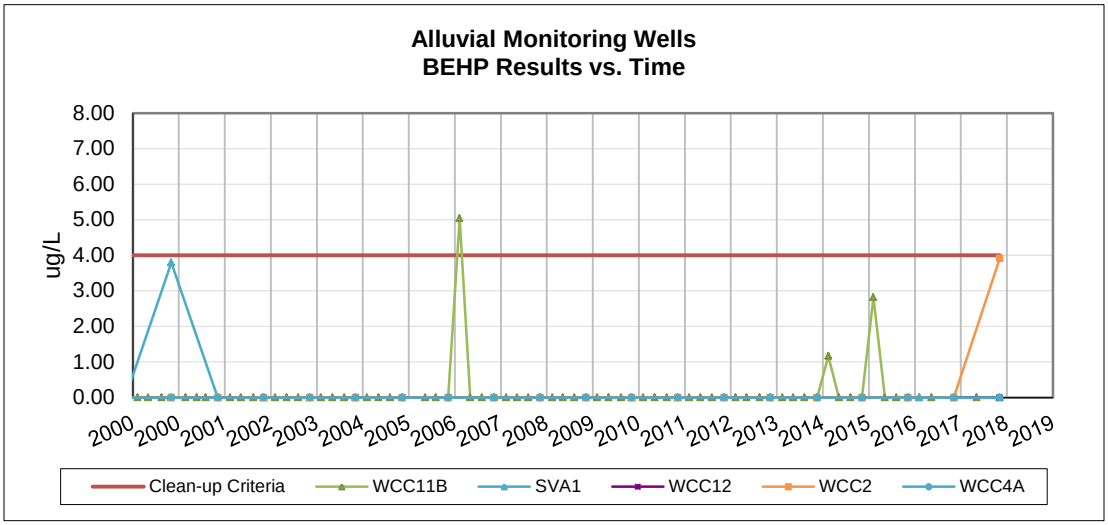


Figure 2-4 Alluvial Monitoring Wells Semi-VOC Concentrations vs. Time



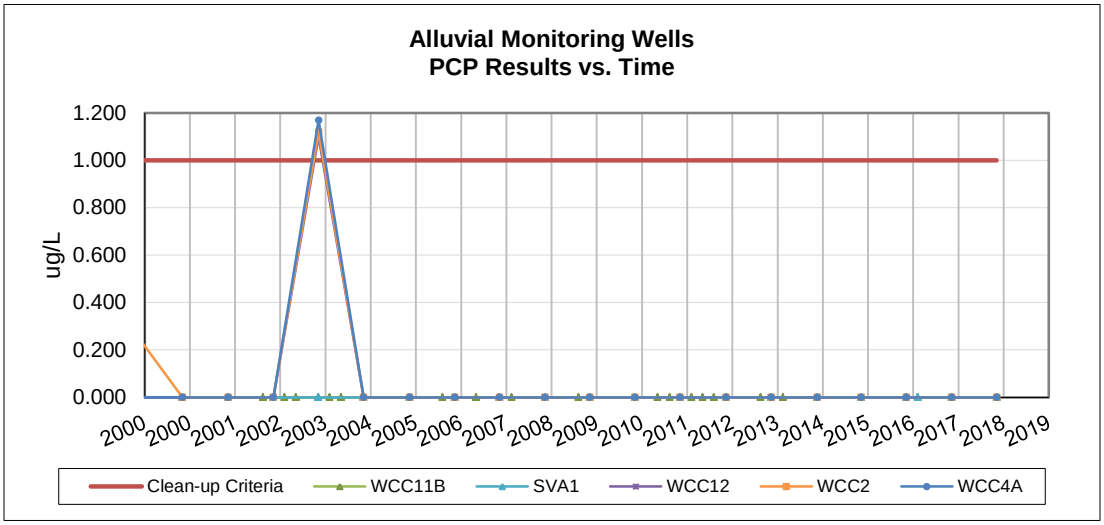
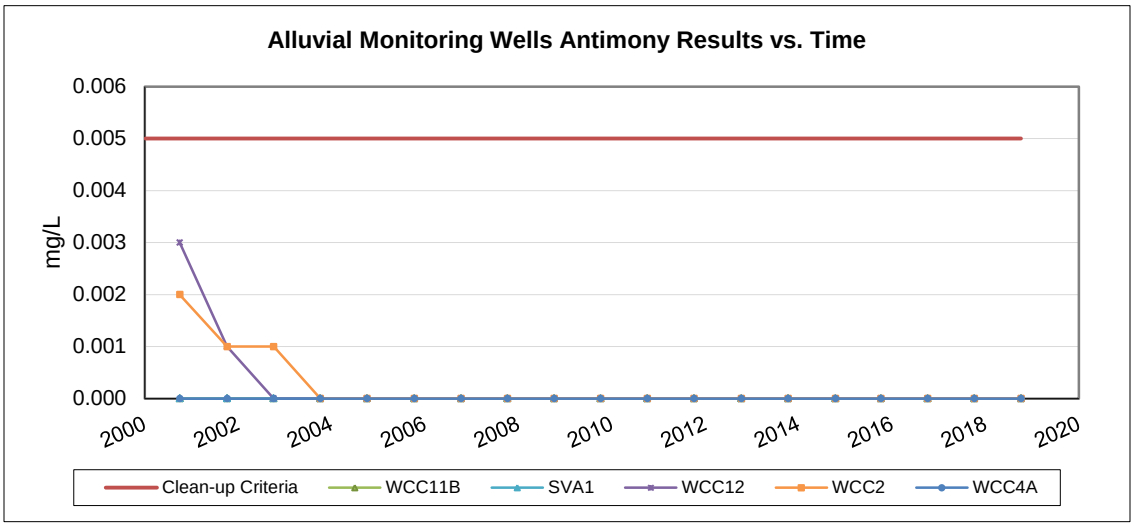
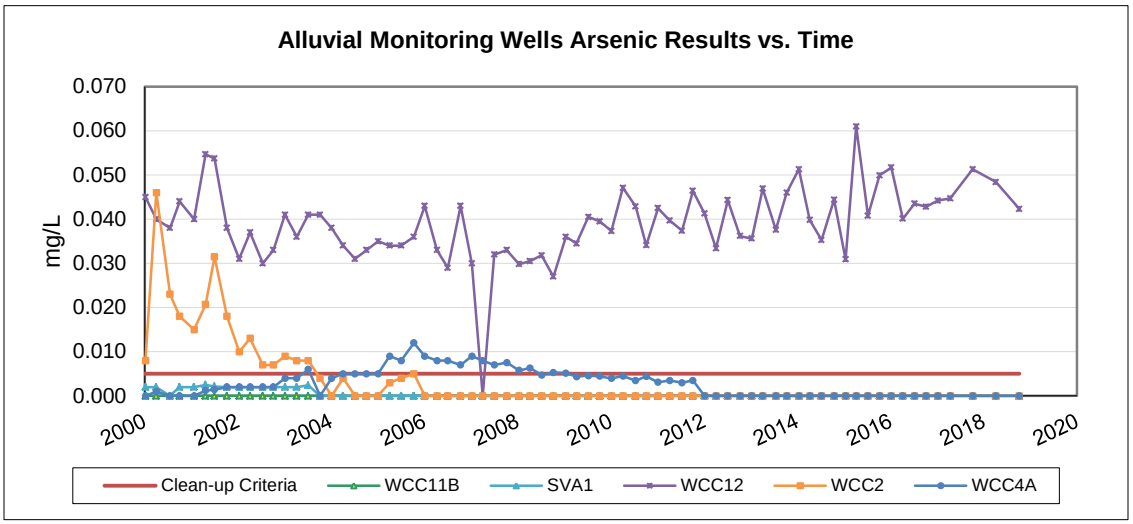


Figure 2-5 Alluvial Monitoring Wells Metals Concentrations vs. Time





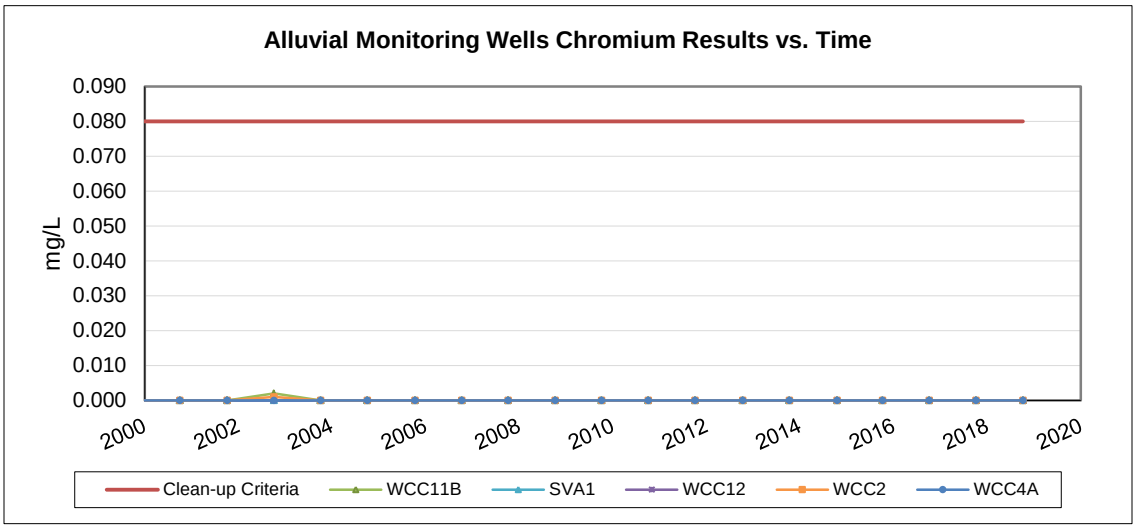
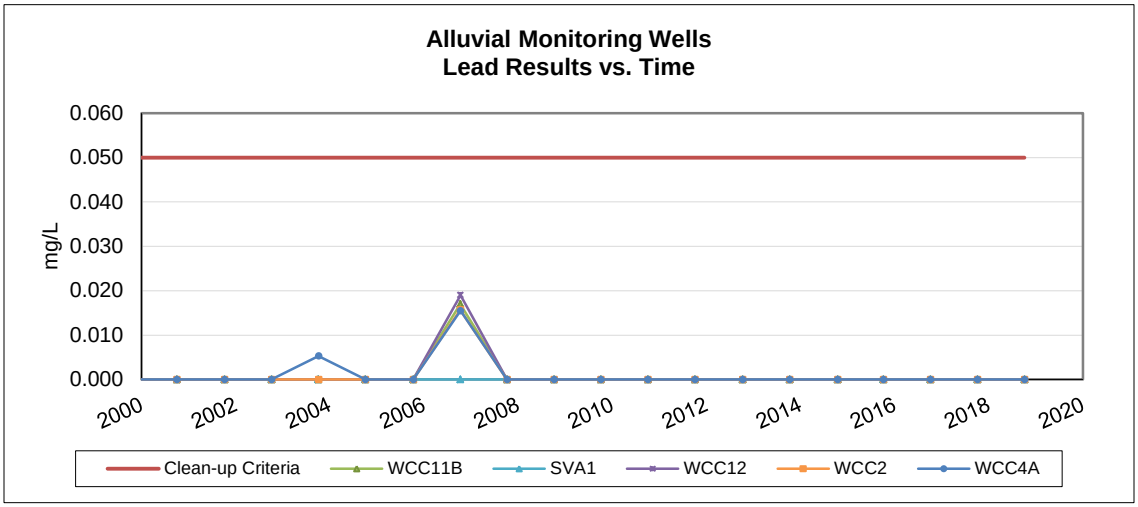


Figure 2-6 Alluvial Monitoring Wells Metals Concentrations vs. Time



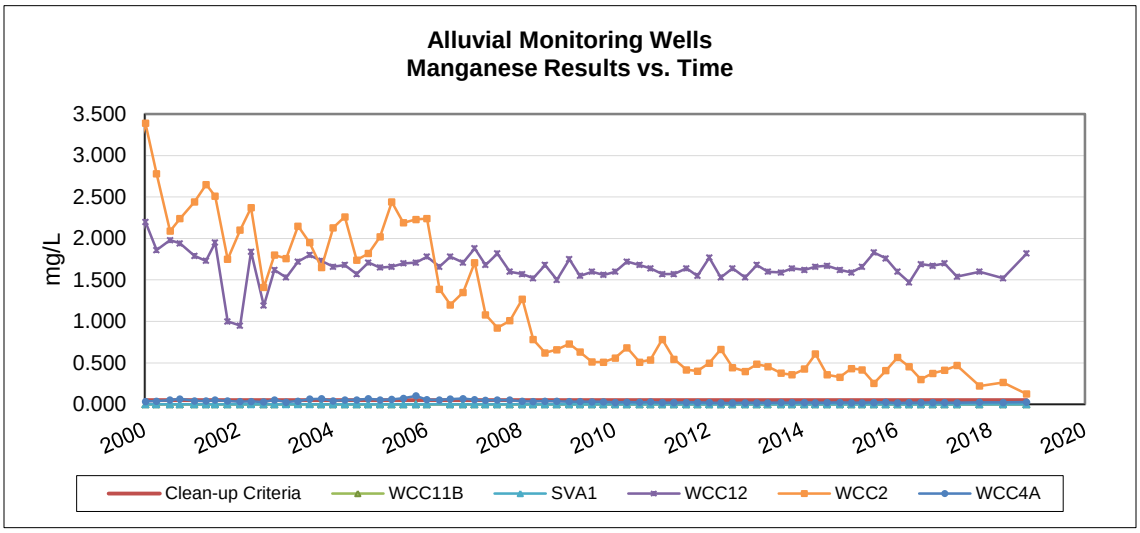
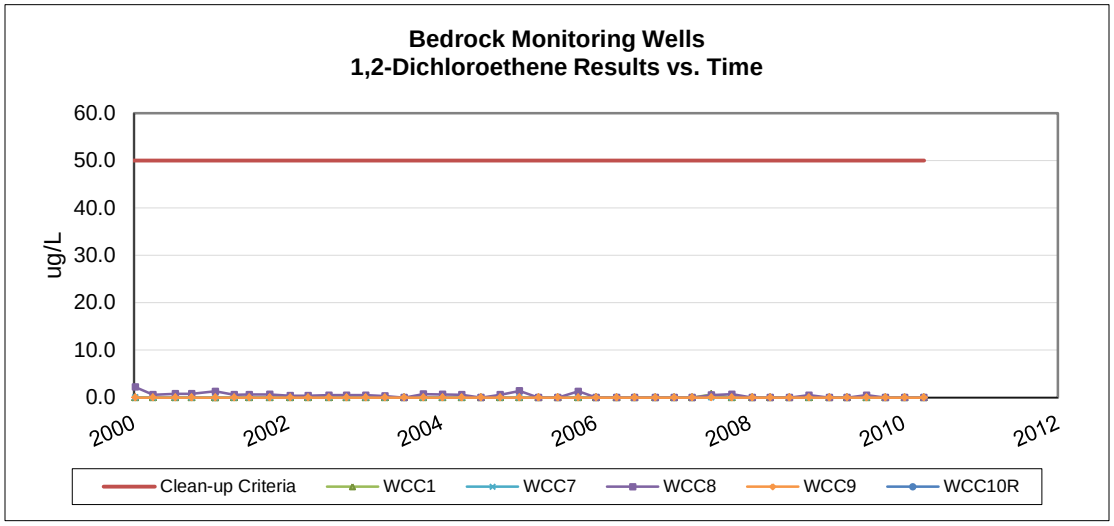
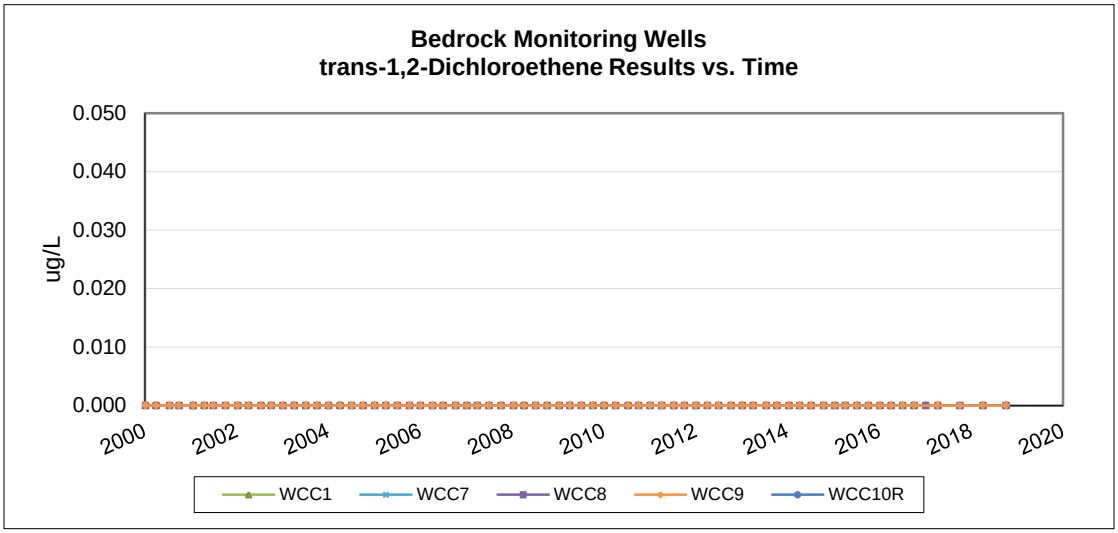


Figure 2-7 Bedrock Monitoring Wells VOC's Concentrations vs. Time





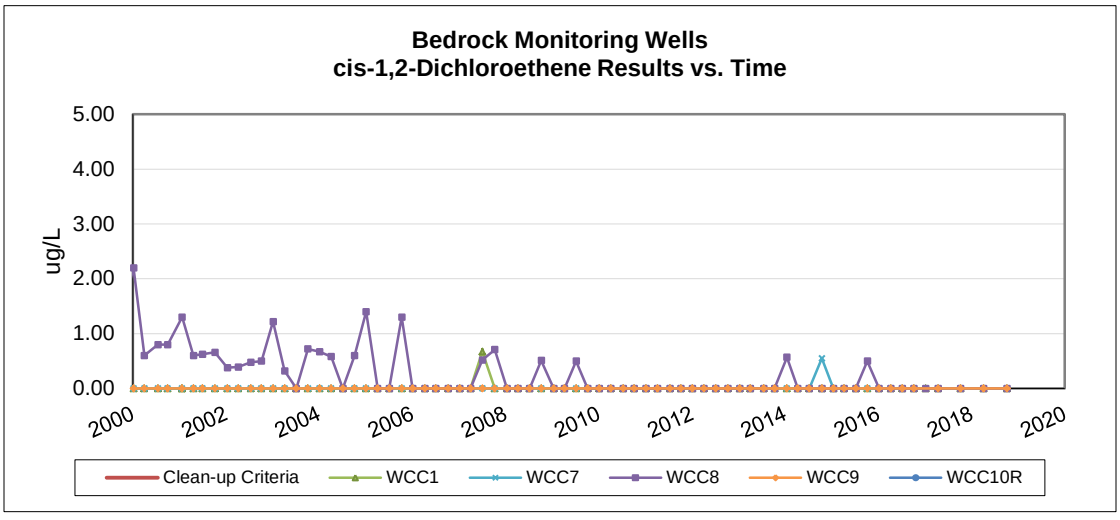
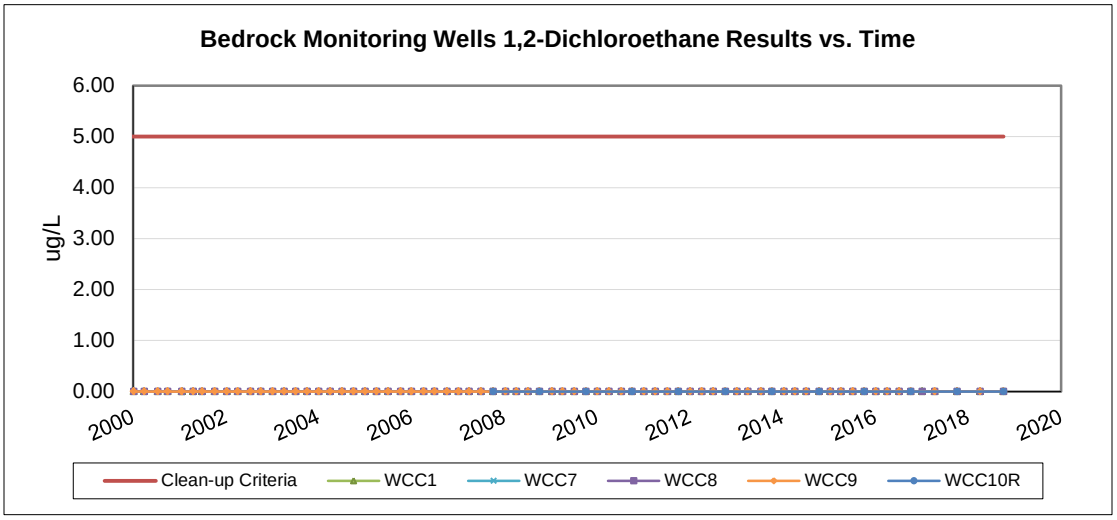
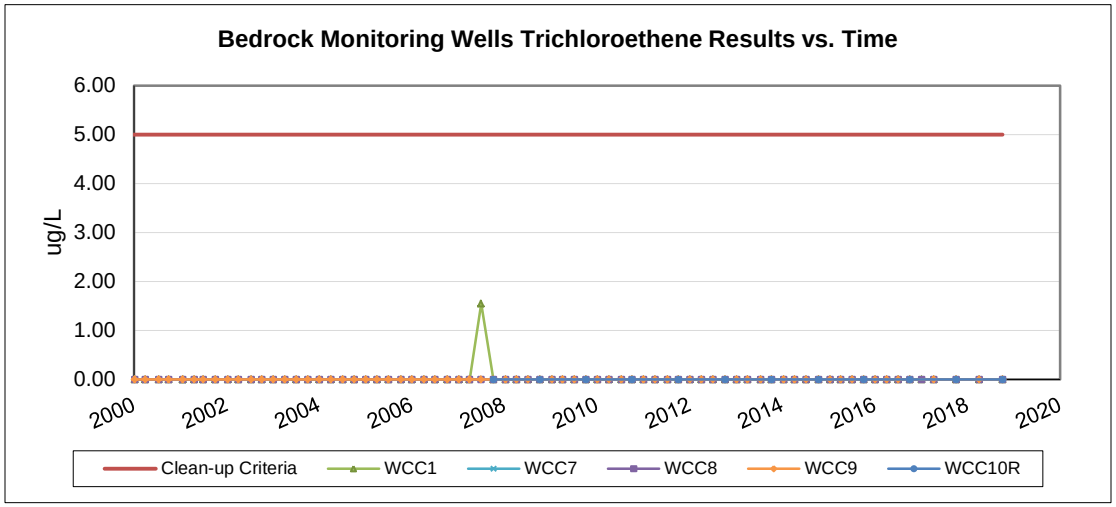


Figure 2-8 Bedrock Monitoring Wells VOC's Concentrations vs. Time





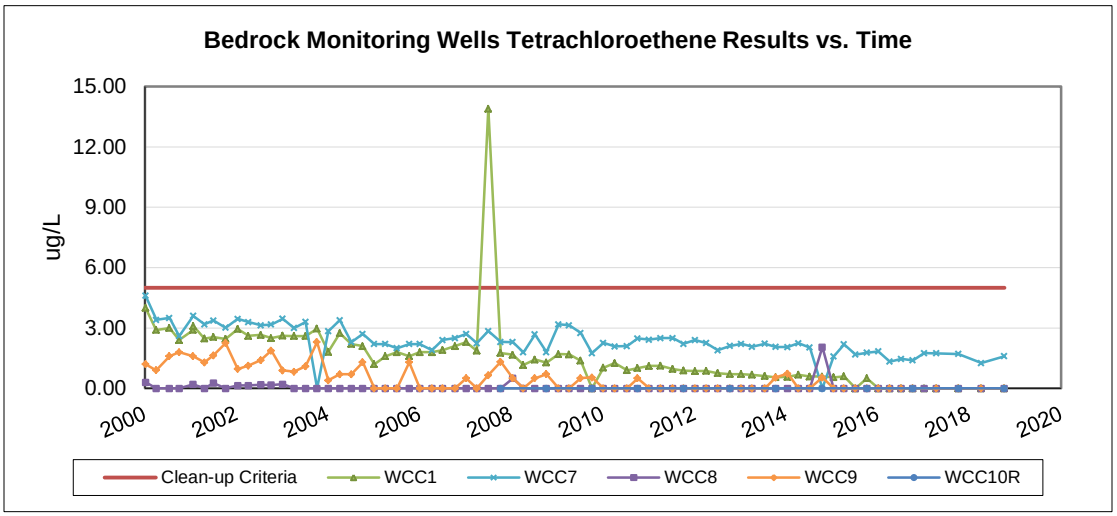


Figure 2-9 Bedrock Monitoring Wells Semi-VOC's Concentrations vs. Time

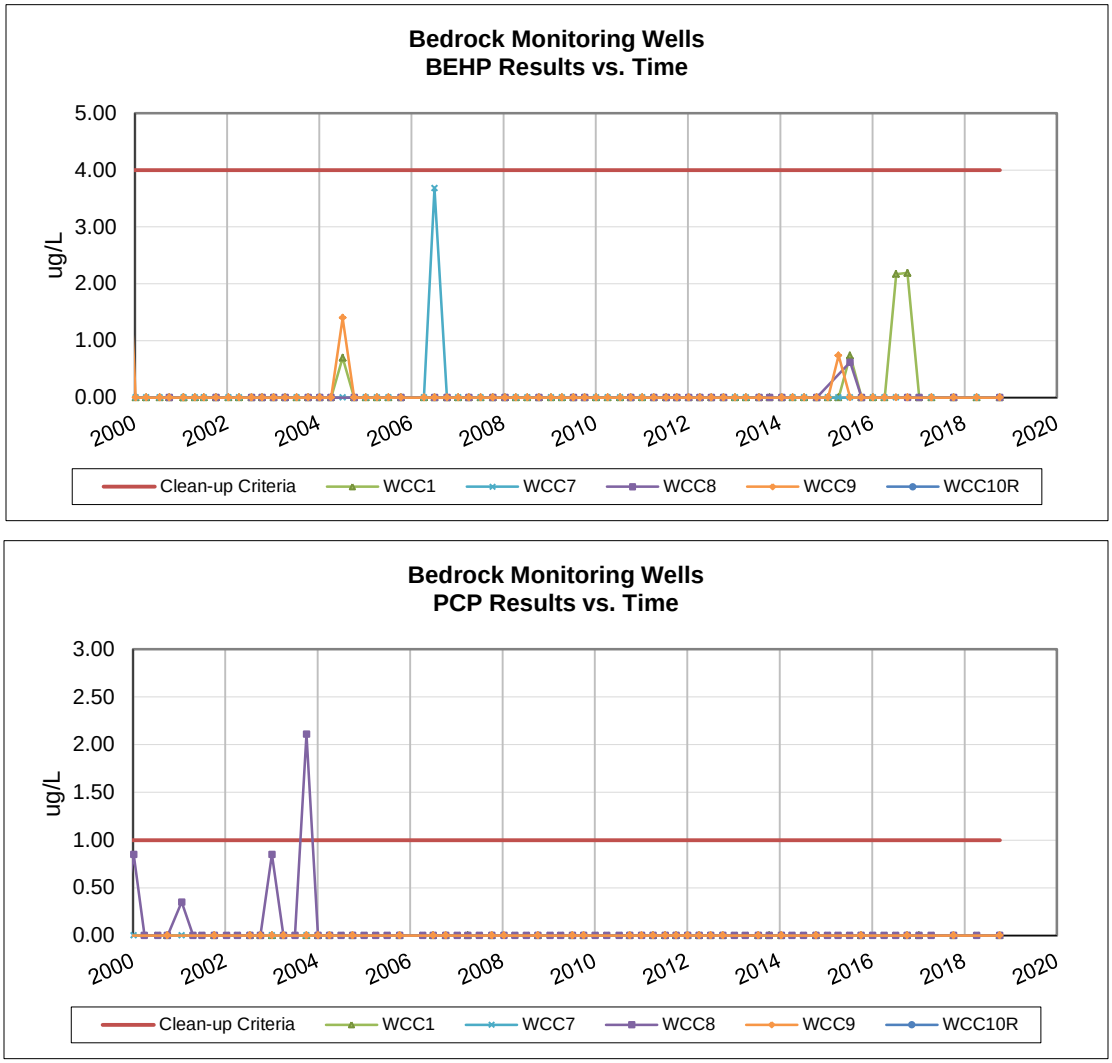
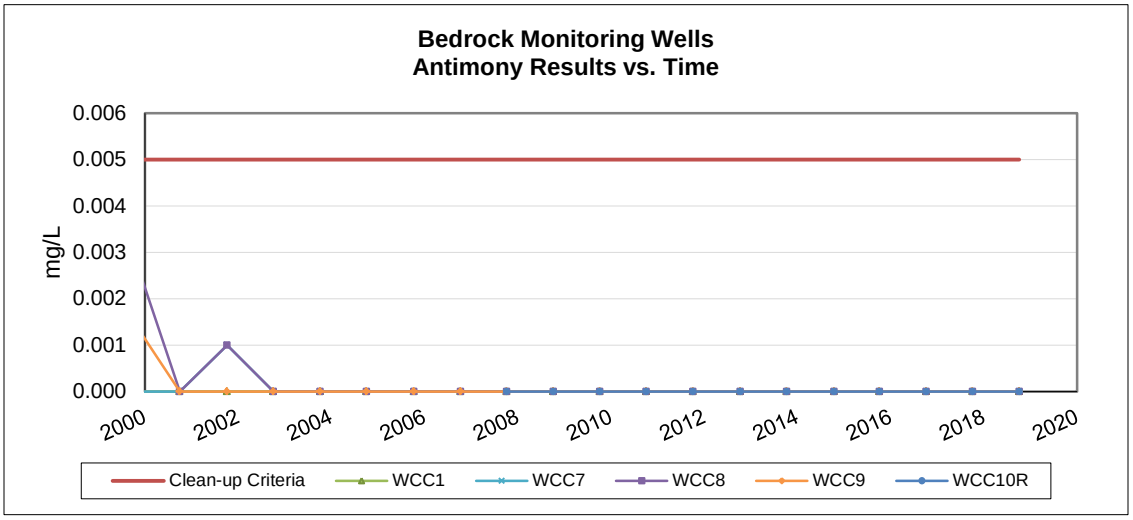
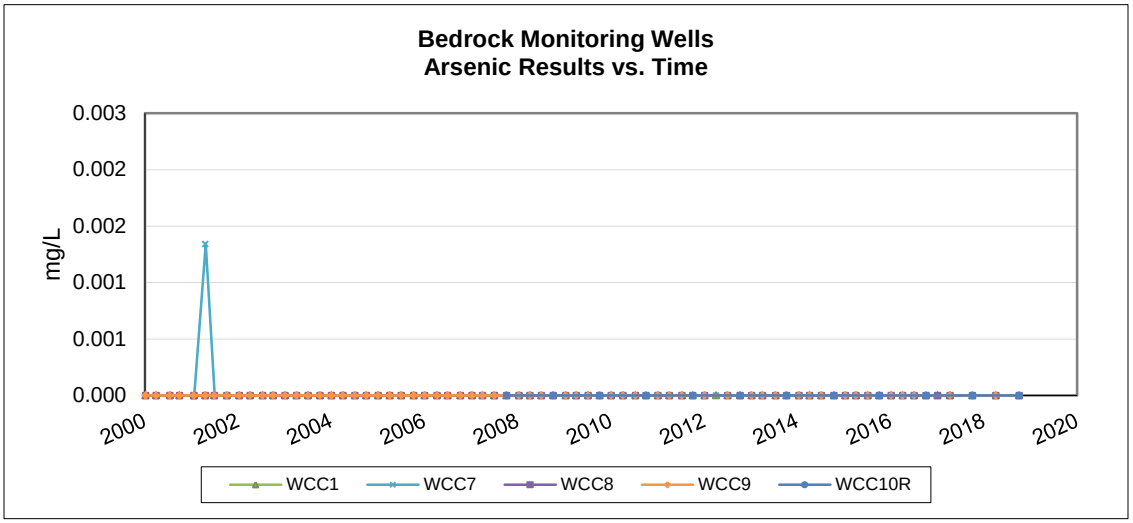


Figure 2-10 Bedrock Monitoring Wells Metals Concentrations vs. Time





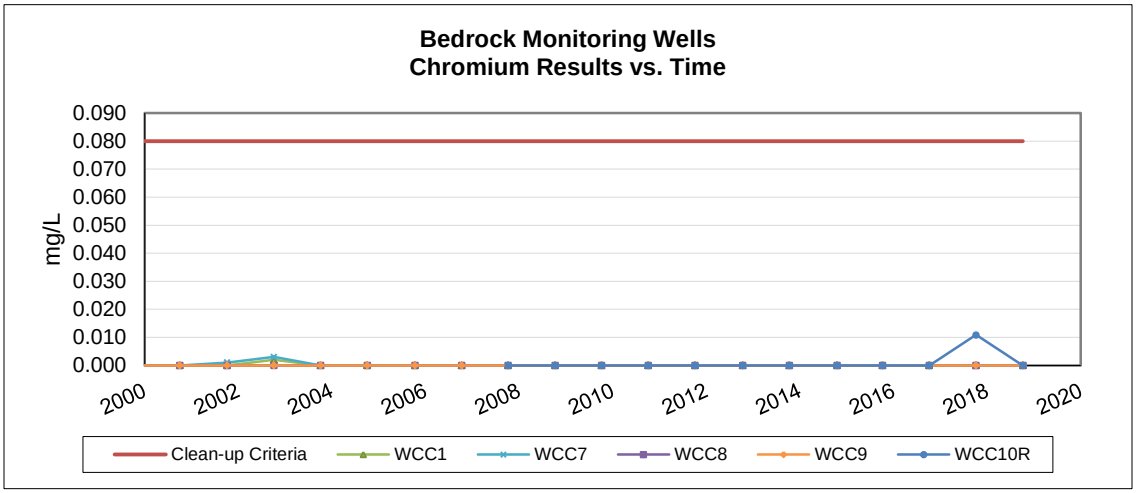
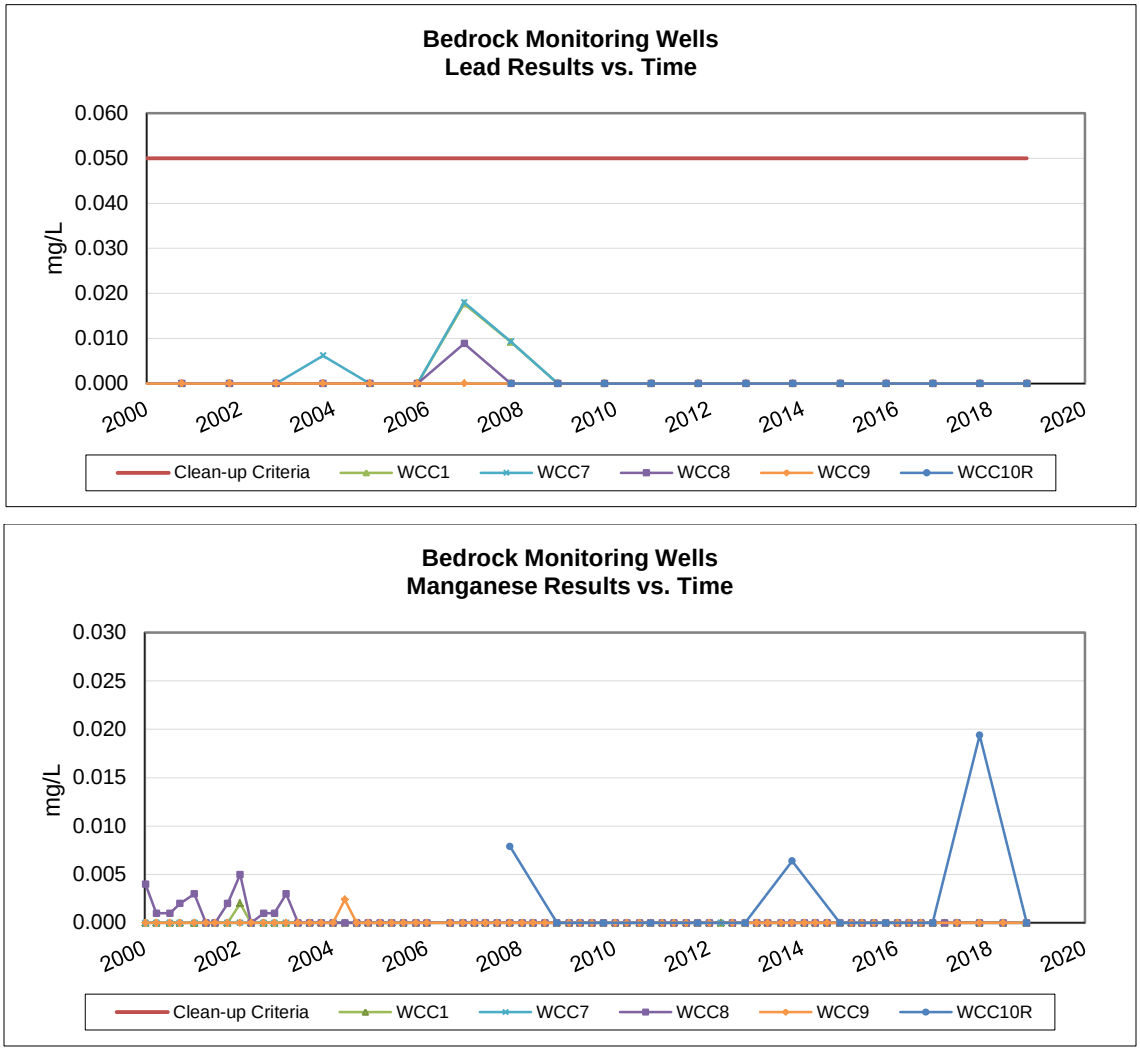


Figure 2-11 Bedrock Monitoring Wells Metals Concentrations vs. Time



3. Summary of Greenacres Landfill Flare Stations and Probes

Table 3-1 Landfill Gas Emission Point Summary

Greenacres landfill Emission Point Summary for 2018		
Date	Flow (cfm)	
Jan	46	
Feb	46	
Mar	47	
Apr	45	
May	41	
Jun	41	
Jul	42	
Aug	42	
Sep	41	
Oct	42	
Nov	42	
Dec	42	
Total	517	
Average	43	
$43*525{,}600/10^6$	=22.6	Million Cubic ft/yr

Table 3-2 Landfill Gas Probes Summary

Greenacres landfill Probe Summary for 2018				
Date	CH4	CO2	O2	Bal
Jan	0.00	0.81	19.70	79.49
Feb	0.00	0.89	19.34	79.77
Mar	0.00	1.18	18.14	80.68
Apr	0.00	0.90	18.92	80.18
May	0.00	0.96	18.96	80.07
Jun	0.00	1.02	18.96	80.02
Jul	0.00	1.04	19.31	79.65
Aug	0.00	1.02	19.27	79.71
Sep	0.00	0.91	19.53	79.56
Oct	0.00	0.91	19.51	79.58
Nov	0.00	0.91	19.60	79.49
Dec	0.00	0.97	19.17	79.86

APPENDIX Groundwater Sampling Field Sheets

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: 11 / 01 / 2018	WELL ID: SVA-1	FIELD TEAM: (MT) GF, KM
SAMPLE ID: W-SVA1-181101	QA / QC SAMPLE ID:	
FIELD CONDITIONS: CLOUDY , 49°F CALM WINDS		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME:	0800	QA / QC SAMPLE TIME:	—
SAMPLE TIME:	0900	END TIME:	0904

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	223464	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	24A	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR			

PURGING INFORMATION

WELL DIAMETER (IN):	2"	1 CASING VOLUME (GAL):	5.5 GAL
TOTAL DEPTH OF WELL (FT):	127.00'	3 CASING VOLUME (GAL):	16.5 GAL
INITIAL DEPTH TO WATER (SWL):	97.31'	PURGE RATE:	
PACKER DEPTH:	—		
COW ABOVE PACKER (FT):	29.69'	PACKER INFORMATION:	
CALCULATION: 29.69 (COW) X 0.17 = 5.05 (GAL) = 5.5 GAL		COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)	

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
5.5G / 0820	11.7	7.91	269	CLEAR
11.0G / 0840	11.4	7.89	266	CLEAR
16.5G / 0859	11.3	7.88	266	CLEAR
/				
			TURBIDITY: 0.17	NTU (meas in field lab)

COMMENTS:

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: **11 / 01 / 2018**	WELL ID: WCC-1	FIELD TEAM: MT , GF, (KM)
SAMPLE ID: W-WCC1-181101	QA / QC SAMPLE ID: —	
FIELD CONDITIONS: Cloudy 48°F		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME: 0813	QA / QC SAMPLE TIME:
SAMPLE TIME: 0903	END TIME: 0910

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	312769	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	1217642	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR			

PURGING INFORMATION

WELL DIAMETER (IN): 2"	1 CASING VOLUME (GAL): 5.5 Gal
TOTAL DEPTH OF WELL (FT): 124.00	3 CASING VOLUME (GAL): 16.5 Gal
INITIAL DEPTH TO WATER (SWL): 93.15	PURGE RATE:
PACKER DEPTH:	
COW ABOVE PACKER (FT): 30.85	PACKER INFORMATION:
CALCULATION:	COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)
30.85 X 0.17 = 5.24 = 5.5 Gal	
(COW) (GAL)	

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
5.5 / 0828	12.7	7.70	491	Clear
11.0 / 0843	12.6	7.68	490	Clear
16.5 / 0858	12.7	7.67	489	Clear
/				
			TURBIDITY: 0.80	NTU (meas in field lab)

COMMENTS:

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: 11 / 01 / 2018	WELL ID: WCC-2	FIELD TEAM: (MT), GF, KM
SAMPLE ID: W-WCC2-181101	QA / QC SAMPLE ID:	
FIELD CONDITIONS: CLOUDY 50°F LT SHOWERS LT SW WIND		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME:	0914	QA / QC SAMPLE TIME:	—
SAMPLE TIME:	0945	END TIME:	0952

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	223464	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	24A	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR			

PURGING INFORMATION

WELL DIAMETER (IN):	2"	1 CASING VOLUME (GAL):	4 GAL
TOTAL DEPTH OF WELL (FT):	123.00	3 CASING VOLUME (GAL):	12 GAL
INITIAL DEPTH TO WATER (SWL):	101.32'	PURGE RATE:	
PACKER DEPTH:			
COW ABOVE PACKER (FT):	21.68	PACKER INFORMATION:	
CALCULATION:		COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)	
21.68 X 0.17 = 3.68 ~ 4.00 GAL			
(COW)	(GAL)		

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
4.0 GAL / 0922	10.8	7.24	461	CLEAR
8.0 GAL / 0931	10.6	7.27	467	CLEAR
12.0 GAL / 0941	10.6	7.25	466	CLEAR
/				
			TURBIDITY: 0.32	NTU (meas in field lab)

COMMENTS:

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: 11 / 01 / 2018	WELL ID: WCC-4A	FIELD TEAM: MT, GF (KM)
SAMPLE ID: W-WCC4A-181101	QA / QC SAMPLE ID: —	
FIELD CONDITIONS: Cloudy, Lt. rain 51°F, raining pretty good Last 20 min's		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME: 1052	QA / QC SAMPLE TIME:
SAMPLE TIME: 1137	END TIME: 1148

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	312769	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	1217642	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR			

PURGING INFORMATION

WELL DIAMETER (IN): 2"	1 CASING VOLUME (GAL): 6.5 gal
TOTAL DEPTH OF WELL (FT): 138.00	3 CASING VOLUME (GAL): 19.5 gal
INITIAL DEPTH TO WATER (SWL): 100.83	PURGE RATE:
PACKER DEPTH:	
COW ABOVE PACKER (FT): 37.17	PACKER INFORMATION:
CALCULATION: 37.17 (COW) X 0.17 = 6.31 = 6.5 (GAL)	COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
6.5 / 1106	11.1	6.84	742	Clear
13 / 1120	10.9	6.86	741	Clear
19.5 / 1133	10.9	6.88	740	Clear
/				
			TURBIDITY: 0.40	NTU (meas in field lab)

COMMENTS: it was raining pretty good during sampling. took best steps I could to cover sample bottles while Sampling

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: 11 / 01 / 2018	WELL ID: WCC-7	FIELD TEAM: MT , GF, KM
SAMPLE ID: W-WCC7-181101	QA / QC SAMPLE ID: —	
FIELD CONDITIONS: Cloudy, Lt. rain 50°F		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME: 0950	QA / QC SAMPLE TIME: —
SAMPLE TIME: 1007	END TIME: 1016

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	312769	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	1217642	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR			

PURGING INFORMATION

WELL DIAMETER (IN): 2"	1 CASING VOLUME (GAL): 2.5
TOTAL DEPTH OF WELL (FT): 86.00	3 CASING VOLUME (GAL): 7.5
INITIAL DEPTH TO WATER (SWL): 70.85	PURGE RATE: —
PACKER DEPTH:	
COW ABOVE PACKER (FT): 15.15	PACKER INFORMATION:
CALCULATION: 15.15 (COW) X 0.17 = 2.57 (GAL) = 2.5	COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
2.5 / 0958	12.7	7.35	845	Clear
5.0 / 1002	12.4	7.30	847	Clear
7.5 / 1005	12.4	7.30	845	Clear
/				
			TURBIDITY: 0.18	NTU (meas in field lab)

COMMENTS:

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: **11 / 01 / 2018**	WELL ID: WCC-8	FIELD TEAM: MT (GF) KM (AS)
SAMPLE ID: W-WCC8-181101	QA / QC SAMPLE ID:	
FIELD CONDITIONS: Cloudy/rainy, 52°		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME: 11:17	QA / QC SAMPLE TIME:
SAMPLE TIME: 11:51	END TIME: 12:13

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	370571	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	1312423	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR	Slope Ind.	23474	

PURGING INFORMATION

WELL DIAMETER (IN): 2"	1 CASING VOLUME (GAL):
TOTAL DEPTH OF WELL (FT): 111.00'	3 CASING VOLUME (GAL):
INITIAL DEPTH TO WATER (SWL): 60.90'	PURGE RATE:
PACKER DEPTH: 97.0'	
COW ABOVE PACKER (FT): 36.1'	PACKER INFORMATION:
CALCULATION: 14.0 X 0.17 = 2.4 use 2.5 or 3 gpv (COW) (GAL)	COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI) 50psi 36.1

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
2.5 / 11:29	11.5	6.60	128.6	clear
5.0 / 11:37	11.5	6.53	132.3	clear
7.5 / 11:47	11.5	6.53	131.5	clear
/				
			TURBIDITY: 0.33	NTU (meas in field lab)

COMMENTS: MS/MSD here, put tarp tent over sample area.

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: **11 / 01 / 2018**	WELL ID: WCC-9	FIELD TEAM: MT, (GF), KM AS
SAMPLE ID: W-WCC9-181101	QA / QC SAMPLE ID:	
FIELD CONDITIONS: rainy & cloudy, 50°		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME: 10:21	QA / QC SAMPLE TIME:
SAMPLE TIME: 10:41	END TIME: 10:48

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	370571	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	1312423	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR	Slope Ind	23474	

PURGING INFORMATION

WELL DIAMETER (IN): 2"	1 CASING VOLUME (GAL):
TOTAL DEPTH OF WELL (FT): 45	3 CASING VOLUME (GAL):
INITIAL DEPTH TO WATER (SWL): 32.66	PURGE RATE:
~~PACKER DEPTH:~~	
COW ~~ABOVE PACKER (FT)~~: 12.34	PACKER INFORMATION:
CALCULATION: 12.34 (COW) X 0.17 = 2.5 (GAL)	COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
2.5 / 10:25	11.2	6.17	100.1	clear
5.0 / 10:30	11.2	6.17	99.9	clear
7.5 / 10:35	11.2	6.16	100.1	clear
/				
			TURBIDITY: 0.29	NTU (meas in field lab)

COMMENTS:

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: **11 / 01 / 2018**	WELL ID: WCC-10R	FIELD TEAM: MT (GF) KM, AS
SAMPLE ID: W-WCC10R-181101	QA / QC SAMPLE ID:	
FIELD CONDITIONS: Cloudy, about 47°, started to rain		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME: 8:31	QA / QC SAMPLE TIME:
SAMPLE TIME: 9:31	END TIME: 9:41

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	370571	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	1312423	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR	Slope Ind	23474	

PURGING INFORMATION

WELL DIAMETER (IN): 2"	1 CASING VOLUME (GAL): 5
TOTAL DEPTH OF WELL (FT): 41.4	3 CASING VOLUME (GAL): 15
INITIAL DEPTH TO WATER (SWL): 12.62	PURGE RATE: —
~~PACKER DEPTH:~~ —	
~~COW ABOVE PACKER (FT):~~ 28.78	PACKER INFORMATION:
CALCULATION: 28.78 (COW) X 0.17 = 4.9 (GAL) = 5.0 gal/vol	COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
5.0 / 8:46	11.6	8.00	176.0	sli silty / dirty
10.0 / 9:03	11.4	7.93	184.7	" " / "
15.0 / 9:27	11.3	7.86	187.0	" " / "
/				
			TURBIDITY: 14.3	NTU (meas in field lab)

COMMENTS:
Nothing unusual observed @/around vicinity of well

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: 11 / 01 / 2018	WELL ID: WCC-11B	FIELD TEAM: (MT) GF, KM
SAMPLE ID: W.WCC11B-181101	QA / QC SAMPLE ID: WS-1-1-181101	
FIELD CONDITIONS: CLOUDY, 52°F LT SW WIND		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME:	1017	QA / QC SAMPLE TIME:	1100
SAMPLE TIME:	1200	END TIME:	1213

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	223464	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	24A	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR			

PURGING INFORMATION

WELL DIAMETER (IN):	2"	1 CASING VOLUME (GAL):	7.5 GAL
TOTAL DEPTH OF WELL (FT):	140.00'	3 CASING VOLUME (GAL):	22.5 GAL
INITIAL DEPTH TO WATER (SWL):	97.19'	PURGE RATE:	
PACKER DEPTH:			
COW ABOVE PACKER (FT):	42.81'	PACKER INFORMATION:	
CALCULATION: 42.81' X 0.17 = 7.27 = 7.5GAL (COW) (GAL)		COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)	

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
7.5GAL / 1047	11.7	7.43	737	CLEAR
15.0GAL / 1118	11.5	7.41	743	CLEAR
22.5GAL 1201	11.3	7.45	741	CLEAR
/				
			TURBIDITY: 0.57	NTU (meas in field lab)

COMMENTS: WCC-11A ~ 97.44' * TARP UP TO SAMPLE

* DUPE TAKEN HERE *

GREENACRES LANDFILL
GROUNDWATER SAMPLING FIELD SHEET

DATE: **11 / 01 / 2018**	WELL ID: WCC 12	FIELD TEAM: MT, GF, KM
SAMPLE ID: W-WCC12-181101	QA / QC SAMPLE ID: —	
FIELD CONDITIONS: Rains, 50		
DEDICATED BLADDER: X	DISPOSABLE BAILER:	OTHER:

TIMES

START TIME: ~~1221~~ 1259	QA / QC SAMPLE TIME: —
SAMPLE TIME: 1347	END TIME:

FIELD MEASUREMENT EQUIPMENT

METER	MAKE / MODEL	SERIAL NO.	CALIB. COMMENTS
pH	EXTECH pH 100	370571	Calibrated to 4, 7 & 10 buffer
CONDUCTIVITY	ECTestr 11+	1312423	Std. to 700 umhos/cm
TURBIDITY	Hach 2100P	#020100024957	Std to 4.02, 39.4, & 331 NTU
SWL INDICATOR	Slope Ind	23474	

PURGING INFORMATION

WELL DIAMETER (IN): 2"	1 CASING VOLUME (GAL): 1.75
TOTAL DEPTH OF WELL (FT): 106.0	3 CASING VOLUME (GAL): 5.25
INITIAL DEPTH TO WATER (SWL): 96.88	PURGE RATE: —
PACKER DEPTH: —	
COW ~~ABOVE PACKER (FT)~~: 9.12'	PACKER INFORMATION:
CALCULATION: 1.75 gal/vol ~~2.0~~	COW X .433 X 1.25 + 30 = PACKER INFLATION (PSI)
9.12 X 0.17 = 1.6 gal use	
(COW) (GAL)	

FIELD PARAMETERS: (+/- 10%) (+/- .1) (+/- 10%)

VOL. PURGED(GAL) / TIME	TEMP °C	pH	CONDUCTIVITY (umhos)	APPEARANCE
1.75 / 1307	14.0	6.56	974	clear, smells bad
3.5 / 1323	14.1	6.57	961	clear, smells bad
5.25 / 1344	14.1	6.59	998	clear, smells bad
/				
			TURBIDITY: 1.11	NTU (meas in field lab)

COMMENTS: - Tarped/tented sample area due to heavy rains