

2017 ANNUAL MONITORING REPORT

OLALLA LANDFILL

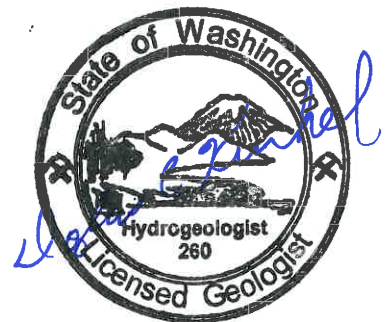
KITSAP COUNTY, WASHINGTON

FEBRUARY 2018



Prepared by

Environmental Partners, Inc., on behalf of
Kitsap County Department of Public Works
Port Orchard, Washington



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CHECKLIST FOR GROUNDWATER REPORTING
Municipal Solid Waste Landfills
WAC 173-351-415

Include a signed, completed copy of this checklist with each quarterly and annual report.

Quarterly groundwater reports shall be submitted to the jurisdictional health department and Ecology within 60 days of receipt of analytical data. Annual groundwater reports shall be submitted to the jurisdictional health department and Ecology by April 1 of each year.

1 st _____ 2 nd _____ 3 rd _____ 4 th <u>X</u> _____ YEAR <u>2017</u> _____	Reference (section, subsection)	Included in this report	Location – page # or appendix #
Quarterly Groundwater Reports: 173-351-415 (2) plus the referenced section			
Statistical calculations and summaries			
Descriptive statistics	420, (1)	<input checked="" type="checkbox"/>	pages 12-21
Statistical tests	420, (2)	<input checked="" type="checkbox"/>	pages 12-21
Notification of statistical increase (if applicable)	420, (4)	<input checked="" type="checkbox"/>	pages 20-21
Notification of concentrations above Chapter 173-200 WAC criteria (if any)	430, (4)	<input checked="" type="checkbox"/>	pages 10-11
Static water level readings	415, (2)	<input checked="" type="checkbox"/>	Appendix A
Potentiometric surface elevation maps depicting flow direction	415, (2)	<input checked="" type="checkbox"/>	Appendix A
Flow rate – calculated	415, (2)	<input type="checkbox"/>	
Cation-anion balances	430, (5a)	<input type="checkbox"/>	
Explanation of greater than 5% (or 10%) difference if needed	430, (5a)	<input type="checkbox"/>	
Trilinear diagrams	430, (5b)	<input type="checkbox"/>	
Leachate analyses (if sampled and tested)	415, (2)	<input type="checkbox"/>	
Data entered into EIM database (date entered: <u>1/26/2018</u>)	415, (3)	<input checked="" type="checkbox"/>	NA
Complete copy of the lab report with chain of custody record.		<input checked="" type="checkbox"/>	CD ROM
Annual Groundwater Reports: 173-351-415 (1) YEAR <u>2017</u>			
Summary of statistical results and trends	415, (1)	<input checked="" type="checkbox"/>	Appendix C
Summary of groundwater flow rate and direction for the year	415, (1)	<input checked="" type="checkbox"/>	page 6
Copy of all potentiometric maps for the year	415, (1)	<input checked="" type="checkbox"/>	Appendix A
Summary geochemical evaluation	415, (1)	<input type="checkbox"/>	
For Quarterly and Annual Reports			
Stamped by a licensed professional	RCW 18.220	<input checked="" type="checkbox"/>	cover

Douglas Kunkel
 Signature of Report Author

2/15/18
 Date

Olalla
 Landfill

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ATTACHMENT

2017 Quarterly Monitoring Analytical Data Sheets (provided on attached CD ROM)

INTRODUCTION

The Olalla Landfill (Landfill) is located approximately 0.75 miles east of Highway 16 on Burley-Olalla Road in Kitsap County, Washington. The Landfill was closed in 1989 in accordance with the Olalla Final Closure Plan (Parametrix, Inc., 1988). Post-closure activities have consisted primarily of quarterly monitoring and maintenance per WAC 173-304-407 (Minimum Functional Standards for Solid Waste Handling [MFS]), “General Closure and Post Closure Requirements” Kitsap County Board of Health Ordinance 2010-01 “Solid Waste Regulations” and Solid Waste Handling Permits (SWHP) issued annually by the Kitsap Public Health District (KPHD).

A Remedial Investigation/Feasibility Study (RI/FS) (Parametrix, 2014a) was performed at the Landfill starting in May 2010 and ending May 2014 when the RI/FS was submitted to the Washington State Department of Ecology (Ecology) and KPHD. Upon approval of the RI/FS the Kitsap County Solid Waste Division (SWD) prepared a Cleanup Action Plan (CAP) (Parametrix, 2014b) to summarize the RI/FS activities and present the preferred cleanup action, which was selected based on the results of the RI/FS. Ecology and KPHD approved the CAP in December 2014. The December 2017 Landfill monitoring event is the 12th event performed under the approved CAP.

The preferred cleanup action, monitored natural attenuation (MNA) and land use controls, is based on a continuation of ongoing groundwater monitoring in accordance with the SWHP. Quarterly monitoring results will be used to evaluate the effectiveness of the cleanup action and to verify that natural attenuation continues to occur at the Landfill. The overall effectiveness of the cleanup action will be evaluated at 5-year intervals as part of the periodic review process.

Specific groundwater, surface water, and landfill gas monitoring methods and procedures that are performed under the requirements of MFS, the SWHP, and the CAP are documented in a Compliance Monitoring Plan (CMP) (Environmental Partners, Inc., 2015). The CMP integrates all the previously noted monitoring program requirements into one document that contains a site-specific Sampling and Analysis Plan (SAP), Quality Assurance Plan (QAP), and Health and Safety Plan (HASP).

This Annual Report documents the results of the fourth quarter 2017 groundwater and landfill gas monitoring event and summarizes the results of the previous quarterly monitoring and reporting events completed at the Landfill in 2017, in accordance with WAC 173-304-405(4), CAP, CMP, and the 2016-2020 SWHP issued by KPHD on February 18, 2016.

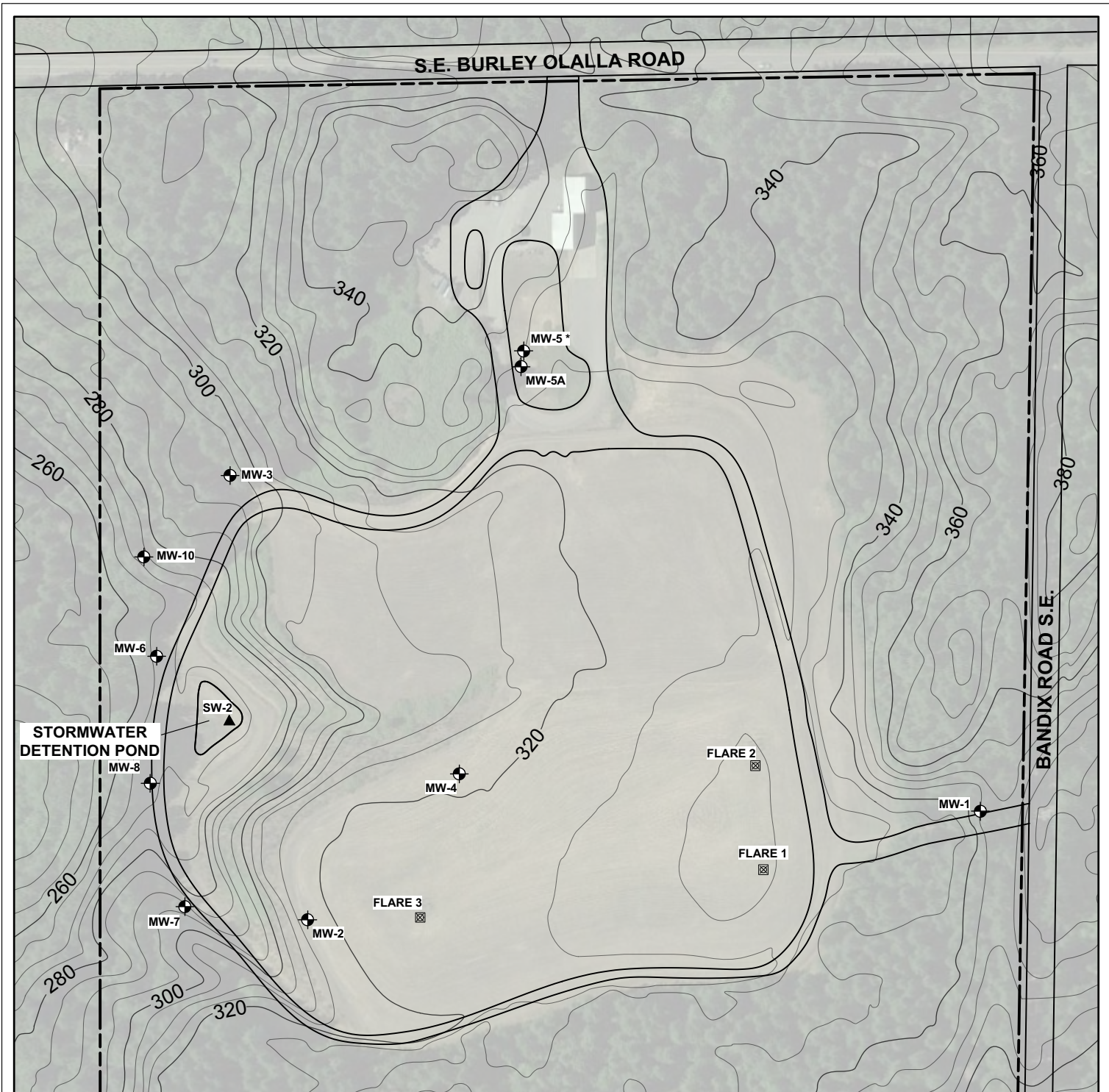
Kitsap County Solid Waste Division (SWD) and Environmental Partners, Inc. (EPI) developed the current statistical evaluation process used in this report with input and direction from KPHD and the Washington State Department of Ecology (Ecology). KPHD and Ecology referenced the United States Environmental Protection Agency (USEPA) 2004 *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (Unified Guidance) (USEPA, 2004) as the basis for evaluating appropriate statistical methods for Landfill groundwater data. The statistical methods used in this report are consistent with recommended methods found in the Unified Guidance, which was updated in 2009 (USEPA, 2009).

Including this section, the 2017 Annual Monitoring Report consists of five main sections: Introduction, Monitoring Program Description, Monitoring Results, Statistical Analysis, and Conclusions. The Monitoring Program Description summarizes the monitoring well network and laboratory analyses. Landfill gas field measurement data, groundwater elevations, and groundwater analytical results are presented in the Monitoring Results section. The statistical data evaluation methods used in this report are consistent with recommended methods found in the Unified Guidance. Results of statistical and non-statistical evaluations of the 2017 monitoring data are summarized in the Conclusions section.

MONITORING PROGRAM DESCRIPTION

The sampling locations, analytical parameters, and frequency of sample collection for quarterly monitoring at the Landfill are specified in the 2016-2020 SWHP and the 2015 CMP. Groundwater, surface water and landfill gas monitoring locations are shown in Figure 1. Specific information pertaining to the 2017 fourth quarter monitoring event is summarized as follows:

- EPI performed groundwater and surface water sampling activities and measured landfill gas parameters at each of the three on-site passive landfill gas flares on December 19, 2017.
- Depth to water measurements were performed at all onsite monitoring wells on December 19, 2017. EPI field staff also measured the depth to water in well MW-5, which is screened in a discontinuous shallow perched groundwater zone that is not hydraulically connected to the uppermost aquifer beneath the Landfill.
- One set of field duplicate samples was collected from monitoring well MW-10 and was given the sample identifier OL-MW-13.
- Groundwater samples were hand delivered to Analytical Resources, Inc. in Tukwila, Washington, for sample analysis on December 20, 2017.
- Samples were analyzed within their respective holding times except laboratory measured pH samples. The pH holding time is 15-minutes, which cannot be achieved at the laboratory but is achieved by the field-measured pH data, which are used for the statistical evaluations.
- Data evaluations, statistical tests, and reporting were performed by EPI in accordance with methods described in the Unified Guidance (USEPA, 2004 [draft] and 2009 [final]) and developed with input and direction from KPHD and Ecology.
- Reporting limits for ammonia, carbonate, iron, nitrite, TOC, potassium, and zinc changed slightly relative to historical data as a result of changing analytical laboratories. All reporting limits are lower than regulatory standards.



NOTES:

BASE MAP SOURCE:
GOOGLE EARTH

TOPOGRAPHIC CONTOUR SOURCE:
KITSAP COUNTY PARCEL VIEWER

*MW-5 IS COMPLETED IN A SHALLOW PERCHED
GROUNDWATER ZONE

MW-2 MONITORING WELL LOCATION

SW-2 SURFACE WATER SAMPLING
LOCATION

LANDFILL GAS FLARE

300 TOPOGRAPHIC ELEVATION CONTOURS

APPROXIMATE PROPERTY BOUNDARY

PERIMETER ACCESS ROAD

0 50 100 200

SCALE: 1" = 200'

FIGURE 1			
OLALLA LANDFILL MONITORING WELL LOCATIONS KITSAP COUNTY, WASHINGTON			
PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	2017 ANNUAL MONITORING REPORT		
LOCATION	OLALLA LANDFILL KITSAP COUNTY, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
1/15/18	AM/VPB	DCK	45406.0

MONITORING RESULTS

Results for 2017 quarterly monitoring events consist of landfill gas composition, groundwater elevations, calculated groundwater gradients and velocities, and groundwater quality data. Surface water quality data were obtained during the December 2017 sampling event, which was performed following several days of heavy precipitation. These data are summarized in this section and in Appendix A. Quarterly monitoring field notes associated with the monitoring events performed in 2017 are presented in Appendix B. The laboratory analytical data reports for 2017 are provided in electronic format in Attachment 1 on the CD ROM included with this report.

Landfill Gas Data

Field measurements of landfill gas were taken from the three passive flares at the Landfill on March 8, June 20, September 12, and December 19, 2017. Landfill gas field measurement data tables are included in Appendix A. Data from the quarterly landfill gas monitoring events performed in 2017 are summarized in the following sections.

March 8, 2017 – First Quarter

- Methane was not detected in any of the three flares. As a result, the calculated Lower Explosive Limit (LEL) values are 0% for all flares.
- Oxygen concentration measurements were 20.0%, 21.2%, and 21.2% by volume in Flares 1, 2, and 3, respectively.
- Carbon dioxide concentration measurements were 1.5%, 0.0%, and 0.2% by volume in Flares 1, 2, and 3, respectively.
- Pressure measurements were 0.01, 0.01, and 0.00 inches of water in Flares 1, 2, and 3, respectively.

June 20, 2017 – Second Quarter

- Methane was not detected in any of the three flares. As a result, the calculated LEL values are 0% for all flares.
- Oxygen concentration measurements were 19.9%, 20.2%, and 20.8% by volume in Flares 1, 2, and 3, respectively.
- Carbon dioxide concentration measurements were 0.2%, 0.2%, and 0.0% by volume in Flares 1, 2, and 3, respectively.
- Pressure measurements were 0.1, 0.2, and 0.01 inches of water in Flares 1, 2, and 3, respectively.

September 12, 2017 – Third Quarter

- Methane was not detected in Flares 1 and 3. As a result, the calculated LEL values are 0% for flares 1 and 3. Flare 2 had a methane concentration of 3.1% by volume and a calculated LEL of 68%.
- Oxygen concentration measurements were 20.1%, 2.1%, and 20.1% by volume in Flares 1, 2, and 3, respectively.
- Carbon dioxide concentration measurements were 0.2%, 0.2%, and 0.0% by volume in Flares 1, 2, and 3, respectively.
- Pressure measurements were 0.01, 0.02, and 0.01 inches of water in Flares 1, 2, and 3, respectively.

December 19, 2017 – Fourth Quarter

- Methane was detected in all three flares at concentrations of 16.1%, 2.4%, and 26.2% by volume in Flares 1, 2, and 3, respectively.
- Measured LEL values were 78%, 16%, and 45% in Flares 1, 2, and 3, respectively. The LEL values are the observed measurements on the GEM 2000 field instrument, not calculated values.
- Oxygen concentration measurements were 6.3%, 16.2%, and 0.2% by volume in Flares 1, 2, and 3, respectively.
- Carbon dioxide concentration measurements were 9.8%, 1.8%, and 15.3% by volume in Flares 1, 2, and 3, respectively.
- Pressure measurements were 0.04 to 0.1, and 0.02 inches of water in Flares 1, 2, and 3, respectively.

Groundwater Elevation, Flow Direction, Gradient, and Velocity

All monitoring wells installed at the Landfill, except for MW-5, are screened in a laterally continuous sand and gravel unit that has been interpreted as belonging to the same aquifer unit (Parametrix, Inc., 1988). Monitoring well MW-5 is screened in a shallow perched groundwater zone. Replacement monitoring well MW-5A was drilled at a nearby location to MW-5 and is screened in the same aquifer as the other monitoring wells at the Landfill.

The Permit and CAP do not require water level or water quality data to be collected from MW-5 as part of the monitoring program for the Landfill because the shallow perched groundwater zone that MW-5 is completed in is not hydraulically connected to the uppermost continuous aquifer in which the other Landfill monitoring wells are completed. However, SWD has elected to measure the depth to water in MW-5 as additional information. Depth to water measurements for MW-5 are included in the field notes presented in Appendix B.

The Permit and CAP specify annual monitoring of cross-gradient monitoring wells MW-5A and MW-7. As requested by the SWD, quarterly groundwater level measurements are made at MW-5A and MW-7 to provide a more comprehensive data set for the groundwater elevation contour map and the groundwater elevation hydrograph.

The groundwater flow direction beneath the Landfill during the December 2017 monitoring event was generally toward the northwest as depicted in Figure 2. Based on the groundwater elevation contours the groundwater flow direction at the Landfill is toward the northwest, with potentially a western component near MW-3 and MW-10, as demonstrated by the quarterly groundwater elevation contour maps for all four quarters of 2017, which are presented in Appendix A. Groundwater elevation contour pattern and flow directions have been consistent throughout all four seasons and over many years of water level measurements.

The four quarters of groundwater flow direction figures for the Landfill are consistent with historical groundwater flow direction maps. The groundwater flow direction maps demonstrate that well MW-1 is consistently upgradient of the Landfill, wells MW-3, MW-6, MW-8, and MW-10 are downgradient of the Landfill, and wells MW-5A and MW-7 are consistently cross-gradient to the Landfill. Historically MW-7 was classified as a downgradient monitoring well but was reclassified as a cross-gradient well in 2013 based on consistent historical groundwater flow directions.

Groundwater elevation data from 1991 through the fourth quarter of 2017 for each of the on-site MFS monitoring wells (except MW-5) are plotted and shown on the water level elevation time-series graph in Appendix A. December 2017 groundwater elevation data were consistently higher than the December 2016 groundwater elevation data for all nine wells. The higher 2017 water level elevations range in magnitude from 0.53 feet higher in interior well MW-3 to 2.59 feet higher in upgradient well MW-1.

Precipitation data from the Bremerton Washington Airport Weather Station indicate that during water year 2017 (November 2016 to October 2017) the area near the Landfill received 66.85 inches of precipitation, which is less than the 81.54¹ inches of precipitation for the 2016 water year (Weather Underground, 2018).

Groundwater flow rates based on the quarterly groundwater elevation contour maps have been calculated based on a modified form of Darcy's Law:

$$V = KI/n$$

Where: V = average linear velocity (L/T)
 K = hydraulic conductivity (L/T)
 I = hydraulic gradient (L/L [dimensionless])
 n = effective porosity (percent expressed as a decimal)

¹ Likely erroneous daily precipitation value of 10.00 inches for March 25, 2016 was removed from data set for the 2016 water year.

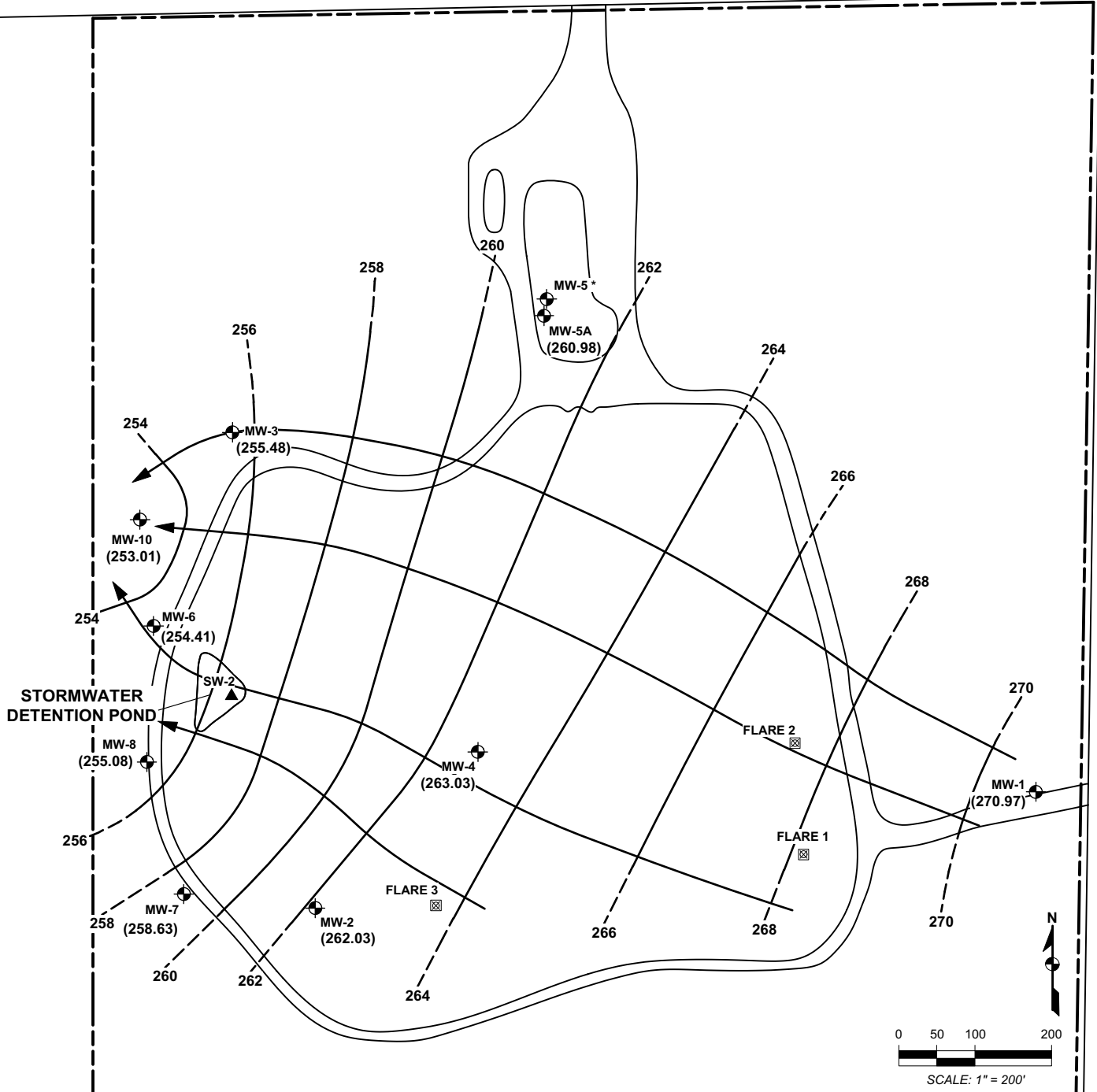










FIGURE 2
OLALLA LANDFILL GROUNDWATER ELEVATION
CONTOUR MAP - DECEMBER 19, 2017

PREPARED BY	 ENVIRONMENTAL PARTNERS INC		
REPORT	2017 ANNUAL MONITORING REPORT		
LOCATION	OLALLA LANDFILL KITSAP COUNTY, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
1/15/18	VPB	DCK	45406.0

- NOTES:**
- * MW-5 IS COMPLETED IN A SHALLOW PERCHED GROUNDWATER ZONE.
- KEY:**
- MW-2  MONITORING WELL LOCATION
 - SW-2  SURFACE WATER SAMPLING LOCATION
 -  LANDFILL GAS FLARE
 -  GROUNDWATER ELEVATION CONTOUR
 -  INFERRED GROUNDWATER FLOW PATH
 -  APPROXIMATE PROPERTY BOUNDARY
 -  PERIMETER ACCESS ROAD

The range of values obtained from these tests indicated that the hydraulic conductivity of the uppermost aquifer at the Landfill is approximately 7×10^{-3} to 3×10^{-2} cm/sec, with an average value of 2.2×10^{-2} cm/sec (62.4 feet/day) (Parametrix, Inc., 1988). This value correlates well with the hydraulic conductivity values calculated using the Hazen equation for soil samples from MW-8 and MW-10, which were 1.2×10^{-2} cm/sec (34 feet/day) and 1.4×10^{-2} cm/sec (40 feet/day), respectively. The single well aquifer test hydraulic conductivity value of 2.2×10^{-2} cm/sec is used for groundwater velocity calculations.

The hydraulic gradient “I” of the aquifer is calculated from groundwater elevation contour maps presented in Appendix A. Average hydraulic gradients calculated for the four quarterly events at the Landfill range from 0.0114 in March 2017 to 0.0182 in June 2017. The effective porosity “n” of the aquifer is estimated to be 0.40, which is a typical value for fine to medium-grained sand (Freeze and Cherry, 1979).

The resulting groundwater flow velocities “V” calculated from 2017 quarterly data range from 1.77 ft./day in March 2017 to 2.84 ft./day in June 2017. The calculated groundwater gradients and flow velocities are summarized in Table 1.

Table 1		
2017 Olalla Landfill Calculated Groundwater Flow Velocities		
Measurement Date	Calculated Hydraulic Gradient, (L/L)	Calculated Groundwater Flow Velocity (ft./day)
March 8, 2017	0.0114	1.77
June 20, 2017	0.0182	2.84
September 12, 2017	0.0181	2.82
December 19, 2017	0.0154	2.41

Surface Water Quality Data

Section IV.D.3.a of the KPHD-issued 2016-2020 SWHP for the Landfill states that surface water samples shall be collected at location SW-2 (see Figure 1) between January and March or between November and December if there is sufficient water for a sample. Surface water station SW-2 had sufficient water flow to sample during the December 19, 2017 sampling event due to rain in the days preceding the sampling event and a surface water sample was collected and analyzed from station SW-2 during that sampling event. A summary of surface water quality data is presented in Appendix A. Analytical results (laboratory data sheets) are presented as an electronic file (a PDF file) in Attachment 1 of the CD ROM for this report to reduce the amount of paper required to produce this report.

Groundwater Quality Data

A summary of the groundwater quality data for 2017 is presented in Appendix A. Laboratory data sheets for all field samples, duplicates, and laboratory quality control samples reported by ARI are presented as an electronic file in Attachment 1 of the CD ROM for this report.

Exceedances of Primary Regulatory Standards

Constituent concentrations in groundwater that exceeded Washington State Drinking Water Primary Standards (WAC 246-290-310) or Washington State Groundwater Primary Standards (WAC 173-300-040) are summarized in Table 2.

Table 2: 2017 Water Quality Constituent Concentrations Exceeding Washington State Primary Standards						
Constituent	Drinking Water Standards ^a	Groundwater Quality Standards ^b	March	June	September	December
MW-1 (upgradient)						
Arsenic	10 µg/L	0.05 µg/L	0.09	0.11	0.10	0.12
MW-3 (downgradient)						
Arsenic	10 µg/L	0.05 µg/L	0.10	0.11	0.19	0.13
Arsenic FD	10 µg/L	0.05 µg/L	0.10	NA	NA	NA
MW-5A (cross-gradient)						
Arsenic	10 µg/L	0.05 µg/L	NA	NA	NA	0.20
MW-6 (downgradient)						
Arsenic	10 µg/L	0.05 µg/L	0.84	1.17	1.37	1.18
Arsenic FD	10 µg/L	0.05 µg/L	NA	1.17	NA	NA
Total Coliform	1/100 mL	1/100 mL		11		
Vinyl Chloride	2 µg/L	0.02 µg/L				0.033
MW-7 (cross-gradient)						
Arsenic	10 µg/L	0.05 µg/L	NA	NA	NA	0.35
MW-8 (downgradient)						
Arsenic	10 µg/L	0.05 µg/L	1.49	2.66	2.28	2.38
Arsenic FD	10 µg/L	0.05 µg/L	NA	NA	2.12	NA
Vinyl Chloride	2 µg/L	0.02 µg/L	0.071	0.060	0.029	0.06
Vinyl Chloride FD	2 µg/L	0.02 µg/L	NA	NA	0.028	NA
MW-10 (downgradient)						
Arsenic	10 µg/L	0.05 µg/L	1.06	1.55	1.64	1.55
Arsenic FD	10 µg/L	0.05 µg/L	NA	NA	NA	1.83
Vinyl Chloride	2 µg/L	0.02 µg/L	0.0227			
Notes: Values are reported in the same units as the regulatory standards FD = Field Duplicate NA = Not Analyzed per the SWHP ^a WAC 246-290-310 ^b WAC 173-200-040						

Exceedances of Secondary Regulatory Standards

Constituent concentrations in groundwater that exceeded Washington State Drinking Water Secondary Standards (WAC 246-290-310) and Washington State Groundwater Secondary Standards (WAC 173-300-040) are summarized in Table 3.

Table 3: 2017 Water Quality Constituent Concentrations Exceeding Washington State Secondary Standards						
Constituent	Drinking Water Standards ^a	Groundwater Quality Standards ^b	March	June	September	December
MW-1 (upgradient)						
pH (field)	--	6.5 – 8.5		5.5	6.4	
pH (lab)	--	6.5 – 8.5	6.3	6.3	6.4	6.4
MW-3 (downgradient)						
Manganese	50 µg/L	50 µg/L	5,210	4,320	8,110	7,650
Manganese FD	50 µg/L	50 µg/L	5,150	NA	NA	NA
pH (field)	--	6.5 – 8.5	6.2	5.5	6.2	6.4
pH (lab)	--	6.5 – 8.5	6.1	6.1	6.2	6.3
MW-5A (cross-gradient)						
pH (lab)	--	6.5 – 8.5	NA	NA	NA	6.4
MW-6 (downgradient)						
Iron	300 µg/L	300 µg/L	581	965	1,240	978
Iron FD	300 µg/L	300 µg/L	NA	944	NA	NA
Manganese	50 µg/L	50 µg/L	500	1,050	778	731
Manganese FD	50 µg/L	50 µg/L	NA	1,020	NA	NA
pH (field)	--	6.5 – 8.5		6.4	6.4	
pH (lab)	--	6.5 – 8.5			6.4	
MW-7 (cross-gradient)						
pH (lab)	--	6.5 – 8.5	NA	NA	NA	6.4
MW-8 (downgradient)						
Iron	300 µg/L	300 µg/L	549	1,480	336	1,460
Iron FD	300 µg/L	300 µg/L	NA	NA	394	NA
Manganese	50 µg/L	50 µg/L	2,320	3,700	2,590	3,570
Manganese FD	50 µg/L	50 µg/L	NA	NA	2,610	NA
pH (field)	--	6.5 – 8.5		6.3		
pH (lab)	--	6.5 – 8.5	6.2			
MW-10 (downgradient)						
Manganese	50 µg/L	50 µg/L	5,150	5,660	3,950	4,470
Manganese FD	50 µg/L	50 µg/L	NA	NA	NA	4,480
pH (field)	--	6.5 – 8.5		6.2		
pH (lab)	--	6.5 – 8.5	6.4	6.4		
Notes: Values are reported in the same units as the regulatory standards FD = Field Duplicate NA = Not Analyzed per the SWHP ^a WAC 246-290-310 ^b WAC 173-200-040 ^c WAC 173-201A-200						

STATISTICAL ANALYSIS

Statistical analysis of groundwater data uses four tools: Shapiro-Wilk test for normality, confidence intervals (parametric and non-parametric), time-series plots, and the Mann-Kendall test for trend. Application of these tools is based on statistical methods identified in the Unified Guidance. These four statistical tools, and non-statistical evaluation tools, are applied to the data following the process shown in Figure 3.

Statistical analyses are performed on a data set consisting of a moving window of the 20 most recent sampling events (as one new data point is added the oldest data point is dropped). The moving window of 20 sampling events provides a sufficient number of data points for adequate statistical power while focusing the statistical evaluations on the most recent and most relevant data. Statistical analyses for the Landfill groundwater monitoring data are performed using the following criteria:

- Dissolved metals, VOCs, conventional water quality parameters, and field parameters required for groundwater analysis under Section IV.D.2 of the 2016-2020 SWHP for the Landfill are presented in two sets of time-series plots and tables showing summary results of Mann-Kendall, Shapiro-Wilk, and confidence interval tests.
- Statistical tests are not automatically performed for every constituent analyzed during quarterly groundwater monitoring. Some constituents have not been detected in the past 20 sampling events or have too few detected data points to support statistical analysis. Data sets that have fewer than four detected values in the past 20 events are not amenable to statistical evaluations. These data sets are temporarily dropped from the statistical evaluation process until they have the minimum number of detected values required for statistical evaluation.
- Non-detections are managed by assigning them a uniform value that is less than the reporting limit for that constituent as prescribed in Section 14.4.2.2 of the Unified Guidance. Recent guidance from the United States Geological Survey (USGS, 2008) suggests that censoring values that are less than the detection limit (non-detects) provides more accurate statistical results compared to substituting a value, commonly one half of the reporting limit. SWD assigns a value of zero to non-detected results as recommended by the USGS and KPHD. Estimated (J-qualified) results are reported as individual values as recommended by the USGS.
- VOC detections may include values at concentrations less than laboratory specified reporting limits (i.e., qualified with a J), but do not include values where the constituent was also detected in the method blank (i.e., values qualified with a B).
- Beginning in 2012, wells MW-5A and MW-7 are sampled at a reduced (annual) frequency and for a reduced list of constituents relative to the other Olalla Landfill monitoring wells. Thus, the statistical evaluations at MW-5A and MW-7 ended in 2012 for some constituents that were no longer analyzed but will continue at a reduced frequency for other constituents that are analyzed annual in samples from these two wells.

The following subsections briefly describe the tools used in the statistical evaluation and summarize analytical results for 2017.

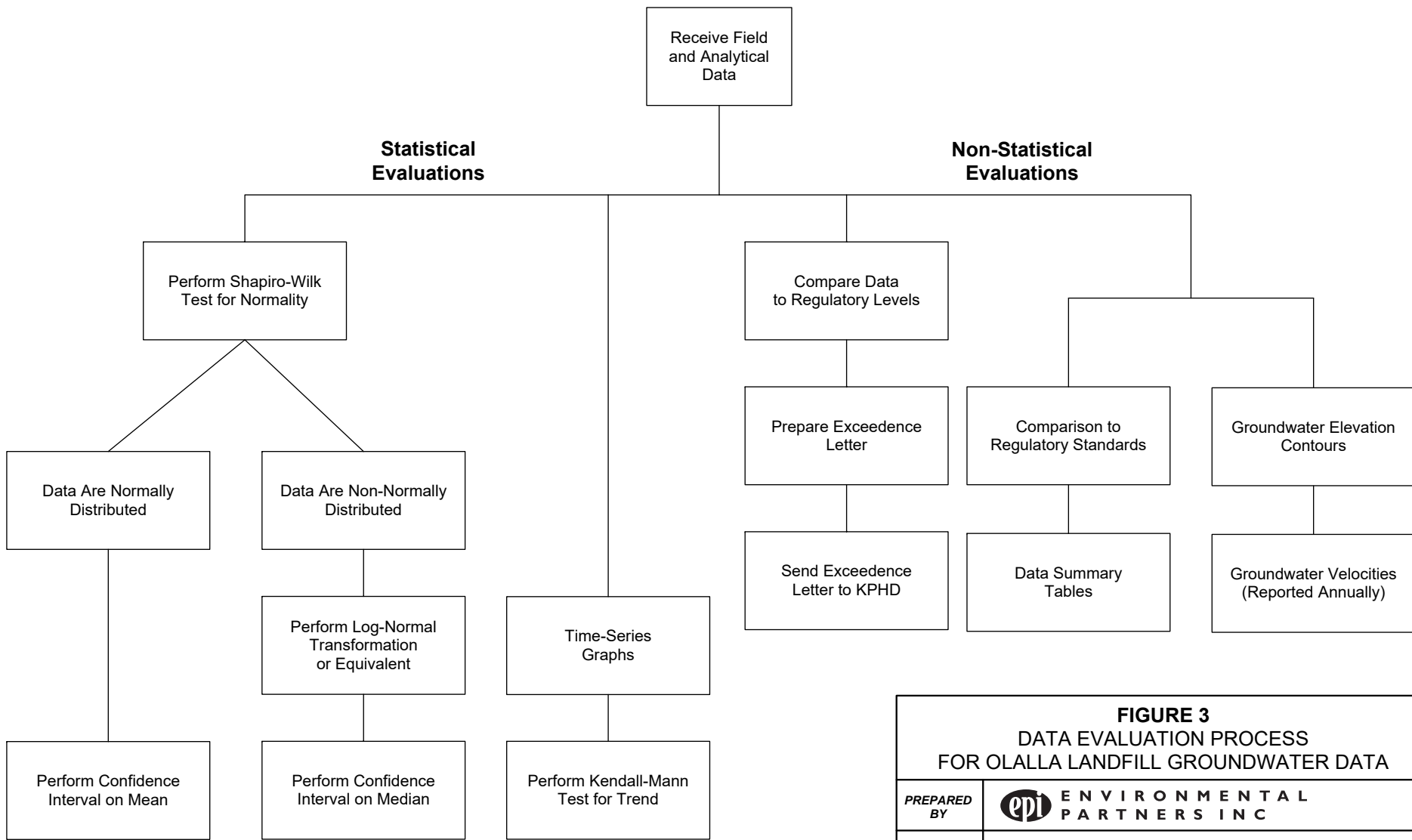



FIGURE 3
DATA EVALUATION PROCESS
FOR OLALLA LANDFILL GROUNDWATER DATA

PREPARED BY	 ENVIRONMENTAL PARTNERING INC		
REPORT	2017 ANNUAL MONITORING REPORT		
LOCATION	OLALLA LANDFILL KITSAP COUNTY, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE 1/15/18	DRAWN BY VPB	REVIEWED BY DCK	PROJECT NUMBER 45406.0

Time–Series Plots

Time-series plots are used to compare field measurements or analytical results from a well or a set of wells over time. The plots provide a convenient graphical means of delineating seasonal trends and large differences in concentration between upgradient and downgradient wells and can be used to readily identify data that exceed regulatory levels. Time-series plots are presented by constituent for upgradient well MW-1, cross-gradient wells MW-5A and MW-7, and downgradient wells MW-3, MW-6, MW-8, and MW-10.

Historical data are presented as two time-series plots for each constituent. The first time-series plot for each constituent presents all quarterly data dating to 1992, when groundwater monitoring was initiated at the Landfill. This time-series plot is useful to graphically demonstrate that groundwater quality has improved over time. Because MW-8 and MW-10 are relatively new (installed in 2010) their data sets are smaller than for other wells in the full time-series plots. The second time-series plot for each constituent presents a moving five-year window of data providing a greater level of detail for more recent data that might not be readily seen at the scale required for time-series plots that graph all historical results.

The moving 20 event window of data adds new data with each successive quarter and drops data from the oldest quarter to maintain a consistent sample population of the most current 20 data points. Using the 20 most current data points corresponds to the same data set used in the other statistical analyses. Full and recent (20-event window) time-series plots are presented in Appendix C.

Applicable Washington State drinking water and groundwater regulatory levels are shown graphically on each time-series plot when possible. Some constituents have regulatory levels that are significantly greater than concentrations detected in groundwater samples from the Landfill and those regulatory levels might not be visible at the scale of the time-series plots. Increasing the Y-axis scale to accommodate the applicable regulatory level would compress the analytical data resulting in a loss of detail on the time-series plots.

Mann-Kendall Trend Test

The Mann-Kendall trend test is a non-parametric statistical method recommended in the Unified Guidance for sites in the compliance assessment and corrective action monitoring phases and is appropriately paired with time-series plots. For this report, the Mann-Kendall trend test is used to determine if upward or downward data trends graphically presented in time-series plots are statistically significant. The Mann-Kendall test is applied to the same five-year moving window of data described in the Time-Series Plots section. December 2017 Mann-Kendall Trend Test results are presented in Table 4 and are summarized in the following bullets. Tabulated Mann-Kendall trend test results for all four quarters of 2017 are presented in Appendix C.

As described in the 2016-2020 SWHP, cross-gradient wells MW-5A and MW-7 are sampled annually for a reduced list of constituents relative to the other Olalla Landfill monitoring wells. The SWHP also specifies the fourth quarter monitoring event as the annual monitoring event during which MW-5A and MW-7 are sampled for the reduced list of constituents included in Table 4.

**Table 4: December 2017 Mann-Kendall Statistically Significant Trend
Test Results**

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10
Ammonia (N)	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	UP
Arsenic - Dissolved	NO TREND	UP	NO TREND	UP	NO TREND	UP	DOWN
Barium - Dissolved	UP	NO TREND	NA	UP	NA	UP	UP
Bicarbonate	NO TREND	UP	NA	NO TREND	NA	NO TREND	NO TREND
Calcium	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Carbonate	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
COD	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Chloride	NO TREND	NO TREND	NA	UP	NA	UP	NO TREND
Dissolved Oxygen	UP	DOWN	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Iron - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Manganese - Dissolved	NO TREND	UP	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Nitrate	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Nitrite	NO TREND	NO TREND	NA	DOWN	NA	DOWN	DOWN
Oxidation Reduction	NO TREND	UP	NO TREND	NO TREND	UP	NO TREND	NO TREND
pH - Field	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Laboratory	DOWN	DOWN	NO TREND	DOWN	NO TREND	DOWN	DOWN
Potassium	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Sodium	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Specific Conductance	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Sulfate	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Temperature	DOWN	DOWN	NO TREND	DOWN	NO TREND	DOWN	DOWN
Total Coliform	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
TOC	NO TREND	NO TREND	NA	NO TREND	NA	UP	NO TREND
Vinyl Chloride	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Zinc - Dissolved	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND

NO TREND = No statistically significant trend.
UP = Statistically significant upward trend.
DOWN = Statistically significant downward trend.
NA = Not analyzed per the SWHP

- Fifteen (15) well-constituent combinations have statistically significant downward concentration trends. The 15 downward well-constituent combination trends are:
 - Arsenic: MW-10
 - Dissolved Oxygen: MW-3
 - Nitrite: MW-6, MW-8, and MW-10
 - pH (laboratory): MW-1, MW-3, MW-6, MW-8, and MW-10
 - Temperature: MW-1, MW-3, MW-6, MW-8, and MW-10
- Three (3) of the 15 well-constituent combinations with statistically significant downward concentration trends also have regulatory standard exceedances in December 2017 data. The three well-constituent combinations are arsenic at MW-10 and pH (laboratory) at MW-1 and MW-3.
- Sixteen (16) well-constituent combinations have statistically significant upward concentration trends. The 16 upward well-constituent combination trends are:
 - Ammonia: MW-10
 - Arsenic: MW-3, MW-6, and MW-8
 - Barium: MW-1, MW-6, MW-8, and MW-10
 - Bicarbonate: MW-3
 - Chloride: MW-6 and MW-8
 - Dissolved Oxygen: MW-1
 - Manganese: MW-3
 - Oxidation Reduction Potential: MW-3 and MW-7
 - Total Organic Carbon: MW-8
- Four (4) of the 16 well constituent combinations with statistically significant upward concentration trends also have regulatory standard exceedances in December 2017 data. The four well-constituent combinations are arsenic at MW-3, MW-6, and MW-8 and manganese at MW-3.
- There are 144 well-constituent combinations that have no statistically significant concentration trend, or the constituents are no longer analyzed in wells MW-5A and MW-7 per the SWHP. Of these 144 well-constituent combinations with no statistically significant trends samples from the wells listed in the following bullets exceed regulatory levels.
 - Arsenic in samples from MW-1, MW-5A, MW-7, and MW-13 (field duplicate of MW-10), exceed the Washington State Groundwater Primary Standard of 0.05 µg/L.
 - Iron in the samples from MW-6 and MW-8 exceed the Washington State Groundwater and Drinking Water Secondary Standards of 300 µg/L.
 - Manganese in samples from MW-6, MW-8, MW-10, and MW-13 (field duplicate of MW-10), exceed the Washington State Groundwater and Drinking Water Secondary Standards of 50 µg/L.
 - Field-measured pH in purge water from well MW-3 is lower than the low value of the Washington State Groundwater Secondary Standard range of 6.5 to 8.5.

- Laboratory-measured pH values in the samples from MW-5A and MW-7 are lower than the low value of the Washington State Secondary Groundwater Standard range of 6.5 to 8.5.

Shapiro-Wilk Test for Normality

The Shapiro-Wilk Test for Normality is a method recommended in the Unified Guidance for evaluating if data sets are normally distributed. The Shapiro-Wilk Test for Normality is applied annually to the five-year moving window of analytical data for each well-constituent pair that has enough data points to apply this statistical method. Shapiro-Wilk results for the December 2017 monitoring event are summarized in Table 5 and in the following bullets. Shapiro-Wilk result summary tables for all four quarters of 2017 are presented in Appendix C.

As described in the Mann-Kendall Trend Test section, MW-5A and MW-7 are sampled at a reduced frequency (annually) and for a reduced list of constituents relative to the other Olalla Landfill monitoring wells and the Shapiro-Wilk statistical evaluations of the reduced list of constituents are included in Table 5.

- There are 175 well-constituent combinations presented in Table 5.
- Sixty-three well-constituent combinations had fewer than four detections and could not be tested for normality or the constituents are no longer analyzed in wells MW-5A and MW-7 per the SWHP; the remaining 112 well-constituent combinations were tested for normality.
- Normal data distributions were noted in 64 of the 112 well-constituent combinations that were tested for normality.
- Non-normal data distributions were noted in 48 of the 112 well-constituent combinations tested for normality.

Data that are normally distributed are evaluated using the 95% confidence interval around the mean (a parametric statistical test). Data that are not normally distributed are adjusted by log-normal transformation prior to being evaluated using the 95% confidence interval around the median (a non-parametric statistical test).

Confidence Interval

The statistical test for confidence interval is recommended in the Unified Guidance and is appropriate for compliance assessment and corrective action monitoring phases. In addition, evaluation of the confidence interval is appropriate when analytical data are compared to a fixed limit such as a regulatory standard. Confidence intervals are a common and statistically defensible way to assess compliance with a fixed numerical limit.

A moving 20 event window of data was evaluated for the 95% confidence interval for each well-constituent pair that had enough data points to apply this statistical method. The moving 20 event window of data adds a new data point with each successive quarter and drops the data from the oldest quarter to maintain a consistent sample population of the most current 20 events of data.

Table 5: December 2017 Shapiro-Wilk Test for Normality Results

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10
Ammonia (N)	Non-Normal	ND	NA	Non-Normal	NA	Non-Normal	Non-Normal
Arsenic - Dissolved	Non-Normal	Non-Normal	Non-Normal	Normal	Normal	Normal	Normal
Barium - Dissolved	Non-Normal	Normal	NA	Non-Normal	NA	Normal	Normal
Bicarbonate	Normal	Non-Normal	NA	Normal	NA	Normal	Normal
Calcium	Normal	Normal	NA	Normal	NA	Normal	Non-Normal
Carbonate	ND	ND	NA	ND	NA	ND	ND
COD	ND	Non-Normal	NA	ND	NA	ND	Non-Normal
Chloride	Normal	Non-Normal	NA	Non-Normal	NA	Non-Normal	Normal
Dissolved Oxygen	Normal	Non-Normal	Normal	Non-Normal	Non-Normal	Normal	Non-Normal
Iron - Dissolved	ND	ND	ND	Normal	ND	Non-Normal	ND
Manganese - Dissolved	ND	Normal	ND	Normal	ND	Normal	Normal
Nitrate	Non-Normal	Non-Normal	NA	Non-Normal	NA	Non-Normal	Non-Normal
Nitrite	Non-Normal	ND	NA	Non-Normal	NA	Non-Normal	Non-Normal
Oxidation-Reduction Potential	Normal	Normal	Normal	Non-Normal	Normal	Non-Normal	Non-Normal
pH - Field	Normal	Normal	Normal	Normal	Normal	Normal	Normal
pH - Laboratory	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Potassium	Non-Normal	Non-Normal	NA	Non-Normal	NA	Non-Normal	Non-Normal
Sodium	Normal	Normal	NA	Normal	NA	Normal	Normal
Specific Conductance	Normal	Normal	Non-Normal	Non-Normal	Normal	Normal	Normal
Sulfate	Normal	Normal	NA	Non-Normal	NA	Normal	Non-Normal
Temperature	Non-Normal	Normal	Normal	Normal	Normal	Normal	Normal
Total Coliform	ND	ND	NA	ND	NA	ND	ND
TOC	ND	Normal	NA	Non-Normal	NA	Normal	Non-Normal
Vinyl Chloride	ND	ND	ND	Non-Normal	ND	Non-Normal	Non-Normal
Zinc - Dissolved	ND	ND	NA	ND	NA	ND	ND

Notes:

ND = Data set has four or fewer quarters with detects and statistical tests cannot be performed.

NA = Not analyzed per the SWHP

Confidence interval results for December 2017 are compared to Washington State Drinking Water and Groundwater Quality Standards and are summarized in Table 6. Confidence interval summaries for all four quarters of 2017 are presented in Appendix C. Exceedance of a regulatory standard is triggered when the lower 95% confidence interval is greater than the regulatory standard. Exceedances are highlighted in red on Table 6. Successful remediation is attained if the upper 95% confidence limit does not exceed the regulatory standard, which is highlighted in green on Table 6. In some cases, the upper 95% confidence interval exceeds the regulatory standard, but the lower 95% confidence interval does not. This condition is not an exceedance but should be monitored for changes and is highlighted in yellow on Table 6.

Observations regarding the 95% confidence interval results are summarized in the following bullets:

- Sixty-six (66) of the well-constituent combinations evaluated had an insufficient number of detections in the moving five-year window of data to perform the statistical analysis or the constituents are no longer analyzed in samples from wells MW-5A and MW-7 per the SWHP. These well-constituent combinations were not evaluated statistically and are represented as ND (not detected) or NA (not analyzed) in Table 6.
- Confidence intervals were evaluated for remaining 109 well-constituent combinations.
- Eighty-nine (89) of the well-constituent combinations that were statistically evaluated had 95% confidence intervals that did not exceed applicable regulatory standards or have no applicable regulatory standards.
- Sixteen (16) of the well-constituent combinations that were statistically evaluated had lower 95% confidence intervals that were greater than applicable regulatory levels (are exceedances). The exceedances are highlighted red in Table 6 and are summarized in the following bullets:
 - Arsenic: MW-1, MW-3, MW-5A, MW-6, MW-7, MW-8, and MW-10
 - Iron: MW-6 and MW-8
 - Manganese: MW-3, MW-6, MW-8, and MW-10
 - pH (field): MW-1 and MW-3
 - pH (laboratory): MW-3
- Four (4) well-constituent combinations have upper 95% confidence intervals that were greater than (less than in the case of pH) applicable regulatory levels but have lower 95% confidence intervals that are less than applicable regulatory levels. These are not statistical exceedances, but they should be monitored for changes. The well-constituent combinations are highlighted yellow in Table 6 and are summarized in the following bullets:
 - pH (field): MW-5A, MW-6, and MW-10
 - Vinyl Chloride: MW-8

Table 6: December 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10	Regulatory Level	Basis for Comparison
Ammonia (N)	11 to 40	ND to 40	NA	13 to 42	NA	30 to 44	28 to 98	None	
Arsenic - Dissolved	0.103 to 0.085	0.089 to 0.118	0.124 to 0.189	0.894 to 1.10	0.278 to 0.553	1.23 to 1.82	1.81 to 2.78	0.05 µg/L	Primary GW Standard
Barium - Dissolved	4.4 to 5.0	12.7 to 15.7	NA	8.0 to 15	NA	6.7 to 8.6	12.8 to 15.5	1000 µg/L	Primary GW Standard
Bicarbonate (mg of CaCO ₃ /L)	36.7 to 46.9	102 to 160	NA	101 to 148	NA	86.0 to 121	147 to 177	None	
Calcium	10,607 to 11,479	36,858 to 47,090	NA	26,168 to 34,542	NA	19,785 to 25,175	35,300 to 40,300	None	
Carbonate (mg of CaCO ₃ /L)	ND	ND	NA	ND	NA	ND	ND	None	
COD	ND	ND	NA	ND	NA	ND	ND to 13.0	None	
Chloride	3,759 to 4,766	2,840 to 3,510	NA	1,800 to 2,570	NA	2,000 to 2,440	5,076 to 8,078	250,000 µg/L	Secondary GW and DW Standard
Dissolved Oxygen (mg/L)	9.57 to 10.2	0.36 to 1.16	7.67 to 11.1	0.20 to 0.43	6.50 to 9.68	0.94 to 2.20	0.15 to 0.47	None	
Iron - Dissolved	ND	ND	ND	832 to 1,250	ND	320 to 549	ND	300 µg/L	Secondary GW and DW Standard
Manganese - Dissolved	ND	3,726 to 5,143	ND	553 to 691	ND	2,261 to 3,092	4,331 to 4,979	50 µg/L	Secondary GW and DW Standard
Nitrate	232 to 703	ND to 28	NA	ND to 20	NA	20 to 142	ND to 82	10,000 µg/L	Primary GW and DW Standard
Nitrite	ND to 3	ND	NA	ND to 3	NA	ND to 3	ND	1,000 µg/L	Primary DW Standard
Oxidation-Reduction Potential	151 to 208	130 to 224	79 to 178	ND to 34.9	65.0 to 121	38.3 to 52.6	57.1 to 135	None	
pH - Field	6.1 to 6.4	6.0 to 6.2	6.4 to 6.7	6.5 to 6.7	6.6 to 6.8	6.5 to 6.7	6.4 to 6.6	6.5 - 8.5	Secondary GW Standard
pH - Laboratory	6.4 to 6.6	6.2 to 6.4	6.5 to 6.8	6.6 to 6.8	6.5 to 6.9	6.6 to 6.8	6.6 to 6.7	6.5 - 8.5	Secondary GW Standard

Table 6: December 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10	Regulatory Level	Basis for Comparison
Potassium	ND to 641	ND to 835	NA	565 to 1,310	NA	600 to 993	735 to 1,200	None	
Sodium	4,389 to 4,683	8,249 to 9,542	NA	6,829 to 7,996	NA	7,182 to 8,217	8,928 to 10,458	20,000 µg/L	Secondary DW Standard
Specific Conductance (µmhos/cm)	119 to 127	318 to 399	111 to 146	201 to 343	99 to 106	192 to 241	360 to 411	700 µmhos/cm	Secondary DW Standard
Sulfate	3,870 to 4,327	13,625 to 18,509	NA	6,490 to 10,200	NA	4,108 to 4,880	7,630 to 15,200	250,000 µg/L	Secondary GW and DW Standard
Temperature (°C)	10.8 to 12.4	11.7 to 12.6	10.6 to 13.0	11.4 to 12.2	9.18 to 11.7	10.7 to 11.8	11.0 to 11.9	None	
Total Coliform (count)	ND	ND	NA	ND	NA	ND	ND	1/100mL	Primary GW and DW Standard
TOC	ND	2,338 to 3,010	NA	1,510 to 2,140	NA	732 to 1,111	2,870 to 3,400	None	
Vinyl Chloride	ND	ND	ND	ND	ND	ND to 0.04	ND	0.02 µg/L	Primary GW Standard
Zinc - Dissolved	ND	ND	NA	ND	NA	ND	ND	5,000 µg/L	Secondary GW and DW Standard

Notes:


All concentrations reported as µg/L unless otherwise noted.

NA = Not analyzed per the SWHP

ND = Data all non-detects or 4 or fewer detections

 = 95% Lower CI Exceeds Regulatory Level (Exceedence)

 = 95% Upper CI Exceeds Regulatory Level but Lower CI Does Not (No Exceedence, No Compliance)

 = 95% Upper CI Does not Exceed Regulatory Level (No Exceedence)

 = No Regulatory Level

Normally Distributed Data - Parametric Confidence Interval - Data not Transformed

Non-Normally Distributed Data - Non-Parametric Confidence Interval - Log Base-10 Transformed Data

Non-Detects treated as 0

CONCLUSIONS

Quarterly monitoring data collected during 2017 at the Olalla Landfill are summarized in the following sections.

Landfill Gas Data

Landfill gas field measurements were performed at the three onsite passive flares during the four quarterly monitoring events in 2017. Landfill gas data for all four quarterly monitoring events are included in Appendix A and are summarized in the following sections.

March 8, 2017 - First Quarter

None of the three flares had measurable concentrations of methane; however, Flare 1 and Flare 3 had low concentrations of carbon dioxide at 1.5% and 0.2% by volume, respectively. Oxygen concentration were at or near ambient and ranged from 20.0% to 21.2% by volume, indicating little to no influence from landfill gas in any of the wells.

Gas pressure measurements ranged from 0.0 to 0.01 inches of water. The very low gas pressure readings from all three flares indicate a very limited potential for landfill gas flow from the flares.

Weather station data from the Bremerton Airport (station KPWT) indicate that barometric pressure increased from of 29.97 inches of mercury on March 7, 2017 to 30.14 inches of mercury on March 8, 2017, the day that the flares were measured (source Weather Underground, 2017). This increase in barometric pressure likely contributed to the lack of landfill gas indicators and low to unmeasurable pressure noted in all three flares.

June 20, 2017 - Second Quarter

None of the three flares had measurable concentrations of methane and oxygen concentrations were at ambient or near ambient levels ranging from 19.19% to 20.8% by volume. Flares 1 and 2 had detectable carbon dioxide concentrations of 0.2% by volume in both flares, indicating an influence of the biodegradation of organics.

Gas pressure measurements ranged from 0.01 to 0.02 inches of water. These low gas pressure readings from all three flares indicate a low potential for landfill gas flow from the flares.

Weather station data from the Bremerton Airport indicate that barometric pressure increased from of 30.08 inches of mercury on June 19, 2017, the day before the monitoring event, to 30.14 inches of mercury on June 20, 2017, the day that the flares were measured (source Weather Underground, 2017). This increase in barometric pressure likely contributed to the lack of landfill gas indicators and low to unmeasurable pressure noted in all three flares.

September 12, 2017 - Third Quarter

Methane was not detected in all Flares 1 and 3 and oxygen concentrations in those flares were 20.1% by volume, which is representative of ambient conditions. In Flare 2, the methane concentration was 3.1% by volume, oxygen was at 2.1% by volume, and carbon dioxide was at 10.5% by volume. The presence of methane and carbon dioxide combination with a significantly depressed oxygen concentration indicates the presence of landfill gas Flare 2 during this monitoring event.

Gas pressure measurements ranged from 0.01 to 0.02 inches of water. The low gas pressure readings in all three flares indicate a low potential for landfill gas flow from the flares.

Weather station data from the Bremerton Airport indicate that barometric pressure decreased from 30.17 inches of mercury on September 11, 2017, the day before the monitoring event, to 30.03 inches of mercury on September 12, 2017, the day the flares were measured (source Weather Underground, Station KPWT, 2017). This decrease in barometric pressure likely contributed to the measurable concentrations of landfill gas indicators in Flare 2.

December 19, 2017 - Fourth Quarter

All three flares had measurable concentrations of methane and carbon dioxide and also exhibited depleted oxygen concentrations. Measured methane concentrations ranged from 2.4% to 26.2% by volume, carbon dioxide concentrations ranged from 1.8% to 15.3% by volume, and oxygen concentrations ranged from 0.2% to 16.2% by volume. These measured gas concentrations indicate influence of the biodegradation of organics.

Gas pressure measurements ranged from 0.02 to 0.10 inches of water. The low gas pressure readings in all three flares indicate a low potential for landfill gas flow from the flares.

Weather station data from Bremerton Airport (Station KPWT) indicate that barometric pressure decreased significantly from 30.09 inches of mercury on December 18, 2017 to 29.64 inches of mercury on December 19, 2017, the day that flare measurements were made (Weather Underground, 2018). The decreasing barometric pressure the day of the measurement event likely contributed to landfill gas being expelled from the subsurface at the time of the monitoring event.

Groundwater Elevation and Flow Direction Data

The groundwater flow direction beneath the Landfill is generally toward the northwest, with groundwater from beneath the Landfill flowing toward downgradient wells MW-3, MW-6, MW-8, and MW-10 as depicted in the quarterly groundwater elevation contour and flow direction figures presented in Attachment A. The groundwater flow directions and elevation contour patterns are consistent with historical groundwater elevation data from the Landfill.

The lowest calculated groundwater gradient among the four quarters of 2017 occurred in March with a horizontal gradient of 0.0114. The resulting calculated groundwater flow velocity is 1.77 ft./day. Groundwater gradients and calculated groundwater velocities were greatest during June, which had a horizontal gradient of 0.0182 and a calculated flow velocity of 2.84 ft./day.

Exceedances of Primary Regulatory Standards

Upgradient Well (MW-1)

Arsenic

- Groundwater samples collected from MW-1 during the four quarterly monitoring events of 2017 had arsenic concentrations of 0.09 µg/L, 0.11 µg/L, 0.10 µg/L, and 0.12 µg/L March, June, September, and December, respectively. Arsenic concentrations exceed the Washington State Groundwater Primary Standard of 0.05 µg/L in samples from MW-1 during all four quarters. Arsenic concentrations in the samples from MW-1 were significantly less than both the Washington State Drinking Water Primary Standard of 10 µg/L and the site-specific Cleanup Level of 1.29 µg/L.
- The presence of arsenic at concentrations greater than the Washington State Groundwater Primary Standard in samples from upgradient well MW-1 is an indication that dissolution of naturally-occurring arsenic in soil contributes to the arsenic concentrations noted in groundwater data from other wells at the Landfill.

Cross-Gradient Wells (MW-5A and MW-7)

Arsenic

MW-5A, MW-7

- Per the SWHP and CMP, cross-gradient wells MW-5A and MW-7 were not sampled during the first three quarterly monitoring events. Groundwater samples collected from MW-5A and MW-7 during the December monitoring event had arsenic concentrations of 0.20 µg/L and 0.35 µg/L, respectively. These concentrations exceed the Washington State Groundwater Primary Standard of 0.05 µg/L but are less than both the Washington State Drinking Water Primary Standard of 10 µg/L and the site-specific Cleanup Level of 1.29 µg/L.
- The presence of arsenic at concentrations greater than the Washington State Groundwater Primary Standard in samples from cross-gradient wells MW-5A and MW-7 is an indication that dissolution of naturally occurring arsenic in soil contributes to the arsenic concentrations noted in groundwater data from other wells at the Landfill.

Downgradient Wells (MW-3, MW-6, MW-8, and MW-10)

Arsenic

MW-3, MW-6, MW-8, and MW-10

- Groundwater samples from downgradient monitoring wells had arsenic concentrations exceeding the Washington State Groundwater Primary Standard of 0.05 µg/L during the four quarterly events in 2017. None of the arsenic concentrations detected during 2017 exceed the Washington State Drinking Water Primary Standard of 10 µg/L. Some samples from MW-6, MW-8, and MW-10 exceeded the site-specific Cleanup Level of 1.29 µg/L. Arsenic concentrations for specific wells are summarized in the following bullets:
 - MW-3 had arsenic concentrations of 0.10 µg/L, 0.10 µg/L, 0.19 µg/L, and 0.13 µg/L in March, June, September, and December, respectively. Arsenic concentrations in samples from MW-3 exhibit an increasing trend as noted in Table 4.

- MW-6 had arsenic concentrations of 0.84 µg/L, 1.17 µg/L, 1.37 µg/L, and 1.18 µg/L in March, June, September, and December, respectively. Arsenic concentrations in samples from MW-6 exhibit an increasing trend as noted in Table 4.
- MW-8 had arsenic concentrations of 1.49 µg/L, 2.66 µg/L, 2.28 µg/L, and 2.38 µg/L in March, June, September, and December, respectively. Arsenic concentrations in samples from MW-8 exhibit an increasing trend as noted in Table 4.
- MW-10 had arsenic concentrations of 1.06 µg/L, 1.55 µg/L, 1.64 µg/L, and 1.55 µg/L in March, June, September, and December, respectively. Arsenic concentrations in samples from MW-10 exhibit a decreasing trend as noted in Table 4.

Total Coliform

MW-6

- Total coliform was detected at a count of 11 colony forming units (cfu) per 100 milliliters (mL) in the June sample from MW-6. This count is greater than the Washington State Drinking Water and Groundwater Primary Standards of 1 cfu per 100 mL.

Vinyl Chloride

MW-6, MW-8 and MW-10

- Vinyl chloride was detected at concentrations greater than the Washington State Groundwater Primary Standard of 0.02 µg/L in samples from MW-6, MW-8, and MW-10 in at least one quarter of 2017. However, none of the detected concentrations of vinyl chloride exceeded the Washington State Drinking Water Primary Standard of 2.0 µg/L or the site-specific Cleanup Level of 0.29 µg/L. Vinyl chloride concentrations for specific wells are summarized in the following bullets:
 - MW-6 had a vinyl chloride concentration of 0.033 µg/L in December.
 - Vinyl chloride was detected in samples from MW-8 at concentrations of 0.071 µg/L, 0.060 µg/L, 0.029 µg/L, and 0.060 µg/L in March, June, September, and December, respectively.
 - MW-10 had a vinyl chloride concentration of 0.0227 µg/L in March.
- Vinyl chloride was not detected in samples from downgradient well MW-3 during any of the four quarterly monitoring events of 2017.

Exceedances of Secondary Regulatory Standards

Upgradient Well (MW-1)

pH (field-measured)

- Groundwater purged from well MW-1 had field-measured pH values of 5.5 and 6.4 during the June and September monitoring events, respectively. These values are lower than the lower limit of the 6.5 to 8.5 range for the Washington State Groundwater Secondary Standard.

pH (laboratory-measured)

- Groundwater samples from well MW-1 had laboratory-measured pH values of 6.3, 6.3, 6.4, and 6.4 during the March, June, September, and December monitoring events, respectively. These values are lower than the lower limit of 6.5 for the Washington State Groundwater Secondary

Standard. There is a statistically significant downward trend in laboratory-measured pH values for MW-1 as noted in Table 4.

Cross-gradient Wells (MW-5A and MW-7)

pH (laboratory-measured)

- Groundwater samples from cross-gradient wells MW-5A and MW-7 had laboratory-measured pH values of 6.4 in samples from both wells during the December monitoring event. These values are lower than the lower limit of 6.5 for the Washington State Groundwater Secondary Standard.

Downgradient Wells (MW-3, MW-6, MW-8, and MW-10)

Iron

MW-6 and MW-8

- Iron is a common constituent in landfill leachate and iron concentrations in groundwater samples from downgradient wells MW-6 and MW-8 exceeded the Washington State Drinking Water Secondary Standard and Groundwater Secondary Standard of 300 µg/L during all four quarterly monitoring events in 2017 as summarized below
 - MW-6 had iron concentrations of 581 µg/L, 965 µg/L, 1,240 µg/L, and 978 µg/L for the March, June, September, and December sampling events, respectively. Iron concentrations in samples from MW-6 have generally visually decreased on the time series graph but exhibit no statistical trend in the more recent data.
 - MW-8 had iron concentrations of 549 µg/L, 1,480 µg/L, 336 µg/L, and 1,460 µg/L for the March, June, September, and December sampling events, respectively.

Manganese

MW-3, MW-6, MW-8, and MW-10

- Manganese is a common constituent of landfill leachate and manganese concentrations in groundwater samples from downgradient wells MW-3, MW-6, MW-8, and MW-10 exceeded the Washington State Drinking Water Secondary Standard and Groundwater Secondary Standard of 50 µg/L during all four quarterly monitoring events in 2017 as summarized below.
 - MW-3 had manganese concentrations of 5,210 µg/L, 4,320 µg/L, 8,110 µg/L, and 7,650 µg/L for the March, June, September, and December sampling events, respectively. Manganese concentrations in samples from MW-3 exhibit a statistically significant increasing trend as noted in Table 4.
 - MW-6 had manganese concentrations of 500 µg/L, 1,050 µg/L, 778 µg/L, and 731 µg/L for the March, June, September, and December sampling events, respectively. Manganese concentrations have generally decreased in samples from well MW-6 since peaking in 1997 but exhibit no statistical trend in the more recent data.
 - MW-8 had manganese concentrations of 2,320 µg/L, 3,700 µg/L, 2,590 µg/L, and 3,570 µg/L for the March, June, September, and December sampling events, respectively.
 - MW-10 had manganese concentrations of 5,150 µg/L, 5,660 µg/L, 3,950 µg/L, and 4,470 µg/L for the March, June, September, and December sampling events, respectively.

pH (field-measured)

MW-3, MW-6, MW-8, and MW-10

- Purge water from downgradient monitoring wells MW-3, MW-6, MW-8, and MW-10 had field-measured pH values of less than the lower limit of the 6.5 to 8.5 range of the Washington State Groundwater Secondary Standard during at least one quarterly event in 2017 as summarized below.
 - MW-3 had field-measured pH values of 6.2, 5.5, 6.2, and 6.4 in March, June, September, and December, respectively.
 - MW-6 had field-measured pH values of 6.4 in both June and September.
 - MW-8 had a field-measured pH of 6.3 in June.
 - MW-10 had a field-measured pH of 6.2 in June.

pH (laboratory-measured)

MW-3, MW-6, MW-8, and MW-10

- Purge water from downgradient monitoring wells MW-3, MW-6, MW-8, and MW-10 had laboratory-measured pH values of less than the lower limit of the 6.5 to 8.5 range of the Washington State Groundwater Secondary Standard during at least one quarterly event in 2017 as summarized below. There are statistically significant downward trends in laboratory pH values for samples from all four downgradient wells as noted in Table 4.
 - MW-3 had laboratory-measured pH values of 6.1, 6.1, 6.2, and 6.3 in March, June, September, and December, respectively.
 - MW-6 had a laboratory-measured pH value of 6.4 in September.
 - MW-8 had a laboratory-measured pH value of 6.2 in March.
 - MW-10 had laboratory-measured pH values of 6.4 in both March and June.

Analytical Tests for Volatile Organic Compounds

This section lists and describes detections of additional VOC constituents in groundwater samples from the Landfill monitoring well network. The VOC detections listed in this section are at concentrations less than applicable Washington State Drinking Water Standards or Washington State Groundwater Quality Standards or are for VOCs that do not have applicable groundwater standards.

- Chlorobenzene was detected in samples from MW-6 at concentrations of 2.37 µg/L, 2.13 µg/L, 1.76 µg/L, and 2.28 µg/L in March, June, September, and December, respectively. These concentrations are significantly less than the Washington State Drinking Water Standard of 100 µg/L. There is no Washington State Groundwater Standard for chlorobenzene.
- Cis-1,2-Dichloroethene was detected in samples from MW-8 at concentrations of 0.67 µg/L, 0.61 µg/L, 0.40 µg/L, and 0.52 µg/L in March, June, September, and December, respectively. These concentrations are significantly less than the Washington State Drinking Water Standard of 70 µg/L. There is no Washington State Groundwater Standard for cis-1,2-dichloroethene.

- The VOC 4-isopropyltoluene, which is a common component of paints, was detected in all samples from the June 2017 monitoring event at concentrations ranging from 0.22 µg/L to 0.43 µg/L. Because 4-isopropyltoluene was only detected during this event and was detected in all samples, including the field duplicate and trip blank samples, it is likely a laboratory contaminant and not representative of groundwater from the landfill. The 4-isopropyltoluene concentration in the trip blank sample was 0.68 µg/L. There are no Washington State Drinking Water or Groundwater Standards for 4-isopropyltoluene.

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- Parametrix, Inc., 2014a. Olalla Landfill Remedial Investigation/Feasibility Study. Prepared for Kitsap County Department of Public Works. May 2014.
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Appendix A:
2017 Quarterly Monitoring Data

Landfill Gas Data
Groundwater Elevations and Contour Maps
Groundwater Quality Data

**Olalla Landfill
2017 Landfill Gas Data**

March 8, 2017	Flare #1	Flare #2	Flare #3
METHANE, (% LEL)	0	0	0
METHANE, (% Volume)	0.0	0.0	0.0
OXYGEN, (% Volume)	20.0	21.2	21.2
CARBON DIOXIDE, (% Volume)	1.5	0.0	0.2
PRESSURE (inches of water column)	0.01	0.01	0.00
AMBIENT TEMPERATURE, (°F)	40		

June 20, 2017	Flare #1	Flare #2	Flare #3
METHANE, (% LEL)	0	0	0
METHANE, (% Volume)	0.0	0.0	0.0
OXYGEN, (% Volume)	19.9	20.2	20.8
CARBON DIOXIDE, (% Volume)	0.2	0.2	0.0
PRESSURE (inches of water column)	0.1	0.2	0.01
AMBIENT TEMPERATURE, (°F)	70		

September 12, 2017	Flare #1	Flare #2	Flare #3
METHANE, (% LEL)	0	68	0
METHANE, (% Volume)	0.0	3.1	0.0
OXYGEN, (% Volume)	20.1	2.1	20.1
CARBON DIOXIDE, (% Volume)	0.1	10.5	0.0
PRESSURE (inches of water column)	0.01	0.02	0.01
AMBIENT TEMPERATURE, (°F)	73		

December 19, 2017	Flare #1	Flare #2	Flare #3
METHANE, (% LEL) ^a	78	16	45
METHANE, (% Volume)	16.1	2.4	26.2
OXYGEN, (% Volume)	6.3	16.2	0.2
CARBON DIOXIDE, (% Volume)	9.8	1.8	15.3
PRESSURE (inches of water column)	0.04	0.1	0.02
AMBIENT TEMPERATURE, (°F)	48		

Notes:

^a LEL is the GEM 2000 instrument reading, not a calculated value from the methane % volume measurement.

**Olalla Landfill
2017 Groundwater Elevations**

Station	Reference Elevation*	Depth to Water (feet)	Groundwater Elevation*
March 8, 2017			
MW-1	343.79	75.82	267.97
MW-2	323.25	61.74	261.51
MW-3	296.95	40.65	256.30
MW-4	320.93	58.60	262.33
MW-5A	332.53	72.82	259.71
MW-6	271.17	16.60	254.57
MW-7	280.43	21.93	258.50
MW-8	272.85	17.67	255.18
MW-10	279.21	25.58	253.63

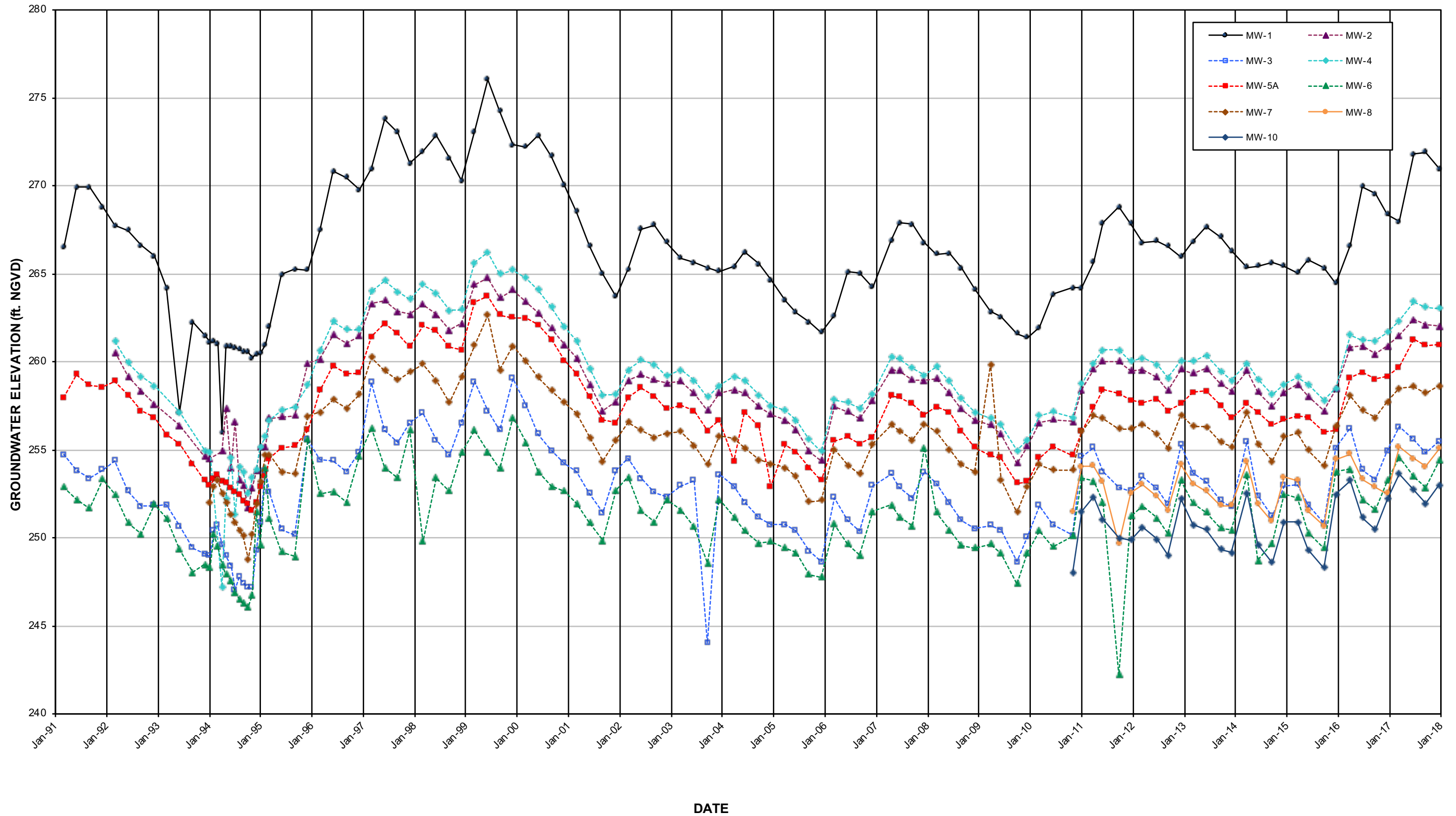
June 20, 2017			
MW-1	343.79	71.98	271.81
MW-2	323.25	60.86	262.39
MW-3	296.95	41.35	255.60
MW-4	320.93	57.50	263.43
MW-5A	332.53	71.24	261.29
MW-6	271.17	17.69	253.48
MW-7	280.43	21.83	258.60
MW-8	272.85	18.35	254.50
MW-10	279.21	26.49	252.72

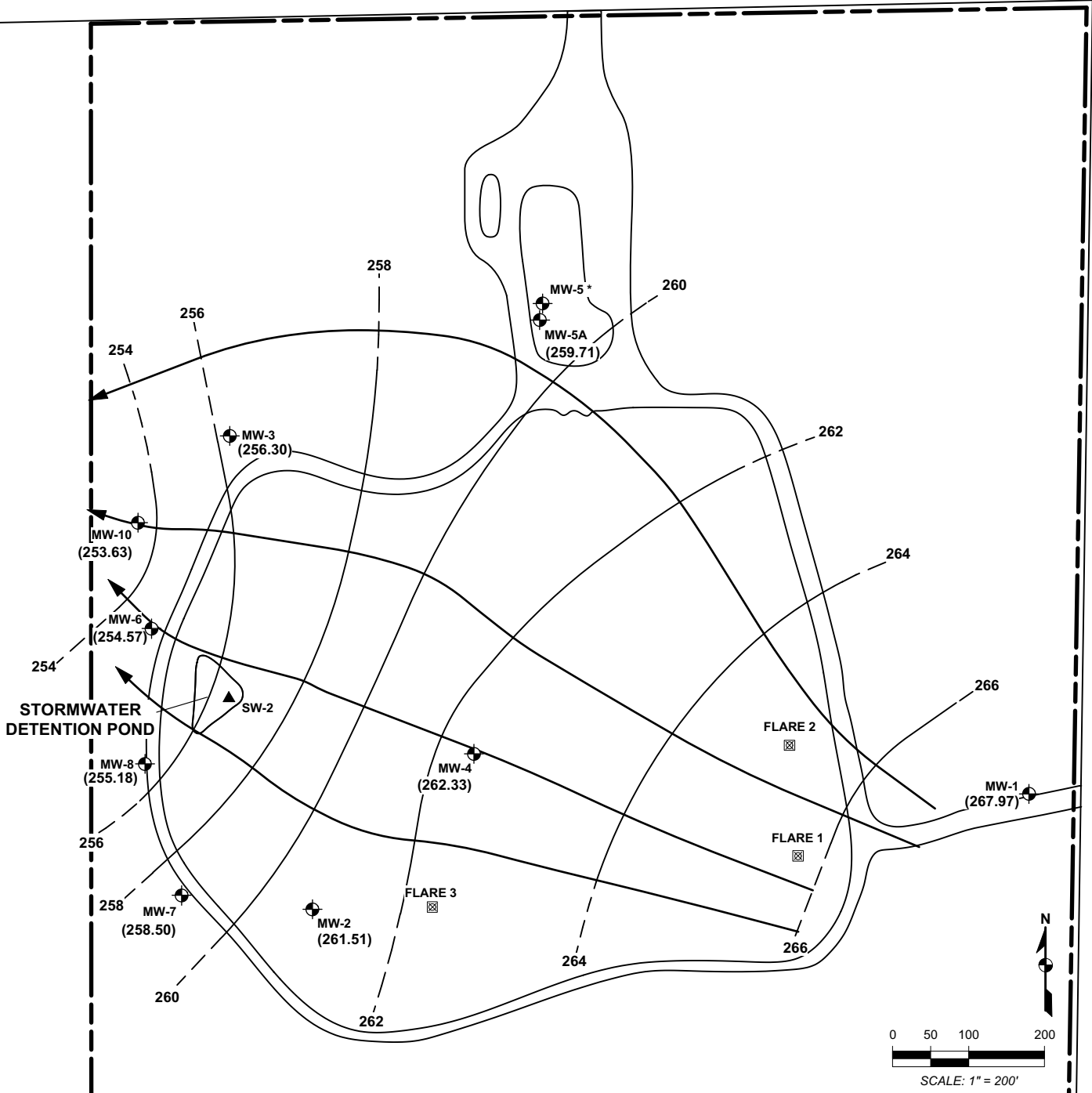
September 12, 2017			
MW-1	343.79	71.89	271.90
MW-2	323.25	61.14	262.11
MW-3	296.95	42.10	254.85
MW-4	320.93	57.82	263.11
MW-5A	332.53	71.60	260.93
MW-6	271.17	18.33	252.84
MW-7	280.43	22.22	258.21
MW-8	272.85	18.81	254.04
MW-10	279.21	27.27	251.94

December 19, 2017			
MW-1	343.79	72.82	270.97
MW-2	323.25	61.22	262.03
MW-3	296.95	41.47	255.48
MW-4	320.93	57.90	263.03
MW-5A	332.53	71.55	260.98
MW-6	271.17	16.76	254.41
MW-7	280.43	21.80	258.63
MW-8	272.85	17.77	255.08
MW-10	279.21	26.20	253.01

*Elevations in Feet NGVD, 29

OLALLA LANDFILL Groundwater Elevations





NOTES:
 * MW-5 IS COMPLETED IN A SHALLOW PERCHED GROUNDWATER ZONE.

MW-2 MONITORING WELL LOCATION

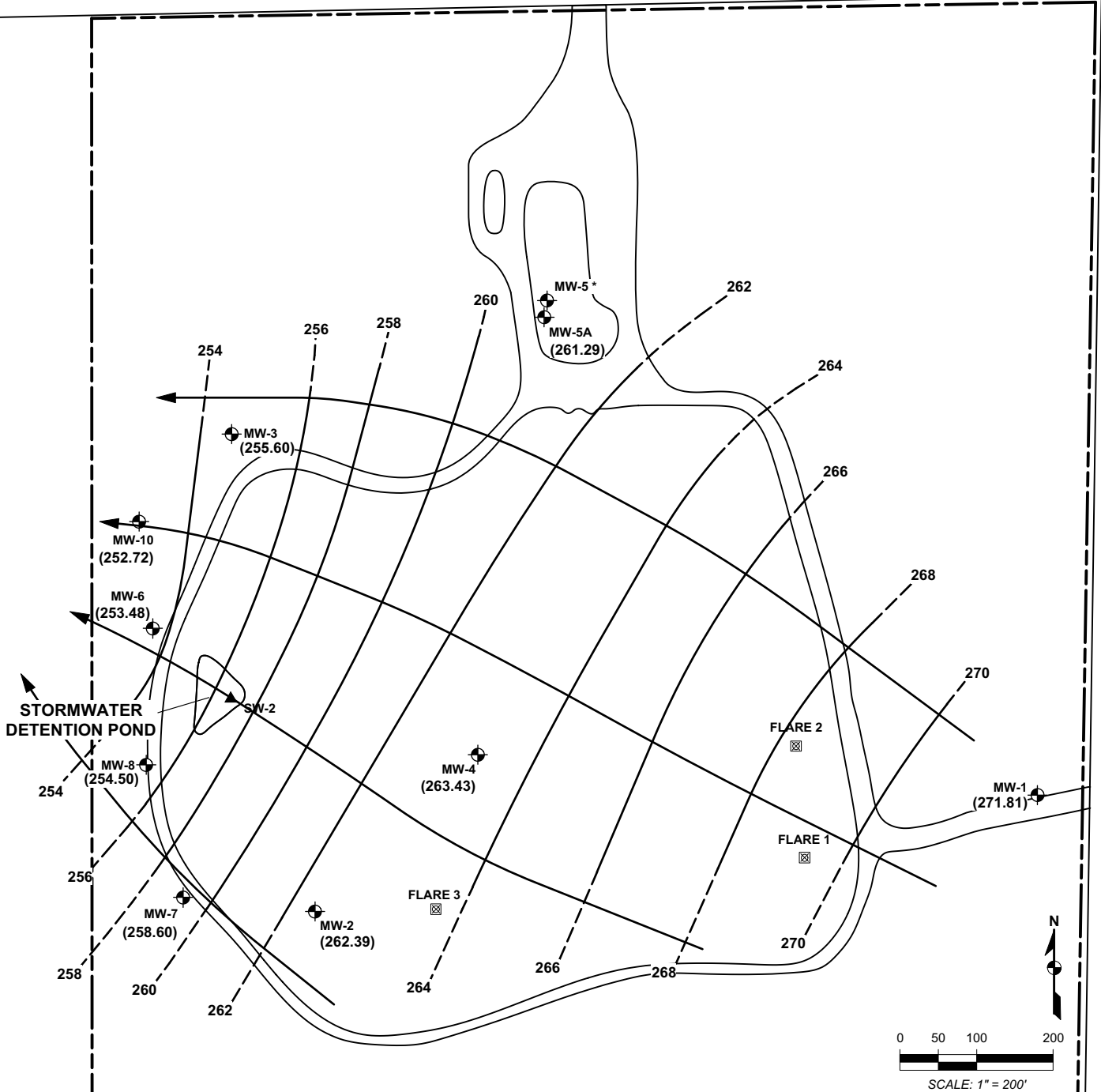
SW-2 SURFACE WATER SAMPLING LOCATION

LANDFILL GAS FLARE

KEY:

- GROUNDWATER ELEVATION CONTOUR
- INFERRED GROUNDWATER FLOW PATH
- APPROXIMATE PROPERTY BOUNDARY
- PERIMETER ACCESS ROAD

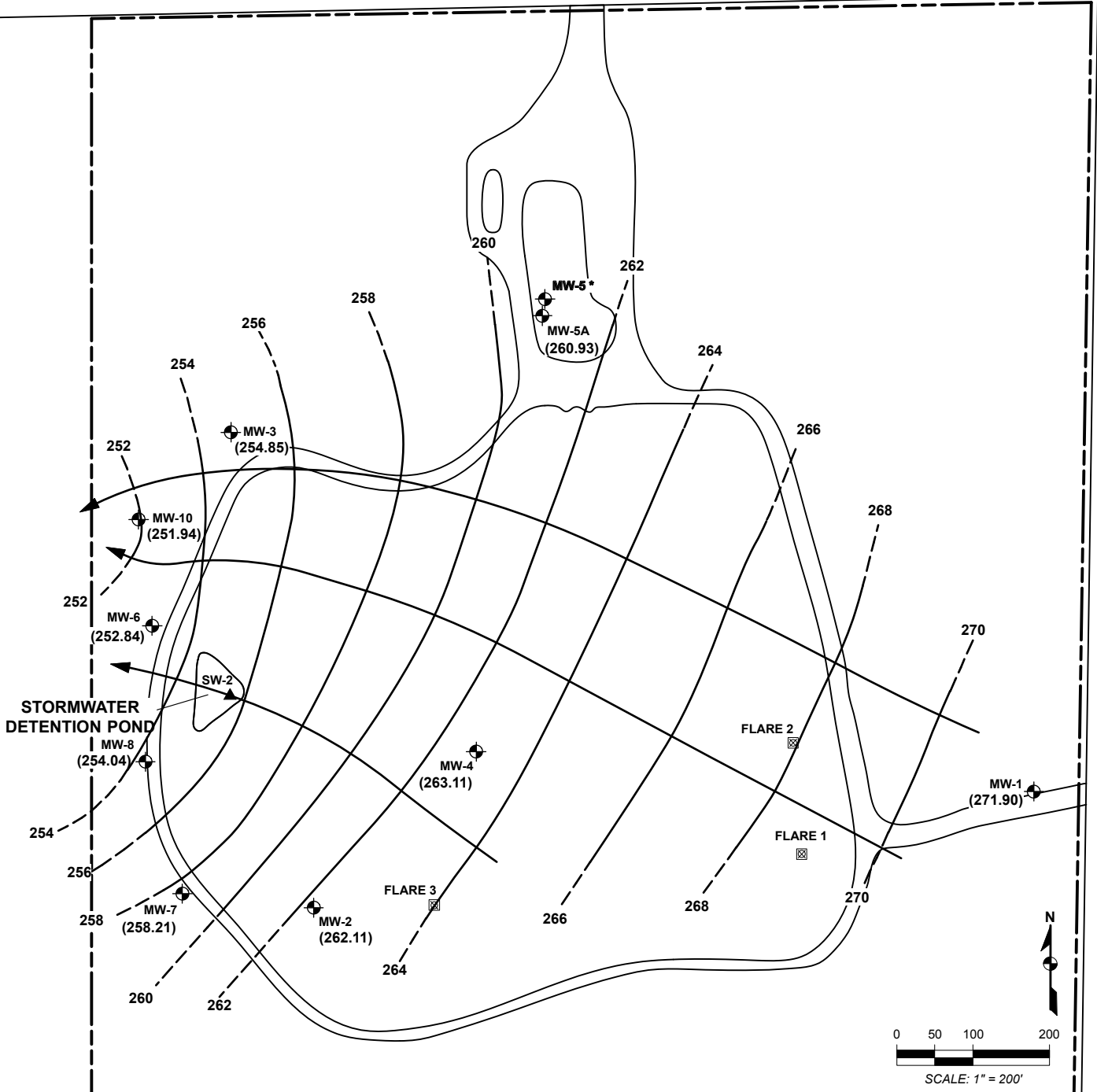
OLALLA LANDFILL GROUNDWATER ELEVATION CONTOUR MAP - MARCH 8, 2017			
PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	2017 ANNUAL MONITORING REPORT		
LOCATION	OLALLA LANDFILL KITSAP COUNTY, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
4/10/17	VPB	DCK	45404.0



- NOTES:**
- * MW-5 IS COMPLETED IN A SHALLOW PERCHED GROUNDWATER ZONE.
- KEY:**
- MW-2 MONITORING WELL LOCATION
 - SW-2 SURFACE WATER SAMPLING LOCATION
 - LANDFILL GAS FLARE
 - GROUNDWATER ELEVATION CONTOUR
 - INFERRED GROUNDWATER FLOW PATH
 - APPROXIMATE PROPERTY BOUNDARY
 - PERIMETER ACCESS ROAD

**OLALLA LANDFILL GROUNDWATER
ELEVATION CONTOUR MAP - JUNE 20, 2017**

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	2017 ANNUAL MONITORING REPORT		
LOCATION	OLALLA LANDFILL KITSAP COUNTY, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE 6/27/17	DRAWN BY VPB	REVIEWED BY DCK	PROJECT NUMBER 45406.0



NOTES:
 * MW-5 IS COMPLETED IN A SHALLOW PERCHED GROUNDWATER ZONE.

MW-2 MONITORING WELL LOCATION

SW-2 SURFACE WATER SAMPLING LOCATION

LANDFILL GAS FLARE

KEY:

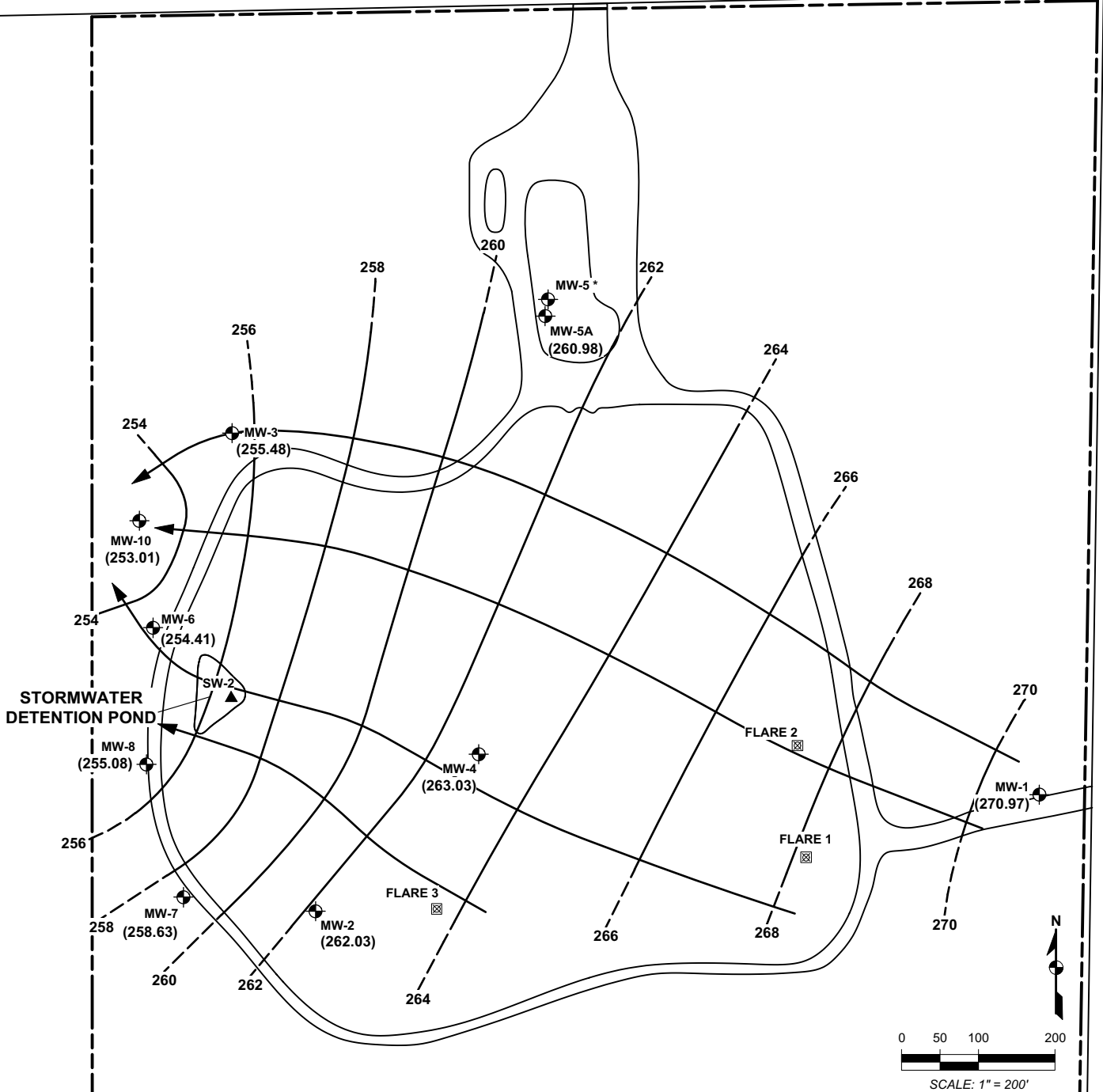
GROUNDWATER ELEVATION CONTOUR

INFERRED GROUNDWATER FLOW PATH

APPROXIMATE PROPERTY BOUNDARY




PERIMETER ACCESS ROAD





OLALLA LANDFILL GROUNDWATER ELEVATION CONTOUR MAP - SEPTEMBER 12, 2017			
PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	2017 ANNUAL MONITORING REPORT		
LOCATION	OLALLA LANDFILL KITSAP COUNTY, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
10/18/17	AM/VPB	DCK	45406.0




NOTES:

* MW-5 IS COMPLETED IN A SHALLOW PERCHED GROUNDWATER ZONE.

- MW-2  MONITORING WELL LOCATION
- SW-2  SURFACE WATER SAMPLING LOCATION
-  LANDFILL GAS FLARE

- KEY:**
-  GROUNDWATER ELEVATION CONTOUR
 -  INFERRED GROUNDWATER FLOW PATH
 -  APPROXIMATE PROPERTY BOUNDARY
 -  PERIMETER ACCESS ROAD

OLALLA LANDFILL GROUNDWATER ELEVATION CONTOUR MAP - DECEMBER 19, 2017

PREPARED BY	 ENVIRONMENTAL PARTNERS INC		
REPORT	2017 ANNUAL MONITORING REPORT		
LOCATION	OLALLA LANDFILL KITSAP COUNTY, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
10/18/17	AM/VPB	DCK	45406.0

Groundwater Quality Data
March 2017 Quarterly Monitoring Event
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	State Drinking Water Standards (a)	State Ground- water Standards (b)	Units	MW-1	MW-3	MW-6	MW-8	MW-10	SW-2	MW-9 (FD)
CONVENTIONALS										
ALKALINITY	----	----	mg/L	44.5	165	139	164	228	20.2	147
AMMONIA NITROGEN	----	----	mg/L	0.040 U	0.040 U	0.040 U	0.040 U	0.094	NA	0.040 U
BICARBONATE	----	----	mg/L	44.5	165	139	164	228	20.2	147
CARBONATE	----	----	mg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CHEMICAL OXYGEN DEMAND	----	----	mg/L	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	NA	10.0 U
CHLORIDE	250**	250**	mg/L	2.68	2.68	3.38	2.33	9.53	1.0 U	2.59
DISSOLVED OXYGEN	----	----	mg/L	10.25	0.10	0.03	3.08	0.03	NA	NA
NITRATE NITROGEN	10*	10*	mg/L	1.62	0.020 U	0.020	0.084	0.020 U	0.020 U	0.020 U
NITRITE NITROGEN	1*	----	mg/L	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
ORP	----	----	mV	257.5	233.9	10.8	72.5	127.6	NA	NA
pH (field)	----	6.5-8.5**	-log H+	6.5	6.2	6.7	6.7	6.5	NA	NA
pH (laboratory)	----	6.5-8.5**	-log H+	6.3	6.1	6.6	6.2	6.4	7.0	6.6
SPECIFIC CONDUCTANCE	700**	----	umhos/cm	110	325	267	274	438	NA	NA
SULFATE	250**	250**	mg/L	3.25	15.0	6.49	5.02	9.37	3.4	14.7
TEMPERATURE	----	----	°C	10.8	11.7	11.8	10.8	11.6	NA	NA
FECAL COLIFORM	----	----	cfu/100 mL	NA	NA	NA	NA	NA	1 U	NA
TOTAL COLIFORM	1/100 mL*	1/100 mL*	cfu/100 mL	1 U	1 U	1 U	1 U	1 U	NA	1 U
TOTAL ORGANIC CARBON	----	----	mg/L	0.5 U	2.40	1.51	1.16	3.63	NA	2.34
TURBIDITY	----	----	NTU	2.2	0.1	4.4	3.2	0.2	NA	NA
DISSOLVED METALS										
ARSENIC	10*	0.05*	µg/L	0.09	0.10	0.84	1.49	1.06	NA	0.10
BARIUM	2,000*	1,000*	µg/L	3.0 U	11.7	10.8	6.4	16.5	NA	12.0
CALCIUM	----	----	mg/L	8.87	33.7	23.0	28.7	39.4	NA	31.7
IRON	300**	300**	µg/L	20 U	20 U	581	549	20 U	NA	20 U
MANGANESE	50**	50**	µg/L	1.0 U	5,210	500	2,320	5,150	NA	5,150
POTASSIUM	----	----	mg/L	0.64	0.81	1.11	0.99	1.3	NA	0.81
SODIUM	20***	----	mg/L	4.39	8.40	5.86	8.51	10.7	NA	8.17
ZINC	5,000**	5,000**	µg/L	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	NA	4.0 U
VOLATILE ORGANIC COMPOUNDS										
VINYL CHLORIDE	2*	0.02*	µg/L	0.02 U	0.02 U	0.02 U	0.071	0.0227	0.02 U	0.02 U

Notes:

Concentration exceeds Washington State Drinking Water or Groundwater Standards
 FD = Field Duplicate of MW-3 was labeled MW-9.
 NA = Not Analyzed

Regulatory Standards:

- (a) WAC 246-290-310
 - (b) WAC 173-200-040
 - (c) WAC 173-201A-200 - Nitrate and Nitrite Standards noted are for Class AA water. Fecal coliform standard is 100/100mL for Primary Contact Re
- The appropriate class of water for the detention pond has not been established.

* Primary Standard

** Secondary Standard

*** Recommended level of concern for consumers with restricted daily sodium intake.

Data Qualifiers:

U = Indicates compound was analyzed for, but not detected at the specified detection limit.
 J = Estimated value - Compound positively identified, but below specified detection limit.

Groundwater Quality Data
March 2017 Quarterly Monitoring Event

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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-9 (FD)
	Drinking Water Standards (a)	Groundwater Standards (b)							
1,1,1,2-TETRACHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-TRICHLOROETHANE	200	200	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-TETRACHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-TRICHLOROETHANE	5	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHANE	----	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHENE	7	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROPROPENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-TRICHLOROBENZENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	70	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRIMETHYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DIBROMO-3-CHLOROPROPANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	600	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROETHANE	5	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROPROPANE	5	0.6	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-TRIMETHYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROPROPANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-DICHLOROBENZENE	75	4	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-DICHLOROPROPANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-BUTANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYLVINYLETHER	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
2-CHLOROTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-HEXANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
4-CHLOROTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-ISOPROPYLTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-METHYL-2-PANTANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACROLEIN	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACRYLONITRILE	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
BENZENE	5	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOCHLOROMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOFORM	----	5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOMETHANE	----	----	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CARBON DISULFIDE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CARBON TETRACHLORIDE	5	0.3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CFC-113	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROBENZENE	100	----	µg/L	0.2 U	0.2 U	2.37	0.2 U	0.2 U	0.2 U
CHLOROBROMOMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLORODIBROMOMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROFORM	----	7	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROMETHANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	70	----	µg/L	0.2 U	0.2 U	0.2 U	0.67	0.2 U	0.2 U

Groundwater Quality Data
March 2017 Quarterly Monitoring Event
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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-9 (FD)
	Drinking Water Standards (a)	Groundwater Standards (b)							
CIS-1,3-DICHLOROPROPENE	----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DIBROMOETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DICHLOROBROMOMETHANE	----	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLBENZENE	700	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLENE DIBROMIDE	----	0.001	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
HEXACHLOROBUTADIENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
ISOPROPYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
METHYLENE CHLORIDE	5	5	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
M & P-XYLENE	10	----	µg/L	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
NAPHTHALENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
N-PROPYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
O-XYLENE	10	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SEC-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
STYRENE	100	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TERT-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TETRACHLOROETHENE	5	0.8	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TOLUENE	1000	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,2-DICHLOROETHENE	100	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,3-DICHLOROPROPENE	----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,4-DICHLORO-2-BUTENE			µg/L	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	5	3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRICHLOROFLUOROMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL ACETATE			µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL CHLORIDE	2	0.02	µg/L	0.02 U	0.02 U	0.02 U	0.071	0.023	0.02 U

Notes: [Redacted] Concentration exceeds State Drinking Water Standards or Groundwater Standards
FD = Field Duplicate of MW-3 was labeled MW-9.

Regulatory Standards:

All regulatory standards listed for VOCs are Primary Regulatory Standards

(a) WAC 246-290-310

(b) WAC 173-200-040

Data Qualifiers:

U = Indicates compound was analyzed for but was not detected at the specified detection limit.

Groundwater Quality Data
June 2017 Quarterly Monitoring Event
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	State Drinking Water Standards (a)	State Ground- water Standards (b)	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-17 (FD)
CONVENTIONALS									
ALKALINITY	----	----	mg/L	48.8	105	171	157	225	174
AMMONIA NITROGEN	----	----	mg/L	0.040 U	0.040 U	0.040 U	0.042	0.087	0.040 U
BICARBONATE	----	----	mg/L	48.8	105	171	157	225	174
CARBONATE	----	----	mg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CHEMICAL OXYGEN DEMAND	----	----	mg/L	10.0 U	10.0 U	10.0 U	10.0 U	13.4	10.0 U
CHLORIDE	250**	250**	mg/L	3.82	3.51	1.95	3.23	7.97	1.91
DISSOLVED OXYGEN	----	----	mg/L	10.29	0.11	0.07	0.87	0.07	NA
NITRATE NITROGEN	10*	10*	mg/L	0.67	0.036	0.032	0.142	0.136	0.033
NITRITE NITROGEN	1*	----	mg/L	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
ORP	----	----	mV	243.8	231.6	4.4	42.7	122.8	NA
pH (field)	----	6.5-8.5**	-log H+	5.5	5.5	6.4	6.3	6.2	NA
pH (laboratory)	----	6.5-8.5**	-log H+	6.3	6.1	6.5	6.5	6.4	6.5
SPECIFIC CONDUCTANCE	700**	----	umhos/cm	117	227	335	304	452	NA
SULFATE	250**	250**	mg/L	3.27	12.6	15.10	5.30	17.30	15.1
TEMPERATURE	----	----	°C	10.8	11.8	10.6	9.8	11.2	NA
TOTAL COLIFORM	1/100 mL*	1/100 mL*	cfu/100 mL	1 U	1 U	11	1 U	1 U	1 U
TOTAL ORGANIC CARBON	----	----	mg/L	0.5 U	1.79	2.30	1.37	3.34	2.19
TURBIDITY	----	----	NTU	0.38	1.2	10.2	3.5	3.0	NA
DISSOLVED METALS									
ARSENIC	10*	0.05*	µg/L	0.11	0.11	1.17	2.66	1.55	1.17
BARIUM	2,000*	1,000*	µg/L	4.4	10.7	16.2	10.7	18.1	14.7
CALCIUM	----	----	mg/L	10.2	21.7	34.2	31.5	44.3	34.3
IRON	300**	300**	µg/L	20 U	20 U	965	1,480	20 U	944
MANGANESE	50**	50**	µg/L	1.0 U	4,320	1,050	3,700	5,660	1,020
POTASSIUM	----	----	mg/L	0.59	0.55	1.23	1.03	1.20	1.21
SODIUM	20***	----	mg/L	4.60	6.48	6.68	7.81	10.3	6.91
ZINC	5,000**	5,000**	µg/L	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
VOLATILE ORGANIC COMPOUNDS									
VINYL CHLORIDE	2*	0.02*	µg/L	0.02 U	0.02 U	0.02 U	0.060	0.02 U	0.02 U

Notes:

Concentration exceeds Washington State Drinking Water or Groundwater Standards

FD = Field Duplicate of MW-6 was labeled MW-17.

NA = Not Analyzed

Regulatory Standards:

(a) WAC 246-290-310

(b) WAC 173-200-040

* Primary Standard

** Secondary Standard

*** Recommended level of concern for consumers with restricted daily sodium intake.

Data Qualifiers:

U = Indicates compound was analyzed for, but not detected at the specified detection limit.

J = Estimated value - Compound positively identified, but below specified detection limit.

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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-17 (FD)
	Drinking Water Standards (a)	Groundwater Standards (b)							
1,1,1,2-TETRACHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-TRICHLOROETHANE	200	200	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-TETRACHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-TRICHLOROETHANE	5	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHANE	----	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHENE	7	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROPROPENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-TRICHLOROBENZENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	70	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRIMETHYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DIBROMO-3-CHLOROPROPANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	600	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROETHANE	5	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROPROPANE	5	0.6	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-TRIMETHYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROPROPANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-DICHLOROBENZENE	75	4	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-DICHLOROPROPANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-BUTANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYLVINYLETHER	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
2-CHLOROTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-HEXANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
4-CHLOROTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-ISOPROPYLTOLUENE	----	----	µg/L	0.29	0.26	0.25	0.43	0.22	0.22
4-METHYL-2-PANTANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACROLEIN	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACRYLONITRILE	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
BENZENE	5	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOCHLOROMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOFORM	----	5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOMETHANE	----	----	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CARBON DISULFIDE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CARBON TETRACHLORIDE	5	0.3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CFC-113	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROBENZENE	100	----	µg/L	0.2 U	0.2 U	2.13	0.2 U	0.2 U	2.20
CHLOROBROMOMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLORODIBROMOMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROFORM	----	7	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROMETHANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	70	----	µg/L	0.2 U	0.2 U	0.2 U	0.61	0.2 U	0.2 U

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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-17 (FD)
	Drinking Water Standards (a)	Groundwater Standards (b)							
CIS-1,3-DICHLOROPROPENE	----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DIBROMOETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DICHLOROBROMOMETHANE	----	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLBENZENE	700	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLENE DIBROMIDE	----	0.001	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
HEXACHLOROBUTADIENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
ISOPROPYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
METHYLENE CHLORIDE	5	5	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
M & P-XYLENE	10	----	µg/L	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
NAPHTHALENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
N-PROPYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
O-XYLENE	10	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SEC-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
STYRENE	100	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TERT-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TETRACHLOROETHENE	5	0.8	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TOLUENE	1000	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,2-DICHLOROETHENE	100	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,3-DICHLOROPROPENE	----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,4-DICHLORO-2-BUTENE			µg/L	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	5	3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRICHLOROFLUOROMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL ACETATE			µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL CHLORIDE	2	0.02	µg/L	0.02 U	0.02 U	0.02 U	0.060	0.02 U	0.02 U

Notes: [Redacted] Concentration exceeds State Drinking Water Standards or Groundwater Standards
FD = Field Duplicate of MW-6 was labeled MW-17.

Regulatory Standards:

All regulatory standards listed for VOCs are Primary Regulatory Standards

(a) WAC 246-290-310

(b) WAC 173-200-040

Data Qualifiers:

U = Indicates compound was analyzed for but was not detected at the specified detection limit.

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	State Drinking Water Standards (a)	State Ground- water Standards (b)	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-12 (FD)
CONVENTIONALS									
ALKALINITY	----	----	mg/L	51.1	272	181	115	167	114
AMMONIA NITROGEN	----	----	mg/L	0.040 U	0.040 U	0.042	0.045	0.098	0.044
BICARBONATE	----	----	mg/L	51.1	272	181	115	167	114
CARBONATE	----	----	mg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CHEMICAL OXYGEN DEMAND	----	----	mg/L	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
CHLORIDE	250**	250**	mg/L	3.53	2.45	2.61	2.84	2.58	2.88
DISSOLVED OXYGEN	----	----	mg/L	10.94	0.29	0.26	0.54	0.26	NA
NITRATE NITROGEN	10*	10*	mg/L	0.55	0.020	0.020 U	0.115	0.020 U	0.119
NITRITE NITROGEN	1*	----	mg/L	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
ORP	----	----	mV	232.2	260.5	46.5	82.8	139.5	NA
pH (field)	----	6.5-8.5**	-log H+	6.4	6.2	6.4	6.5	6.6	NA
pH (laboratory)	----	6.5-8.5**	-log H+	6.4	6.2	6.4	6.5	6.6	6.5
SPECIFIC CONDUCTANCE	700**	----	umhos/cm	120	518	340	217	337	NA
SULFATE	250**	250**	mg/L	4.58	20.2	8.82	4.88	17.60	4.8
TEMPERATURE	----	----	°C	10.8	12.0	11.0	10.6	11.1	NA
TOTAL COLIFORM	1/100 mL*	1/100 mL*	cfu/100 mL	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL ORGANIC CARBON	----	----	mg/L	0.5 U	3.43	2.14	0.93	3.06	0.93
TURBIDITY	----	----	NTU	5.00	3.0	16.9	12.6	5.4	NA
DISSOLVED METALS									
ARSENIC	10*	0.05*	µg/L	0.10	0.19	1.37	2.28	1.64	2.12
BARIUM	2,000*	1,000*	µg/L	3.1	18.7	15.0	5.0	11.6	7.5
CALCIUM	----	----	mg/L	11.0	60.9	35.9	21.6	34.4	22.2
IRON	300**	300**	µg/L	20 U	20 U	1,240	336	20 U	394
MANGANESE	50**	50**	µg/L	1.0 U	8,110	778	2,590	3,950	2,610
POTASSIUM	----	----	mg/L	0.51	0.50	1.31	0.88	1.04	0.93
SODIUM	20***	----	mg/L	4.23	11.70	7.02	7.12	8.1	7.25
ZINC	5,000**	5,000**	µg/L	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
VOLATILE ORGANIC COMPOUNDS									
VINYL CHLORIDE	2*	0.02*	µg/L	0.02 U	0.02 U	0.02 U	0.029	0.02 U	0.028

Notes:

Concentration exceeds Washington State Drinking Water or Groundwater Standards

FD = Field Duplicate of MW-8 was labeled MW-12.

NA = Not Analyzed

Regulatory Standards:

(a) WAC 246-290-310

(b) WAC 173-200-040

* Primary Standard

** Secondary Standard

*** Recommended level of concern for consumers with restricted daily sodium intake.

Data Qualifiers:

U = Indicates compound was analyzed for, but not detected at the specified detection limit.

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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-12 (FD)
	Drinking Water Standards (a)	Groundwater Standards (b)							
1,1,1,2-TETRACHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-TRICHLOROETHANE	200	200	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-TETRACHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-TRICHLOROETHANE	5	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHANE	----	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHENE	7	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROPROPENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-TRICHLOROBENZENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	70	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRIMETHYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DIBROMO-3-CHLOROPROPANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	600	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROETHANE	5	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROPROPANE	5	0.6	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-TRIMETHYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROPROPANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-DICHLOROBENZENE	75	4	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-DICHLOROPROPANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-BUTANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYLVINYLETHER	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
2-CHLOROTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-HEXANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
4-CHLOROTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-ISOPROPYLTOLUENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-METHYL-2-PANTANONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACROLEIN	----	----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACRYLONITRILE	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
BENZENE	5	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOCHLOROMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOFORM	----	5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOMETHANE	----	----	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CARBON DISULFIDE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CARBON TETRACHLORIDE	5	0.3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CFC-113	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROBENZENE	100	----	µg/L	0.2 U	0.2 U	1.76	0.2 U	0.2 U	0.2 U
CHLOROBROMOMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLORODIBROMOMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROFORM	----	7	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROMETHANE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	70	----	µg/L	0.2 U	0.2 U	0.2 U	0.40	0.2 U	0.39

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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-12 (FD)
	Drinking Water Standards (a)	Groundwater Standards (b)							
CIS-1,3-DICHLOROPROPENE	----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DIBROMOETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DICHLOROBROMOMETHANE	----	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLBENZENE	700	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLENE DIBROMIDE	----	0.001	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
HEXACHLOROBUTADIENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE	----	----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
ISOPROPYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
METHYLENE CHLORIDE	5	5	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
M & P-XYLENE	10	----	µg/L	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
NAPHTHALENE	----	----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
N-PROPYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
O-XYLENE	10	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SEC-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
STYRENE	100	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TERT-BUTYLBENZENE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TETRACHLOROETHENE	5	0.8	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TOLUENE	1000	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,2-DICHLOROETHENE	100	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,3-DICHLOROPROPENE	----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,4-DICHLORO-2-BUTENE			µg/L	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	5	3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRICHLOROFLUOROMETHANE	----	----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL ACETATE			µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL CHLORIDE	2	0.02	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U

Notes: [REDACTED] Concentration exceeds State Drinking Water Standards or Groundwater Standards

FD = Field Duplicate of MW-8 was labeled MW-12.

Regulatory Standards:

All regulatory standards listed for VOCs are Primary Regulatory Standards

(a) WAC 246-290-310

(b) WAC 173-200-040

Data Qualifiers:

U = Indicates compound was analyzed for but was not detected at the specified detection limit.

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	State Drinking Water Standards (a)	State Ground- water Standards (b)	State Surface Water Standards (c)	Units	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10	SW-2	MW-13 (FD)
CONVENTIONALS													
ALKALINITY	-----	-----	-----	mg/L	46.0	265	NA	156	NA	179	199	NA	203
AMMONIA NITROGEN	-----	-----	-----	mg/L	0.040 U	0.040 U	NA	0.040 U	NA	0.040 U	0.085	NA	0.082
BICARBONATE	-----	-----	-----	mg/L	46.0	265	NA	156	NA	179	199	NA	203
CARBONATE	-----	-----	-----	mg/L	1.0 U	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.0 U
CHEMICAL OXYGEN DEMAND	-----	-----	-----	mg/L	10.0 U	11.6	NA	10.0 U	NA	10.0 U	10.7	NA	10.0 U
CHLORIDE	250**	250**	-----	mg/L	3.00	1.88	NA	4.57	NA	2.89	14.8	NA	14.8
DISSOLVED OXYGEN	-----	-----	-----	mg/L	10.82	0.29	9.66	0.22	5.14	1.82	0.22	NA	NA
NITRATE NITROGEN	10*	10*	<10	mg/L	1.50	0.020 U	NA	0.020 U	NA	0.132	0.020 U	0.020 U	0.020 U
NITRITE NITROGEN	1*	-----	-----	mg/L	0.010 U	0.010 U	NA	0.010 U	NA	0.010 U	0.010 U	NA	0.010 U
ORP	-----	-----	-----	mV	273.1	229.3	246.1	15.0	198.8	38.7	136.1	NA	NA
pH (field)	-----	6.5-8.5**	6.5-8.56	-log H+	6.6	6.4	6.8	6.7	6.8	6.8	6.7	7.2	NA
pH (laboratory)	-----	6.5-8.5**	6.5-8.56	-log H+	6.4	6.3	6.4	6.5	6.4	6.6	6.5	6.5	6.5
SPECIFIC CONDUCTANCE	700**	-----	-----	umhos/cm	113	488	121	295	89	332	400	38	NA
SULFATE	250**	250**	-----	mg/L	3.96	23.8	NA	5.78	NA	5.41	6.02	NA	5.97
TEMPERATURE	-----	-----	<16	°C	10.7	11.6	11.5	11.3	10.8	11.1	11.3	7.2	NA
FECAL COLIFORM	-----	-----	100	cfu/100 mL	NA	NA	NA	NA	NA	NA	NA	280	NA
TOTAL COLIFORM	1/100 mL*	1/100 mL*	-----	cfu/100 mL	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	NA	1 UJ
TOTAL ORGANIC CARBON	-----	-----	-----	mg/L	0.5 U	3.56	NA	1.91	NA	1.52	3.46	NA	3.47
TURBIDITY	-----	-----	-----	NTU	0.6	1.2	0.38	1.4	0.13	11.0	0.51	NN	NA
DISSOLVED METALS													
ARSENIC	10*	0.05*	-----	µg/L	0.12	0.13	0.20	1.18	0.35	2.38	1.55	NA	1.83
BARIUM	2,000*	1,000*	-----	µg/L	3.3	19.1	NA	12.1	NA	11.8	14.8	NA	14.6
CALCIUM	-----	-----	-----	mg/L	9.9	56.5	NA	31.5	NA	33.6	39.7	NA	40.3
IRON	300**	300**	-----	µg/L	20 U	20 U	20 U	978	20 U	1,460	20 U	NA	20 U
MANGANESE	50**	50**	-----	µg/L	1.0 U	7,650	1.0 U	731	1.0 U	3,570	4,470	NA	4,480
POTASSIUM	-----	-----	-----	mg/L	0.52	0.84	NA	1.10	NA	1.00	1.04	NA	1.11
SODIUM	20***	-----	-----	mg/L	3.80	10.3	NA	6.18	NA	8.93	8.13	NA	8.44
ZINC	5,000**	5,000**	-----	µg/L	4.0 U	4.0 U	NA	4.0 U	NA	4.0 U	4.0 U	NA	4.93
VOLATILE ORGANIC COMPOUNDS													
VINYL CHLORIDE	2*	0.02*	µg/L	µg/L	0.02 U	0.02 U	0.02 U	0.033	0.02 U	0.063	0.02 U	0.02 U	0.02

Notes:

Concentration exceeds Washington State Drinking Water or Groundwater Standards

FD = Field Duplicate of MW-10 was labeled MW-13.

NA = Not Analyzed

Regulatory Standards:

(a) WAC 246-290-310

(b) WAC 173-200-040

(c) WAC 173-201A-200 - Nitrate and Nitrite Standards noted are for Class AA water. Fecal coliform standard is 100/100mL for Primary Contact Recreation.

The appropriate class of water for the detention pond has not been established.

* Primary Standard

** Secondary Standard

*** Recommended level of concern for consumers with restricted daily sodium intake.

Data Qualifiers:

U = Indicates compound was analyzed for, but not detected at the specified detection limit.

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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-13 (FD)
	Drinking Water Standards	Groundwater Standards							
	(a)	(b)							
1,1,1,2-TETRACHLOROETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-TRICHLOROETHANE	200	200	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-TETRACHLOROETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-TRICHLOROETHANE	5	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHANE	-----	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROETHENE	7	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-DICHLOROPROPENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-TRICHLOROBENZENE	-----	-----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-TRICHLOROPROPANE	-----	-----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	70	-----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-TRIMETHYLBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DIBROMO-3-CHLOROPROPANE	-----	-----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	600	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROETHANE	5	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-DICHLOROPROPANE	5	0.6	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-TRIMETHYLBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-DICHLOROPROPANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-DICHLOROBENZENE	75	4	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-DICHLOROPROPANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-BUTANONE	-----	-----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROETHYLVINYLETHER	-----	-----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
2-CHLOROTOLUENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-HEXANONE	-----	-----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
4-CHLOROTOLUENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-ISOPROPYLTOLUENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-METHYL-2-PANTANONE	-----	-----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	-----	-----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACROLEIN	-----	-----	µg/L	5 U	5 U	5 U	5 U	5 U	5 U
ACRYLONITRILE	-----	-----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
BENZENE	5	1	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOCHLOROMETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOFORM	-----	5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
BROMOMETHANE	-----	-----	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CARBON DISULFIDE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CARBON TETRACHLORIDE	5	0.3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CFC-113	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROBENZENE	100	-----	µg/L	0.2 U	0.2 U	2.28	0.2 U	0.2 U	0.2 U
CHLOROBROMOMETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLORODIBROMOMETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROFORM	-----	7	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHLOROMETHANE	-----	-----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	70	-----	µg/L	0.2 U	0.2 U	0.2 U	0.52	0.2 U	0.2 U

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VOLATILE ORGANIC COMPOUNDS	State	State	Units	MW-1	MW-3	MW-6	MW-8	MW-10	MW-13 (FD)
	Drinking Water Standards (a)	Groundwater Standards (b)							
CIS-1,3-DICHLOROPROPENE	-----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DIBROMOETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
DICHLOROBROMOMETHANE	-----	0.5	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLBENZENE	700	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
ETHYLENE DIBROMIDE	-----	0.001	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
HEXACHLOROBUTADIENE	-----	-----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IODOMETHANE	-----	-----	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
ISOPROPYLBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
METHYLENE CHLORIDE	5	5	µg/L	1 U	1 U	1 U	1 U	1 U	1 U
M & P-XYLENE	10	-----	µg/L	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
NAPHTHALENE	-----	-----	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-BUTYLBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
N-PROPYLBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
O-XYLENE	10	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SEC-BUTYLBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
STYRENE	100	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TERT-BUTYLBENZENE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TETRACHLOROETHENE	5	0.8	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TOLUENE	1000	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,2-DICHLOROETHENE	100	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,3-DICHLOROPROPENE	-----	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRANS-1,4-DICHLORO-2-BUTENE			µg/L	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	5	3	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TRICHLOROFLUOROMETHANE	-----	-----	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL ACETATE			µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VINYL CHLORIDE	2	0.02	µg/L	0.02 U	0.02 U	0.03	0.06	0.02 U	0.02 U

Notes: [Redacted] Concentration exceeds State Drinking Water Standards or Groundwater Standards
 FD = Field Duplicate of MW-10 was labeled MW-13.

Regulatory Standards:

All regulatory standards listed for VOCs are Primary Regulatory Standards

(a) WAC 246-290-310

(b) WAC 173-200-040

Data Qualifiers:

U = Indicates compound was analyzed for but was not detected at the specified detection limit.

Appendix B:
2017 Monitoring Field Notes

Olalla Landfill Quarterly Monitoring Field Book March 2017



**Olalla Landfill
Kitsap County, Washington
Project Number: 45405.0**

**Environmental Partners, Inc.
1180 NW Maple Street, Suite 310
Issaquah, Washington 98027
(425) 395-0010**

Depth to Water Measurement Field Data - Olalla Landfill Monitoring

Well	Time	Measuring Point Elevation (ft. NGVD ¹)	Depth to Water (ft.)	Comments and Well Inspection ² Notes
MW-1	08:28	343.79	75.82	Nothing new
MW-2	15:21	323.25	61.74	"
MW-3	10:00	296.95	40.65	"
MW-4	15:25	320.93	58.60	"
MW-5	0940	334.17	8.12	"
MW-5A	0943	332.53	72.82	"
MW-6	1248	271.17	16.60	"
MW-7	15:14	280.43	21.93	"
MW-8	14:10	272.85	17.67	"
MW-10	11:17	279.21	25.58	"

Notes:

¹NGVD = National Geodetic Vertical Datum (1929)

²Observations regarding the condition of the well and surrounding area (e.g., protective casing, surface seal, cap, lock, bollards, soil conditions near the well such as depressions, ponded surface water, or other subsidence features, and any installed sampling equipment).

**Table 3-1: Monitoring Well Construction Data Summary
Olalla Landfill, Kitsap County, WA**

Well	Total Well Depth (ft bgs)	Measuring Point Elevation (ft NGVD 29)	Surface Elevation (ft NGVD 29)	Screened Interval (ft bgs)	Northing	Easting	Measuring Point Description
MW-1	87	343.79	342.53	82-87	161858.133	560525.840	Pump wellhead
MW-2	73	323.25	318.95	68-73	161704.534	559572.839	Top of PVC casing
MW-3	55.5	296.95	294.95	50.5-55.5	162333.903	559463.060	Pump wellhead
MW-4	68	320.93	317.35	63-68	161911.192	559787.735	Top of PVC casing
MW-5	35.5	334.17	332.78	25-35	162510.115	559878.901	Top of PVC casing
MW-5A	98	332.53	331.43	86-96	162487.878	559875.742	Pump wellhead
MW-6	35	271.17	269.14	28-33	162077.699	559358.970	Pump wellhead
MW-7	33	280.43	278.21	21-31	161723.016	559398.979	Pump wellhead
MW-8	38	272.85	270.73	25-35	161897.813	559350.147	Pump wellhead
MW-10	47	279.21	276.84	37-47	162218.490	559340.899	Pump wellhead

Notes:

NGVD 29 = National Geodetic Vertical Datum (1929)

bgs = below ground surface

**Table 2-1: CAP and SWHP Monitoring Schedule
Olalla Landfill, Kitsap County, WA**

Sample Location	First Quarter									Second and Third Quarters									Fourth Quarter										
	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Fecal Coliform	Geochemical	TOC / COD	Landfill Gas Parameters	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Geochemical	TOC / COD	Landfill Gas Parameters	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Fecal Coliform	Geochemical	TOC / COD	D. Metals - COC list	pH (field and lab)	Vinyl Chloride	Landfill Gas Parameters
MW-1	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-2	■									■								■											
MW-3	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-4	■									■								■											
MW-5	■									■								■											
MW-5A	■									■								■	■							■	■	■	
MW-6	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-7	■									■								■	■							■	■	■	
MW-8	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-10	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
SW-2 ¹		■					■	■											■					■	■				
Flares 1, 2, 3								■																					■

Notes:

¹ Surface water sample from SW-2 collected during first quarter or fourth quarter, not both quarters.

Field Parameters = pH, specific conductance, temperature, ORP, and DO

VOCs = Volatile organic compounds by EPA Method 8260C standard list, vinyl chloride by selective ion monitoring (SIM)

T (total) Metals = calcium, potassium, sodium

D (dissolved) Metals = arsenic, barium, iron, manganese, zinc

Geochemical = alkalinity, ammonia, bicarbonate, carbonate, chloride, sulfate, nitrate, nitrite, pH

TOC / COD = total organic carbon / chemical oxygen demand

Dissolved Metals - COC list = arsenic, iron, manganese

Landfill gas parameters = methane (%LEL), oxygen(% vol), carbon dioxide (% vol), and gas pressure

Multiparameter Probe Calibration Log - Olalla Landfill Groundwater Monitoring

Meter Type	Manufacturer	Model Number	Mfg. Serial#	Rental Co. Serial #	Date	Time
YSI						

Calibrated to Autocal Solution

Calibration Solution Manufacturer _____ Lot Number _____ Exp. Date _____

pH = _____ Turbidity = _____ Temperature = _____

Conductivity = _____ Dissolved Oxygen = _____ ORP = _____

Comments:

Meter calibrated by Equipco, see Certificate of calibration

Meter Type	Manufacturer	Model Number	Mfg. Serial#	Rental Co. Serial #	Date	Time

Calibrated to Autocal Solution

Calibration Solution Manufacturer _____ Lot Number _____ Exp. Date _____

pH = _____ Turbidity = _____ Temperature = _____

Conductivity = _____ Dissolved Oxygen = _____ ORP = _____

Comments:

Instrument Calibration Log - Olalla Landfill Monitoring

Calibrated By: _____

Date: _____

Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
pH					
pH Electrode					
Calibrated: _____ to 4.00 buffer _____ to 7.00 buffer _____ to 10.00 buffer at _____ °C					
Slope = _____ Comments: _____					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
Specific Cond.					
Specific Conductance: Calibrated _____ μS/cm to _____ μS/cm calibration standard					
Electrical Conductivity: Calibrated _____ μS/cm to _____ μS/cm calibration standard at _____ °C					
Comments: _____					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
ORP Meter					
ORP Electrode					
Electrode measured _____ millivolts at _____ °C using Zobell prepared on ____ / ____ / ____					
Table value for Zobell solution at this temperature is _____ mV.					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
Turbidity	<i>Hanna</i>				
Meter reads <u>0.1</u> NTUs using <u>0.0</u> NTUs standard			Comments: <i>ok</i>		
Meter reads <u>10.1</u> NTUs using <u>10.0</u> NTUs standard					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
DO Meter					
Air-Calibration: Measured temperature _____ °C corresponds to _____ mg/L DO (from Table I)					
Atmospheric pressure / elevation correction factor _____ (from Table II)					
Corrected calibration value _____ mg/L DO (Table I value multiplied by Table II value)					
Comments: _____					

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	Plw-1	Date	8-Mar-17
Sample ID	Olalla - Glw-MWI - 3/17	Field Team: (Initials)	ELC
Field Conditions	Cool 40°F + cloudy		

Purge Information

Well Diameter (in.)	8	Purge Method	Submersible pump
Well Depth (ft.)	87	Peristaltic Pump	
Initial Depth to Water (ft.)	75.85	Bladder Pump	
Depth of Water Column	11.8	Other: :	
1 Casing Volume	1.79	Start Time	0853
Controller Setting (Hz)	206	End Time	0916
	<i>ms/cm</i>	Total Gallons Purged	14

Time	Gallons	pH	Conductivity	NTU	DO ^{mg/L}	Temp. ^C	ORP ^{mV}	Appearance
08:54	1	6.43	0.110		10.34	10.2	276.6	clear
08:57	4	6.49	0.110		10.28	10.7	255.3	"
09:00	6.5	6.50	0.110		10.26	10.8	254.1	"
09:07	9.5	6.50	0.110		10.26	10.8	256.6	"
09:06	11.5	6.50	0.110	2.2	10.25	10.8	257.5	"

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	0910	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice, <u>Field filter</u>	

End Time 0916

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-3</u>	Date	8-Mar-17
Sample ID	<u>Olalla-Low-MW-3-3/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>and duplicate Olalla-Low-MW-3-3/17</u>		

Purge Information

Well Diameter (in.)	<u>2"</u>	Purge Method	<u>Submersible pump</u>
Well Depth (ft.)	<u>55.5</u>		Peristaltic Pump
Initial Depth to Water (ft.)	<u>40.65</u>		Bladder Pump
Depth of Water Column	<u>14.85</u>		Other: .:
1 Casing Volume	<u>2.38</u>	Start Time	<u>10:19</u>
Controller Setting (Hz)	<u>146</u>	End Time	<u>10:46</u>
		Total Gallons Purged	<u>15</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
<u>10:22</u>	<u>1.5</u>	<u>6.03</u>	<u>0.325</u>	<u>-</u>	<u>0.44</u>	<u>11.4</u>	<u>264.0</u>	<u>Clear</u>
<u>10:25</u>	<u>3.5</u>	<u>6.19</u>	<u>0.323</u>		<u>0.25</u>	<u>11.6</u>	<u>248.0</u>	<u>"</u>
<u>10:28</u>	<u>5.5</u>	<u>6.21</u>	<u>0.324</u>		<u>0.17</u>	<u>11.7</u>	<u>242.7</u>	<u>"</u>
<u>10:31</u>	<u>8.7</u>	<u>6.21</u>	<u>0.323</u>		<u>0.13</u>	<u>11.7</u>	<u>239.4</u>	<u>"</u>
<u>10:34</u>	<u>9</u>	<u>6.21</u>	<u>0.324</u>		<u>0.11</u>	<u>11.7</u>	<u>236.6</u>	<u>"</u>
<u>10:37</u>	<u>11</u>	<u>6.21</u>	<u>0.325</u>	<u>0.14</u>	<u>0.10</u>	<u>11.7</u>	<u>233.9</u>	<u>"</u>

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>10:38</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 1046

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	MW-10	Date	8-Mar-17
Sample ID	Olalla-6W-MW10-3/17	Field Team: (Initials)	ELC
Field Conditions			

Purge Information

Well Diameter (in.)	2"	Purge Method	<input checked="" type="checkbox"/> Submersible pump <input type="checkbox"/> Peristaltic Pump <input type="checkbox"/> Bladder Pump Other:
Well Depth (ft.)	47	Start Time	11:57
Initial Depth to Water (ft.)	28.58	End Time	12:20
Depth of Water Column	21.42	Total Gallons Purged	13
1 Casing Volume	3.43		
Controller Setting (Hz)	123		

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
11:57	0.5	6.43	0.439		0.23	11.4	158.3	Clear
12:01	1.5	6.46	0.436		0.15	11.5	146.8	"
12:04	4	6.47	0.436		0.10	11.5	139.5	"
12:07	6.25	6.48	0.437		0.08	11.5	153.0	"
12:10	7.5	6.47	0.439		0.06	11.5	150.0	"
12:13	9.5	6.47	0.457		0.04	11.6	125.2	"
12:16	11	6.47	0.438	0.23	0.03	11.6	127.6	"

Sample Information

Sample Method(s) Submersible pump Peristaltic pump Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	12:17	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 12:20

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-6</u>	Date	8-Mar-17
Sample ID	<u>Olalla-GW-MW6-3/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Cool, 40 F rain</u>		

Purge Information

Well Diameter (in.)	<u>2"</u>	Purge Method	<u>Submersible pump</u>
Well Depth (ft.)	<u>35</u>		Peristaltic Pump
Initial Depth to Water (ft.)	<u>16.60</u>		Bladder Pump
Depth of Water Column	<u>18.40</u>		Other: :
1 Casing Volume	<u>2.94</u>	Start Time	<u>12:54</u>
Controller Setting (Hz)	<u>106</u>	End Time	<u>1:32</u>
		Total Gallons Purged	<u>20</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
12:57	<u>2.00</u>	6.71	0.261	-	0.24	11.7	21.7	<u>sl. white cloud</u>
13:00	<u>4.5</u>	6.72	0.262		0.15	11.8	23.8	<u>clearing up</u>
13:04	<u>6.8</u>	6.71	0.264		0.09	11.8	18.2	"
13:09	<u>9</u>	6.71	0.264		0.06	11.8	15.3	<u>clear</u>
13:11	<u>12.2</u>	6.71	0.265		0.04	11.8	13.6	"
13:14	<u>15</u>	6.70	0.266		0.03	11.8	12.1	"
13:17	<u>17.8</u>	6.69	0.267	4.38	0.03	11.8	10.8	"

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>13:18</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to ph<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to ph<2, ice. Field filter	

End Time 1:32

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-8</u>	Date	8-Mar-17
Sample ID	<u>Olalla-GW-MW8-3/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>45 F 141</u>		

Purge Information

Well Diameter (in.)	<u>8</u>	Purge Method	<u>Submersible pump</u>
Well Depth (ft.)	<u>38</u>		Peristaltic Pump
Initial Depth to Water (ft.)	<u>17.67</u>		Bladder Pump
Depth of Water Column	<u>20.33</u>		Other: _____
1 Casing Volume	<u>8.25</u>	Start Time	<u>1420</u>
Controller Setting (Hz)	<u>101</u>	End Time	<u>1448</u>
		Total Gallons Purged	<u>14</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
1423	1.5	6.61	0.223		3.76	10.6	43.1	Clear
1426	3.5	6.70	0.250		3.27	10.7	84.2	"
1429	4.5	6.71	0.259		3.27	10.7	80.5	"
1432	6.5	6.71	0.267		3.17	10.7	76.9	"
1435	8	6.71	0.269		3.15	10.8	75.2	"
1438	9.5	6.71	0.272		3.12	10.7	73.6	"
1441	11	6.70	0.274	3.23	3.08	10.8	72.5	"

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>1443</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 1448

Comments / Exceptions:

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Landfill Gas Monitoring Field Data - Olalla Landfill Monitoring

Instrument Used:	LanTec GEM 2000	Date and Time:	2/8/17 15:30
Ambient Temperature:		Field Team:	Fi Condey
Field Conditions:	40°F, rain		

Landfill Gas Data

Flare #	Time	Methane (% vol.)	% LEL	Oxygen (% vol.)	Carbon Dioxide (% vol.)	Temperature (°C)	Gas Pressure (H ₂ O)
3	15:36	0	0	21.2	0.2		0.0
1	15:48	0	0	20.0	1.5		0.01
2	15:55	0	0	21.2	0.0		0.01

Comments / Inspection Results¹

¹Inspect the following: lock and gate operation, tightness of bolts and clamps, differential settlement, valve operation, debris or breaks in hose barb.

Surface Water Outflow pipe SW2
 08:00 - flowing at approx 5 gallon/min
 - collected sample in 2, 250 ml poly
 1, sterile plastic container

- approx 3' of water in pond



RENTALS

YSI ProDSS RENTAL CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: *SM*

DATE: *3/7/17*

RENTAL CUSTOMER: *EPT*

INSTRUMENT INFORMATION

RENTAL I.D. NUMBER: YSIPRODSS. *02*

SERIAL NUMBER: *16F 102613*

CALIBRATION INFORMATION

PARAMETER:	STANDARD:	PASS ()	LOT #
1. CONDUCTIVITY	1,000 μ Mhos	<u>X</u>	<u>46387</u>
2. pH ZERO	pH 7	<u>X</u>	<u>44912</u>
pH SLOPE	pH 4	<u>X</u>	<u>44935</u>
pH SLOPE	pH 10	<u>X</u>	<u>44934</u>
3. DISSOLVED OXYGEN	Air Calibration Barometric pressure = 760mmHg	<u>X</u>	N/A
4. TURBIDITY ZERO	0.0 NTU's	—	N/A
TURBIDITY SPAN	20 NTU's	—	—
5. REDOX (ORP)	231mV (YSI Zobell solution)	<u>X</u>	<u>110113</u>

EQUIPCO

CES LANDTECH MODEL: GEM 2000 CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: AM

DATE: 3/7/17

INSTRUMENT INFORMATION

RENTAL ID: GEM2000. 11

SERIAL NUMBER: 6M07638/04

CALIBRATION INFORMATION

1. CALIBRATION GAS: 35 % CO₂

LOT #: 573162

GAS RESPONSE: 35 % CO₂ ±2%

2. CALIBRATION GAS: 50 % Vol. Methane

LOT #: 573162

GAS RESPONSE: 50 % Vol. Methane ±2%

OXYGEN RESPONSE IN FRESH AIR ENVIRONMENT: 20.9% ✓

OXYGEN DOWNSCALE RESPONSE CHECKED: 0% WITH 99.9% Nitrogen ✓

THIS INSTRUMENT HAS BEEN CALIBRATED TO STANDARDS SET FORTH BY THE
MANUFACTURER

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number:	Turn-around Requested: Standard	Page: 1 of 1
ARI Client Company: Environmental Partners, Inc.	Phone: 425-395-0010	Date: 3/9/17
Client Contact: Doug Kunkel		Ice Present?
Client Project Name: Olalla Land Fill		No. of Coolers: 2
		Cooler Temps:

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments
					VOCs and V. and Chlor. de	Dissolved Metals	Total Metals	Alk/Carb 60 carb	NO ₂ , NO ₃ , Cl, Sul, pit	Amonia/TOC COD	Total Coliform	Fecal Coliform	
Olalla-GW-MW1-3/17	3/8/17	0910	water	11	X	X	X	X	X	X	X		
Olalla-GW-MW3-3/17	"	10:38		11	X	X	X	X	X	X	X		
Olalla-GW-MW10-3/17	"	12:17		11	X	X	X	X	X	X	X		
Olalla-GW-MW6-3/17	"	13:18		11	X	X	X	X	X	X	X		
Olalla-GW-MW8-3/17	"	14:43		11	X	X	X	X	X	X	X		
Olalla-GW-MW9-3/17	"	—	↓	11	X	X	X	X	X	X	X		
Olalla-SW2-3/17	"	08:00	water	3				X	X			X	
trip blank	"	—	water	4	X								
Comments/Special Instructions See Mark Harris for full list of analytes.	Relinquished by: (Signature)	Received by: (Signature)		Relinquished by: (Signature)		Received by: (Signature)							
	Printed Name: Eric Caddy	Printed Name: Brittney Hall		Printed Name:		Printed Name:							
	Company: EPI	Company: ARI		Company:		Company:							
	Date & Time: 3/9/17 0805	Date & Time: 3/9/17 805 B.H.		Date & Time:		Date & Time:							

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Olalla Landfill Quarterly Monitoring Field Book June 2017

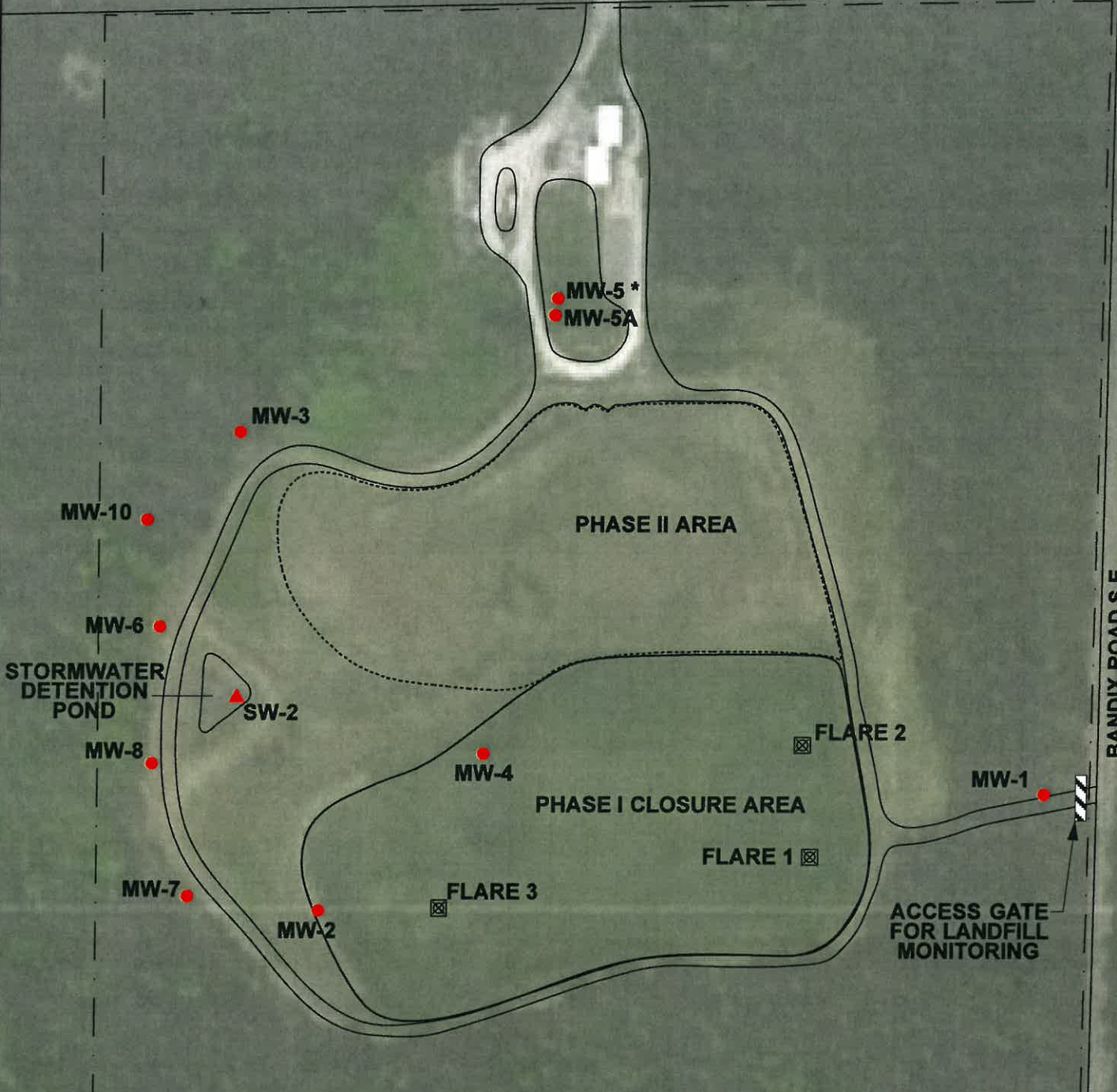


**Olalla Landfill
Kitsap County, Washington
Project Number: 45405.0**

**Environmental Partners, Inc.
1180 NW Maple Street, Suite 310
Issaquah, Washington 98027
(425) 395-0010**

S.E. BURLEY OLALLA ROAD

BANDIX ROAD S.E.



BASE MAP SOURCE:
- Google Earth
TOPOGRAPHIC CONTOUR SOURCE:
- KITSAP COUNTY PARCEL VIEWER

MW-5 is completed in a shallow perched groundwater zone.

- NOTES:**
- - - APPROXIMATE PROPERTY BOUNDARY
 - ~ PERIMETER ACCESS ROAD
 - MW-8 ● MONITORING WELL
 - SW-2 ▲ SURFACE WATER SAMPLING LOCATION
 - ☒ LANDFILL GAS FLARE

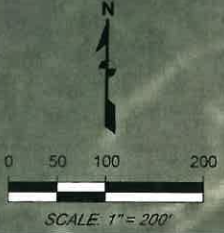



FIGURE 1-2

OLALLA LANDFILL
MONITORING WELL, FLARE, AND SURFACE WATER SAMPLING LOCATIONS
KITSAP COUNTY, WASHINGTON

PREPARED BY	 ENVIRONMENTAL PARTNERS INC		
PROJECT	OLALLA LANDFILL QAPP/45403.0		
LOCATION	2850 SE BURLEY-OLALLA ROAD OLALLA, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
2/25/15	ALW/CLM	ALW/CLM	45403.0

Depth to Water Measurement Field Data - Olalla Landfill Monitoring

Well	Time	Measuring Point Elevation (ft. NGVD ¹)	Depth to Water (ft.)	Comments and Well Inspection ² Notes
MW-1	08:36	343.79	71.98	
MW-2	15:25	323.25	60.86	
MW-3	10:15	296.95	41.35	
MW-4	15:30	320.93	57.50	
MW-5	09:47	334.17	9.92	
MW-5A	09:49	332.53	71.24	
MW-6	12:51	271.17	17.69	
MW-7	15:12	280.43	21.83	
MW-8	14:06	272.85	18.35	
MW-10	11:18	279.21	26.49	

Notes:

¹NGVD = National Geodetic Vertical Datum (1929)

²Observations regarding the condition of the well and surrounding area (e.g., protective casing, surface seal, cap, lock, bollards, soil conditions near the well such as depressions, ponded surface water, or other subsidence features, and any installed sampling equipment).

Controller's Office
 MW-1 - 206
 MW-3 - 146
 MW-10 - 123
 MW-6 - 106
 MW-8 - 101

**Table 2-1: CAP and SWHP Monitoring Schedule
Olalla Landfill, Kitsap County, WA**

Sample Location	First Quarter									Second and Third Quarters									Fourth Quarter										
	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Fecal Coliform	Geochemical	TOC / COD	Landfill Gas Parameters	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Geochemical	TOC / COD	Landfill Gas Parameters	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Fecal Coliform	Geochemical	TOC / COD	D. Metals - COC list	pH (field and lab)	Vinyl Chloride	Landfill Gas Parameters
MW-1	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-2	■									■								■											
MW-3	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-4	■									■								■											
MW-5	■									■								■											
MW-5A	■									■								■	■							■	■	■	
MW-6	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-7	■									■								■	■							■	■	■	
MW-8	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
MW-10	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■				
SW-2 ¹		■				■	■												■				■	■					
Flares 1, 2, 3								■									■												■

Notes:

¹ Surface water sample from SW-2 collected during first quarter or fourth quarter, not both quarters.

Field Parameters = pH, specific conductance, temperature, ORP, and DO

VOCs = Volatile organic compounds by EPA Method 8260C standard list, vinyl chloride by selective ion monitoring (SIM)

T (total) Metals = calcium, potassium, sodium

D (dissolved) Metals = arsenic, barium, iron, manganese, zinc

Geochemical = alkalinity, ammonia, bicarbonate, carbonate, chloride, sulfate, nitrate, nitrite, pH

TOC / COD = total organic carbon / chemical oxygen demand

Dissolved Metals - COC list = arsenic, iron, manganese

Landfill gas parameters = methane (%LEL), oxygen(% vol), carbon dioxide (% vol), and gas pressure

*Duplicates
MW-17 dup of MW-6*

Appendix B: Olalla Landfill MFS Monitoring Recommended Equipment List

Field Instruments Provided by Consultant:	Example	Location
Multi-parameter meter or individual meters as noted:	YSI 556 or Horiba U-22	
pH meter	Orion 250A	Rent
Specific conductance meter	YSI Pro 30	Rent
Dissolved oxygen meter	YSI Model 50B	Rent
ORP meter	YSI ORP15	Rent
Turbidity meter	LaMott 2020	Storage
Flow-through cell for field parameter instruments		
Landfill gas meter (commonly rented)	Landtech GEM 5000, or equivalent	Rent
Water Level Indicator	Solinst, Heron, Slope Indicator	Storage
Equipment to Obtain from the County:		
Keys to Bandix Road Gate, wells, and gates to flares		office
Grundfos Rediflow II pump controller and electrical cables		office
Equipment Provided by Consultant:		
Appropriate voltage gas powered generator		Rent
Power cord for generator		—
Extra fuel for generator in DOT-approved container(s)		home
Field logbook with appropriate field data forms		office
Pens		"
Sample bottles and coolers		"
Spray bottles		home kit
Appropriate PPE (see HASP)		home
5-gallon purge water buckets		Storage
Watch or phone for sample times		polson's
Utility knife or equivalent		—
Cell Phone		✓
Expendible Supplies:		
0.45 micron filters - 5		Storage
Nitrile gloves		"
Garbage bags		"
Ziploc-type bags		"
Paper towels		"
Ice		bay
Distilled or deionized water		Storage
Liquinox™ or equivalent non-phosphate detergent		"
Chain of custody forms		office
Strapping tape (if shipping sample coolers)		—
Clear packing tape (if shipping sample coolers)		—
Calibration fluids for pH, specific conductance, DO, and ORP		—
Calibration gases (methane, oxygen, CO ₂) and appropriate regulators and hoses		—
Extra batteries or charging cords for meters and water level indicator		office

united

ARI - delivered

Instrument Calibration Log - Olalla Landfill Monitoring

Calibrated By: Equipco - S66 Calibration Co. Inc

Date: 6/19/17

Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
pH	YSI	Pro DSS	16F102613	YSI Pro DSS.02	6/19/17
pH Electrode					
Calibrated: _____ to 4.00 buffer _____ to 7.00 buffer _____ to 10.00 buffer at _____ °C					
Slope = _____ Comments: _____					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
Specific Cond.	as above				
Specific Conductance: Calibrated _____ μS/cm to _____ μS/cm calibration standard					
Electrical Conductivity: Calibrated _____ μS/cm to _____ μS/cm calibration standard at _____ °C					
Comments: _____					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
ORP Meter					
ORP Electrode	as above				
Electrode measured _____ millivolts at _____ °C using Zobell prepared on / /					
Table value for Zobell solution at this temperature is _____ mV.					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
Turbidity	Hanna	HI 98703	G0046927	—	08:30
Meter reads <u>0.08</u> NTUs using <u>0.1</u> NTUs standard					
Meter reads <u>13.9</u> NTUs using <u>15</u> NTUs standard					
Comments: _____					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
DO Meter	YSI as above				
Air-Calibration: Measured temperature _____ °C corresponds to _____ mg/L DO (from Table I)					
Atmospheric pressure / elevation correction factor _____ (from Table II)					
Corrected calibration value _____ mg/L DO (Table I value multiplied by Table II value)					
Comments: _____					

6/20/17

**Table 3-1: Monitoring Well Construction Data Summary
Olalla Landfill, Kitsap County, WA**

Well	Total Well Depth (ft bgs)	Measuring Point Elevation (ft NGVD 29)	Surface Elevation (ft NGVD 29)	Screened Interval (ft bgs)	Northing	Easting	Measuring Point Description
MW-1	87	343.79	342.53	82-87	161858.133	560525.840	Pump wellhead
MW-2	73	323.25	318.95	68-73	161704.534	559572.839	Top of PVC casing
MW-3	55.5	296.95	294.95	50.5-55.5	162333.903	559463.060	Pump wellhead
MW-4	68	320.93	317.35	63-68	161911.192	559787.735	Top of PVC casing
MW-5	35.5	334.17	332.78	25-35	162510.115	559878.901	Top of PVC casing
MW-5A	98	332.53	331.43	86-96	162487.878	559875.742	Pump wellhead
MW-6	35	271.17	269.14	28-33	162077.699	559358.970	Pump wellhead
MW-7	33	280.43	278.21	21-31	161723.016	559398.979	Pump wellhead
MW-8	38	272.85	270.73	25-35	161897.813	559350.147	Pump wellhead
MW-10	47	279.21	276.84	37-47	162218.490	559340.899	Pump wellhead

Notes:

NGVD 29 = National Geodetic Vertical Datum (1929)

bgs = below ground surface

Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-1</u>	Date	20-Jun-17
Sample ID	<u>012-MW-6/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Underwater @ 65' depth, 65°F</u>		

Purge Information

Well Diameter (in.)	2"	Purge Method	Submersible pump
Well Depth (ft.)	87		Peristaltic Pump
Initial Depth to Water (ft.)	71.98		Bladder Pump
Depth of Water Column			Other :
1 Casing Volume		Start Time	08:55
Controller Setting (Hz)	2/10	End Time	09:14
		Total Gallons Purged	17.5

Time	Gallons	pH	Conductivity ^{µS/cm}	NTU	DO ^{mg/L}	Temp. ^{°C}	ORP ^{mV}	Appearance
08:57	1	6.11	117.0	—	10.3	10.5	187.2	Clear
09:00	4.5	5.38	117.2		10.31	10.7	221.5	"
09:03	8	5.34	117.1		10.29	10.8	230.8	"
09:06	11.5	5.37	117.1		10.29	10.8	240.4	"
09:09	14	5.41	117.0		10.29	10.8	240.2	"
09:12	16.5	5.45	117.0	0.38	10.29	10.8	243.8	"

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	0912	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 0915

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MLW-3</u>	Date	20-Jun-17
Sample ID	<u>OL-MLW3-6/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Cloudy, drizzle 65°F</u>		

Purge Information

Well Diameter (in.)	2"	Purge Method	Submersible pump
Well Depth (ft.)	55.5		Peristaltic Pump
Initial Depth to Water (ft.)	46.35		Bladder Pump
Depth of Water Column	14.0	Other: :	
1 Casing Volume	2.41	Start Time	1034
Controller Setting (Hz)	146	End Time	1044
		Total Gallons Purged	14

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
1005	1.5	6.18	251.2		1.35	11.1	198.7	Cloudy
1028	2.5	5.85	223.3		0.26	11.7	210.3	"
1031	5	5.65	226.0		0.24	11.8	223.9	"
1034	6.5	5.57	228.6		0.18	11.8	228.0	"
1037	8.2	5.53	226.0		0.14	11.8	227.2	"
1040	10.5	5.53	227.5		0.12	11.8	231.9	"
1043	13.2	5.53	227.4	1.2	0.11	11.8	231.6	"

Sample Information

Sample Method(s): Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	1044	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 1044

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-10</u>	Date	20-Jun-17
Sample ID	<u>OL-MW10-6/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Cloudy, 65°F</u>		

Purge Information

Well Diameter (in.)	<u>2"</u>	Purge Method	<u>Submersible pump</u> Peristaltic Pump Bladder Pump
Well Depth (ft.)	<u>47</u>	Other: :	
Initial Depth to Water (ft.)	<u>26.49</u>	Start Time	<u>11:30</u>
Depth of Water Column	<u>20.51</u>	End Time	<u>11:50</u>
1 Casing Volume	<u>3.44</u>	Total Gallons Purged	<u>12</u>
Controller Setting (Hz)	<u>120</u>		

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
11:31	0.25	6.47	444.1		1.46	10.5	106.4	CL69K
11:34	2	6.34	451.7		0.53	11.0	153.1	"
11:37	3.8	6.23	451.1		0.18	11.1	139.7	"
11:40	5.2	6.00	451.9		0.13	11.2	135.0	"
11:42	6.8	6.18	451.7		0.09	11.1	128.2	"
11:46	8.9	6.17	451.4		0.08	11.1	124.5	"
11:49	11.2	6.17	451.9	3.02	0.07	11.2	122.8	"

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>11:50</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 11:50

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	MW-6	Date	20-Jun-17
Sample ID	OL-MW6-6/17	Field Team: (Initials)	ELC
Field Conditions	partly cloudy 70°F Duplicate - OL-MW17-6/17		

Purge Information

Well Diameter (in.)	2"	Purge Method	Submersible pump
Well Depth (ft.)	35		Peristaltic Pump
Initial Depth to Water (ft.)	17.64		Bladder Pump
Depth of Water Column	17.31	Other :	
1 Casing Volume	2.44	Start Time	1310
Controller Setting (Hz)	106	End Time	1331
		Total Gallons Purged	14

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
1312	0.5	6.46	317.6		1.37	10.5	-6.0	Clear 1312 Ground
1315	2.2	6.63	328.5		0.33	10.6	-1.2	clear
1318	5	6.47	332.2		0.18	10.6	4.2	"
1321	6.8	6.42	333.7		0.13	10.6	6.3	"
1324	8.8	6.42	334.1		0.10	10.6	5.1	"
1327	10.5	6.42	334.9		0.08	10.6	4.3	"
1330	13	6.42	335.3	10.2	0.07	10.6	4.4	"

Sample Information

Sample Method(s): Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	1331	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 1331

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-8</u>	Date	20-Jun-17
Sample ID	<u>OL-MW8-6/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Cloudy, 71°F</u>		

Purge Information

Well Diameter (in.)	<u>2"</u>
Well Depth (ft.)	<u>78</u>
Initial Depth to Water (ft.)	<u>18.35</u>
Depth of Water Column	<u>19.65</u>
1 Casing Volume	<u>3.34</u>
Controller Setting (Hz)	<u>10</u>

Purge Method	<u>Submersible pump</u>
	Peristaltic Pump
	Bladder Pump
	Other: _____
Start Time	<u>14:12</u>
End Time	<u>14:33</u>
Total Gallons Purged	<u>10</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
14:13	0.5	7.37	144.7		0.06	9.4	88.6	<u>slightly cloudy</u>
14:16	2	6.55	278.7		0.36	9.7	28.0	<u>clear</u>
14:19	3.3	6.40	288.5		0.62	9.8	35.7	''
14:22	5	6.34	295.5		0.74	9.8	39.5	''
14:25	6	6.31	299.2		0.87	9.8	41.9	''
14:28	7.5	6.29	300.2		0.88	9.8	42.7	''
14:31	9.2	6.25	303.5	3.54	0.87	9.8	42.7	''

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>14:33</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 14:33

Comments / Exceptions:

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Landfill Gas Monitoring Field Data - Olalla Landfill Monitoring

Instrument Used:	Landtec GEM 2000	Date and Time:	6/20/17
Ambient Temperature:	70° F	Field Team:	E. Casady
Field Conditions:	Overcast, slight breeze		

Landfill Gas Data

Flare #	Time	Methane (% vol.)	% LEL	Oxygen (% vol.)	Carbon Dioxide (% vol.)	Temperature (°C)	Gas Pressure ("H ₂ O)
3	15:42	0.0	0	20.8	0.0		0.01
1	15:51	0.0	0	19.9	0.2		0.10
2	16:00	0.0	0	20.2	0.2		0.20

Comments / Inspection Results¹

¹Inspect the following: lock and gate operation, tightness of bolts and clamps, differential settlement, valve operation, debris or breaks in hose barb.

June 2017 Quarterly Event Bottle Order Form

Project Name	Olalla Landfill Monitoring
Project Number	45404.0
Client:	Environmental Partners, Inc. 1180 NW Maple St. Suite 310 Issaquah, WA 98027
Client Contact:	Eric Caddey (425) 281-3629

Date of Bottle Request	6/14/2017
Date Bottle are Needed	Please deliver to EPI office on Friday 6/16/17
Estimated Date Samples will Return:	6/21/2017

Lab PM:	Mark Harris
----------------	-------------

Order completed by:	B.H. 6/15/17 sent 2 coolers
----------------------------	-----------------------------

# of Coolers:	as needed
----------------------	-----------

<input checked="" type="checkbox"/> B.H.	Include LOOSE Labels
--	----------------------

Trip Blanks	<input checked="" type="checkbox"/> 1 set (2 VOAs)
--------------------	--

<input checked="" type="checkbox"/>	Include COC's
-------------------------------------	---------------

Number of Samples	Analysis Requested	Bottles Per Sample	Bottle Size and Type	Preservation	Total Bottles
Groundwater Samples					
6	<input checked="" type="checkbox"/> Volatiles	2	40mL VOA	HCL	<input checked="" type="checkbox"/> 12
6	<input checked="" type="checkbox"/> Vinyl chloride by SIM or Low Level	1	40mL VOA	HCL	<input checked="" type="checkbox"/> 6
6	<input checked="" type="checkbox"/> Dissolved Mn)	1	500 250 mL HDPE	Field Filtered/HNO ₃	<input checked="" type="checkbox"/> 6
6	<input checked="" type="checkbox"/> Total metals (K, Na, Ca)	1	500 250 mL HDPE	HNO ₃	<input checked="" type="checkbox"/> 6
6	Nitrate, nitrite, chloride, sulfate, alkalinity, carbonate, bicarbonate pH, and ammonia	1	500 nL 500 mL poly	-	<input checked="" type="checkbox"/> 6
6	<input checked="" type="checkbox"/> COD	1	250 mL HDPE Amber	H ₂ SO ₄	<input checked="" type="checkbox"/> 6
6	<input checked="" type="checkbox"/> TOC	1	250 mL amber glass	H ₂ SO ₄	<input checked="" type="checkbox"/> 6
6	<input checked="" type="checkbox"/> Total coliform	1	poly	-	<input checked="" type="checkbox"/> 6

Total Bottles: 54

6	<input checked="" type="checkbox"/> Ammonia	1	500 nL HDPE	H ₂ SO ₄	<input checked="" type="checkbox"/> 6	FO03982
6	<input checked="" type="checkbox"/> Alkalinity	1	1 L HDPE	—	<input checked="" type="checkbox"/> 6	FO03982

EPI

7128100
7128100
00068243
00068243
FO03982
67521
67521
0105-2052 SP

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number:	Turn-around Requested: Standard	Page: 1 of 1
ABI Client Company: Environmental Partners, Inc.	Phone: 425-395-006	Date: 6/21/17
Client Contact: Doug Kunkel		Ice Present? /
Client Project Name: Olalla Land Fill		No. of Coolers: /
Client Project #: 45405.0	Samplers: Eric Caddey	Cooler Temps: /

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments	
					Volatiles and VC by JM	Dissolved Metals	Total Metals	Nitrate Nitrite Chloride Sulfate pH	CO ₂ TOC	Total Coliform	Ammonia	Alk. Carb. bicarb		
OL-MW1-6/17	6/20/17	0913	water	11	X	X	X	X	X	X	X	X	X	- See total analyte list in D. Kunkel's email
OL-MW3-6/17	6/20/17	1044	"	11	X	X	X	X	X	X	X	X	Dissolved metals fold filtered	
OL-MW10-6/17	6/20/17	11:50	"	11	X	X	X	X	X	X	X	X		
OL-MW6-6/17	6/20/17	13:31	"	11	X	X	X	X	X	X	X	X		
OL-MW8-6/17	6/20/17	14:33	"	11	X	X	X	X	X	X	X	X		
OL-MW17-6/17	6/20/17	-	"	11	X	X	X	X	X	X	X	X		
Trip blank	6/20/17	-	"	2	X									- volatiles only for T.B.

Comments/Special Instructions	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Eric Caddey	Printed Name: Shelly L Fishel	Printed Name:	Printed Name:
	Company: EPI	Company: API	Company:	Company:
	Date & Time: 6/21/17 08:35	Date & Time: 6/21/17 0835	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

EQUIPCO

CES LANDTECH MODEL: GEM 2000 CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: GM

DATE: 6/19/17

INSTRUMENT INFORMATION

RENTAL ID: GEM2000. 11

SERIAL NUMBER: GM07638/04

CALIBRATION INFORMATION

1..CALIBRATION GAS: 35 % CO₂

LOT #: 573162

GAS RESPONSE: 35 % CO₂ ±2%

2. CALIBRATION GAS: 50 % Vol. Methane

LOT #: 573162

GAS RESPONSE: 50 % Vol. Methane ±2%

OXYGEN RESPONSE IN FRESH AIR ENVIRONMENT: 20.9% ✓

OXYGEN DOWNSCALE RESPONSE CHECKED: 0% WITH 99.9% Nitrogen ✓

THIS INSTRUMENT HAS BEEN CALIBRATED TO STANDARDS SET FORTH BY THE
MANUFACTURER



RENTALS

YSI ProDSS RENTAL CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: GM

DATE: 6/19/17

RENTAL CUSTOMER: EPT

INSTRUMENT INFORMATION

RENTAL I.D. NUMBER: YSIPRODSS. 02

SERIAL NUMBER: 16F102613

CALIBRATION INFORMATION

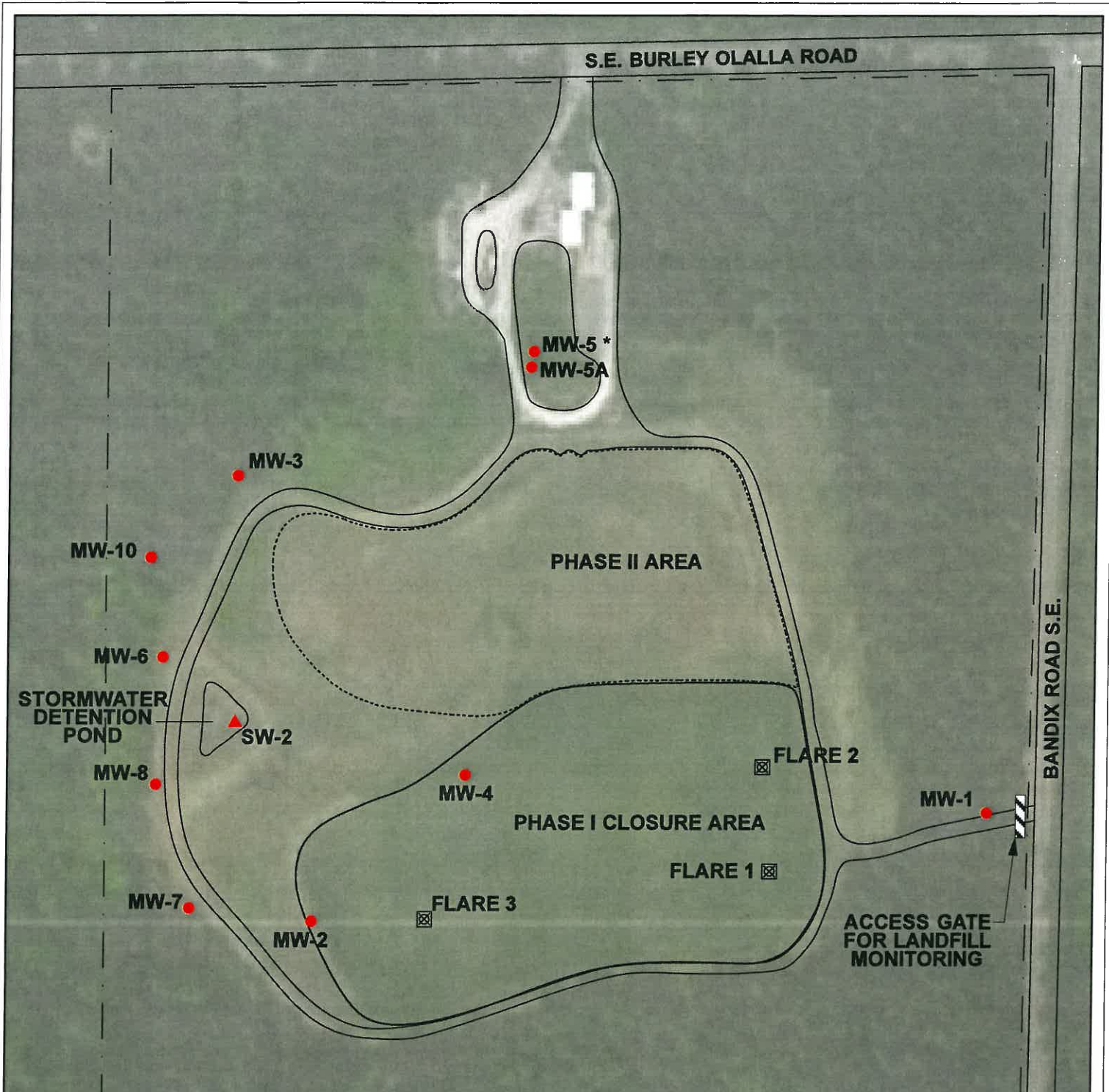
PARAMETER:	STANDARD:	PASS ()	LOT #
1. CONDUCTIVITY	1,000 µMhos	<u>X</u>	<u>46387</u>
2. pH ZERO	pH 7	<u>X</u>	<u>44912</u>
pH SLOPE	pH 4	<u>X</u>	<u>44935</u>
pH SLOPE	pH 10	<u>X</u>	<u>47003</u>
3. DISSOLVED OXYGEN	Air Calibration Barometric pressure = 760mmHg	<u>X</u>	N/A
4. TURBIDITY ZERO	0.0 NTU's	—	N/A
TURBIDITY SPAN	20 NTU's	—	—
5. REDOX (ORP)	231mV (YSI Zobell solution)	<u>X</u>	<u>081116</u>

Olalla Landfill Quarterly Monitoring Field Book September 2017



**Olalla Landfill
Kitsap County, Washington
Project Number: 45405.0**

**Environmental Partners, Inc.
1180 NW Maple Street, Suite 310
Issaquah, Washington 98027
(425) 395-0010**








BASE MAP SOURCE:
- Google Earth

TOPOGRAPHIC CONTOUR SOURCE:
- KITSAP COUNTY PARCEL VIEWER

MW-5 is completed in a shallow
perched groundwater zone.

NOTES:

-  APPROXIMATE PROPERTY BOUNDARY
-  PERIMETER ACCESS ROAD
-  MW-8 MONITORING WELL
-  SW-2 SURFACE WATER SAMPLING LOCATION
-  LANDFILL GAS FLARE

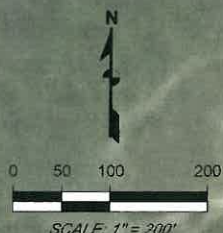



FIGURE 1-2			
OLALLA LANDFILL MONITORING WELL, FLARE, AND SURFACE WATER SAMPLING LOCATIONS KITSAP COUNTY, WASHINGTON			
PREPARED BY	 ENVIRONMENTAL PARTNERS INC		
PROJECT	OLALLA LANDFILL QAPP/45403.0		
LOCATION	2850 SE BURLEY-OLALLA ROAD OLALLA, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
2/25/15	ALW/CLM	ALW/CLM	45403.0

Depth to Water Measurement Field Data - Olalla Landfill Monitoring

Well	Time	Measuring Point Elevation (ft. NGVD ¹)	Depth to Water (ft.)	Comments and Well Inspection ² Notes
MW-1	08:50	343.79	71.89	ok
MW-2	15:15	323.25	61.14	ok
MW-3	10:20	296.95	42.10	ok
MW-4	15:21	320.93	57.82	same - PVC sticks up above metal casing - cap & lock
MW-5	09:52	334.17	11.82	ok
MW-5A	09:55	332.53	71.60	ok
MW-6	12:41	271.17	18.33	same - lid sits on pump plug
MW-7	14:57	280.43	22.22	ok
MW-8	13:40	272.85	18.81	ok
MW-10	11:40	279.21	27.27	ok

Notes:

¹NGVD = National Geodetic Vertical Datum (1929)

²Observations regarding the condition of the well and surrounding area (e.g., protective casing, surface seal, cap, lock, bollards, soil conditions near the well such as depressions, ponded surface water, or other subsidence features, and any installed sampling equipment).

MW-12 dup of MW-8

**Table 3-1: Monitoring Well Construction Data Summary
Olalla Landfill, Kitsap County, WA**

Well	Total Well Depth (ft bgs)	Measuring Point Elevation (ft NGVD 29)	Surface Elevation (ft NGVD 29)	Screened Interval (ft bgs)	Northing	Easting	Measuring Point Description
MW-1	87	343.79	342.53	82-87	161858.133	560525.840	Pump wellhead
MW-2	73	323.25	318.95	68-73	161704.534	559572.839	Top of PVC casing
MW-3	55.5	296.95	294.95	50.5-55.5	162333.903	559463.060	Pump wellhead
MW-4	68	320.93	317.35	63-68	161911.192	559787.735	Top of PVC casing
MW-5	35.5	334.17	332.78	25-35	162510.115	559878.901	Top of PVC casing
MW-5A	98	332.53	331.43	86-96	162487.878	559875.742	Pump wellhead
MW-6	35	271.17	269.14	28-33	162077.699	559358.970	Pump wellhead
MW-7	33	280.43	278.21	21-31	161723.016	559398.979	Pump wellhead
MW-8	38	272.85	270.73	25-35	161897.813	559350.147	Pump wellhead
MW-10	47	279.21	276.84	37-47	162218.490	559340.899	Pump wellhead

Notes:

NGVD 29 = National Geodetic Vertical Datum (1929)

bgs = below ground surface

Multiparameter Probe Calibration Log - Olalla Landfill Groundwater Monitoring

Meter Type	Manufacturer	Model Number	Mfg. Serial#	Rental Co. Serial #	Date	Time
multimeter	YSI	ProDSS	16F102616	05	9/4/17	

Calibrated to Autocal Solution

Calibration Solution Manufacturer ~~YSI~~ Lot Number _____ Exp. Date _____

pH = _____ Turbidity = _____ Temperature = _____

Conductivity = _____ Dissolved Oxygen = _____ ORP = _____

Comments: *EquipCo provided Certificate of Calibration*

Meter Type	Manufacturer	Model Number	Mfg. Serial#	Rental Co. Serial #	Date	Time

Calibrated to Autocal Solution

Calibration Solution Manufacturer _____ Lot Number _____ Exp. Date _____

pH = _____ Turbidity = _____ Temperature = _____

Conductivity = _____ Dissolved Oxygen = _____ ORP = _____

Comments:

**Table 2-1: CAP and SWHP Monitoring Schedule
Olalla Landfill, Kitsap County, WA**

Sample Location	First Quarter									Second and Third Quarters						Fourth Quarter														
	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Fecal Coliform	Geochemical	TOC / COD	Landfill Gas Parameters	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Geochemical	TOC / COD	Landfill Gas Parameters	Water Level	Field Parameters	VOCs	T & D Metals	Total Coliform	Fecal Coliform	Geochemical	TOC / COD	D. Metals - COC list	pH (field and lab)	Vinyl Chloride	Landfill Gas Parameters	
MW-1	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■					
MW-2	■									■								■												
MW-3	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■					
MW-4	■									■								■												
MW-5	■									■								■												
MW-5A	■									■								■	■							■	■	■		
MW-6	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■		■	■		
MW-7	■									■								■	■							■	■	■		
MW-8	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■					
MW-10	■	■	■	■	■		■	■		■	■	■	■	■	■	■		■	■	■	■	■		■	■					
SW-2 ¹		■				■	■												■				■	■						
Flares 1, 2, 3								■																					■	

Notes:

¹ Surface water sample from SW-2 collected during first quarter or fourth quarter, not both quarters.

Field Parameters = pH, specific conductance, temperature, ORP, and DO

VOCs = Volatile organic compounds by EPA Method 8260C standard list, vinyl chloride by selective ion monitoring (SIM)

T (total) Metals = calcium, potassium, sodium

D (dissolved) Metals = arsenic, barium, iron, manganese, zinc

Geochemical = alkalinity, ammonia, bicarbonate, carbonate, chloride, sulfate, nitrate, nitrite, pH

TOC / COD = total organic carbon / chemical oxygen demand

Dissolved Metals - COC list = arsenic, iron, manganese

Landfill gas parameters = methane (%LEL), oxygen(% vol), carbon dioxide (% vol), and gas pressure

Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	MW-1	Date	12-Sep-17
Sample ID	OL-MW-01	Field Team: (Initials)	ELC
Field Conditions	Sunny, 65°F		

Purge Information

Well Diameter (in.)	2"	Purge Method	Submersible pump
Well Depth (ft.)	5.5 8.7		Peristaltic Pump
Initial Depth to Water (ft.)	71.8		Bladder Pump
Depth of Water Column	15.11	Other:	
1 Casing Volume	2.57	Start Time	09:07
Controller Setting (Hz)	206	End Time	09:30

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance	Total Gallons Purged	
									mg/L	ml
09:08	2.5	6.61	0.120	-	10.62	10.4	183.3	clear		
09:11	4	6.45	0.120		10.86	10.7	195.3	"		
09:14	7.8	6.39	0.120		10.91	10.8	205.9	"		
09:18	12	6.38	0.120		10.94	10.8	213.7	"		
09:21	14	6.37	0.120		10.94	10.8	218.1	"		
09:24	17	6.37	0.120		10.94	10.8	222.2	"		
09:27	19.5	6.37	0.120	5.00	10.94	10.8	223.2	"		

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	09:28	3 (4) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 09:30

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-3</u>	Date	12-Sep-17
Sample ID	<u>OL-MW-03</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Sunny, 65°F</u>		

Purge Information

Well Diameter (in.)	<u>2"</u>	Purge Method	<input checked="" type="radio"/> Submersible pump
Well Depth (ft.)	<u>55.5</u>		<input type="radio"/> Peristaltic Pump
Initial Depth to Water (ft.)	<u>40.1</u>		<input type="radio"/> Bladder Pump
Depth of Water Column	<u>13.40</u>	Other:	
1 Casing Volume	<u>2.28</u>	Start Time	<u>10:27</u>
Controller Setting (Hz)	<u>143</u>	End Time	<u>10:51</u>
		Total Gallons Purged	<u>10:14</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
10:30	1	6.17	0.524		0.70	11.7	268.9	Clear
10:32	3	6.17	0.518		0.45	12.0	267.3	"
10:36	5	6.16	0.523		0.40	12.0	266.7	"
10:39	6.2	6.16	0.520		0.35	12.0	267.9	"
10:42	8	6.16	0.518		0.33	12.0	268.9	"
10:45	10	6.16	0.516		0.31	12.0	269.1	"
10:48	11.5	6.16	0.520		0.30	12.0	262.0	"
10:51	13	6.16	0.518	3.02	0.29	12.0	260.5	"

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>10:51</u>	<u>3</u> 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 10:51

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	MW-10	Date	12-Sep-17
Sample ID	OL-MW-10	Field Team: (Initials)	ELC
Field Conditions	Sunny 65°		

Purge Information

Well Diameter (in.)	2"	Purge Method :	Submersible pump
Well Depth (ft.)	47		Peristaltic Pump
Initial Depth to Water (ft.)	27.27		Bladder Pump
Depth of Water Column	19.73		Other :
1 Casing Volume	3.35	Start Time	11:45
Controller Setting (Hz)	125	End Time	12:11
		Total Gallons Purged	14

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
11:48	1	6.61	0.338		0.70	10.5	154.7	C1640
11:51	2.2	6.56	0.337		0.43	11.1	168.6	"
11:54	4.5	6.56	0.335		0.35	11.1	158.5	"
11:57	6	6.56	0.337		0.31	11.1	152.4	"
12:00	8	6.56	0.337		0.29	11.1	149.0	"
12:03	9.5	6.56	0.336		0.28	11.1	144.6	"
12:06	11	6.56	0.338		0.26	11.1	140.8	"
12:09	13	6.56	0.337	5.42	0.26	11.1	139.5	"

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	12:09	540 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 12:11

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	PW-6	Date	12-Sep-17
Sample ID	OL-MW-06	Field Team: (Initials)	ELC
Field Conditions	Partly cloudy, 65°F		

Purge Information

Well Diameter (in.)	2"	Purge Method	Submersible pump
Well Depth (ft.)	35		Peristaltic Pump
Initial Depth to Water (ft.)	18.33		Bladder Pump
Depth of Water Column	16.67		Other: _____
1 Casing Volume	2.83	Start Time	12:49
Controller Setting (Hz)	107	End Time	13:11
		Total Gallons Purged	15

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
12:52	2	6.41	0.337		0.51	11.0	69.7	slightly cloudy
12:55	4.5	6.39	0.337		0.37	11.0	60.6	"
12:58	6.5	6.39	0.338		0.32	11.0	55.1	"
13:01	9	6.39	0.358		0.29	11.0	51.8	"
13:03	10	6.39	0.338		0.28	11.0	49.8	clear
13:06	12	6.40	0.339		0.26	11.0	47.5	"
13:09	14	6.40	0.340	16.9	0.26	11.0	46.5	tr. silt

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	1309	300 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 13:11

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	MW-8	Date	12-Sep-17
Sample ID	OL-MW-08 and	Field Team: (Initials)	ELC
Field Conditions	Duplicate OL-MW-12		

Purge Information

Well Diameter (in.)	2"	Purge Method	Submersible pump
Well Depth (ft.)	38		Peristaltic Pump
Initial Depth to Water (ft.)	18.81		Bladder Pump
Depth of Water Column	14.91	Other: :	
1 Casing Volume	3.26	Start Time	13:56
Controller Setting (Hz)	106	End Time	14:20
		Total Gallons Purged	16

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
13:59	1.5	6.75	0.146		0.46	10.6	102.8	Slightly cloudy
14:02	3.5	6.57	0.194		0.44	10.6	106.0	"
14:05	5.5	6.55	0.200		0.44	10.7	100.3	clear
14:08	7.5	6.53	0.212		0.46	10.7	95.2	"
14:11	10	6.53	0.216		0.48	10.7	91.6	"
14:14	11.5	6.53	0.217		0.49	10.6	86.5	"
14:17	13	6.54	0.217		0.51	10.6	84.9	"
14:20	15	6.53	0.217	12.6	0.54	10.6	82.8	"

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	14:20	500-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		500-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 14:20

Comments / Exceptions:

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Landtec

Landfill Gas Monitoring Field Data - Olalla Landfill Monitoring

Instrument Used: Gen 2000	Gen 2000	Date and Time:	9/12/17
Ambient Temperature:	≈ 73°F	Field Team:	ELC
Field Conditions:	Partly cloudy, slight breeze		

Landfill Gas Data

Flare #	Time	Methane (% vol.)	% LEL	Oxygen (% vol.)	Carbon Dioxide (% vol.)	Temperature (°C)	Gas Pressure ("H ₂ O)
3	15:35	0.0	0%	20.1	0.0	—	0.01
1	15:46	0.0	0.0	20.1	0.1	—	0.01
2	15:52	3.1	68	2.1	10.5	—	0.02

Comments / Inspection Results¹

- need new PVC nozzle of #3

•
Certificate of calibration provided by Equipco.

¹Inspect the following: lock and gate operation, tightness of bolts and clamps, differential settlement, valve operation, debris or breaks in hose barb.

YSI ProDSS RENTAL CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: *DM*

DATE: 9/11/17

RENTAL CUSTOMER: *Enc Partners*

INSTRUMENT INFORMATION

RENTAL I.D. NUMBER: YSIPRODSS *OS*

SERIAL NUMBER: *16F102616*

CALIBRATION INFORMATION

PARAMETER:	STANDARD:	PASS ()	LOT #
1. CONDUCTIVITY	1,000 μ Mhos	<input checked="" type="checkbox"/>	<u>50227</u>
2. pH ZERO	pH 7	<input checked="" type="checkbox"/>	<u>51187</u>
pH SLOPE	pH 4	<input checked="" type="checkbox"/>	<u>51238</u>
pH SLOPE	pH 10	<input checked="" type="checkbox"/>	<u>50228</u>
3. DISSOLVED OXYGEN	Air Calibration Barometric pressure = 760mmHg	<input checked="" type="checkbox"/>	N/A
4. TURBIDITY ZERO	0.0 NTU's	_____	N/A
TURBIDITY SPAN	20 NTU's	_____	_____
5. REDOX (ORP)	231mV (YSI Zobell solution)	<input checked="" type="checkbox"/>	<u>061317</u>

EQUIPCO

CES LANDTECH MODEL: GEM 2000 CALIBRATION CERTIFICATE

SERVICE TECHNICIAN:

QM

DATE:

9/11/17

INSTRUMENT INFORMATION

RENTAL ID: GEM2000. 08

SERIAL NUMBER: GM 07210/03

CALIBRATION INFORMATION

1. CALIBRATION GAS: 35 % CO₂

LOT #: S73162

GAS RESPONSE: 35 % CO₂ +2%

2. CALIBRATION GAS: 50 % Vol. Methane

LOT #: S73160

GAS RESPONSE: 50 % Vol. Methane +2%

OXYGEN RESPONSE IN FRESH AIR ENVIRONMENT: 20.9% ✓

OXYGEN DOWNSCALE RESPONSE CHECKED: 0% WITH 99.9% Nitrogen ✓

THIS INSTRUMENT HAS BEEN CALIBRATED TO STANDARDS SET FORTH BY THE
MANUFACTURER

Olalla Landfill Quarterly Monitoring Field Book December 2017



**Olalla Landfill
Kitsap County, Washington
Project Number: 45405.0**

**Environmental Partners, Inc.
1180 NW Maple Street, Suite 310
Issaquah, Washington 98027
(425) 395-0010**

S.E. BURLEY OLALLA ROAD

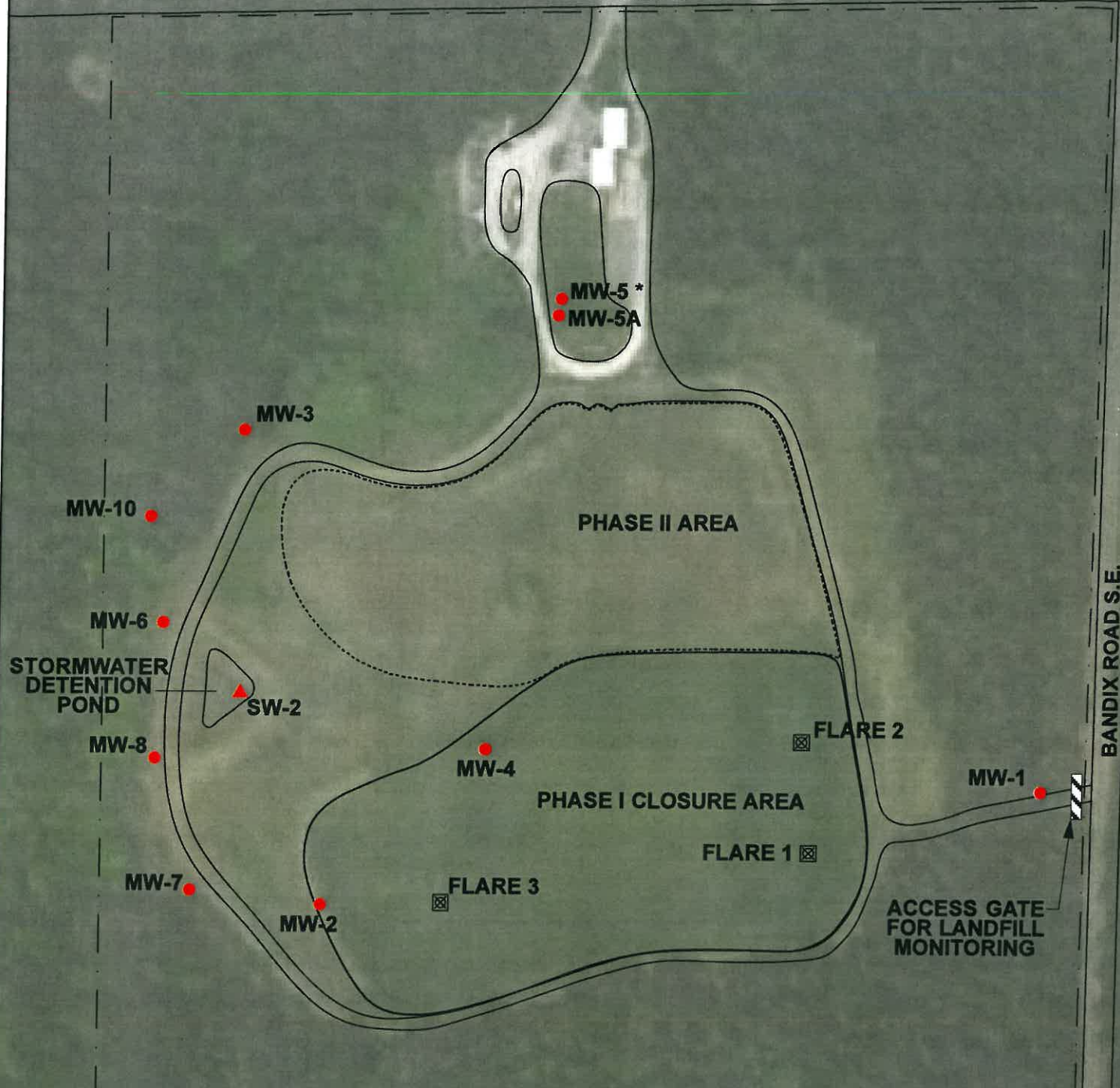


FIGURE 1-2

OLALLA LANDFILL
 MONITORING WELL, FLARE, AND SURFACE WATER SAMPLING LOCATIONS
 KITSAP COUNTY, WASHINGTON

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
PROJECT	OLALLA LANDFILL QAPP/45403.0		
LOCATION	2850 SE BURLEY-OLALLA ROAD OLALLA, WASHINGTON		
PREPARED FOR	KITSAP COUNTY		
DATE	DRAWN BY	REVIEWED BY	PROJECT NUMBER
2/25/15	ALW/CLM	ALW/CLM	45403.0

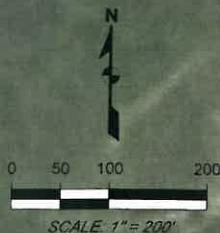
BASE MAP SOURCE:
 - Google Earth

TOPOGRAPHIC CONTOUR SOURCE:
 - KITSAP COUNTY PARCEL VIEWER

MW-5 is completed in a shallow perched groundwater zone.

NOTES:

- APPROXIMATE PROPERTY BOUNDARY
- PERIMETER ACCESS ROAD
- MONITORING WELL
- SURFACE WATER SAMPLING LOCATION
- LANDFILL GAS FLARE



Instrument Calibration Log - Olalla Landfill Monitoring

Calibrated By: _____

Date: _____

Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
pH					
pH Electrode					
Calibrated: _____ to 4.00 buffer _____ to 7.00 buffer _____ to 10.00 buffer at _____ °C					
Slope = _____ Comments: _____					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
Specific Cond.					
Specific Conductance: Calibrated _____ μS/cm to _____ μS/cm calibration standard					
Electrical Conductivity: Calibrated _____ μS/cm to _____ μS/cm calibration standard at _____ °C					
Comments: _____					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
ORP Meter					
ORP Electrode					
Electrode measured _____ millivolts at _____ °C using Zobell prepared on ____ / ____ / ____					
Table value for Zobell solution at this temperature is _____ mV.					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
Turbidity					
Meter reads _____ NTUs using _____ NTUs standard			Comments: _____		
Meter reads _____ NTUs using _____ NTUs standard					
Meter Type	Manufacturer	Model Number	Manufacturer Serial #	Rental Co. Serial #	Time
DO Meter					
Air-Calibration: Measured temperature _____ °C corresponds to _____ mg/L DO (from Table I)					
Atmospheric pressure / elevation correction factor _____ (from Table II)					
Corrected calibration value _____ mg/L DO (Table I value multiplied by Table II value)					
Comments: _____					

Multiparameter Probe Calibration Log - Olalla Landfill Groundwater Monitoring

Meter Type	Manufacturer	Model Number	Mfg. Serial#	Rental Co. Serial #	Date	Time
MULTIMETER	YSI			01	12/19/17	

Calibrated to Autocal Solution

Calibration Solution Manufacturer _____ Lot Number _____ Exp. Date _____

pH = _____ Turbidity = _____ Temperature = _____

Conductivity = _____ Dissolved Oxygen = _____ ORP = _____

Comments: see attached calibration certificate

Meter Type	Manufacturer	Model Number	Mfg. Serial#	Rental Co. Serial #	Date	Time

Calibrated to Autocal Solution

Calibration Solution Manufacturer _____ Lot Number _____ Exp. Date _____

pH = _____ Turbidity = _____ Temperature = _____

Conductivity = _____ Dissolved Oxygen = _____ ORP = _____

Comments:

GEM 200 landfill gas meter - see attached calibration certificate.

**Table 3-1: Monitoring Well Construction Data Summary
Olalla Landfill, Kitsap County, WA**

Well	Total Well Depth (ft bgs)	Measuring Point Elevation (ft NGVD 29)	Surface Elevation (ft NGVD 29)	Screened Interval (ft bgs)	Northing	Easting	Measuring Point Description
MW-1	87	343.79	342.53	82-87	161858.133	560525.840	Pump wellhead
MW-2	73	323.25	318.95	68-73	161704.534	559572.839	Top of PVC casing
MW-3	55.5	296.95	294.95	50.5-55.5	162333.903	559463.060	Pump wellhead
MW-4	68	320.93	317.35	63-68	161911.192	559787.735	Top of PVC casing
MW-5	35.5	334.17	332.78	25-35	162510.115	559878.901	Top of PVC casing
MW-5A	98	332.53	331.43	86-96	162487.878	559875.742	Pump wellhead
MW-6	35	271.17	269.14	28-33	162077.699	559358.970	Pump wellhead
MW-7	33	280.43	278.21	21-31	161723.016	559398.979	Pump wellhead
MW-8	38	272.85	270.73	25-35	161897.813	559350.147	Pump wellhead
MW-10	47	279.21	276.84	37-47	162218.490	559340.899	Pump wellhead

Notes:

NGVD 29 = National Geodetic Vertical Datum (1929)

bgs = below ground surface

Depth to Water Measurement Field Data - Olalla Landfill Monitoring

Well	Time	Measuring Point Elevation (ft. NGVD ¹)	Depth to Water (ft.)	Comments and Well Inspection ² Notes
MW-1	09:17	343.79	72.82	
MW-2	15:25	323.25	61.22	
MW-3	11:26	296.95	41.47	
MW-4	15:31	320.93	57.90	
MW-5	10:15	334.17	9.12	
MW-5A	10:10	332.53	71.55	
MW-6	13:08	271.17	16.76	
MW-7	14:05	280.43	21.80	
MW-8	13:55	272.85	17.77	
MW-10	12:12	279.21	26.20	

Notes:

¹NGVD = National Geodetic Vertical Datum (1929)

²Observations regarding the condition of the well and surrounding area (e.g., protective casing, surface seal, cap, lock, bollards, soil conditions near the well such as depressions, ponded surface water, or other subsidence features, and any installed sampling equipment).

Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-1</u>	Date	19-Dec-17
Sample ID	<u>MW-1-1417</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Rain 48 F</u>		

Purge Information

Well Diameter (in.)	<u>3"</u>	Purge Method	<u>Submersible pump</u>
Well Depth (ft.)	<u>87</u>	Peristaltic Pump	
Initial Depth to Water (ft.)	<u>72.32</u>	Bladder Pump	
Depth of Water Column	<u>14.18</u>	Other :	
1 Casing Volume	<u>2.27</u>	Start Time	<u>0927</u>
Controller Setting (Hz)	<u>207.3</u>	End Time	<u>0946</u>
		Total Gallons Purged	<u>16</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
<u>0928</u>	<u>2</u>	<u>6.57</u>	<u>0.113</u>	<u>-</u>	<u>10.79</u>	<u>10.4</u>	<u>242.7</u>	<u>Cl60"</u>
<u>0931</u>	<u>5</u>	<u>6.56</u>	<u>0.113</u>	<u>-</u>	<u>10.74</u>	<u>10.6</u>	<u>255.9</u>	<u>"</u>
<u>0934</u>	<u>8</u>	<u>6.55</u>	<u>0.113</u>	<u>-</u>	<u>10.87</u>	<u>10.7</u>	<u>264.9</u>	<u>"</u>
<u>0937</u>	<u>10</u>	<u>6.54</u>	<u>0.113</u>	<u>-</u>	<u>10.82</u>	<u>10.7</u>	<u>270.5</u>	<u>"</u>
<u>0940</u>	<u>12.5</u>	<u>6.54</u>	<u>0.113</u>	<u>-</u>	<u>10.85</u>	<u>10.7</u>	<u>270.2</u>	<u>"</u>
<u>0943</u>	<u>15</u>	<u>6.54</u>	<u>0.113</u>	<u>0.6</u>	<u>10.82</u>	<u>10.7</u>	<u>273.1</u>	<u>"</u>

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>0944</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		250-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 0947

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-5A</u>	Date	19-Dec-17
Sample ID	<u>MW-5A-12/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Rain 48°F</u>		

Purge Information

Well Diameter (in.)	<u>2"</u>
Well Depth (ft.)	<u>98'</u>
Initial Depth to Water (ft.)	<u>71.55'</u>
Depth of Water Column	
1 Casing Volume	
Controller Setting (Hz)	<u>201.3</u>

Purge Method : Submersible pump
 Peristaltic Pump
 Bladder Pump
 Other :
 Start Time 10:24
 End Time 10:45
 Total Gallons Purged 63

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
<u>10:26</u>	<u>1</u>	<u>6.90</u>	<u>0.114</u>	<u>-</u>	<u>9.76</u>	<u>11.1</u>	<u>206.1</u>	<u>Cloudy</u>
<u>10:29</u>	<u>2</u>	<u>6.81</u>	<u>0.118</u>	<u>-</u>	<u>9.71</u>	<u>11.4</u>	<u>214.2</u>	<u>11</u>
<u>10:32</u>	<u>5</u>	<u>6.78</u>	<u>0.119</u>	<u>-</u>	<u>9.71</u>	<u>11.5</u>	<u>228.6</u>	<u>clearing up</u>
<u>10:35</u>	<u>7</u>	<u>6.77</u>	<u>0.121</u>	<u>-</u>	<u>9.69</u>	<u>11.4</u>	<u>238.3</u>	<u>Clear</u>
<u>10:38</u>	<u>9</u>	<u>6.78</u>	<u>0.121</u>	<u>-</u>	<u>9.67</u>	<u>11.5</u>	<u>243.2</u>	<u>11</u>
<u>10:41</u>	<u>12</u>	<u>6.77</u>	<u>0.121</u>	<u>0.38</u>	<u>9.66</u>	<u>11.5</u>	<u>246.1</u>	<u>11</u>

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>10:42</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform	<u>-</u>	300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters	<u>-</u>	Sm OJ	ice	
Nitrate/Nitrite/SO4/pH	<u>-</u>	Lg OJ	ice	
TOC/COD/AmH3	<u>-</u>	250-ml AG	H2SO4	
Total Metals	<u>-</u>	500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. <u>Field filter</u>	

End Time 10:45

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-3-1115</u>	Date	19-Dec-17
Sample ID		Field Team: (Initials)	ELC
Field Conditions	<u>Rain 48°F</u>		

Purge Information

Well Diameter (in.)	<u>2</u>	Purge Method: <u>Submersible pump</u>	
Well Depth (ft.)	<u>55.5</u>	<input type="checkbox"/> Peristaltic Pump	
Initial Depth to Water (ft.)	<u>41.47</u>	<input type="checkbox"/> Bladder Pump	
Depth of Water Column	<u>14.07</u>	Other: _____	
1 Casing Volume	<u>2.24</u>	Start Time	<u>11:32</u>
Controller Setting (Hz)	<u>145</u>	End Time	<u>11:52</u>
		Total Gallons Purged	<u>10</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
<u>11:34</u>	<u>1.5</u>	<u>6.42</u>	<u>0.498</u>	<u>-</u>	<u>0.64</u>	<u>11.3</u>	<u>228.6</u>	<u>Clear</u>
11:38								
<u>11:40</u>	<u>3</u>	<u>6.39</u>	<u>0.491</u>		<u>0.42</u>	<u>11.5</u>	<u>237.4</u>	<u>1</u>
<u>11:43</u>	<u>1.05</u>	<u>6.38</u>	<u>0.489</u>		<u>0.33</u>	<u>11.6</u>	<u>232.1</u>	<u>1</u>
<u>11:46</u>	<u>7</u>	<u>6.39</u>	<u>0.488</u>		<u>0.30</u>	<u>11.6</u>	<u>230.1</u>	<u>"</u>
<u>11:49</u>	<u>9</u>	<u>6.39</u>	<u>0.488</u>	<u>1.2</u>	<u>0.29</u>	<u>11.6</u>	<u>229.3</u>	<u>"</u>

Sample Information

Sample Method(s) Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>11:50</u>	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		250-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 11:52

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill *and Duplicate MW-13-12/17*

Station	MW-10	Date	19-Dec-17
Sample ID	MW-10-12/17	Field Team: (Initials)	ELC
Field Conditions	Shower 50°F		

Purge Information

Well Diameter (in.)	2
Well Depth (ft.)	47
Initial Depth to Water (ft.)	26.70
Depth of Water Column	20.80
1 Casing Volume	7.33
Controller Setting (Hz)	123

Purge Method	Submersible pump
	Peristaltic Pump
	Bladder Pump
	Other:
Start Time	12:28
End Time	12:48
Total Gallons Purged	13

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
1230	.5	6.76	0.426	-	1.38	10.8	184.3	Clear
1233	2.5	6.69	0.403		0.42	11.2	162.4	"
1236	4.5	6.70	0.400		0.31	11.3	150.4	"
1239	6.5	6.69	0.401		0.20	11.3	148.9	"
1242	9	6.70	0.401		0.23	11.3	138.2	"
1245	11.2	6.70	0.400	0.51	0.22	11.3	136.1	"

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	1245	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		250-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 12:48

Comments / Exceptions:

Duplicate MW-13-12/17

11

Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-6 MW-6-11/17</u>	Date	19-Dec-17
Sample ID		Field Team: (Initials)	ELC
Field Conditions	<u>Showers 48°F</u>		

Purge Information

Well Diameter (in.)	2	Purge Method	Submersible pump
Well Depth (ft.)	35		Peristaltic Pump
Initial Depth to Water (ft.)	16.76		Bladder Pump
Depth of Water Column	18.24		Other: _____
1 Casing Volume	2.43	Start Time	13:10
Controller Setting (Hz)	108	End Time	13:30
		Total Gallons Purged	14

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
13:12	0.5	6.72	0.309	-	1.22	11.1	54.1	cloudy
13:15	2.5	6.70	0.297		0.45	11.3	23.8	"
13:18	5	6.72	0.296		0.22	11.3	15.2	clearing
13:21	7.5	6.72	0.296		0.27	11.3	15.7	"
13:24	10	6.72	0.296		0.24	11.3	15.2	clean
13:27	12.5	6.69	0.295	1.4	0.22	11.3	15.0	"

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	1328	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		250-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 1330

Comments / Exceptions:

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Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	Date
Sample ID	Field Team: (Initials)
Field Conditions	

MW-8 19-Dec-17
MW-8-0117 ELC
Shower, 48°F

Purge Information

Well Diameter (in.)	2	Purge Method	Submersible pump
Well Depth (ft.)	38		Peristaltic Pump
Initial Depth to Water (ft.)	17.77		Bladder Pump
Depth of Water Column	20.23		Other: _____
1 Casing Volume	3.24	Start Time	1358
Controller Setting (Hz)	104.2	End Time	1417
		Total Gallons Purged	11

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
14:00	0.5	6.77	0.328		0.71	10.9	36.6	C169
14:02	2.5	6.80	0.324		1.45	11.1	31.8	"
14:08	5	6.81	0.332		1.78	11.1	36.3	"
14:09	7.5	6.81	0.333		1.82	11.1	38.3	"
14:12	9	6.81	0.332	11.0	1.82	11.1	38.7	"

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	14:15	(5) 40-ml VOA	HCL, ice	
Total Coliform		300-ml sterile AG or poly	Na2S2O3	
Geochemical Parameters		Sm OJ	ice	
Nitrate/Cl/Nitrite/SO4/pH		Lg OJ	ice	
TOC/COD/NH3		250-ml AG	H2SO4	
Total Metals		500-ml HDPE	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice. Field filter	

End Time 1417

Comments / Exceptions:

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.....

Groundwater Sampling Field Data

EPI Project No./Site: 45405.0/Kitsap County - Olalla Landfill

Station	<u>MW-7</u>	Date	19-Dec-17
Sample ID	<u>MW-7-12/17</u>	Field Team: (Initials)	ELC
Field Conditions	<u>Shower 45°F</u>		

Purge Information

Well Diameter (in.)	<u>3"</u>	Purge Method	<u>Submersible pump</u>
Well Depth (ft.)	<u>33.</u>		Peristaltic Pump
Initial Depth to Water (ft.)	<u>21.80</u>		Bladder Pump
Depth of Water Column	<u>11.20</u>		Other: _____
1 Casing Volume	<u>1.79</u>	Start Time	<u>1439</u>
Controller Setting (Hz)	<u>114</u>	End Time	<u>1457</u>
		Total Gallons Purged	<u>7</u>

Time	Gallons	pH	Conductivity	NTU	DO	Temp.	ORP	Appearance
14:41	1.2	6.65	0.089		5.45	10.4	161.2	cloudy
14:45	2	6.72	0.089		5.19	10.6	176.4	"
14:48	3.2	6.75	0.089		5.14	10.7	157.7	clearing up
14:51	4	6.75	0.089		5.13	10.7	194.4	clear
14:54	5.2	6.75	0.089	0.13	5.14	10.7	195.3	"

Sample Information

Sample Method(s) : Submersible pump / Peristaltic pump / Bladder Pump / Other _____

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Volatiles and VC	<u>14:55</u>	<u>40-ml VOA</u>	HCL, ice	
Total Sulfide		<u>300-ml sterile AG or poly</u>	Na2S2O3	
Geochemical Parameters		<u>3m OJ</u>	ice	
<u>Nitrate/Cl/Nitrite/SO4/pH</u>		Lg OJ	ice	
<u>TOC/COD/MH3</u>		<u>250-ml AG</u>	H2SO4	
<u>Total Metals</u>		<u>500-ml HDPE</u>	HNO3 to pH<2, ice	
Dissolved Metals		500-ml HDPE	HNO3 to pH<2, ice, <u>Field filter</u>	

End Time 1457

Comments / Exceptions:

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.....

.....

Surface Water Sampling Field Data - Olalla Landfill Monitoring

Station	SW-2	Date	12/19/07
Sample: ID	SW-2-12/17	Field Team: (Initials)	EC
Field Conditions	Rainy - hard		

Field Parameter Data

Time	pH	Specific Conductance	Temperature (°C)	Appearance and Flow Rate
08:31	7.19	0.038	7.2	yellow, 60 gpm

Sample Information

Analysis	Time	Bottle Type	Preservative/Filtration	Comments
Fecal Coliform	0825	500-mL sterile AG or poly	Cool to <4°C	
Nitrate-Nitrogen	"	500-mL HDPE	Cool to <4°C	
pH	"	500 125-mL AG HDPE	Cool to <4°C	

Sample End Time 0826

Comments / Exceptions:

Good strong flow, been raining hard all night large pond filled up to approx 1.5' of reaching out flow pipe
 14:00- Pond full up to out flow pipe and flowing out

Notes: Where multiple visits are required to complete sampling, parameters are to be checked prior to sampling for each visit. Enter data under field comments.

Landfill Gas Monitoring Field Data - Olalla Landfill Monitoring

Instrument Used:	GEM 2000	Date and Time:	12/19/17
Ambient Temperature:	48°F	Field Team:	ELC
Field Conditions:	Windy, cool		

Landfill Gas Data

Flare #	Time	Methane (% vol.)	% LEL	Oxygen (% vol.)	Carbon Dioxide (% vol.)	Temperature (°C)	Gas Pressure ("H ₂ O)
3	15:40	26.2	45	0.2	15.3		0.02
1	15:55	16.1	+78	6.3	9.8		0.04
2	16:06	2.4	16	16.2	1.8		0.10

Comments / Inspection Results¹

¹Inspect the following: lock and gate operation, tightness of bolts and clamps, differential settlement, valve operation, debris or breaks in hose barb.

EQUIPCO

CES LANDTECH MODEL: GEM 2000 CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: GM

DATE: 12/18/17

INSTRUMENT INFORMATION

RENTAL ID: GEM2000. 11

SERIAL NUMBER: 6107638/04

CALIBRATION INFORMATION

1. CALIBRATION GAS: 35 % CO₂

LOT #: 573162

GAS RESPONSE: 35 % CO₂ +2%

2. CALIBRATION GAS: 50 % Vol. Methane

LOT #: 573162

GAS RESPONSE: 50 % Vol. Methane +2%

OXYGEN RESPONSE IN FRESH AIR ENVIRONMENT: 20.9% ✓

OXYGEN DOWNSCALE RESPONSE CHECKED: 0% WITH 99.9% Nitrogen ✓

THIS INSTRUMENT HAS BEEN CALIBRATED TO STANDARDS SET FORTH BY THE
MANUFACTURER

YSI ProDSS RENTAL CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: 

DATE: 12/18/17

RENTAL CUSTOMER: EPI

INSTRUMENT INFORMATION

RENTAL I.D. NUMBER: YSIPRODSS. 01

SERIAL NUMBER: 16F102612

CALIBRATION INFORMATION

PARAMETER:	STANDARD:	PASS ()	LOT #
1. CONDUCTIVITY	1,000 μ Mhos	<input checked="" type="checkbox"/>	<u>50227</u>
2. pH ZERO	pH 7	<input checked="" type="checkbox"/>	<u>44912</u>
pH SLOPE	pH 4	<input checked="" type="checkbox"/>	<u>44935</u>
pH SLOPE	pH 10	<input checked="" type="checkbox"/>	<u>50268</u>
3. DISSOLVED OXYGEN	Air Calibration Barometric pressure = 760mmHg	<input checked="" type="checkbox"/>	N/A
4. TURBIDITY ZERO	0.0 NTU's	---	N/A
TURBIDITY SPAN	20 NTU's	---	---
5. REDOX (ORP)	231mV (YSI Zobell solution)	<input checked="" type="checkbox"/>	<u>061317</u>

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number:	Turn-around Requested: Standards	Page: 1 of 1
ARI Client Company: Environmental Partners, Inc.	Phone: 425-395-0010	Date: 12/20/17
Client Contact: Doug Kunkel	No. of Coolers:	Ice Present? Cooler Temps:

Client Project Name: Olalia Landfill	Analysis Requested	Notes/Comments
Client Project #: 45405.0	Samplers: Eric Caddey 425-281-3629	566 email for complete analysis list

Sample ID	Date	Time	Matrix	No. Containers	VOCS	Vinyl Chloride	Disc. Metals	Total metals	Chemistry - Nitrate Nitrite, Chloride, Cyanide, Carbonyl Sulfide, Arsenic	pH	CO2/TAC	Total Coliform	Nitrate-Nitrogen	Fecal Coliform
MW-1-12/17	12/19/17	09:44	water	10	X	X	X	X	X	X	X	X		
MW-5A-12/17		10:42	water	4		X	X			X				
MW-3-12/17		11:50	water	10	X	X	X	X	X	X	X	X		
MW-10-12/17		12:45	water	10	X	X	X	X	X	X	X	X		
MW-6-12/17		13:28	water	10	X	X	X	X	X	X	X	X		
MW-8-12/17		14:15	water	10	X	X	X	X	X	X	X	X		
MW-7-12/17		14:55	water	4		X	X			X				
MW-13-12/17		-	water	10	X	X	X	X	X	X	X	X		
Trip blank		-	water	3	X									
SW-2-12/17	12	08:25	water	3						X			X	X

Comments/Special Instructions	Relinquished by: (Signature) <i>ZM</i>	Received by: (Signature) <i>B. Fisk</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Eric Caddey	Printed Name: Brandon Fisk	Printed Name:	Printed Name:
	Company: EPI	Company: ARI	Company:	Company:
	Date & Time: 12/20/17 0805	Date & Time: 12/20/17 805	Date & Time:	Date & Time:

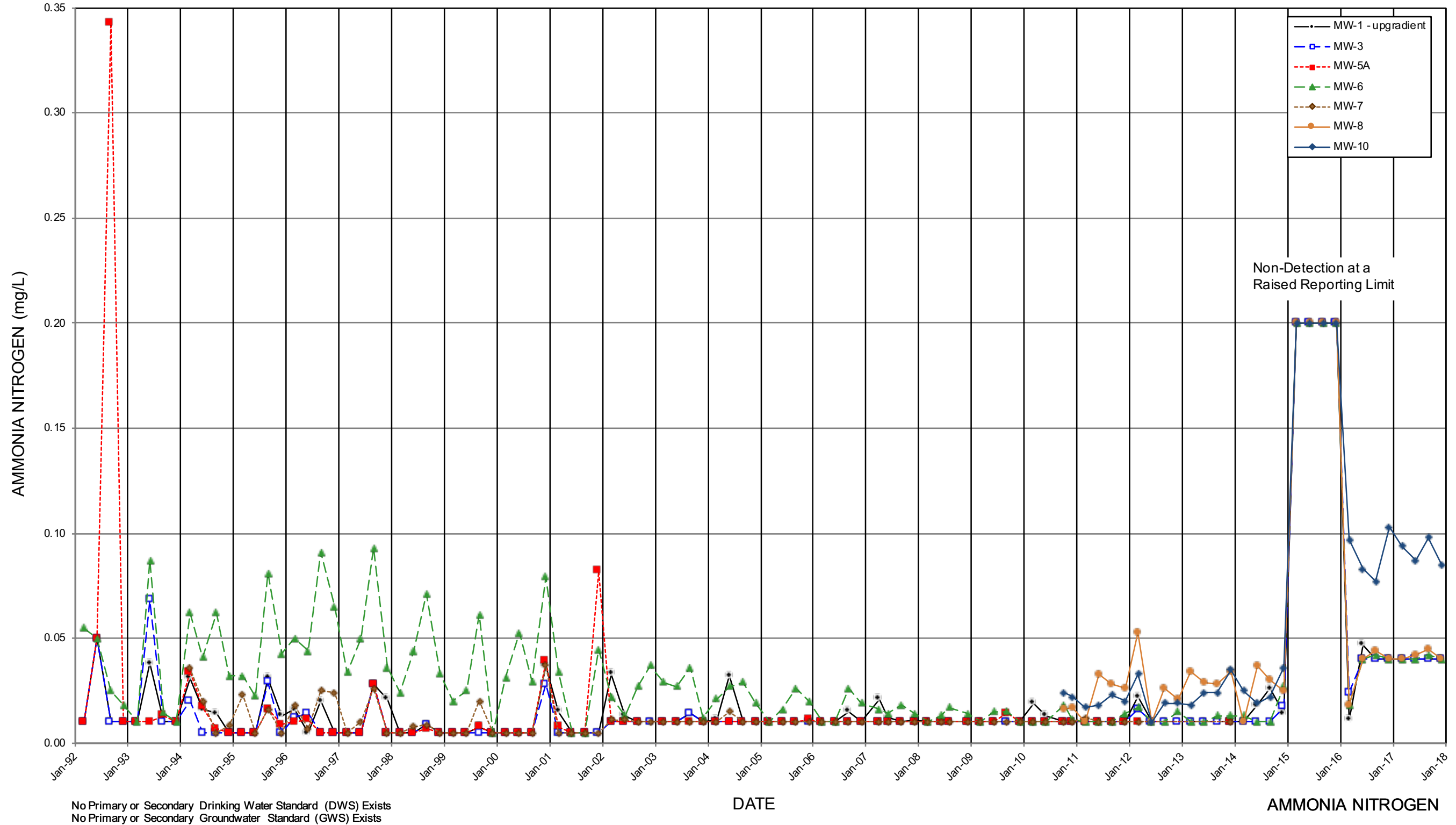
Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Appendix C:
2017 Statistical Summaries

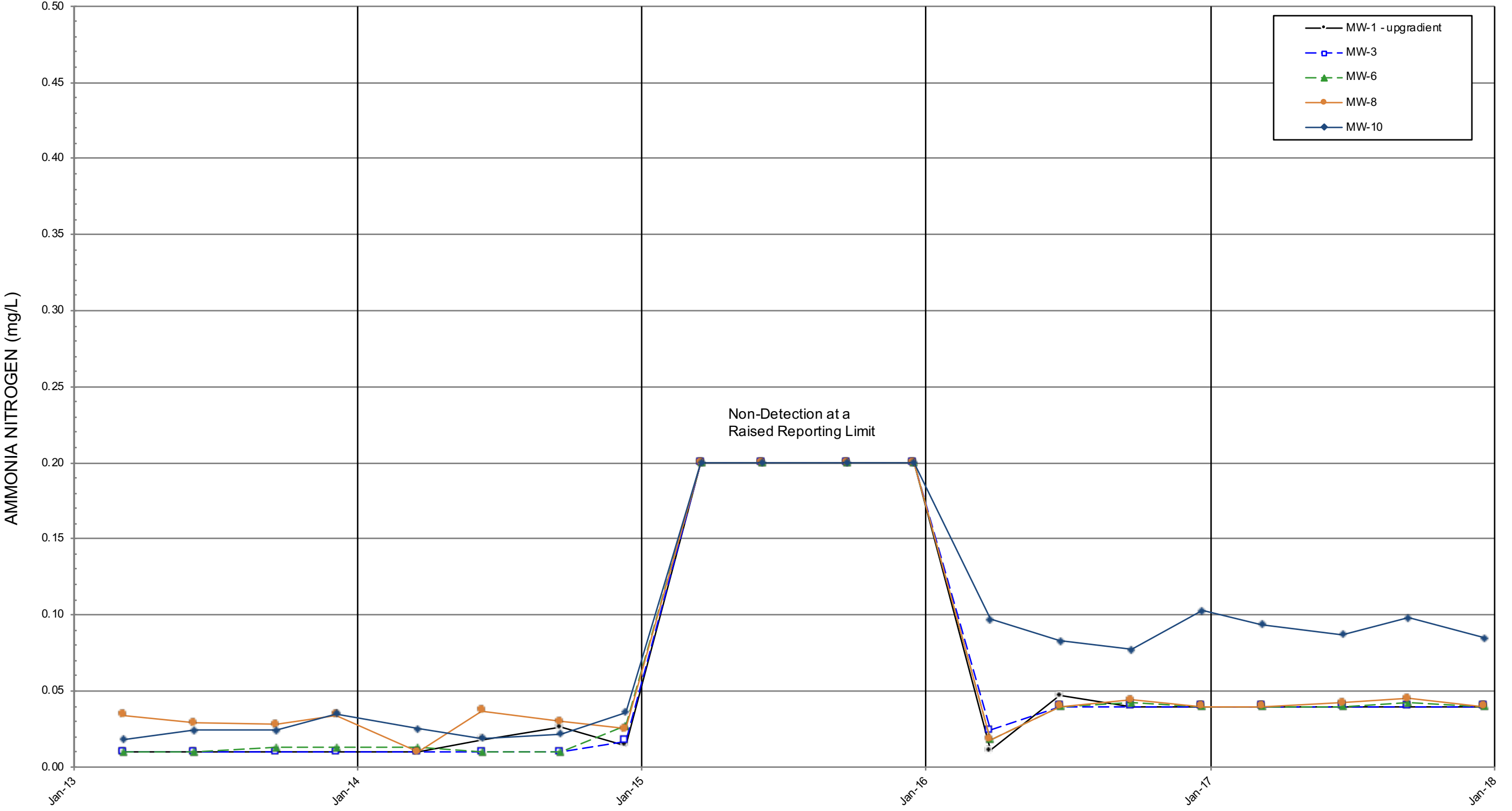
Time-Series Plots through December 2017
Mann-Kendall Statistically Significant Trend Test Summary Tables
Shapiro-Wilk Test for Normality Summary Tables
Confidence Interval Summary Tables

OLALLA LANDFILL Quarterly Monitoring Data



OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

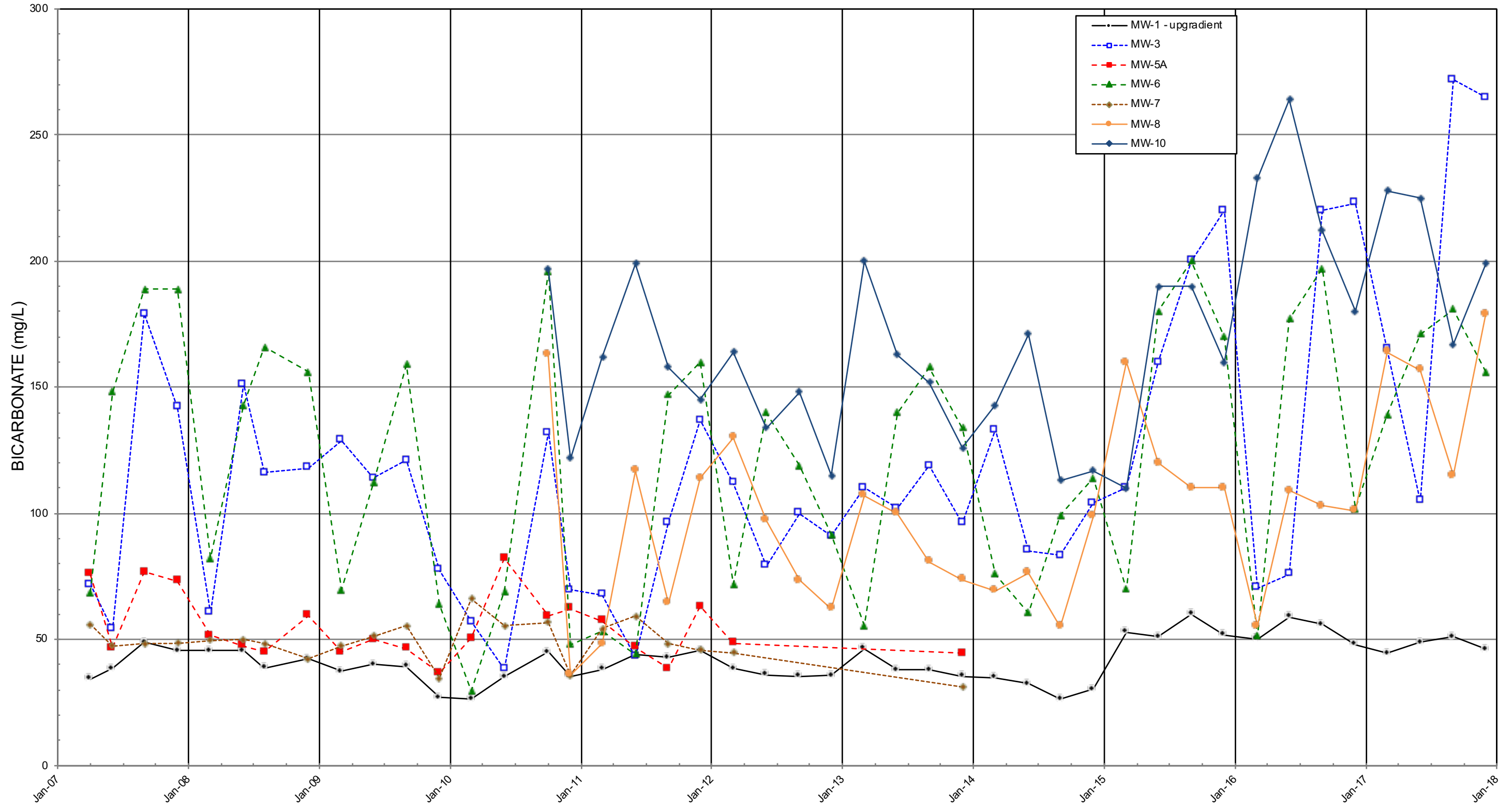


No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

AMMONIA NITROGEN (RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



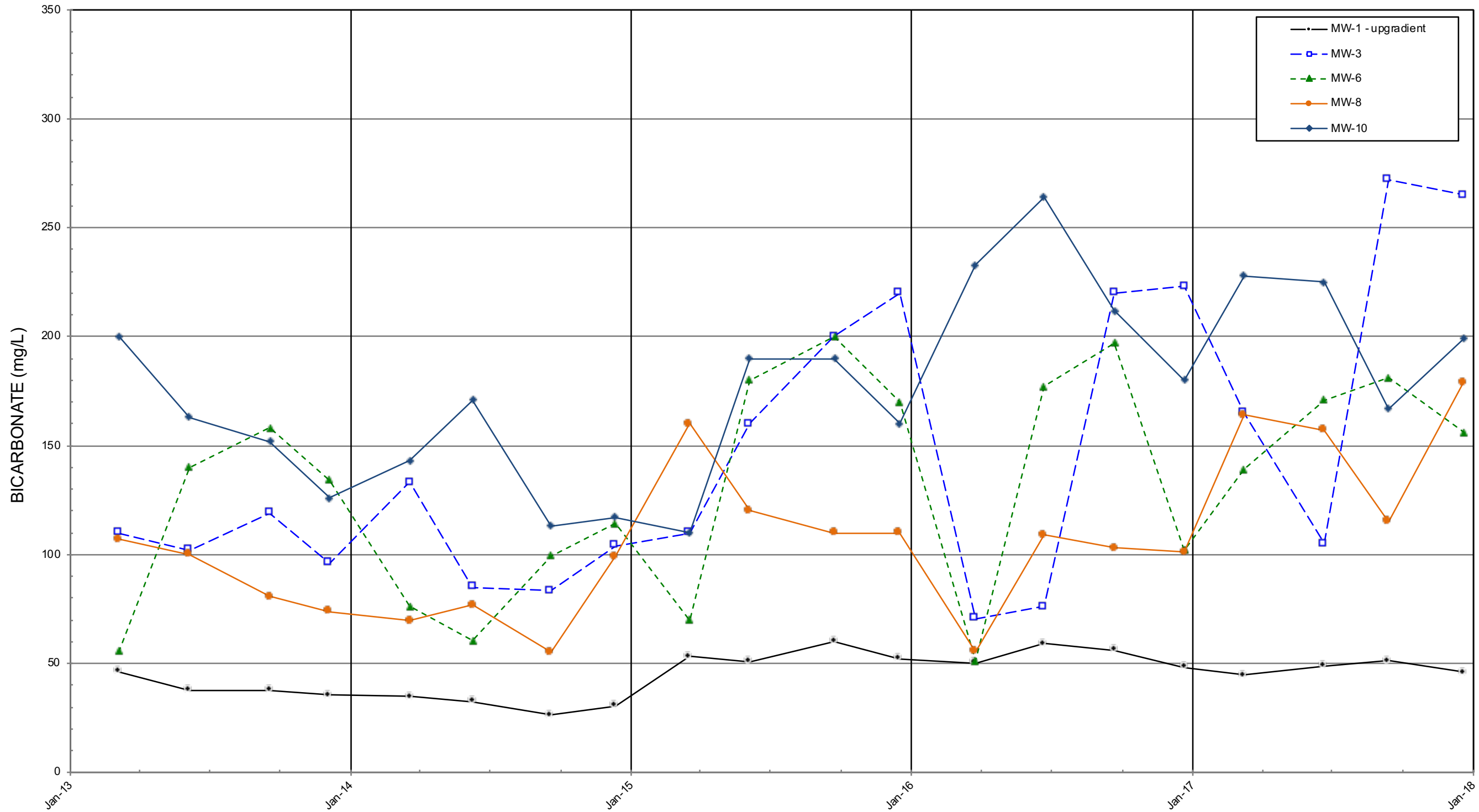
No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

BICARBONATE
 (Analysis started in 2007)

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

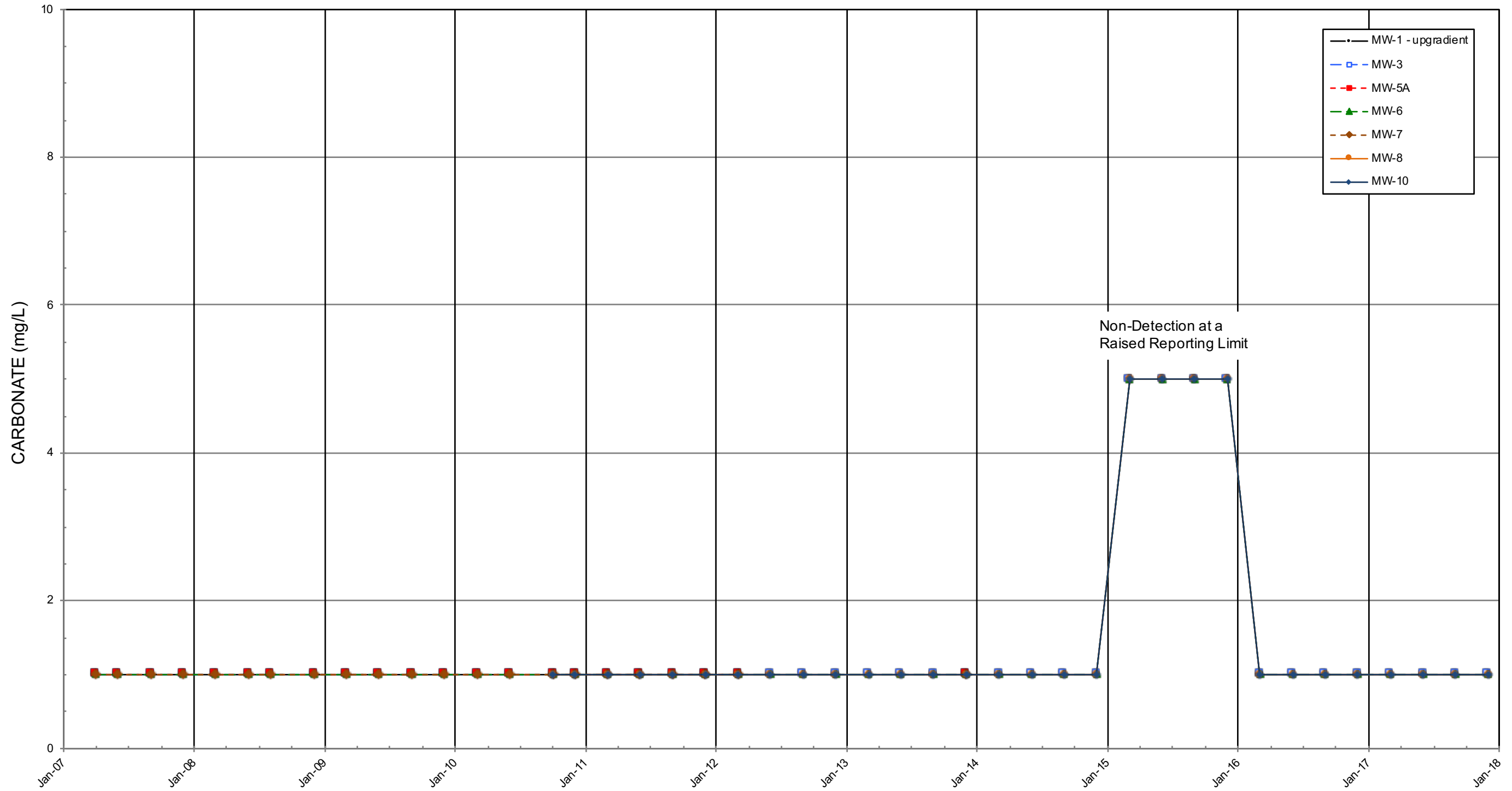


No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

BICARBONATE
(RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



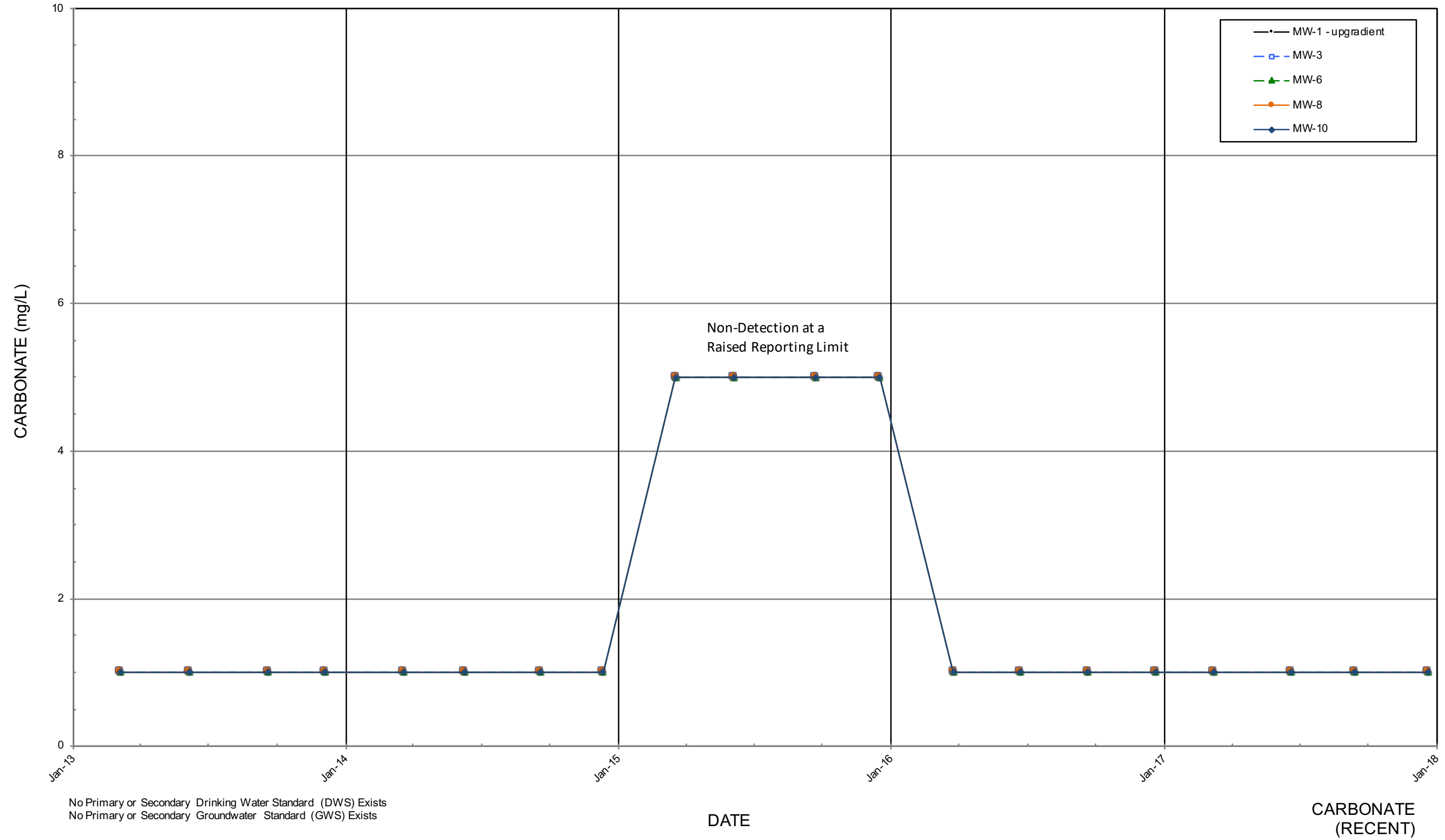
No Primary or Secondary Drinking Water Standard (DWS) Exists
No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

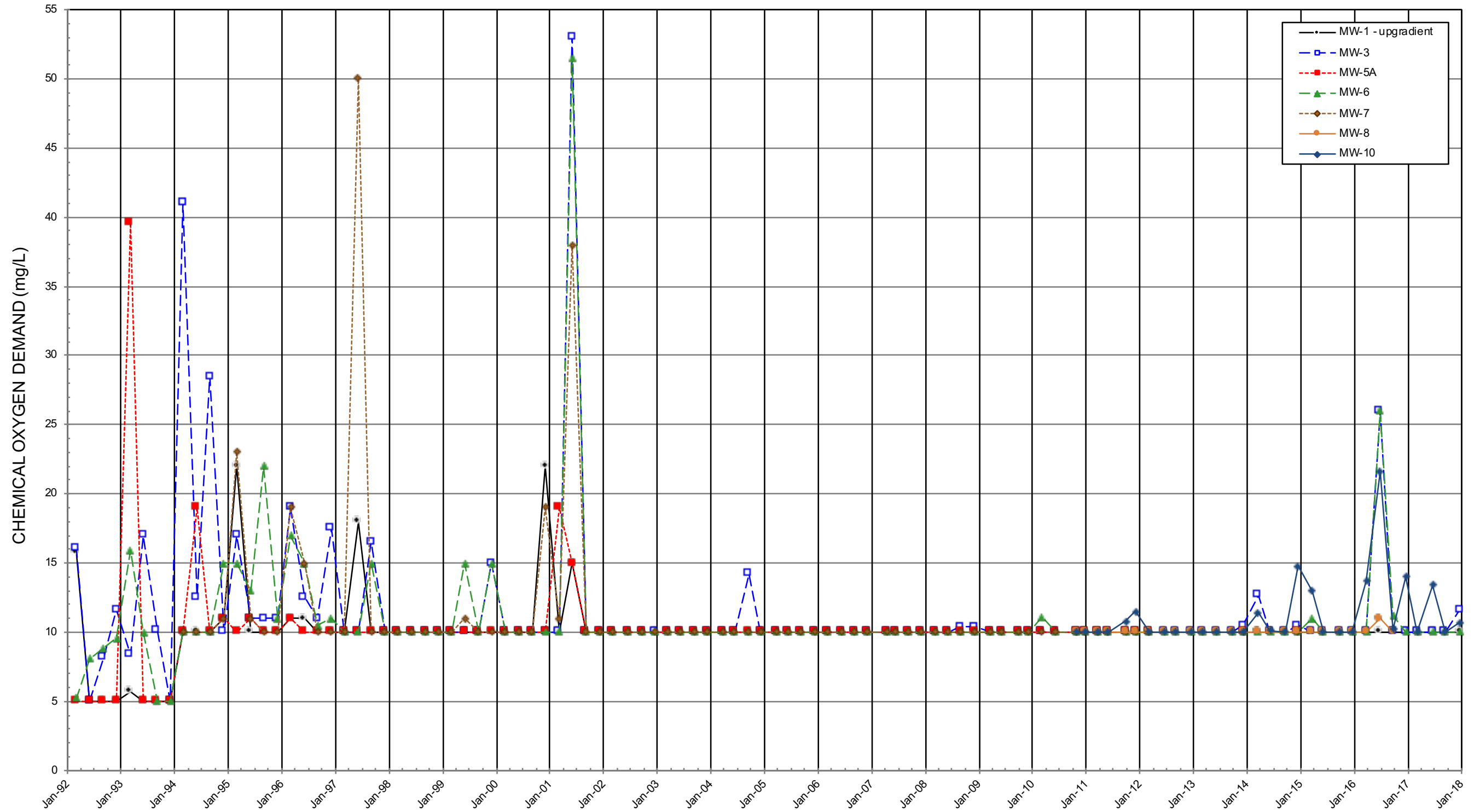
CARBONATE
(Analysis started in 2007)

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



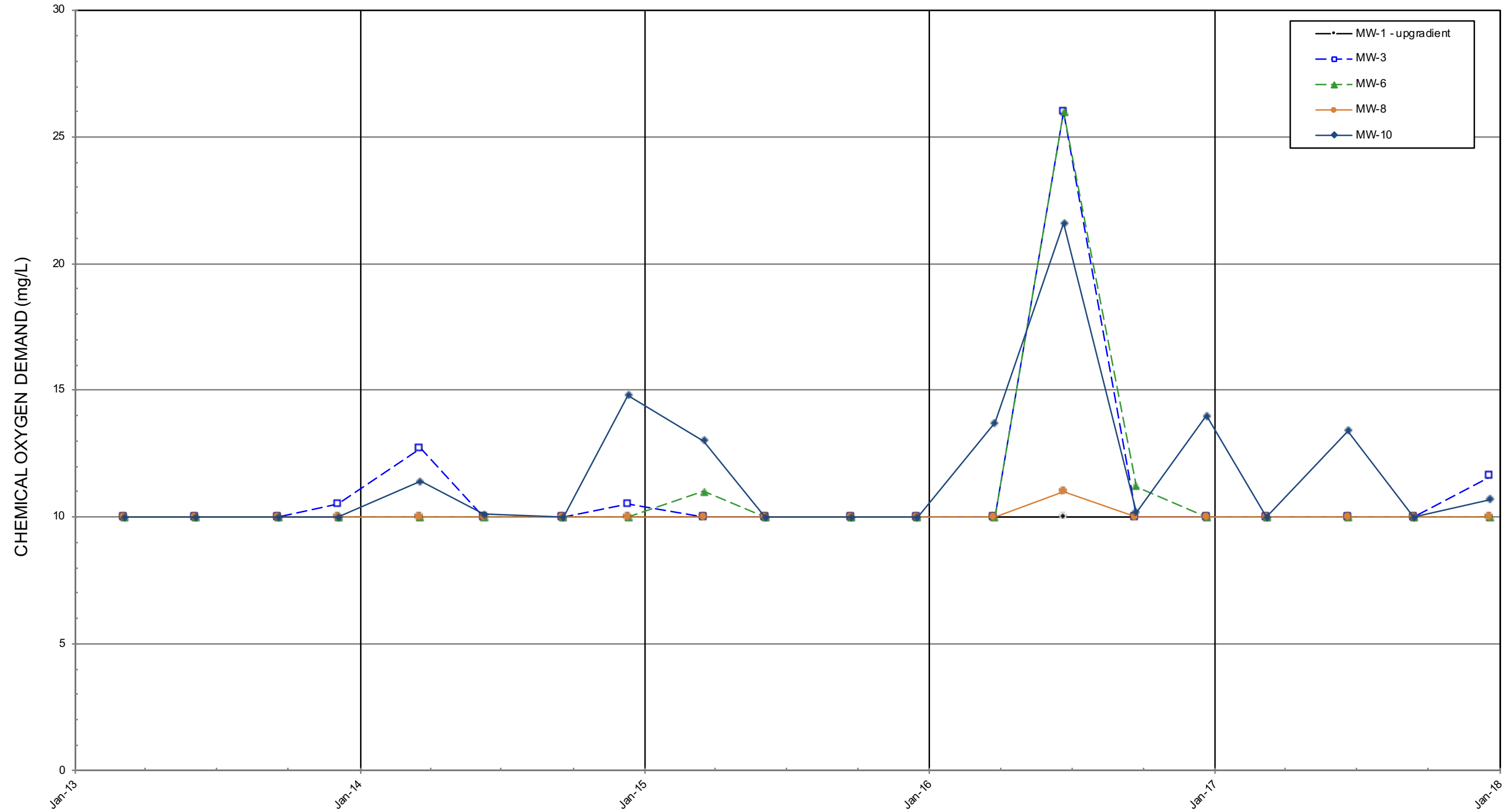
No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

CHEMICAL OXYGEN DEMAND

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

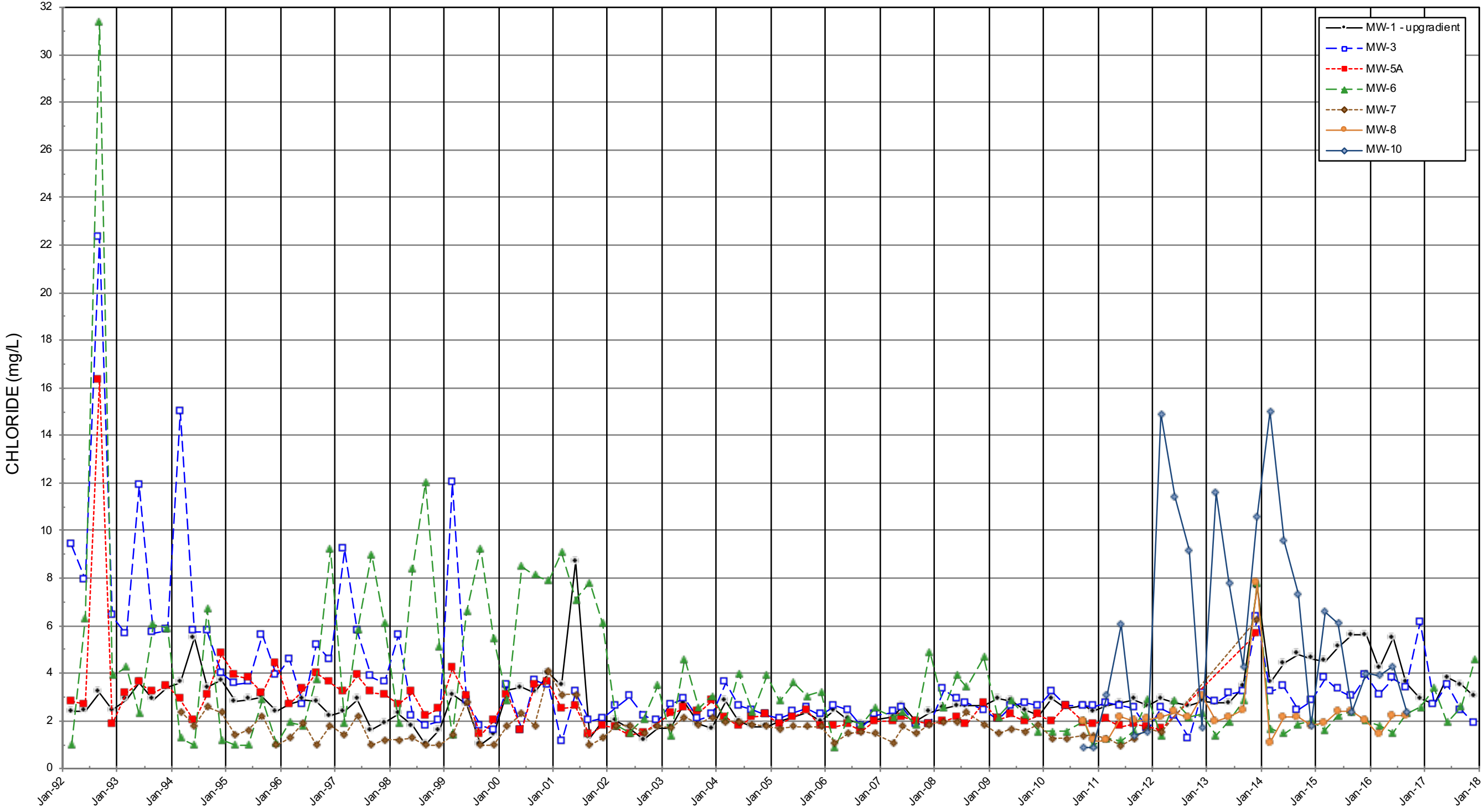


No Primary or Secondary Drinking Water Standard (DWS) Exists
No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

CHEMICAL OXYGEN DEMAND (RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



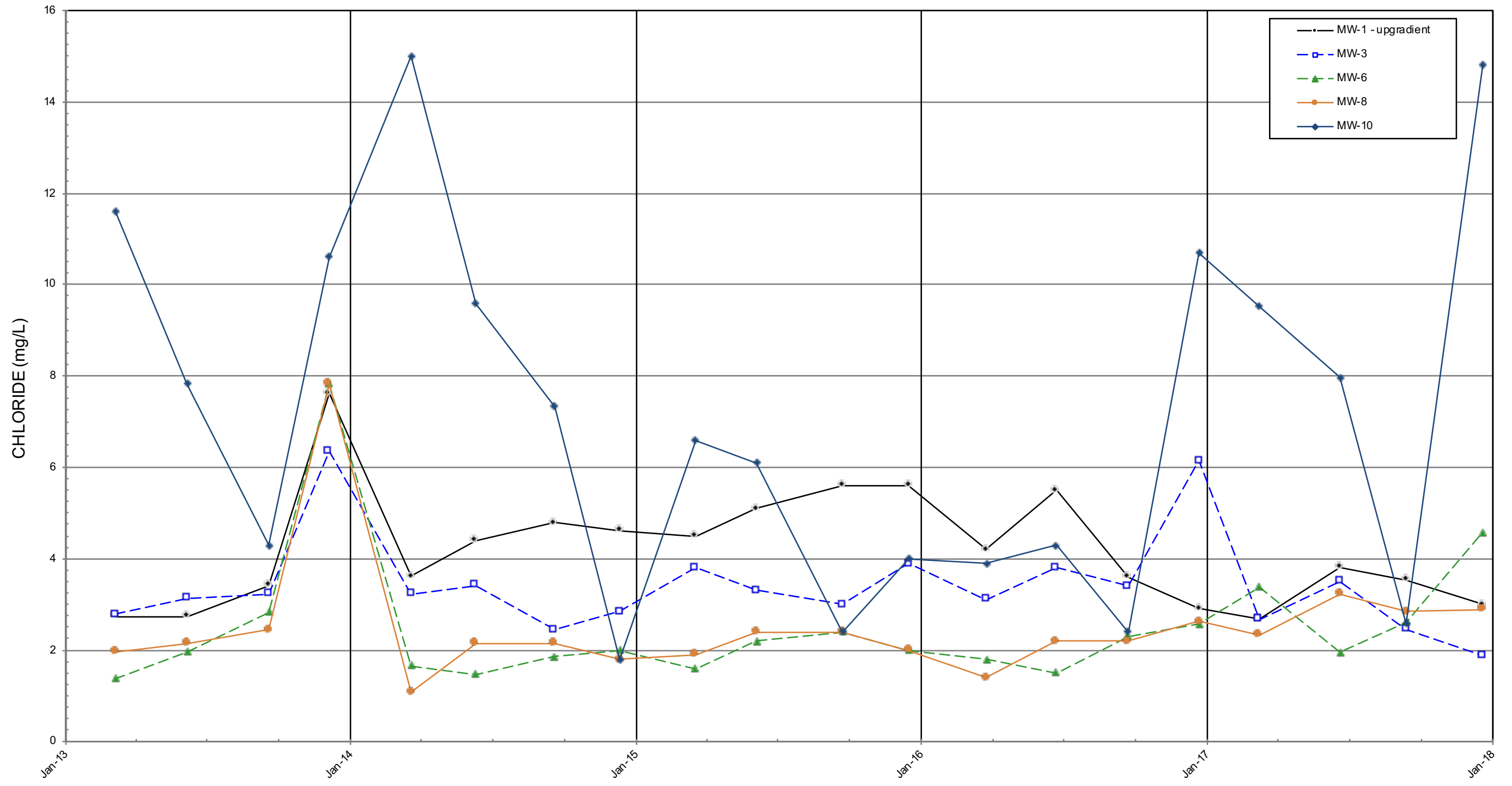
Secondary Drinking Water Standard (DWS) = 250 mg/L (off scale)
Secondary Groundwater Standard (GWS) = 250 mg/L (off scale)

DATE

CHLORIDE

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

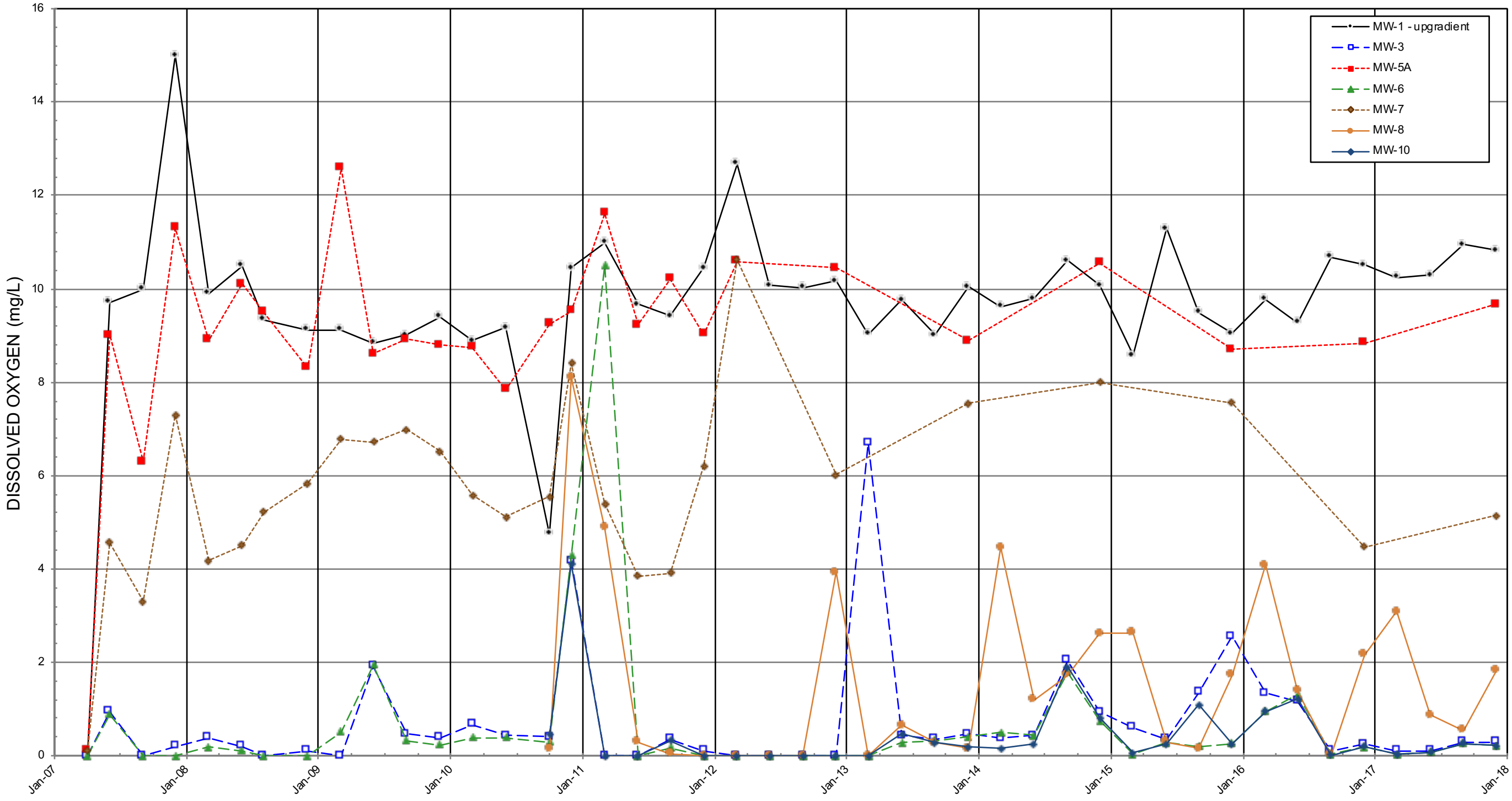


Secondary Drinking Water Standard (DWS) = 250 mg/L (off scale)
 Secondary Groundwater Standard (GWS) = 250 mg/L (off scale)

DATE

CHLORIDE (RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



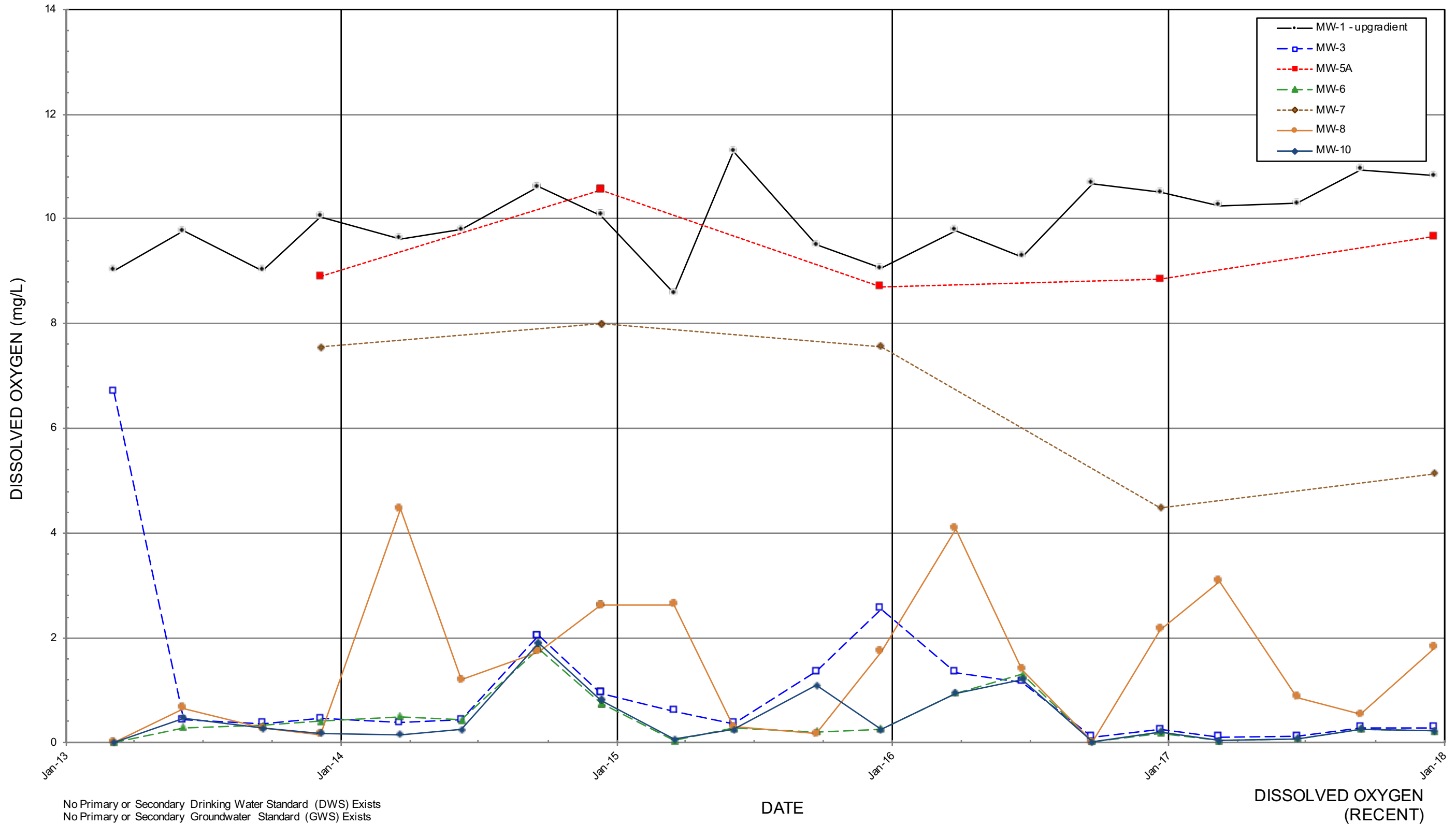
No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

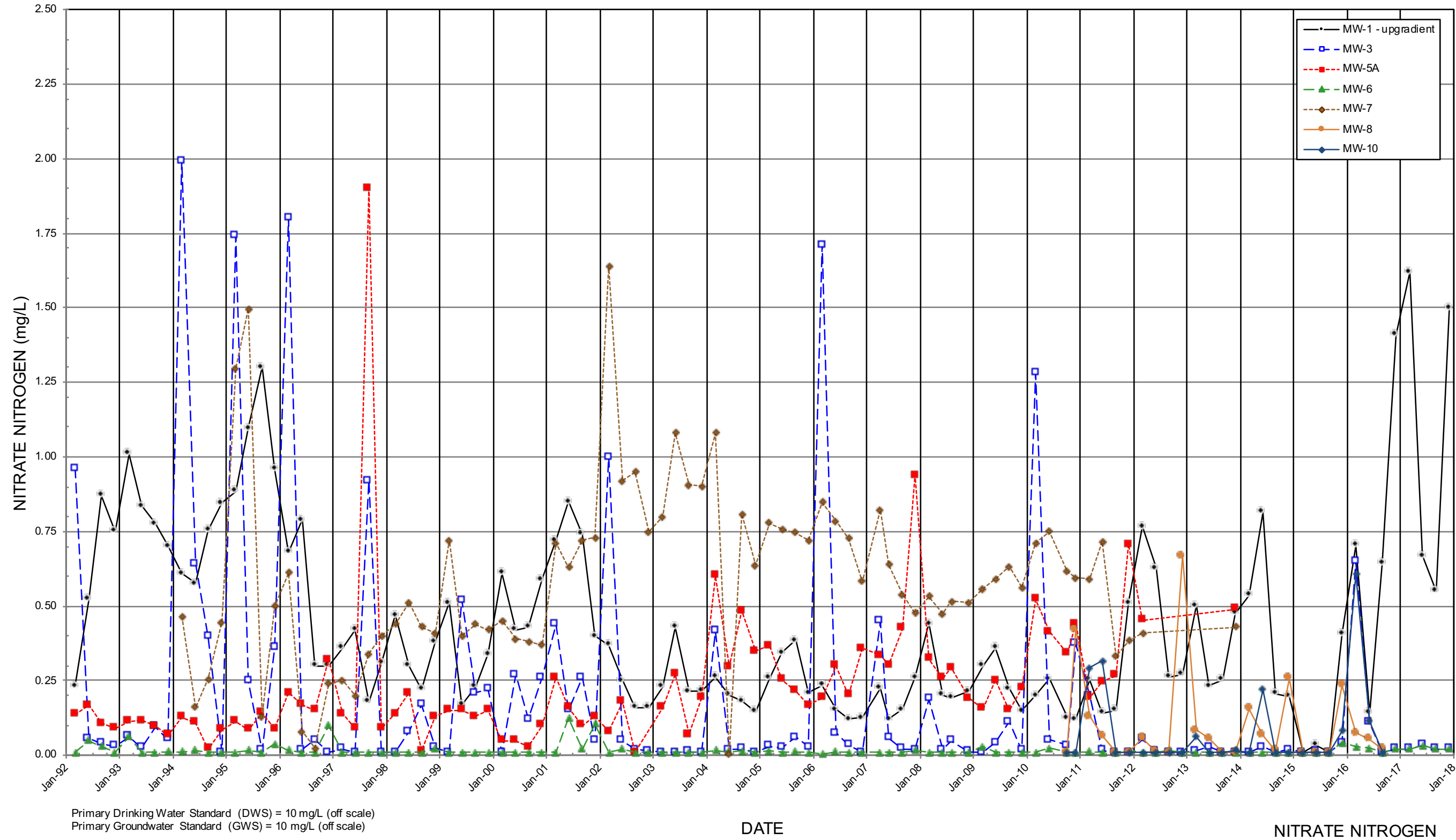
DISSOLVED OXYGEN
 (Analysis started in 2007)

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

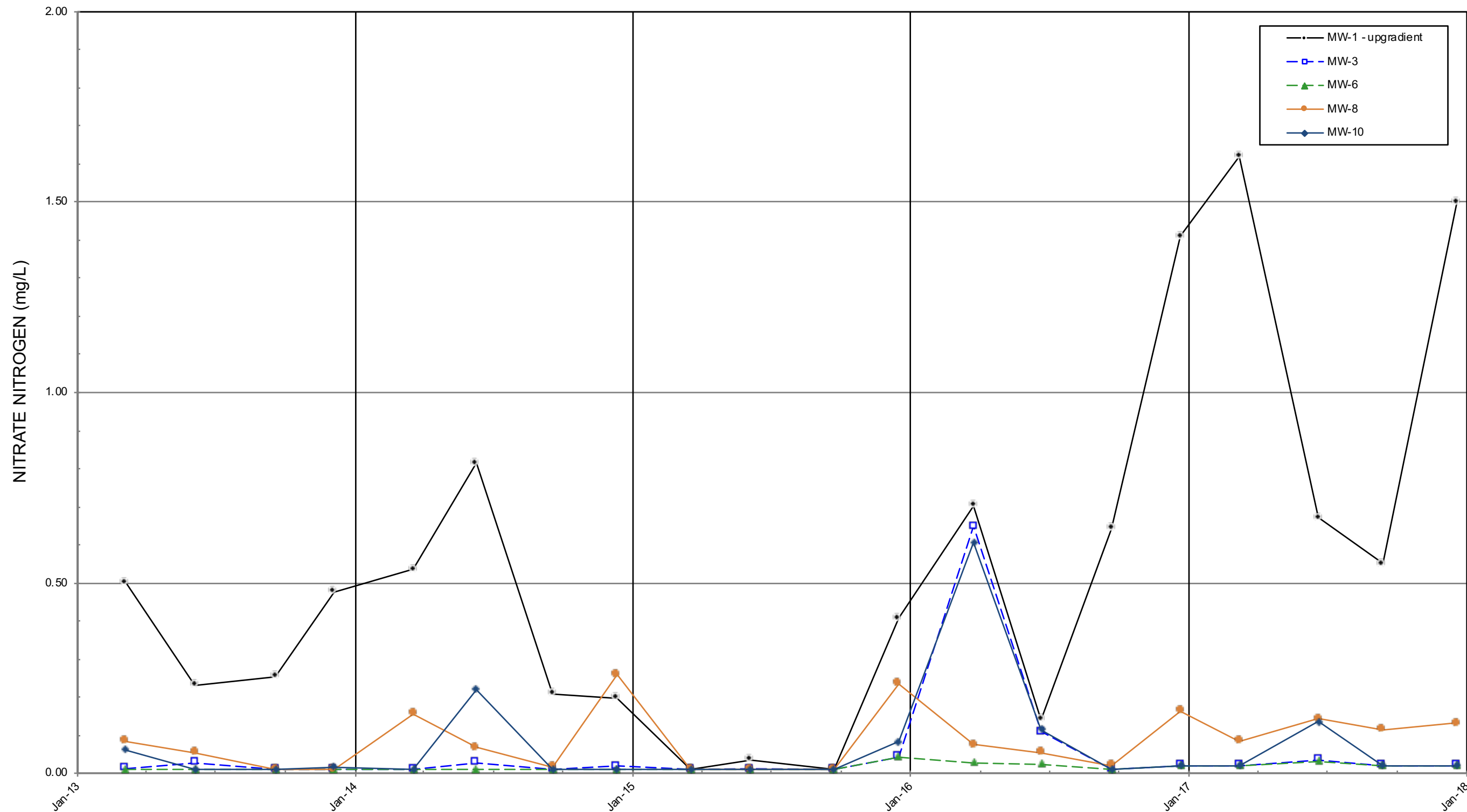


OLALLA LANDFILL Quarterly Monitoring Data



OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

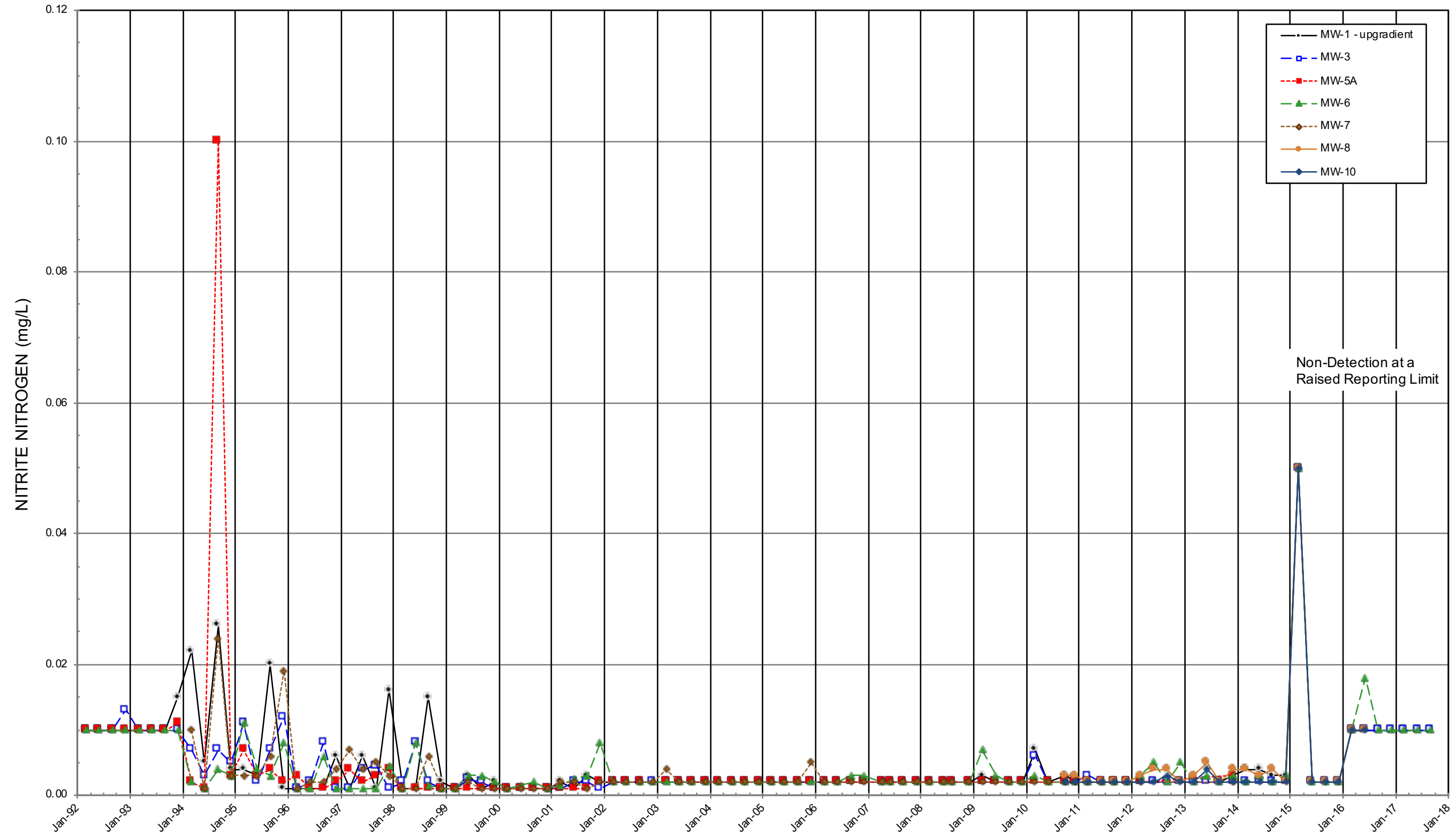


Primary Drinking Water Standard (DWS) = 10 mg/L (off scale)
Primary Groundwater Standard (GWS) = 10 mg/L (off scale)

DATE

NITRATE NITROGEN
(RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



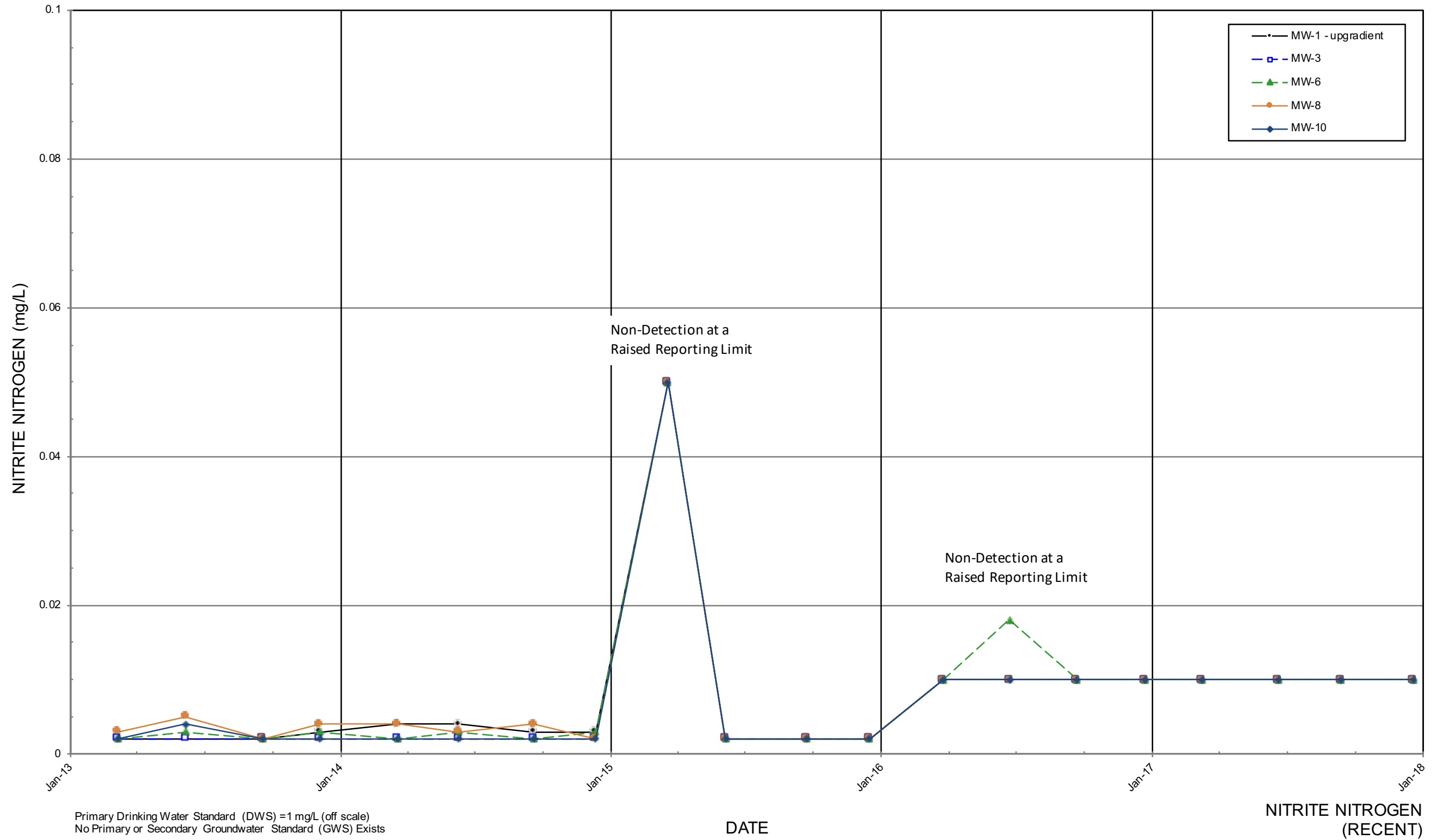
Primary Drinking Water Standard (DWS) = 1 mg/L (off scale)
No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

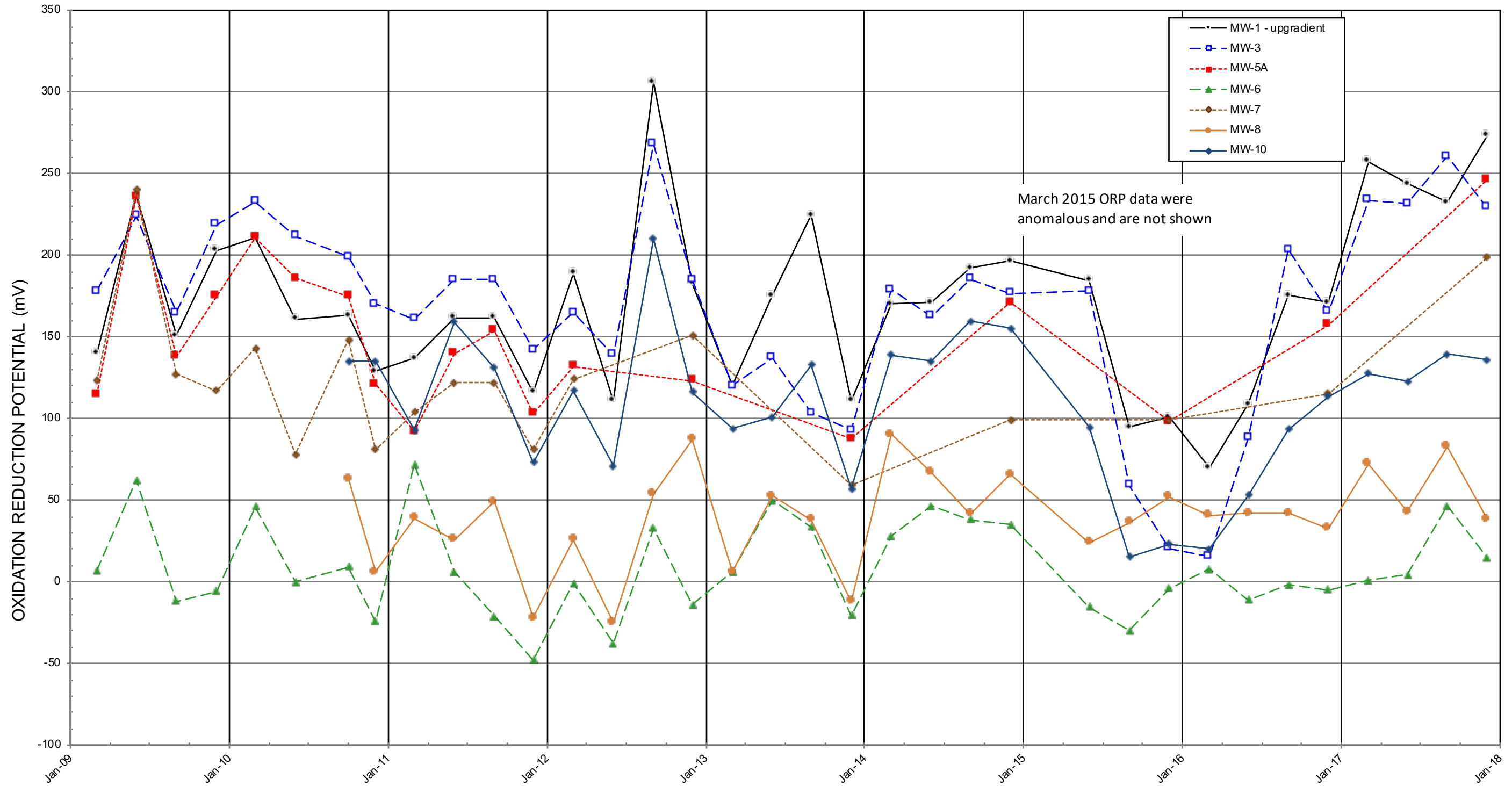
NITRITE NITROGEN

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



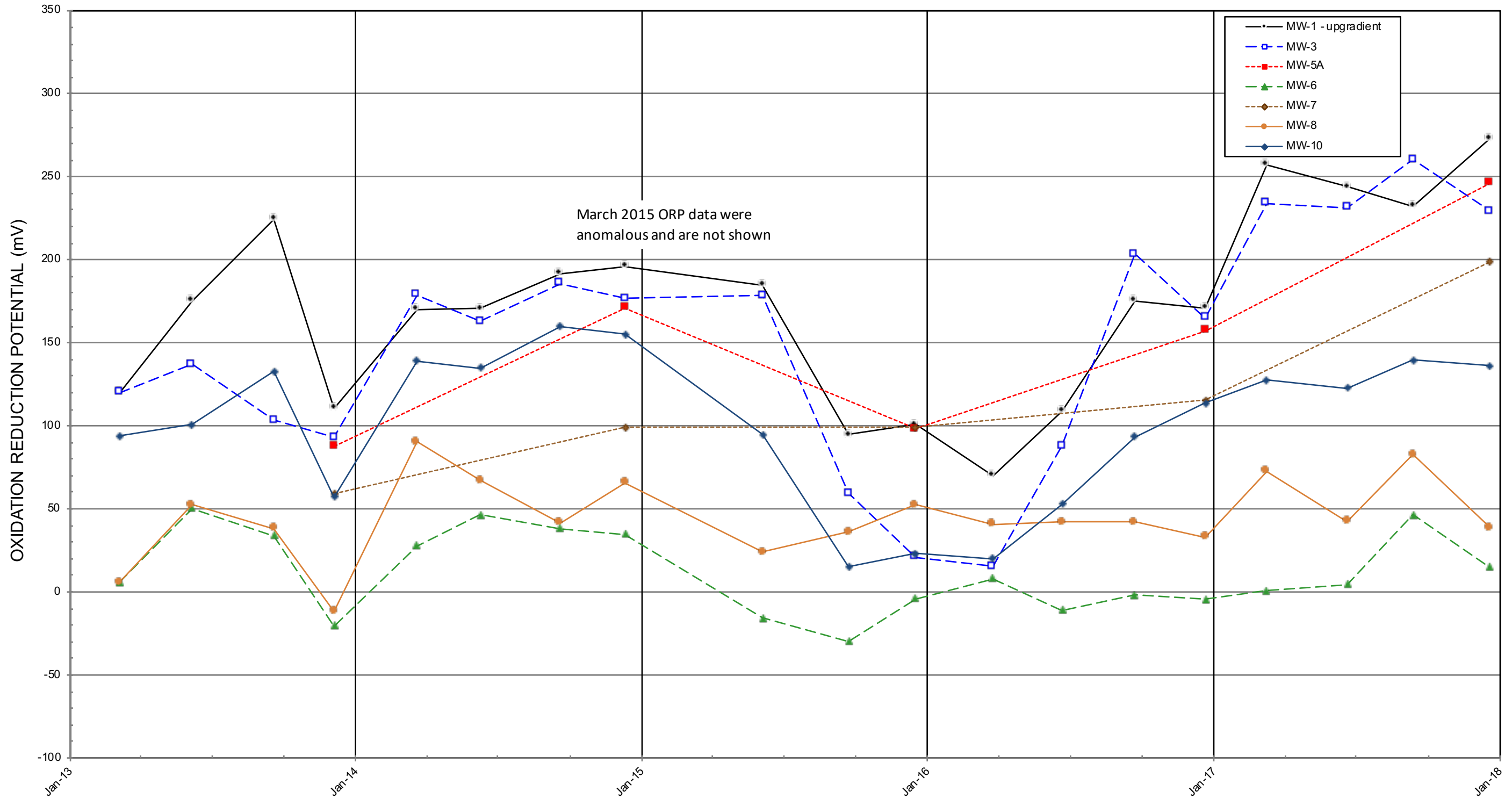
No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

OXIDATION REDUCTION POTENTIAL
 (Analysis started in 2009)

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

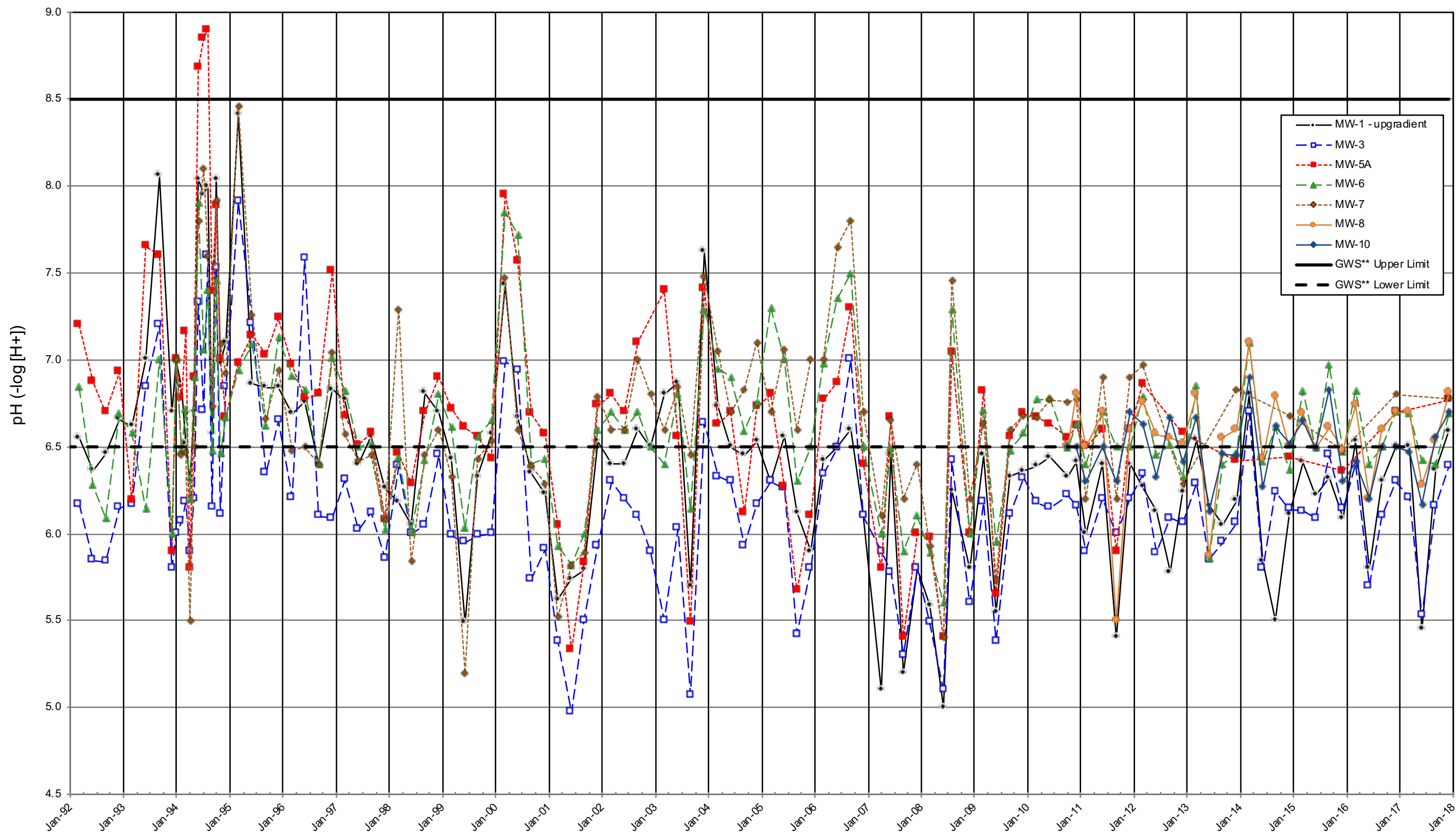


No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

OXIDATION REDUCTION
 POTENTIAL (RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



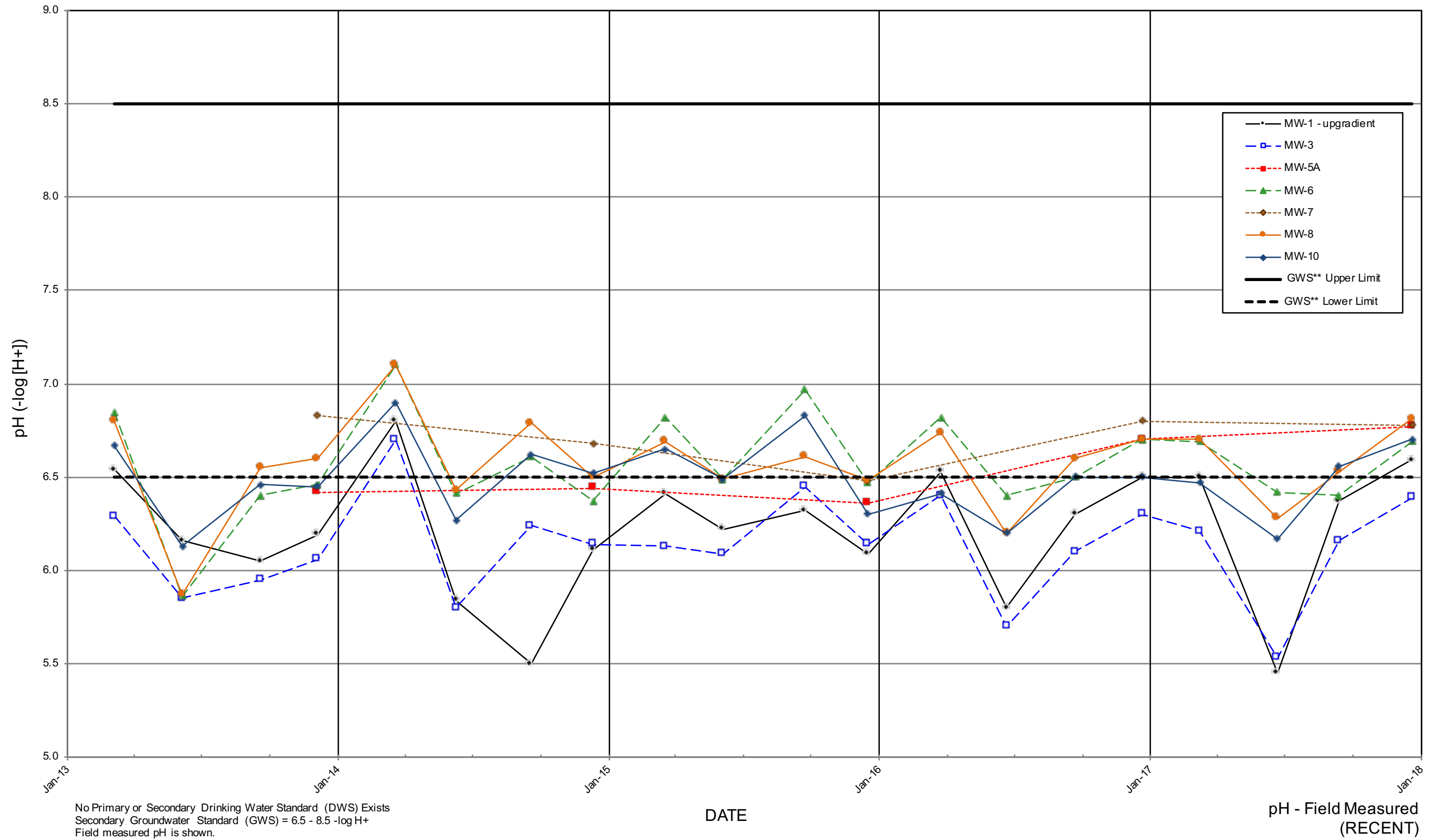
No Primary or Secondary Drinking Water Standard (DWS) Exists
 Secondary Groundwater Standard (GWS) = 6.5 - 8.5 -log H+

DATE

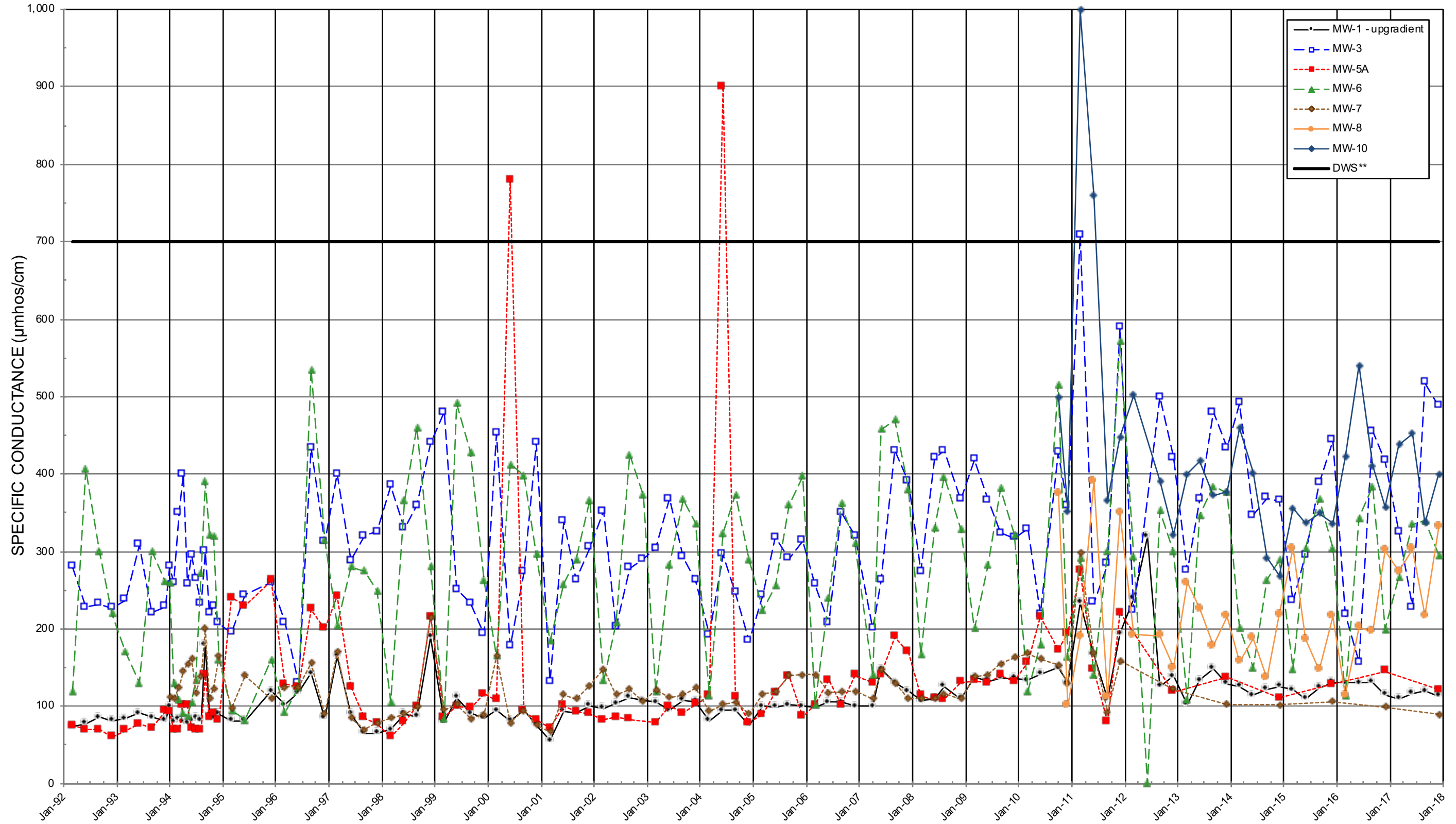
pH - Field Measured

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



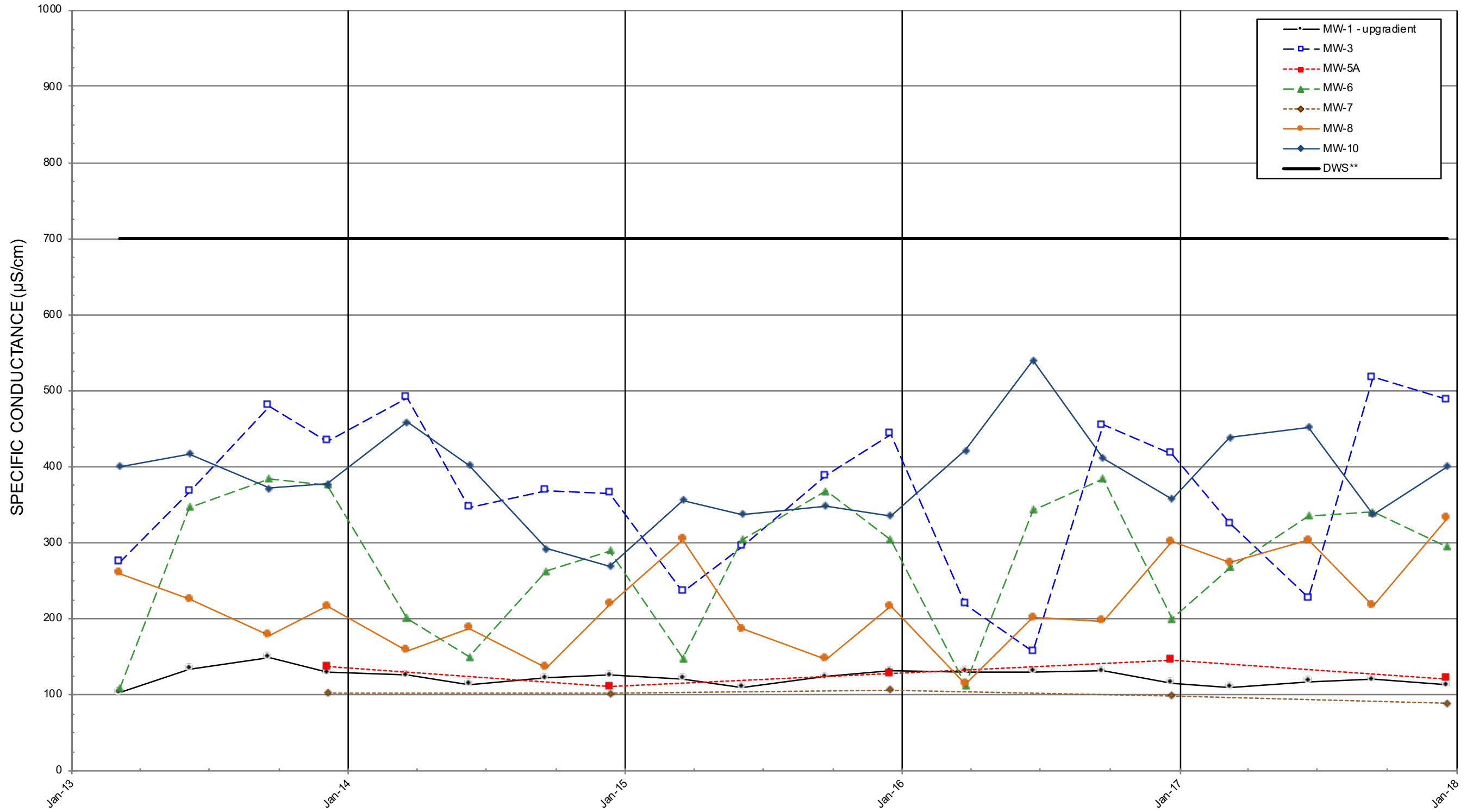
Secondary Drinking Water Standard (DWS) = 700 µmhos/cm
No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

SPECIFIC CONDUCTANCE

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

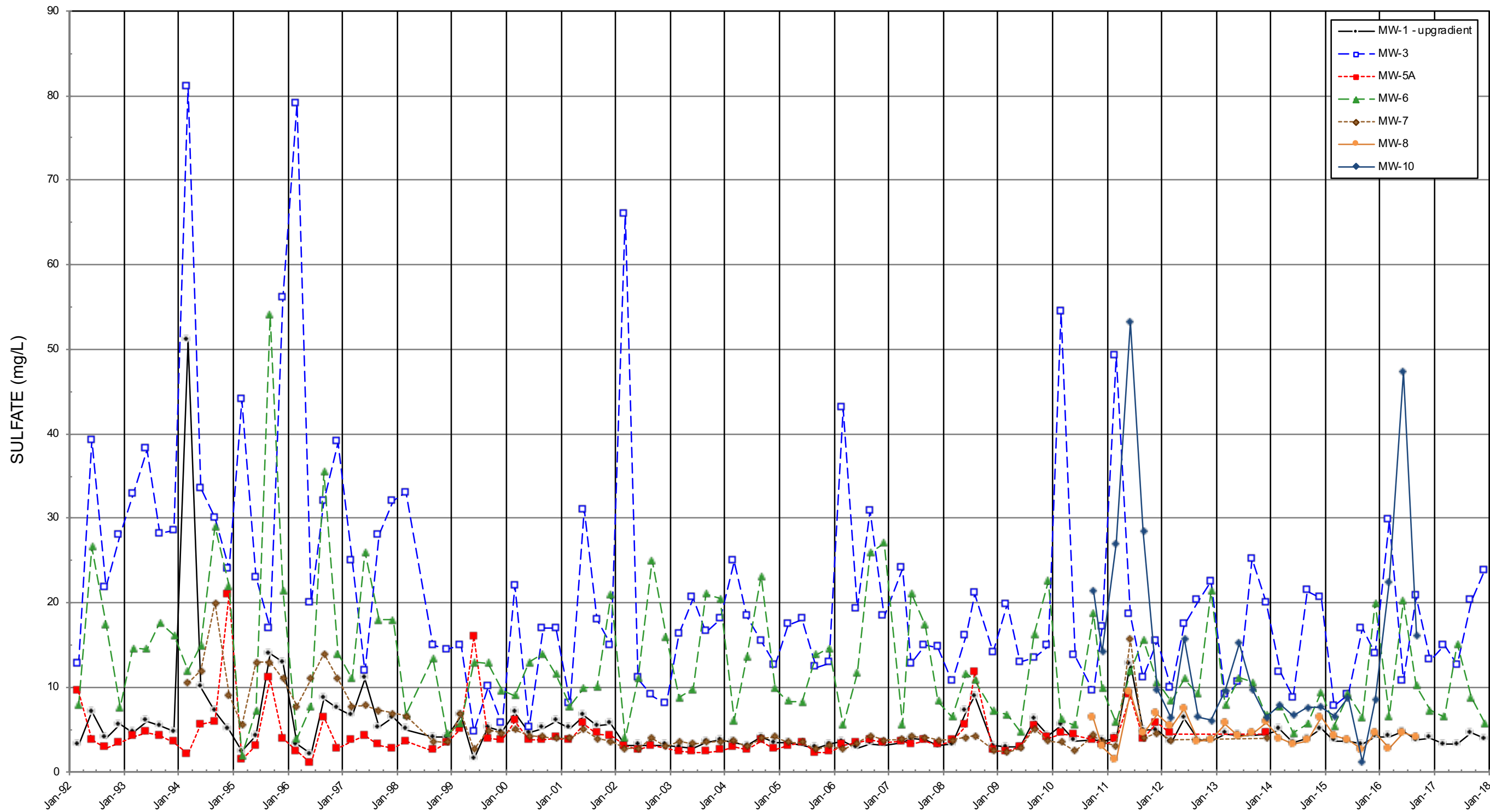


Secondary Drinking Water Standard (DWS) = 700 $\mu\text{S}/\text{cm}$
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

SPECIFIC CONDUCTANCE (RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



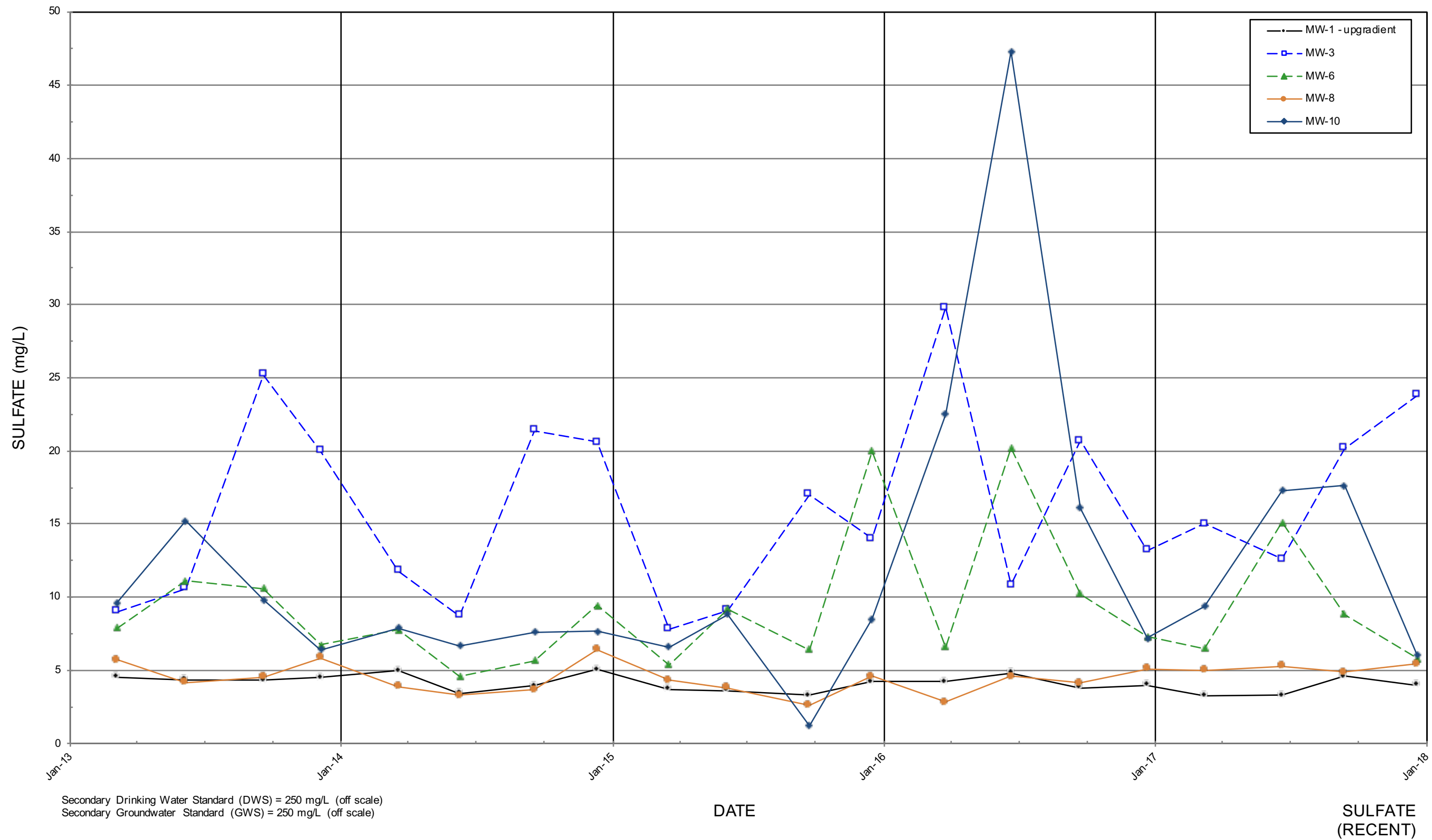
Secondary Drinking Water Standard (DWS) = 250 mg/L (off scale)
Secondary Groundwater Standard (GWS) = 250 mg/L (off scale)

DATE

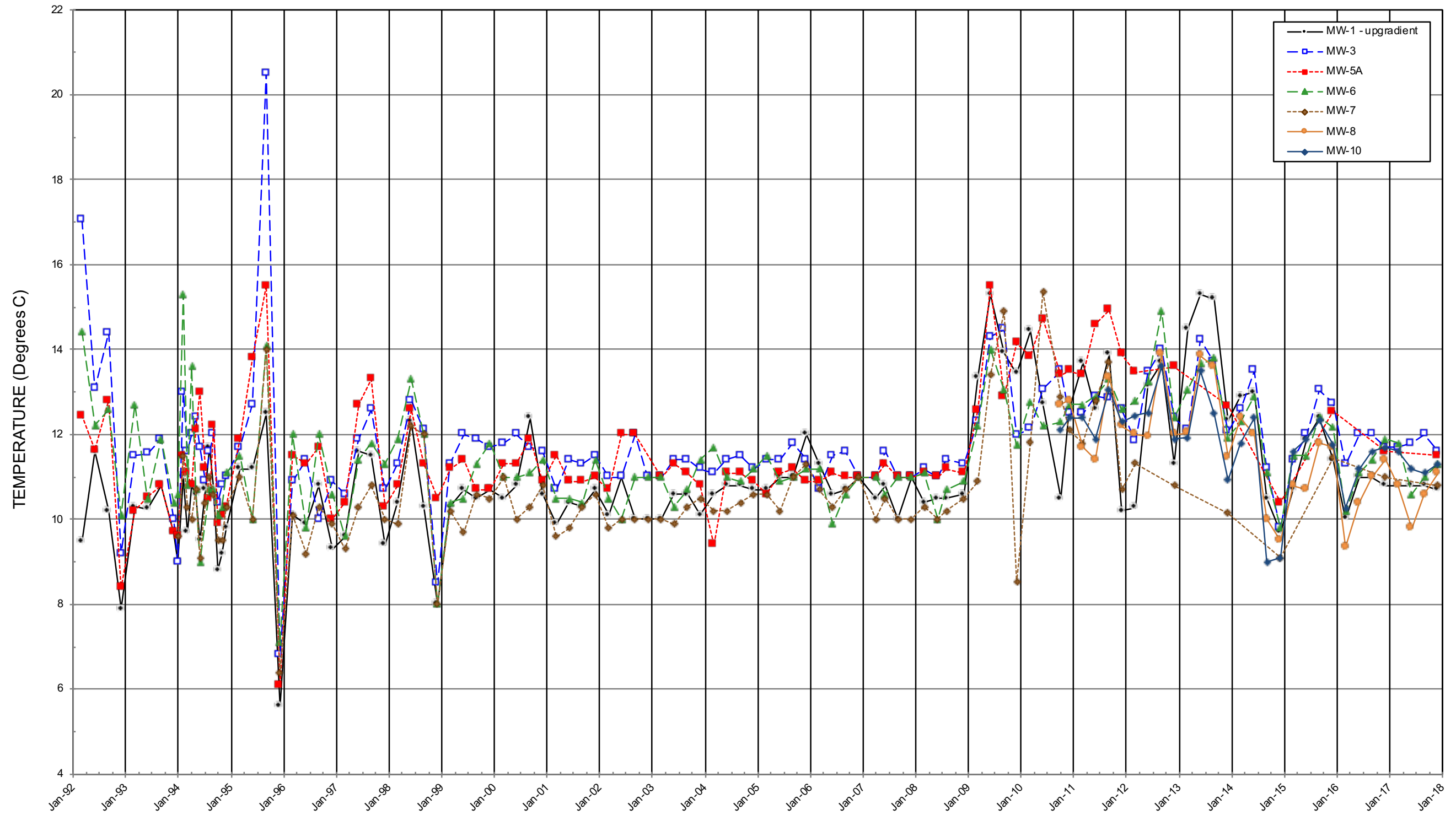
SULFATE

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



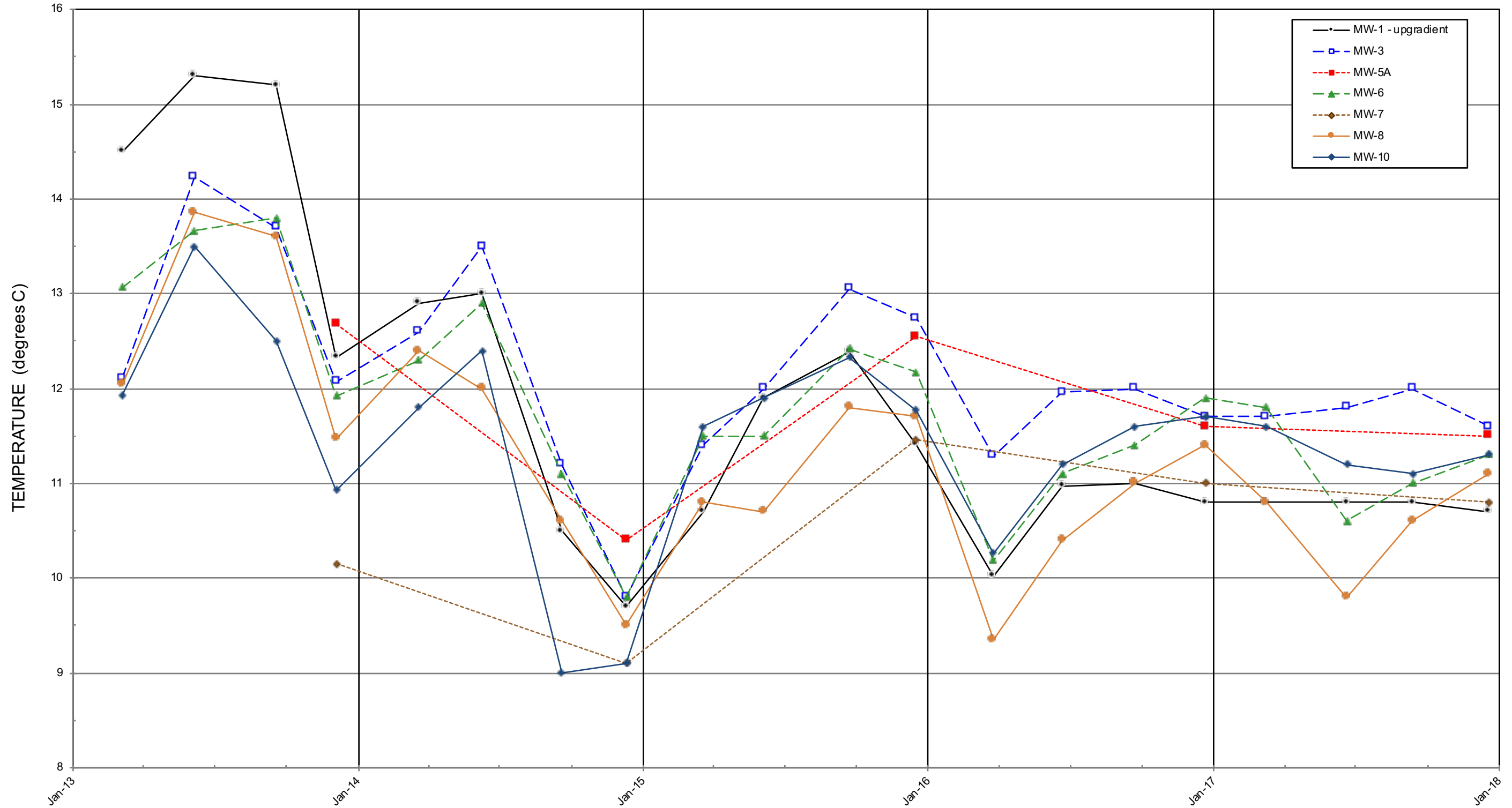
No Primary or Secondary Drinking Water Standard (DWS) Exists
No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

TEMPERATURE

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



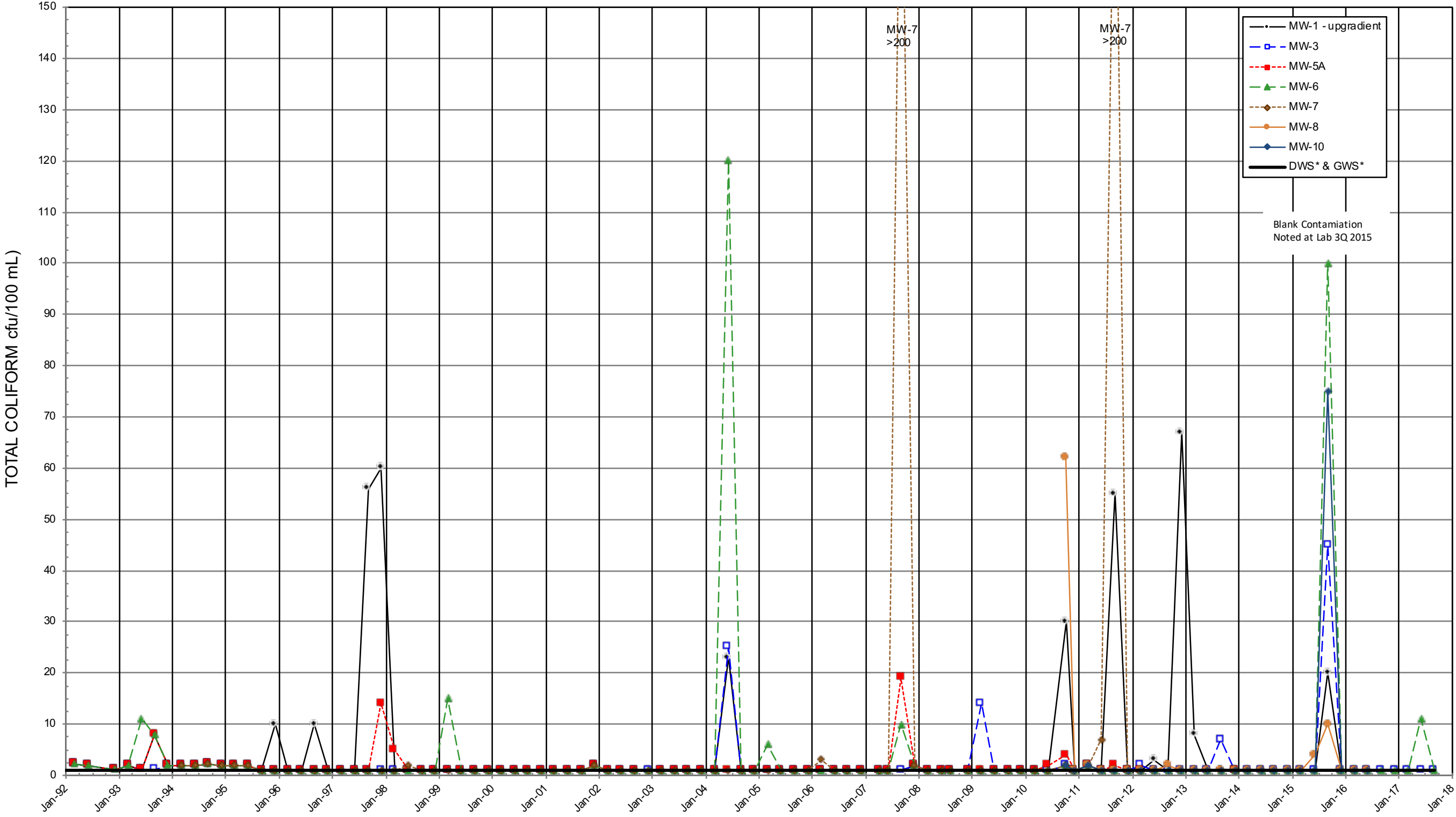
No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

TEMPERATURE
 (RECENT)

OLALLA LANDFILL

Quarterly Monitoring Data



Primary Drinking Water Standard (DWS) = 1 cfu/100 mL
 Primary Groundwater Standard (GWS) = 1 cfu/100 mL

DATE

TOTAL COLIFORM

- MW-1 - upgradient
- MW-3
- MW-5A
- ▲- MW-6
- ◆- MW-7
- MW-8
- ◆- MW-10
- DWS* & GWS*

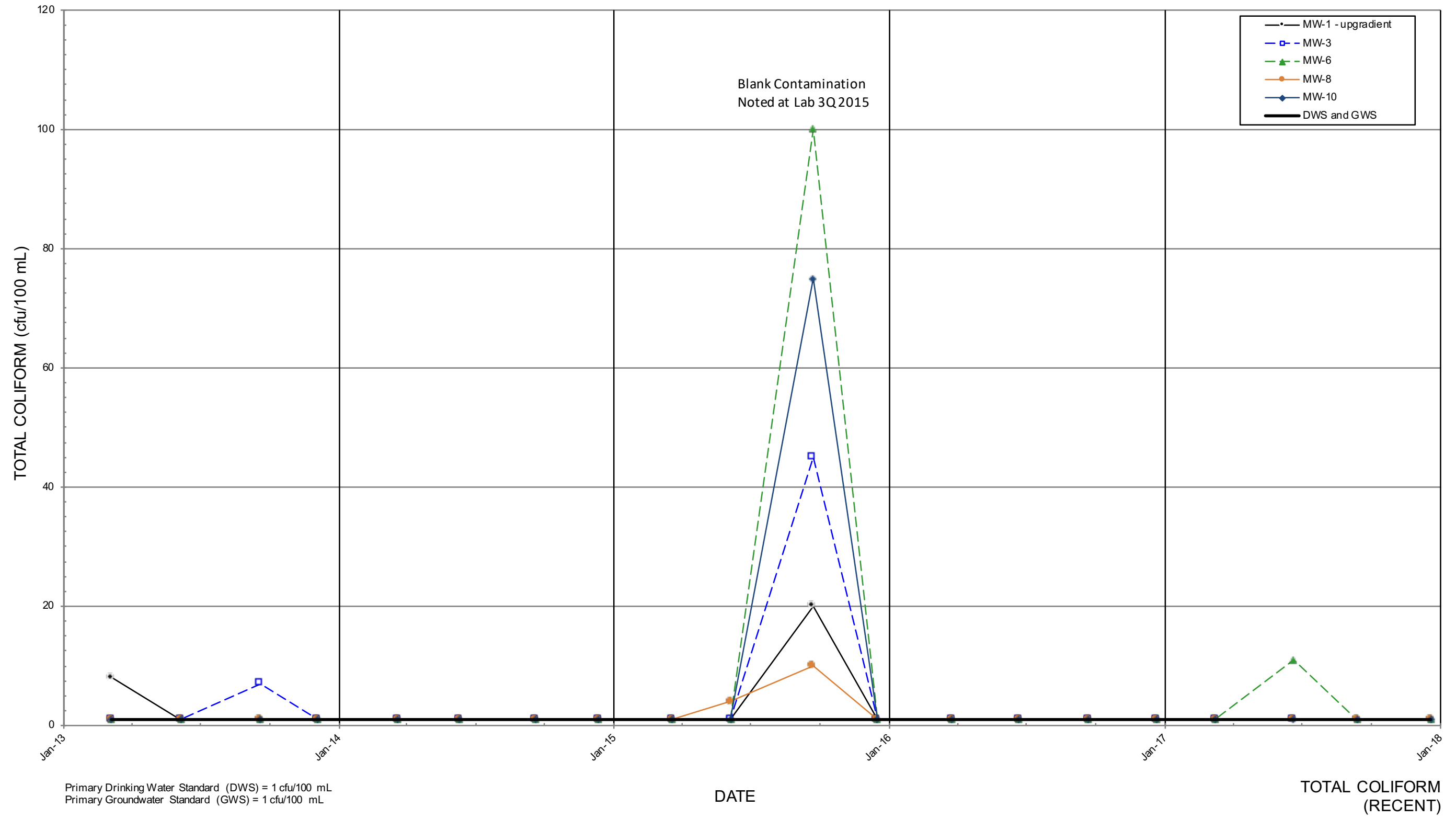
Blank Contamination
 Noted at Lab 3Q 2015

MW-7
 >200

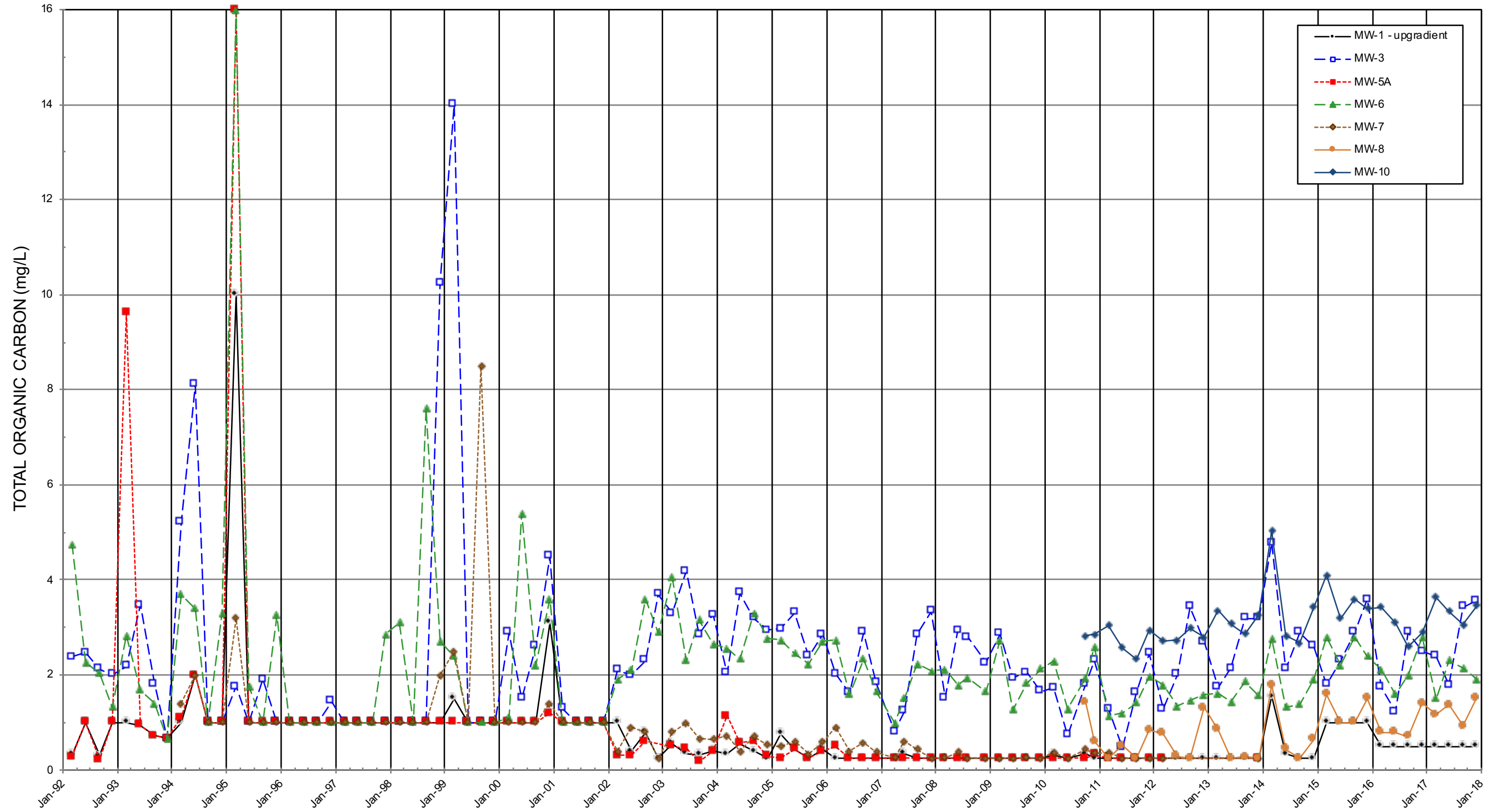
MW-7
 >200

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



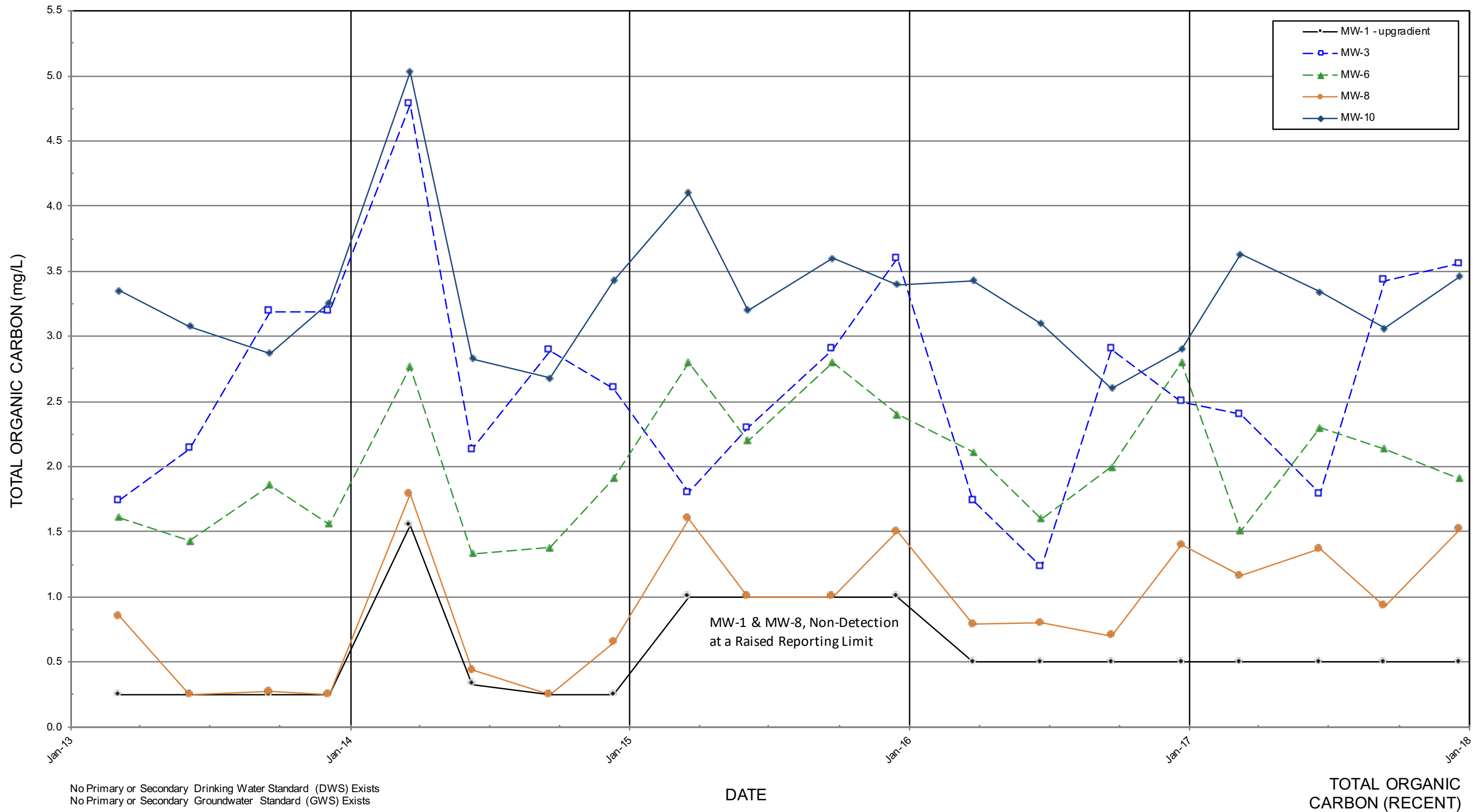
Data split (beginning 12/01) is due to a change in the Method Detection Limit
 No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

TOTAL ORGANIC CARBON

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

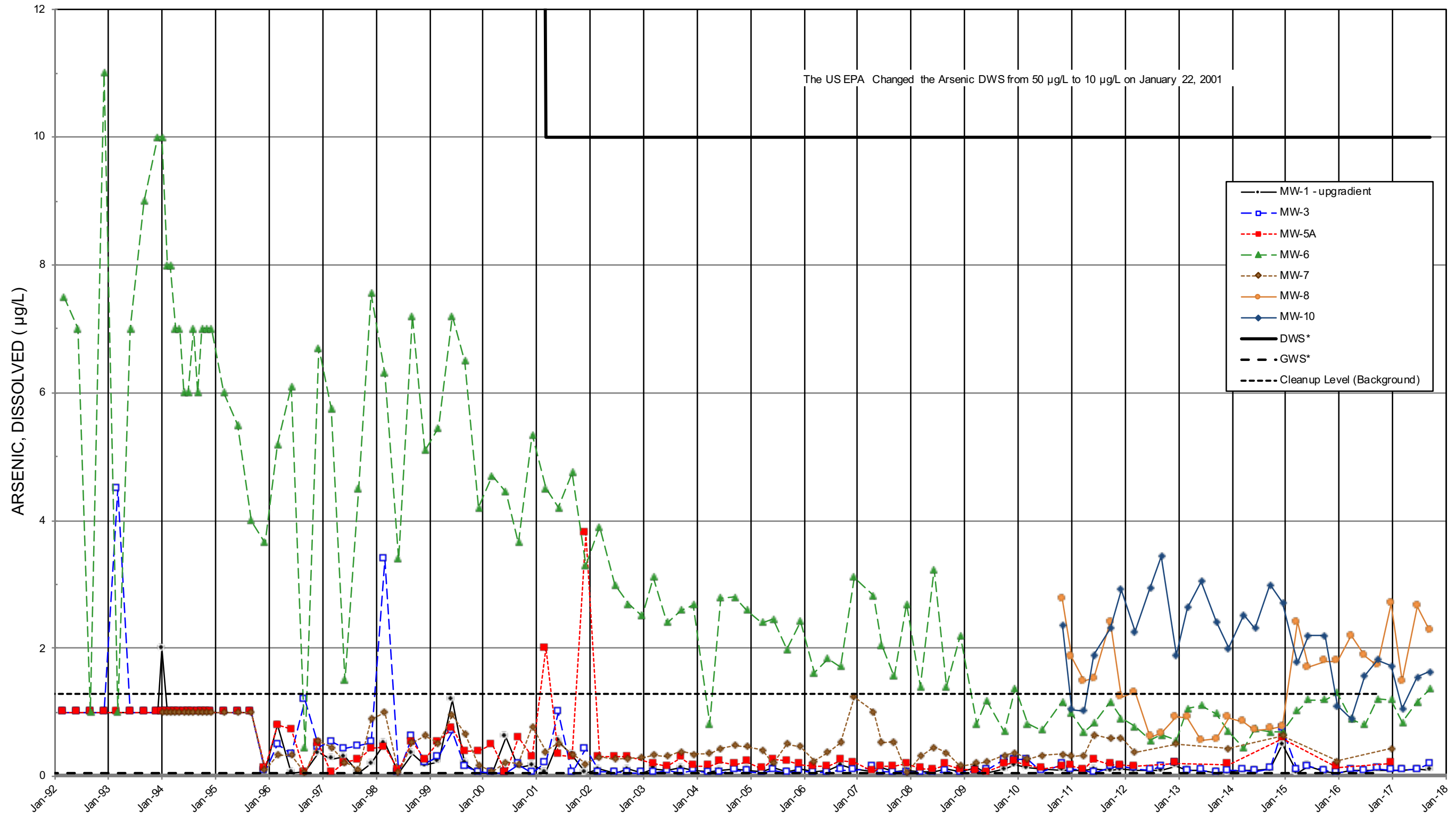


No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

TOTAL ORGANIC CARBON (RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



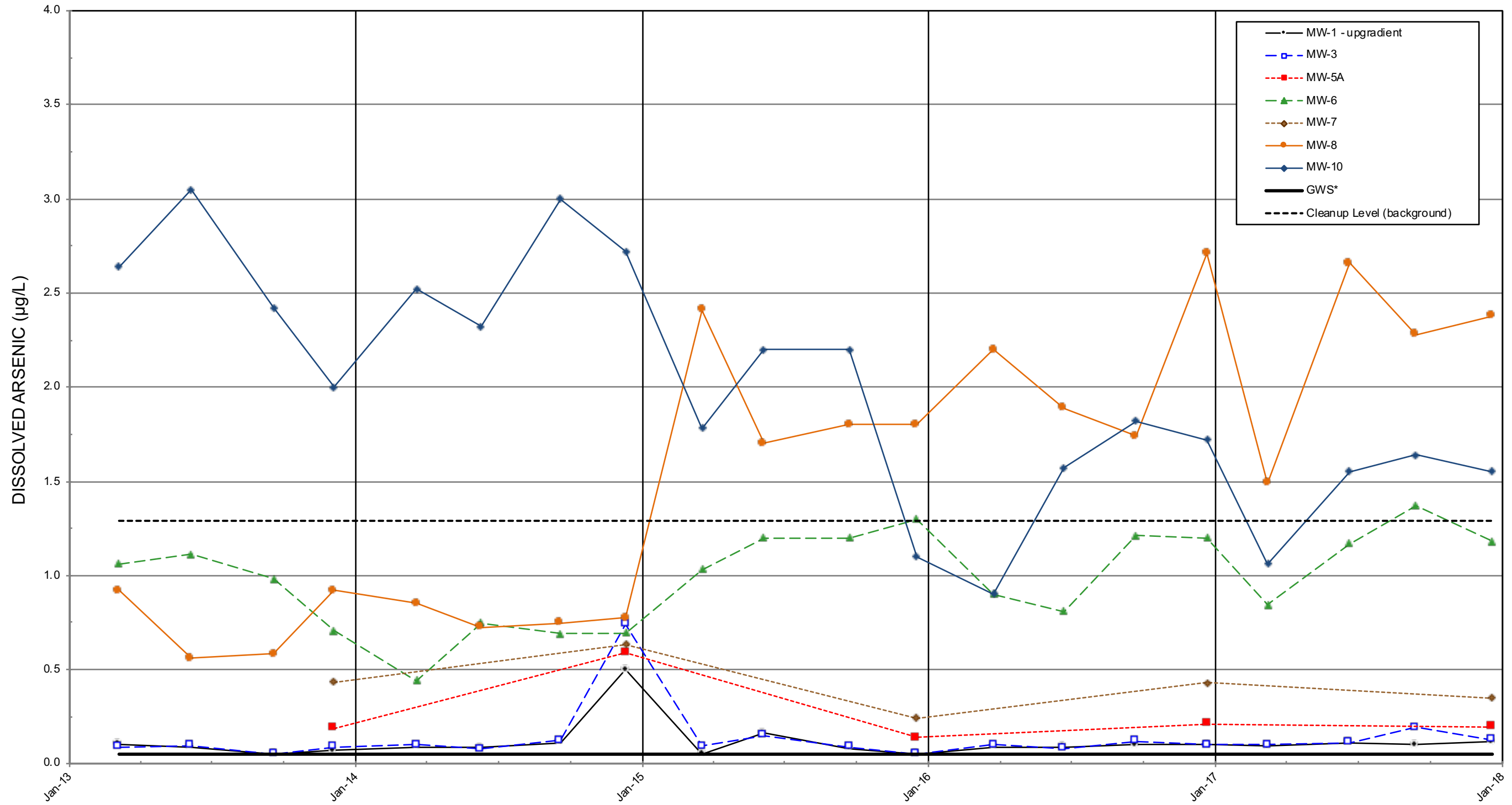
Cleanup Level (Background) = 1.29 ug/L
 Primary Drinking Water Standard (DWS) = 10 µg/L
 Primary Groundwater Standard (GWS) = 0.05 µg/L

DATE

DISSOLVED ARSENIC

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



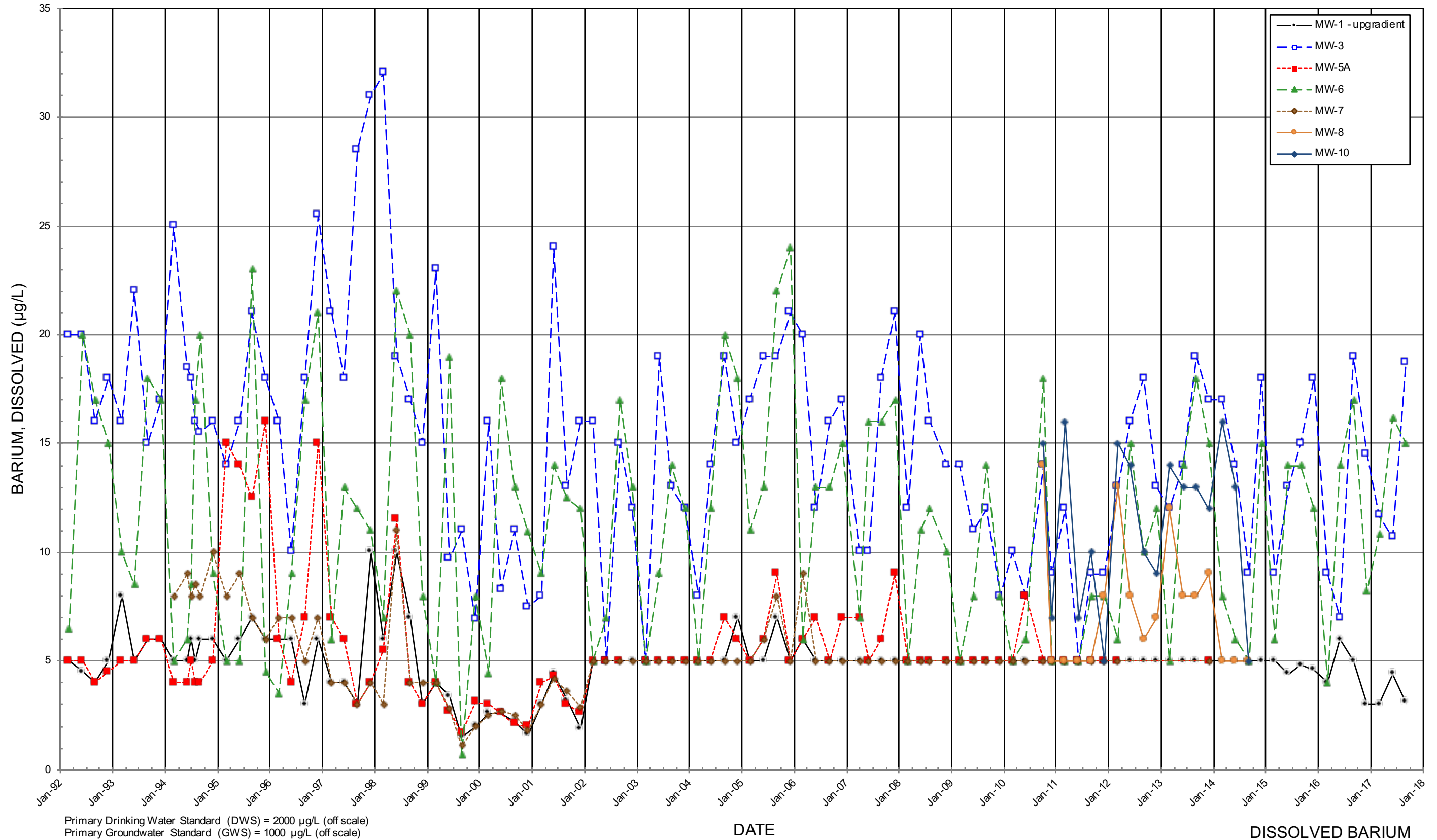
Site Specific Cleanup Level (background) = 1.29 µg/L
 Primary Drinking Water Standard (DWS) = 10 µg/L (off scale)
 Primary Groundwater Standard (GWS) = 0.05 µg/L

DATE

DISSOLVED ARSENIC (RECENT)

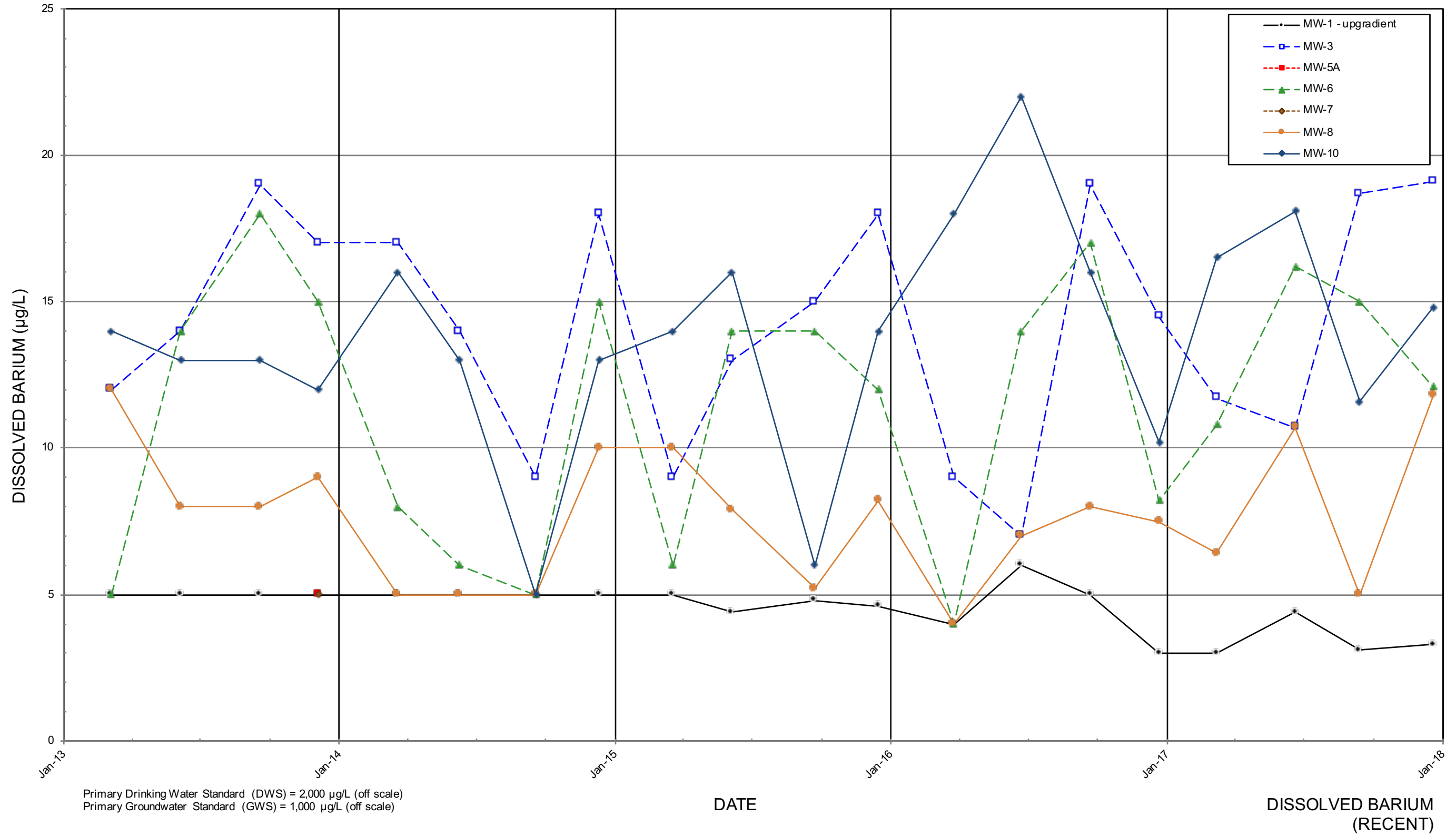
OLALLA LANDFILL

Quarterly Monitoring Data

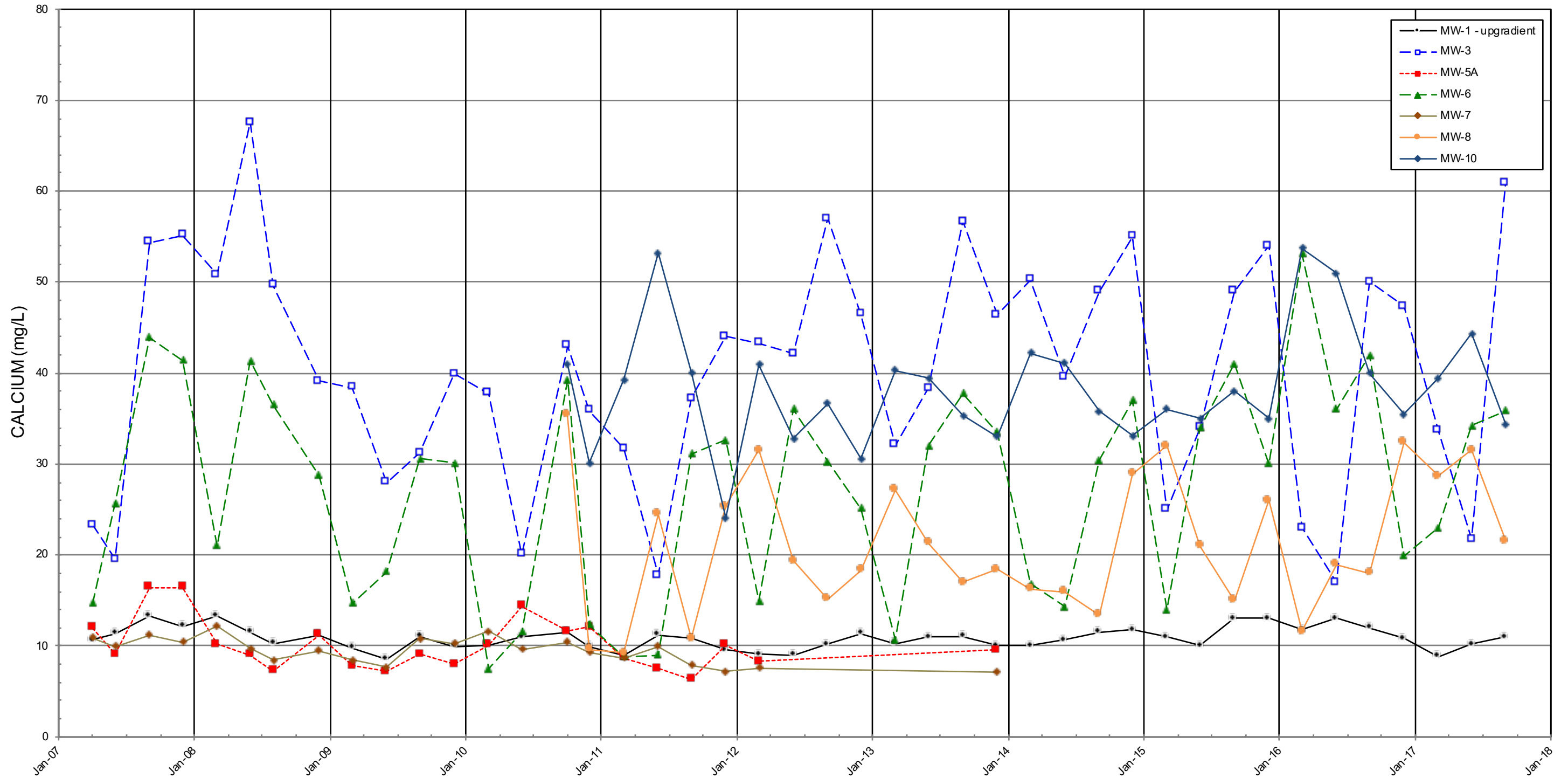


OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



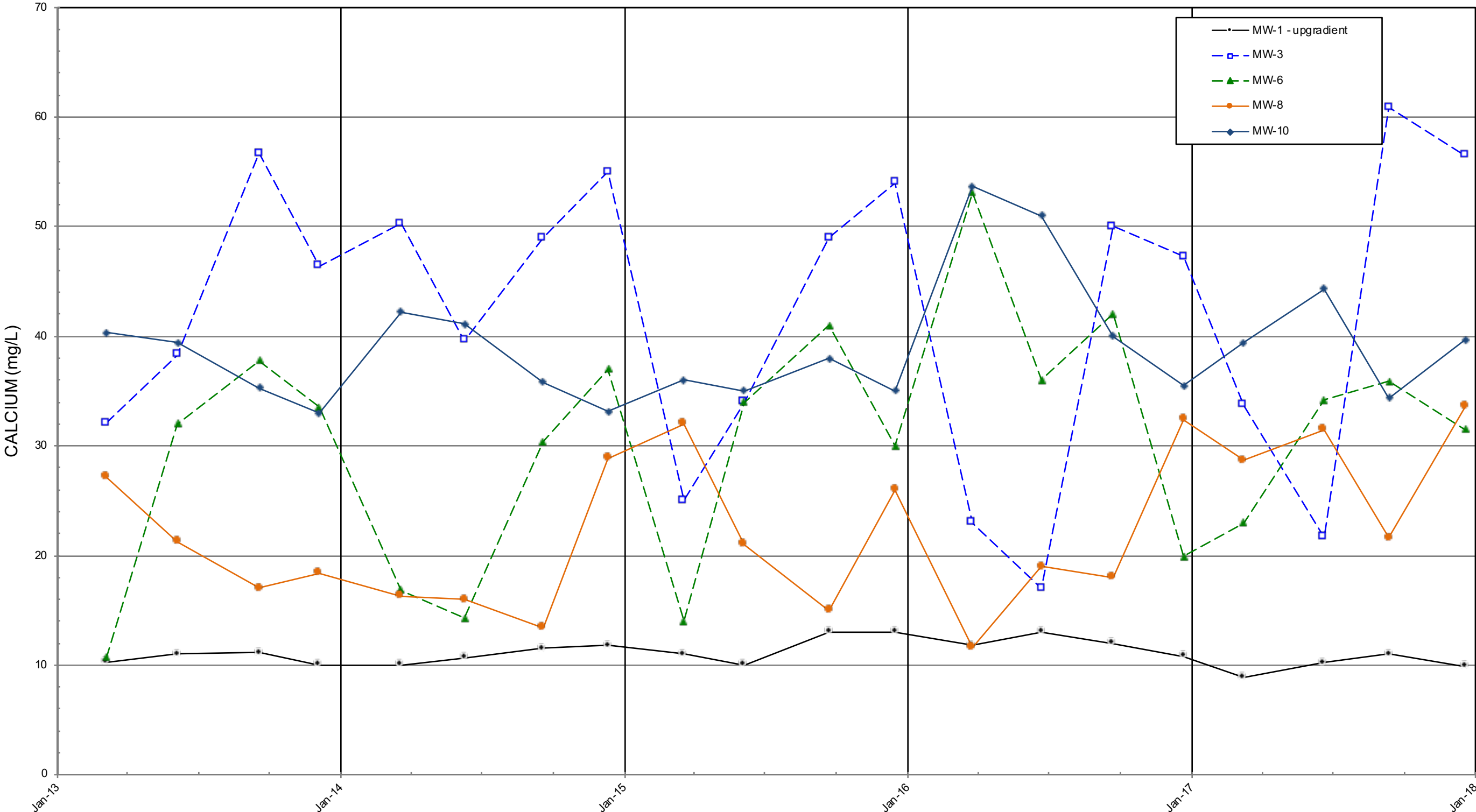
No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

CALCIUM
 (Analysis started in 2007)

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

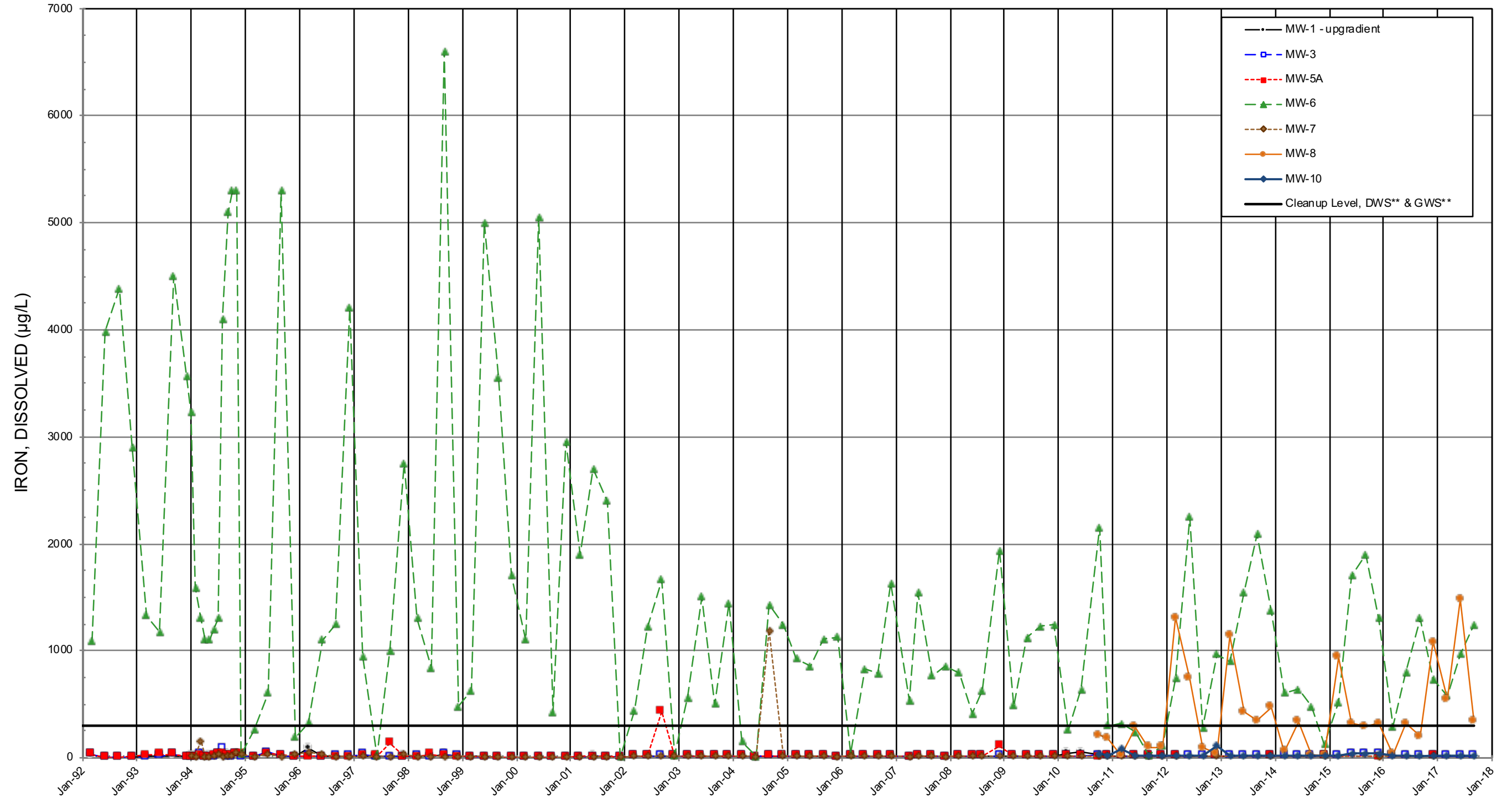


No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

CALCIUM (RECENT)

OLALLA LANDFILL Quarterly Monitoring Data



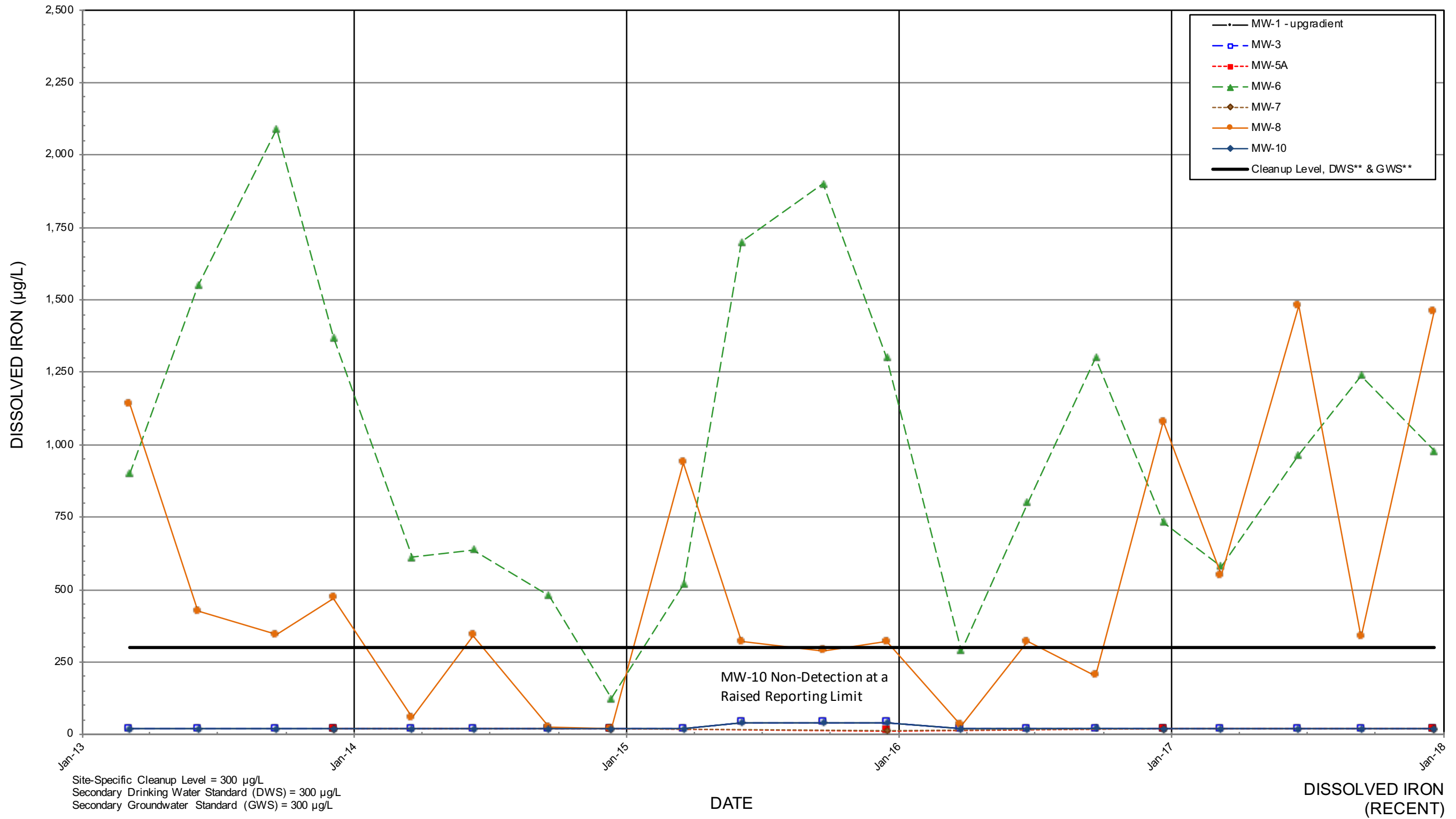
Cleanup Level = 300 µg/L
 Secondary Drinking Water Standard (DWS) = 300 µg/L
 Secondary Groundwater Standard (GWS) = 300 µg/L

DATE

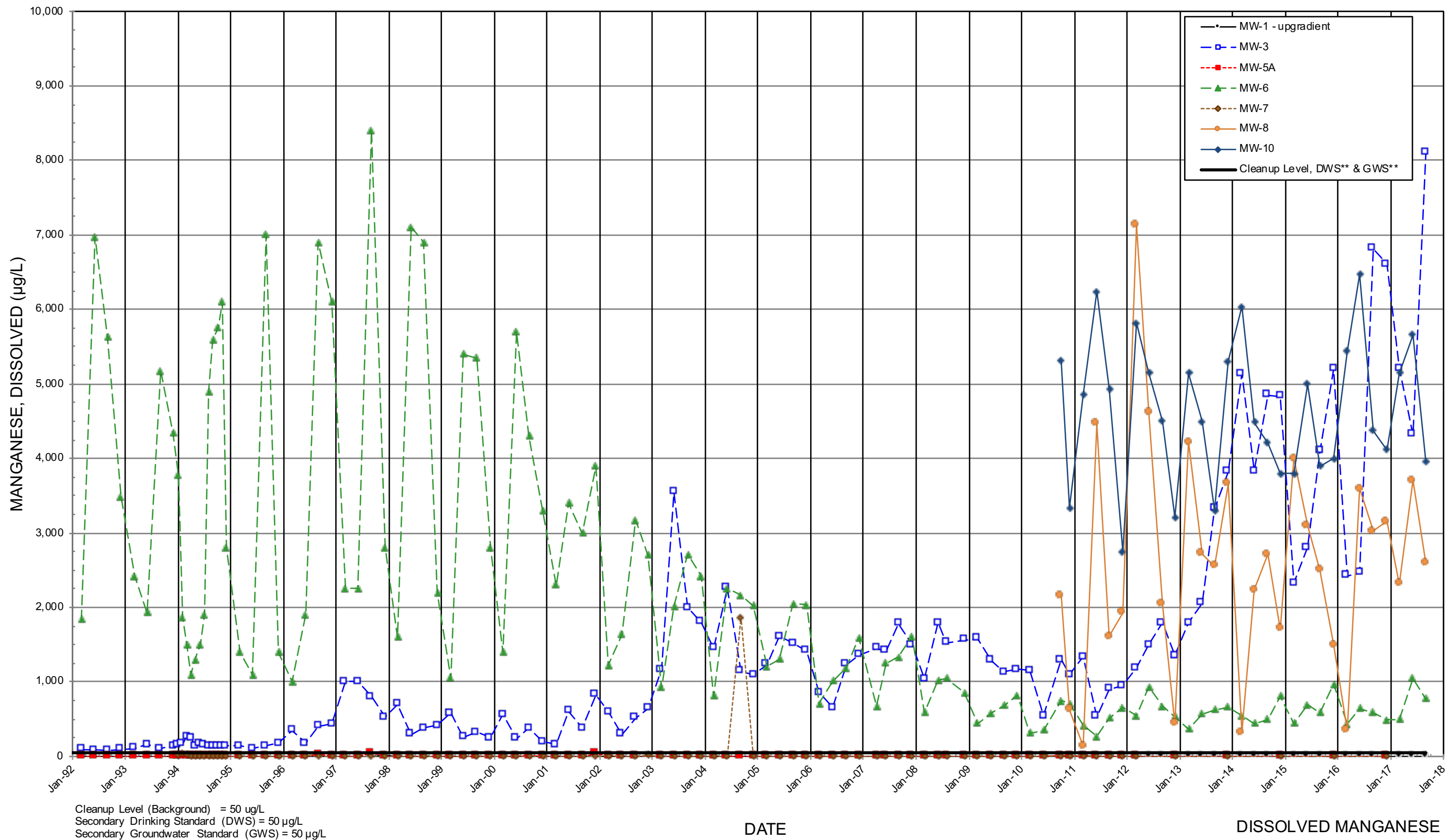
DISSOLVED IRON

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

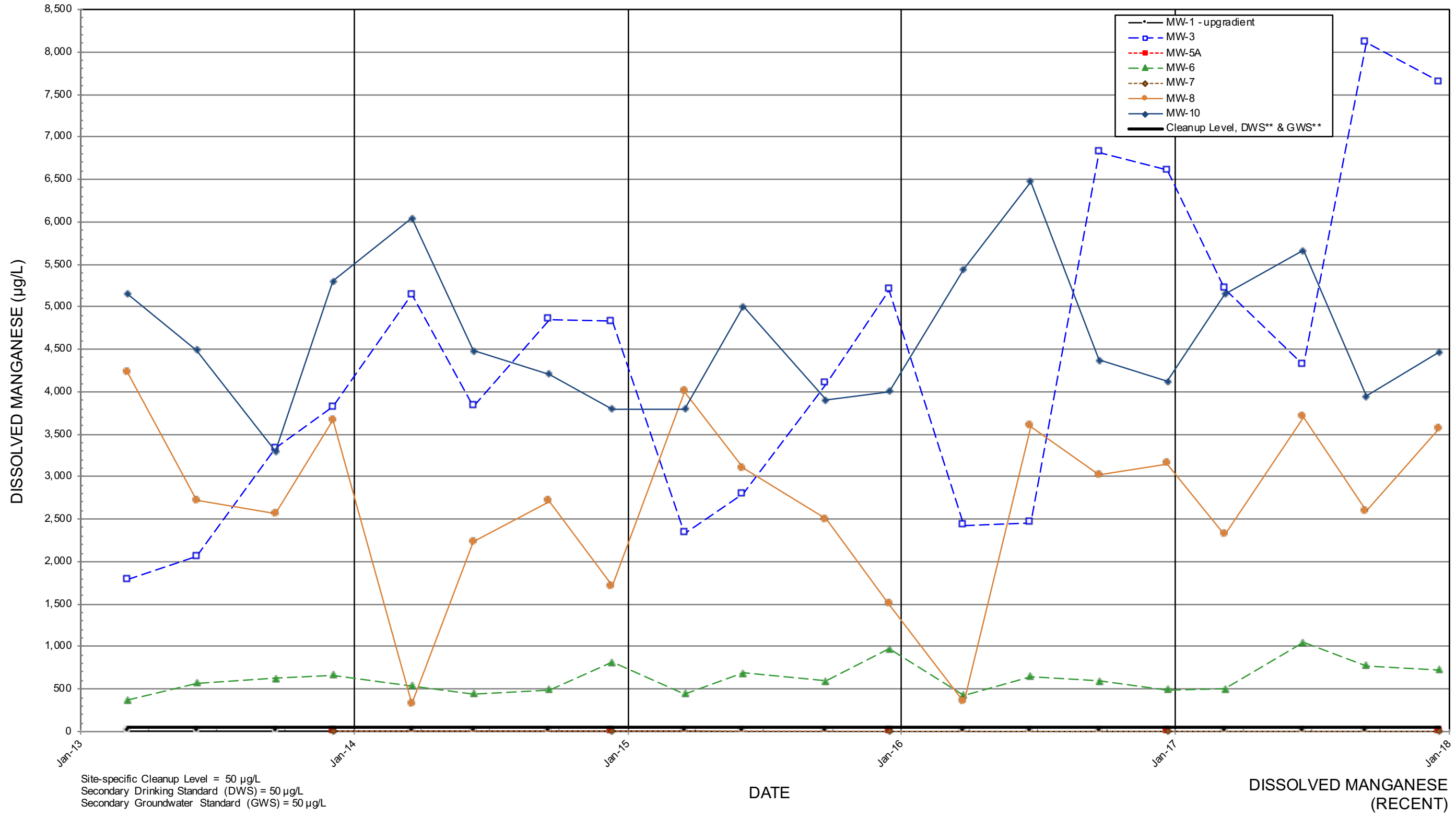


OLALLA LANDFILL Quarterly Monitoring Data

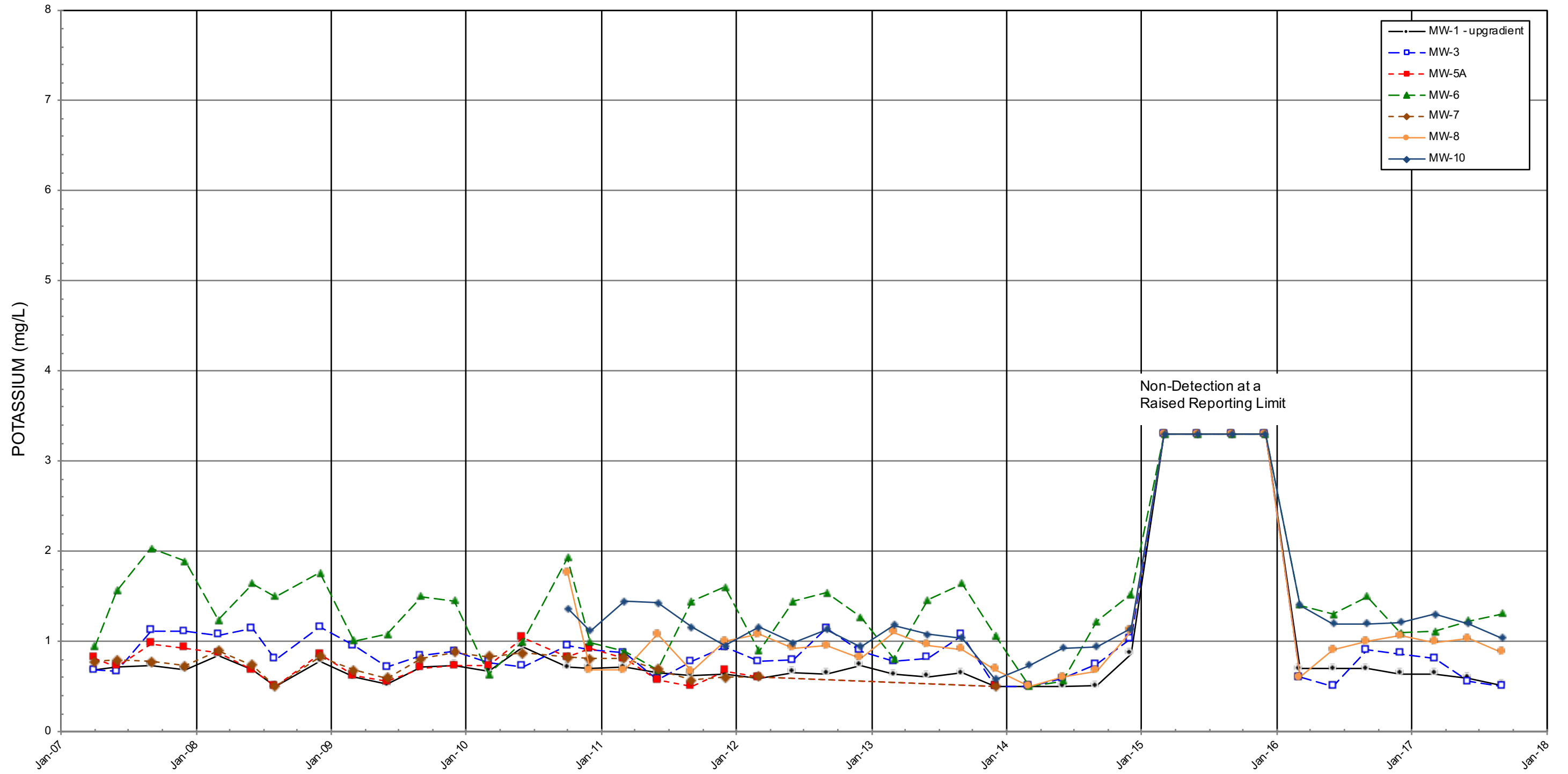


OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



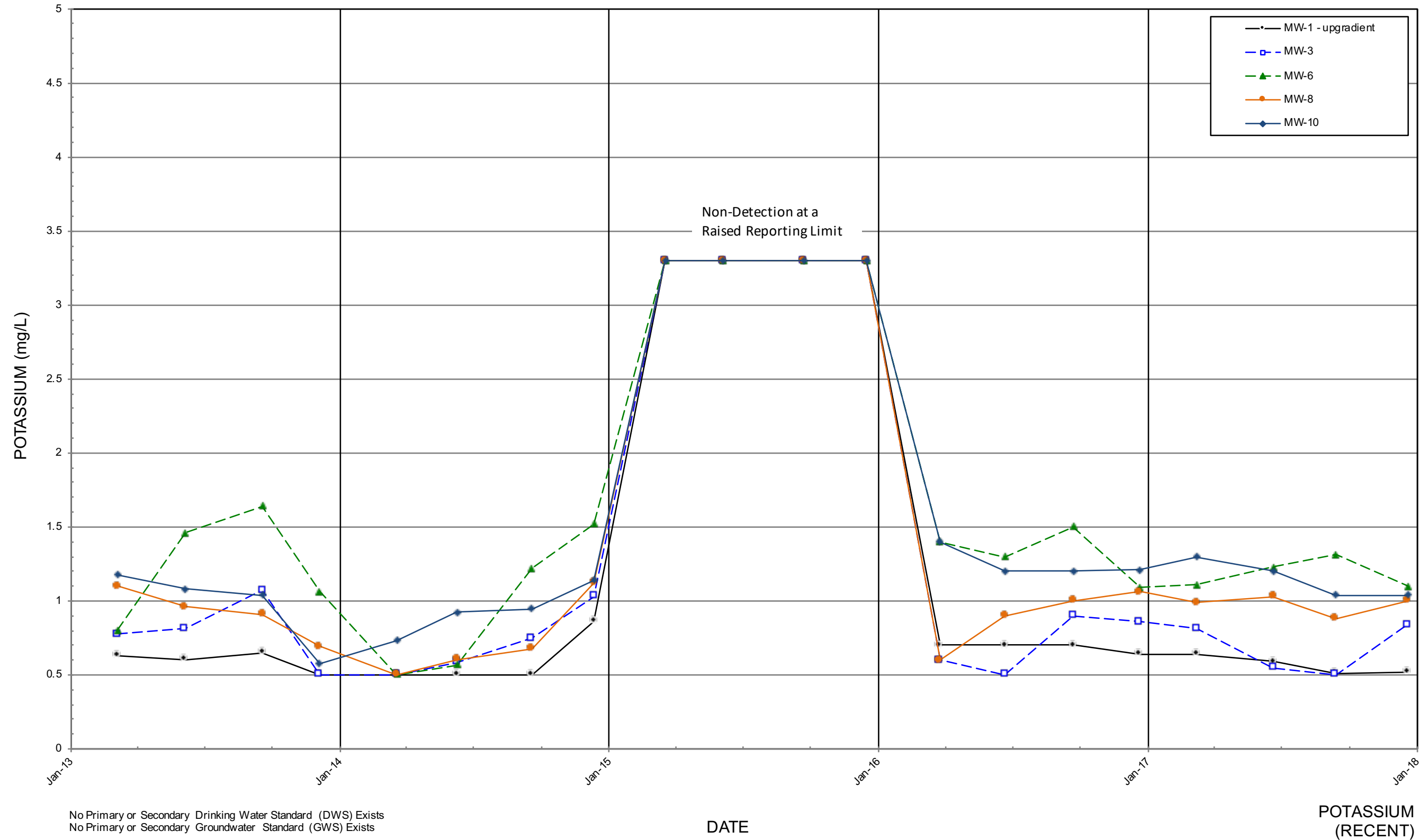
No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

POTASSIUM
 (Analysis started in 2007)

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

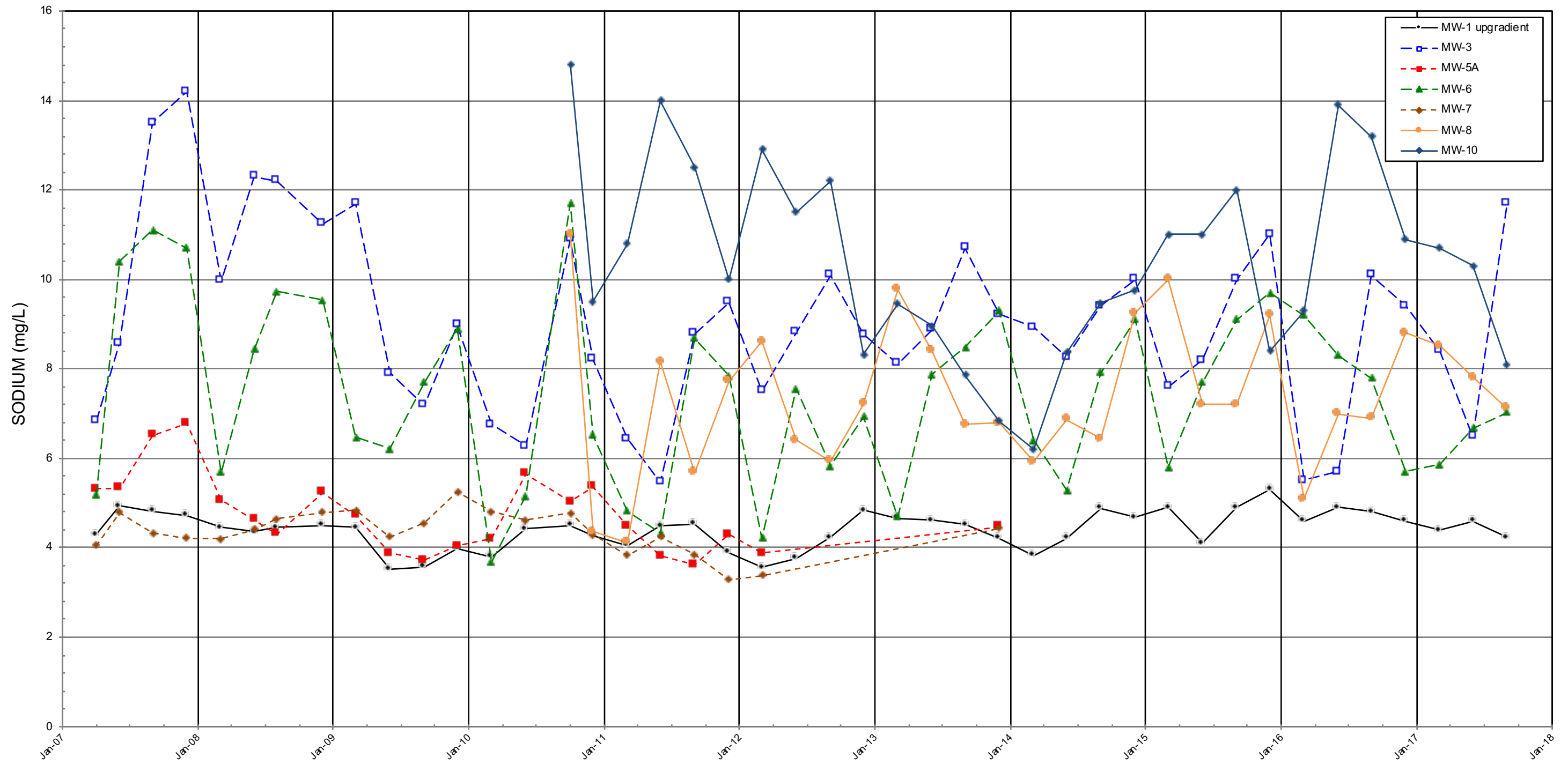


No Primary or Secondary Drinking Water Standard (DWS) Exists
 No Primary or Secondary Groundwater Standard (GWS) Exists

POTASSIUM (RECENT)

OLALLA LANDFILL

Quarterly Monitoring Data



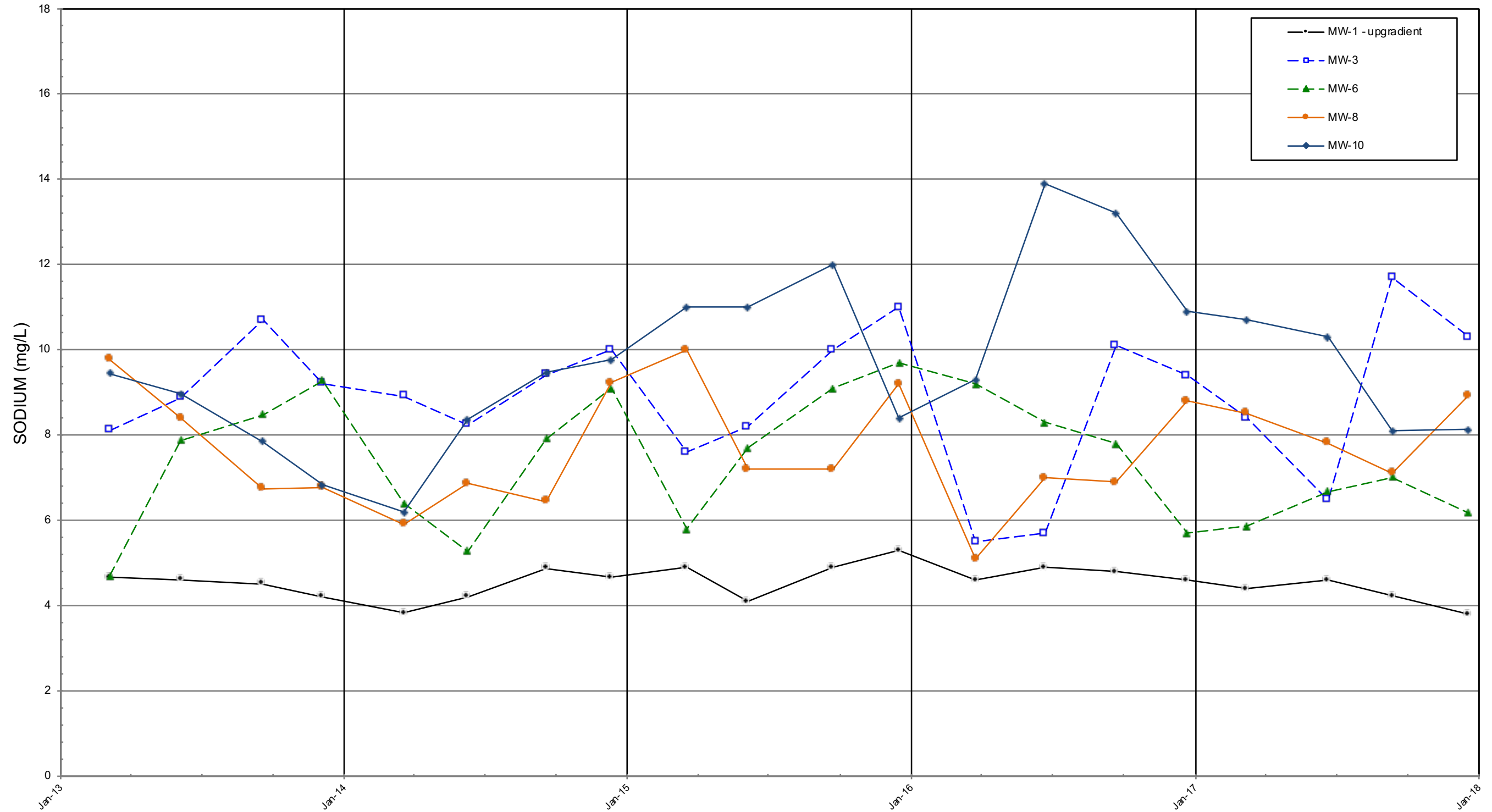
No Primary or Secondary Drinking Water Standard (DWS) Exists. Recommended level of concern for consumers with restricted daily sodium intake is 20 mg/L (off scale)
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

SODIUM
 (Analysis started in 2007)

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)

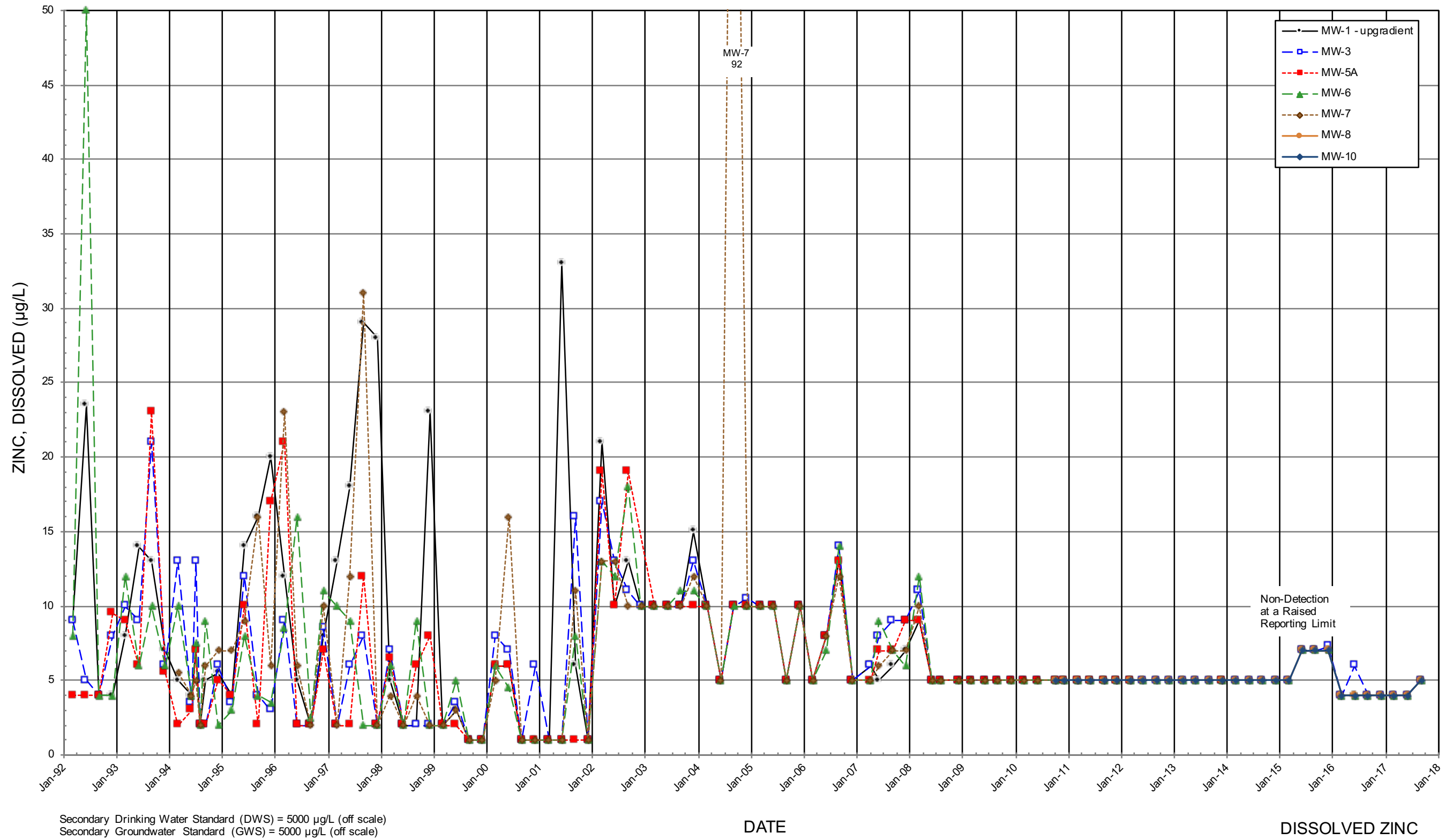


No Primary or Secondary Drinking Water Standard (DWS) Exists. Recommended level of concern for consumers with restricted daily sodium intake is 20 mg/L (off scale)
 No Primary or Secondary Groundwater Standard (GWS) Exists

DATE

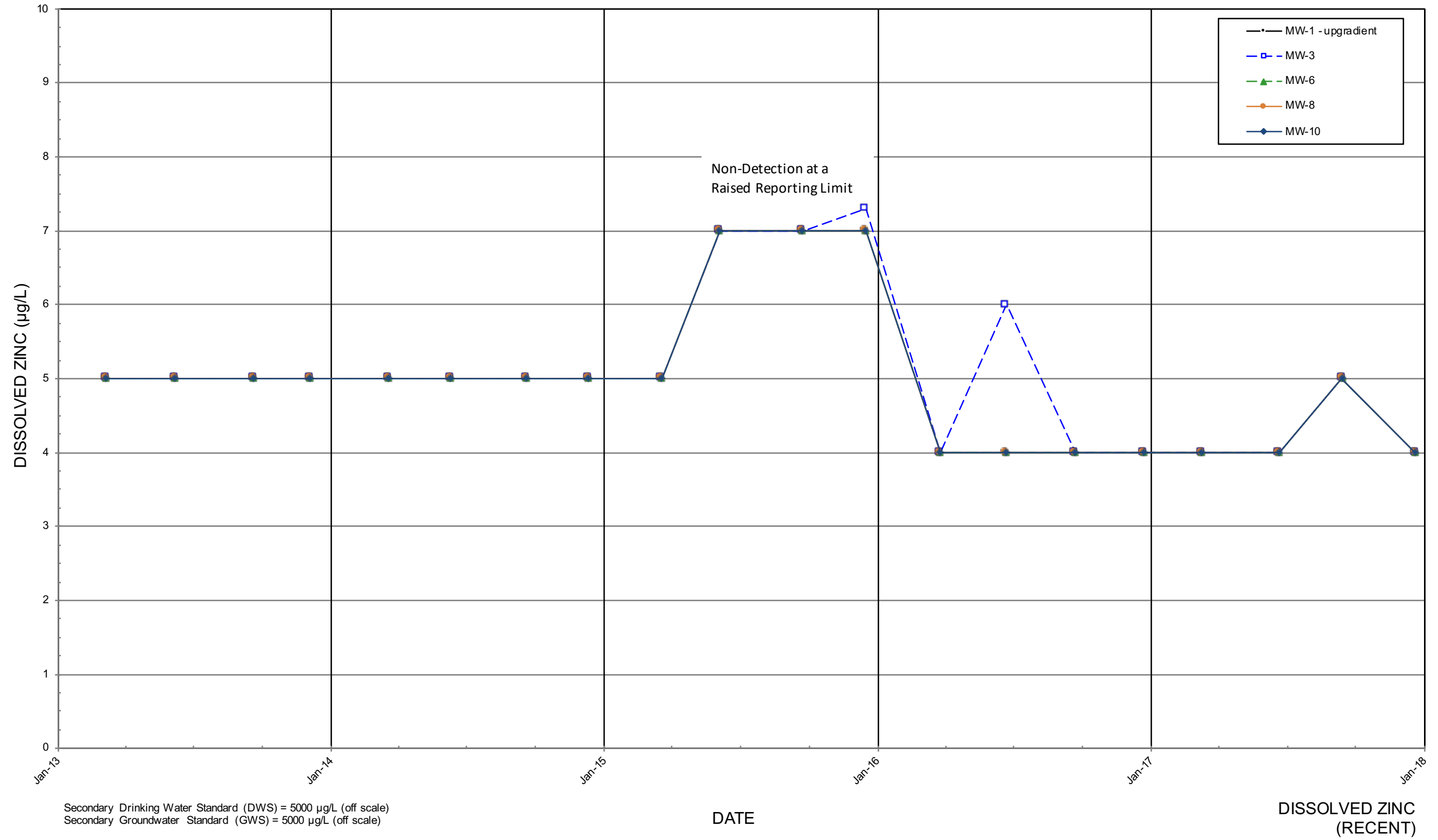
SODIUM
(RECENT)

OLALLA LANDFILL Quarterly Monitoring Data

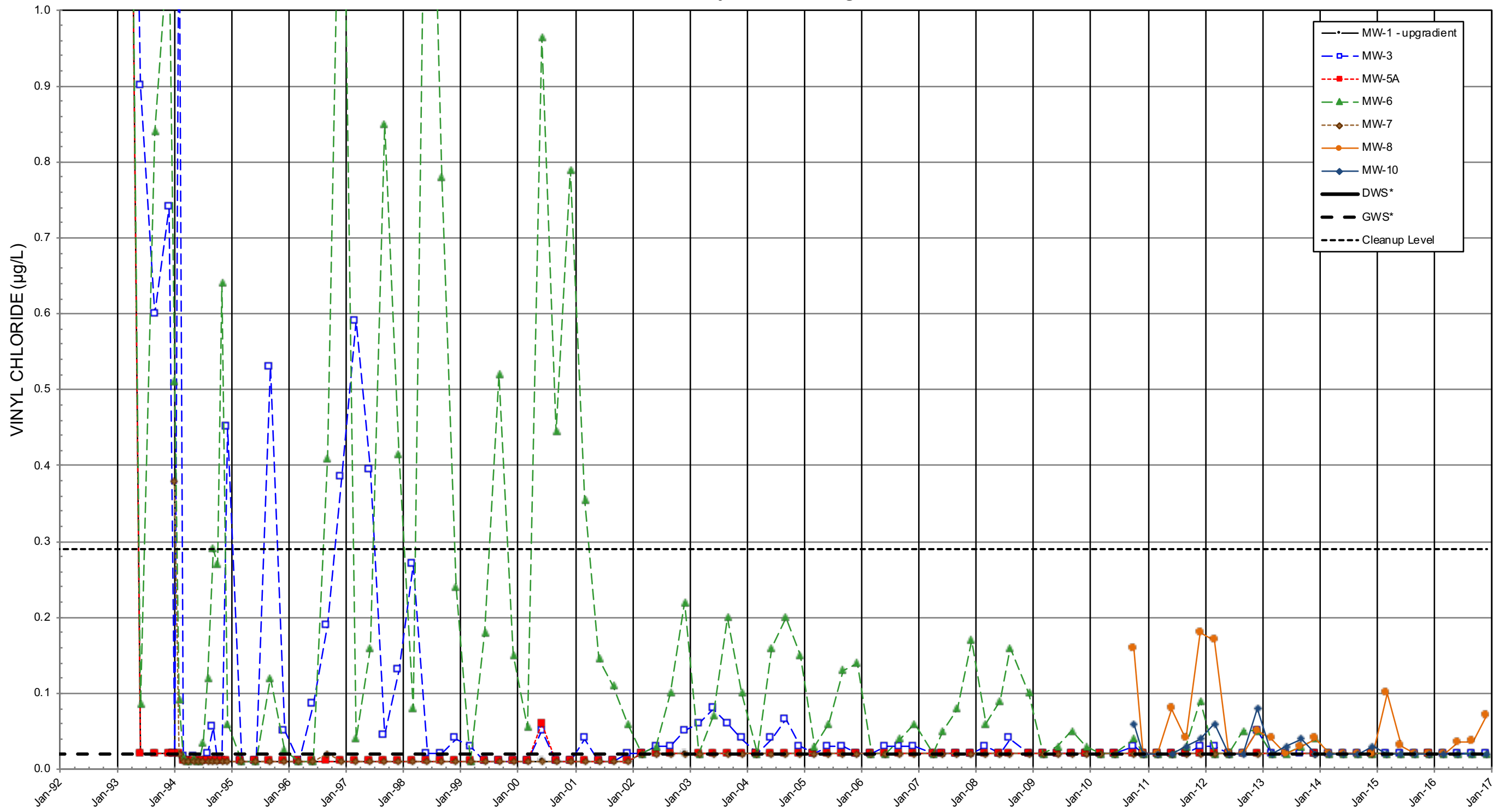


OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



OLALLA LANDFILL Quarterly Monitoring Data



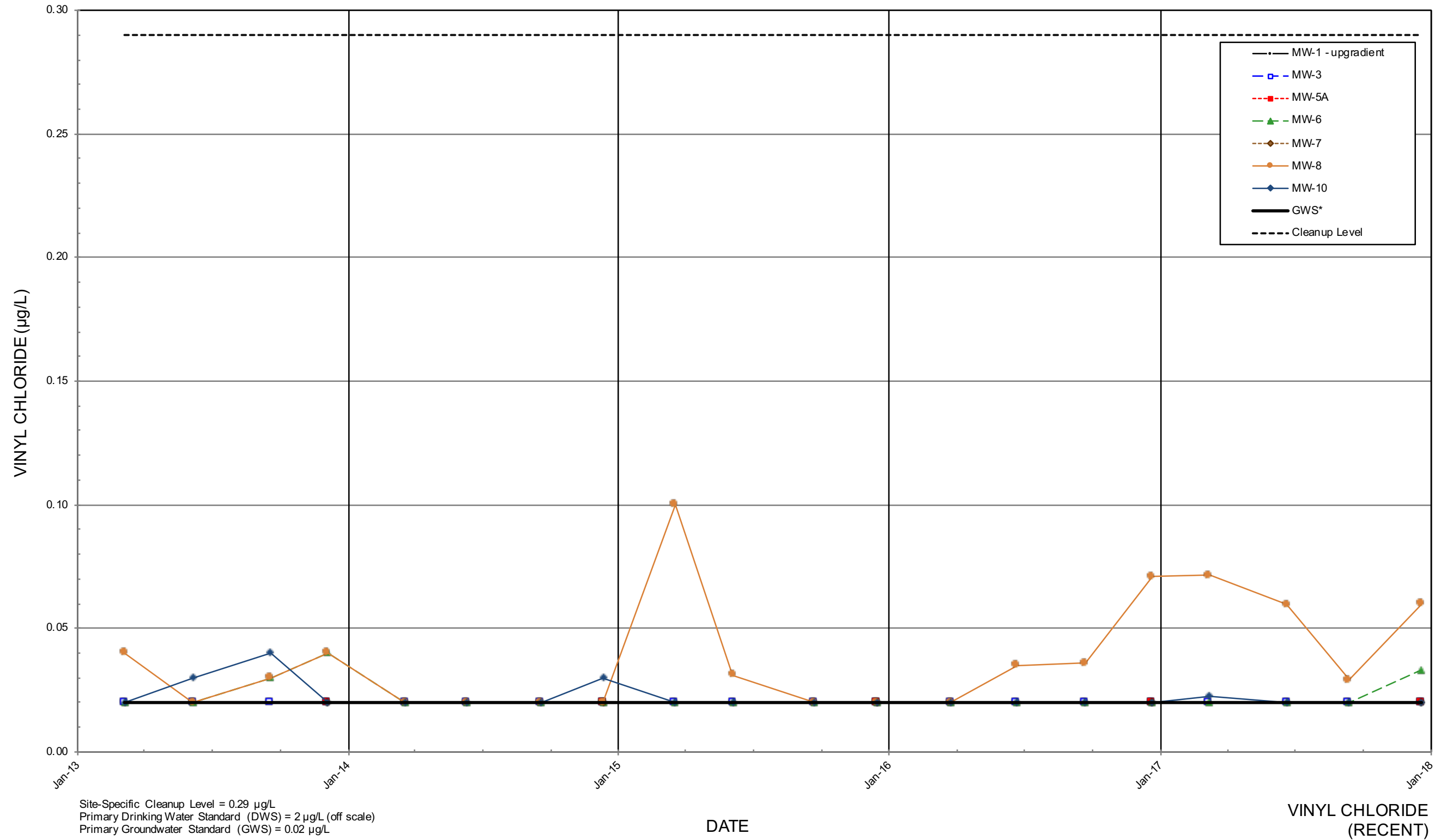
Site-Specific Cleanup Level = 0.29 µg/L
 Primary Drinking Water Standard (DWS) = 2 µg/L (off scale)
 Primary Groundwater Standard (GWS) = 0.02 µg/L

DATE

VINYL CHLORIDE

OLALLA LANDFILL

Quarterly Monitoring Data (most recent five years)



**March 2017 Mann-Kendall Statistically Significant Trend
Test Results**

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10
Ammonia (N)	NO TREND	NO TREND	NO TREND	NO TREND	UP
Arsenic - Dissolved	NO TREND	NO TREND	UP	UP	DOWN
Barium - Dissolved	UP	NO TREND	NO TREND	NO TREND	NO TREND
Bicarbonate	NO TREND	UP	NO TREND	UP	UP
Calcium	UP	NO TREND	NO TREND	NO TREND	NO TREND
Carbonate	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Chemical Oxygen Demand	NO TREND	NO TREND	NO TREND	NO TREND	UP
Chloride	UP	UP	NO TREND	NO TREND	NO TREND
Dissolved Oxygen	NO TREND	NO TREND	NO TREND	UP	NO TREND
Iron - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Manganese - Dissolved	NO TREND	UP	NO TREND	NO TREND	NO TREND
Nitrate	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Nitrite	NO TREND	NO TREND	DOWN	DOWN	DOWN
Oxidation Reduction Potential	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Field	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Laboratory	NO TREND	NO TREND	NO TREND	NO TREND	DOWN
Potassium	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Sodium	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Specific Conductance	DOWN	DOWN	NO TREND	NO TREND	NO TREND
Sulfate	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Temperature	DOWN	DOWN	DOWN	DOWN	DOWN
Total Coliform	DOWN	NO TREND	NO TREND	NO TREND	NO TREND
TOC	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Vinyl Chloride	NO TREND	DOWN	DOWN	NO TREND	NO TREND
Zinc - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND

NO TREND = No statistically significant trend.

UP = Statistically significant upward trend.

DOWN = Statistically significant downward trend.

**June 2017 Mann-Kendall Statistically Significant Trend
Test Results**

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10
Ammonia (N)	NO TREND	NO TREND	NO TREND	NO TREND	UP
Arsenic - Dissolved	NO TREND	NO TREND	UP	UP	DOWN
Barium - Dissolved	UP	NO TREND	NO TREND	NO TREND	UP
Bicarbonate	NO TREND	UP	NO TREND	NO TREND	NO TREND
Calcium	UP	NO TREND	NO TREND	NO TREND	NO TREND
Carbonate	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Chemical Oxygen Demand	NO TREND	NO TREND	NO TREND	NO TREND	UP
Chloride	NO TREND	UP	NO TREND	NO TREND	DOWN
Dissolved Oxygen	NO TREND	NO TREND	UP	UP	UP
Iron - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Manganese - Dissolved	NO TREND	UP	NO TREND	NO TREND	NO TREND
Nitrate	NO TREND	NO TREND	UP	NO TREND	NO TREND
Nitrite	NO TREND	NO TREND	DOWN	DOWN	DOWN
Oxidation Reduction Potential	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Field	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Laboratory	DOWN	NO TREND	NO TREND	DOWN	DOWN
Potassium	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Sodium	UP	NO TREND	NO TREND	NO TREND	NO TREND
Specific Conductance	DOWN	DOWN	NO TREND	NO TREND	NO TREND
Sulfate	NO TREND	NO TREND	NO TREND	NO TREND	UP
Temperature	DOWN	DOWN	DOWN	DOWN	DOWN
Total Coliform	DOWN	NO TREND	NO TREND	NO TREND	NO TREND
TOC	NO TREND	NO TREND	UP	NO TREND	NO TREND
Vinyl Chloride	NO TREND	DOWN	DOWN	NO TREND	DOWN
Zinc - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND

NO TREND = No statistically significant trend.

UP = Statistically significant upward trend.

DOWN = Statistically significant downward trend.

**September 2017 Mann-Kendall Statistically Significant Trend
Test Results**

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10
Ammonia (N)	NO TREND	NO TREND	NO TREND	NO TREND	UP
Arsenic - Dissolved	NO TREND	NO TREND	UP	UP	DOWN
Barium - Dissolved	UP	NO TREND	NO TREND	NO TREND	UP
Bicarbonate	NO TREND	UP	NO TREND	NO TREND	NO TREND
Calcium	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Carbonate	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Chemical Oxygen Demand	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Chloride	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Dissolved Oxygen	UP	NO TREND	NO TREND	NO TREND	NO TREND
Iron - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Manganese - Dissolved	NO TREND	UP	NO TREND	NO TREND	NO TREND
Nitrate	NO TREND	UP	UP	NO TREND	NO TREND
Nitrite	NO TREND	NO TREND	DOWN	DOWN	NO TREND
Oxidation Reduction Potential	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Field	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Laboratory	DOWN	NO TREND	DOWN	DOWN	DOWN
Potassium	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Sodium	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Specific Conductance	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Sulfate	NO TREND	NO TREND	NO TREND	NO TREND	UP
Temperature	DOWN	DOWN	DOWN	DOWN	DOWN
Total Coliform	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
TOC	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Vinyl Chloride	NO TREND	NO TREND	DOWN	NO TREND	NO TREND
Zinc - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND

NO TREND = No statistically significant trend.

UP = Statistically significant upward trend.

DOWN = Statistically significant downward trend.

**December 2017 Mann-Kendall Statistically Significant Trend
Test Results**

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10
Ammonia (N)	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	UP
Arsenic - Dissolved	NO TREND	UP	NO TREND	UP	NO TREND	UP	DOWN
Barium - Dissolved	UP	NO TREND	NA	UP	NA	UP	UP
Bicarbonate	NO TREND	UP	NA	NO TREND	NA	NO TREND	NO TREND
Calcium	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Carbonate	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
COD	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Chloride	NO TREND	NO TREND	NA	UP	NA	UP	NO TREND
Dissolved Oxygen	UP	DOWN	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Iron - Dissolved	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Manganese - Dissolved	NO TREND	UP	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Nitrate	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Nitrite	NO TREND	NO TREND	NA	DOWN	NA	DOWN	DOWN
Oxidation Reduction	NO TREND	UP	NO TREND	NO TREND	UP	NO TREND	NO TREND
pH - Field	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
pH - Laboratory	DOWN	DOWN	NO TREND	DOWN	NO TREND	DOWN	DOWN
Potassium	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Sodium	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Specific Conductance	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Sulfate	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
Temperature	DOWN	DOWN	NO TREND	DOWN	NO TREND	DOWN	DOWN
Total Coliform	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND
TOC	NO TREND	NO TREND	NA	NO TREND	NA	UP	NO TREND
Vinyl Chloride	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND	NO TREND
Zinc - Dissolved	NO TREND	NO TREND	NA	NO TREND	NA	NO TREND	NO TREND

NO TREND = No statistically significant trend.
UP = Statistically significant upward trend.
DOWN = Statistically significant downward trend.
NA = Not analyzed per the SWHP

March 2017 Shapiro-Wilk Test for Normality Results

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10
Ammonia (N)	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Arsenic - Dissolved	Non-Normal	Non-Normal	Normal	Non-Normal	Normal
Barium - Dissolved	Non-Normal	Normal	Normal	Normal	Normal
Bicarbonate	Normal	Non-Normal	Normal	Normal	Normal
Calcium	Normal	Normal	Normal	Normal	Non-Normal
Carbonate	ND	ND	ND	ND	ND
Chemical Oxygen Demand	ND	ND	ND	ND	Non-Normal
Chloride	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Normal
Dissolved Oxygen	Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Iron - Dissolved	ND	ND	Normal	Non-Normal	ND
Manganese - Dissolved	ND	Normal	Normal	Normal	Normal
Nitrate	Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Nitrite	Non-Normal	ND	Non-Normal	Non-Normal	Non-Normal
Oxidation Reduction Potential	Normal	Normal	Non-Normal	Non-Normal	Non-Normal
pH - Field	Normal	Normal	Normal	Non-Normal	Normal
pH - Laboratory	Normal	Normal	Normal	Non-Normal	Normal
Potassium	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Sodium	Normal	Normal	Normal	Normal	Normal
Specific Conductance	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Sulfate	Non-Normal	Normal	Non-Normal	Normal	Non-Normal
Temperature	Normal	Normal	Normal	Normal	Non-Normal
Total Coliform	Non-Normal	ND	ND	ND	ND
TOC	ND	Normal	Non-Normal	Non-Normal	Non-Normal
Vinyl Chloride	ND	ND	Non-Normal	Non-Normal	Non-Normal
Zinc - Dissolved	ND	ND	ND	ND	ND

Notes:

ND = Data set has four or fewer quarters with detects and statistical tests cannot be performed.

NA = Not analyzed per the SWHP

June 2017 Shapiro-Wilk Test for Normality Results

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10
Ammonia (N)	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Arsenic - Dissolved	Non-Normal	Non-Normal	Normal	Non-Normal	Normal
Barium - Dissolved	Non-Normal	Normal	Normal	Normal	Normal
Bicarbonate	Normal	Non-Normal	Normal	Normal	Normal
Calcium	Normal	Normal	Normal	Non-Normal	Non-Normal
Carbonate	ND	ND	ND	ND	ND
Chemical Oxygen Demand	ND	ND	ND	ND	Non-Normal
Chloride	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Normal
Dissolved Oxygen	Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Iron - Dissolved	ND	ND	Normal	Non-Normal	ND
Manganese - Dissolved	ND	Normal	Non-Normal	Normal	Normal
Nitrate	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Nitrite	Non-Normal	ND	Non-Normal	Non-Normal	Non-Normal
Oxidation Reduction Potential	Normal	Normal	Non-Normal	Non-Normal	Non-Normal
pH - Field	Normal	Normal	Normal	Normal	Normal
pH - Laboratory	Normal	Normal	Normal	Normal	Normal
Potassium	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Sodium	Normal	Normal	Normal	Normal	Normal
Specific Conductance	Non-Normal	Normal	Non-Normal	Non-Normal	Non-Normal
Sulfate	Non-Normal	Normal	Non-Normal	Normal	Non-Normal
Temperature	Normal	Normal	Normal	Normal	Non-Normal
Total Coliform	Non-Normal	ND	ND	ND	ND
TOC	ND	Normal	Non-Normal	Non-Normal	Non-Normal
Vinyl Chloride	ND	ND	Non-Normal	Non-Normal	Non-Normal
Zinc - Dissolved	ND	ND	ND	ND	ND

Notes:

ND = Data set has four or fewer quarters with detects and statistical tests cannot be performed.

NA = Not analyzed per the SWHP

September 2017 Shapiro-Wilk Test for Normality Results

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10
Ammonia (N)	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Arsenic - Dissolved	Non-Normal	Non-Normal	Normal	Non-Normal	Normal
Barium - Dissolved	Non-Normal	Normal	Non-Normal	Normal	Normal
Bicarbonate	Normal	Non-Normal	Normal	Normal	Normal
Calcium	Normal	Normal	Normal	Non-Normal	Non-Normal
Carbonate	ND	ND	ND	ND	ND
Chemical Oxygen Demand	ND	ND	ND	ND	Non-Normal
Chloride	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Normal
Dissolved Oxygen	Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Iron - Dissolved	ND	ND	Normal	Non-Normal	ND
Manganese - Dissolved	ND	Normal	Non-Normal	Normal	Normal
Nitrate	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Nitrite	Non-Normal	ND	Non-Normal	Non-Normal	Non-Normal
Oxidation Reduction Potential	Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
pH - Field	Normal	Normal	Normal	Normal	Normal
pH - Laboratory	Normal	Normal	Normal	Normal	Normal
Potassium	Non-Normal	Non-Normal	Non-Normal	Non-Normal	Non-Normal
Sodium	Normal	Normal	Normal	Normal	Normal
Specific Conductance	Non-Normal	Normal	Non-Normal	Normal	Normal
Sulfate	Non-Normal	Normal	Non-Normal	Normal	Non-Normal
Temperature	Non-Normal	Normal	Normal	Normal	Normal
Total Coliform	Non-Normal	ND	ND	ND	ND
TOC	ND	Normal	Normal	Normal	Non-Normal
Vinyl Chloride	ND	ND	Non-Normal	Non-Normal	Non-Normal
Zinc - Dissolved	ND	ND	ND	ND	ND

Notes:

ND = Data set has four or fewer quarters with detects and statistical tests cannot be performed.

NA = Not analyzed per the SWHP

December 2017 Shapiro-Wilk Test for Normality Results

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10
Ammonia (N)	Non-Normal	ND	NA	Non-Normal	NA	Non-Normal	Non-Normal
Arsenic - Dissolved	Non-Normal	Non-Normal	Non-Normal	Normal	Normal	Normal	Normal
Barium - Dissolved	Non-Normal	Normal	NA	Non-Normal	NA	Normal	Normal
Bicarbonate	Normal	Non-Normal	NA	Normal	NA	Normal	Normal
Calcium	Normal	Normal	NA	Normal	NA	Normal	Non-Normal
Carbonate	ND	ND	NA	ND	NA	ND	ND
COD	ND	Non-Normal	NA	ND	NA	ND	Non-Normal
Chloride	Normal	Non-Normal	NA	Non-Normal	NA	Non-Normal	Normal
Dissolved Oxygen	Normal	Non-Normal	Normal	Non-Normal	Non-Normal	Normal	Non-Normal
Iron - Dissolved	ND	ND	ND	Normal	ND	Non-Normal	ND
Manganese - Dissolved	ND	Normal	ND	Normal	ND	Normal	Normal
Nitrate	Non-Normal	Non-Normal	NA	Non-Normal	NA	Non-Normal	Non-Normal
Nitrite	Non-Normal	ND	NA	Non-Normal	NA	Non-Normal	Non-Normal
Oxidation-Reduction Potential	Normal	Normal	Normal	Non-Normal	Normal	Non-Normal	Non-Normal
pH - Field	Normal	Normal	Normal	Normal	Normal	Normal	Normal
pH - Laboratory	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Potassium	Non-Normal	Non-Normal	NA	Non-Normal	NA	Non-Normal	Non-Normal
Sodium	Normal	Normal	NA	Normal	NA	Normal	Normal
Specific Conductance	Normal	Normal	Non-Normal	Non-Normal	Normal	Normal	Normal
Sulfate	Normal	Normal	NA	Non-Normal	NA	Normal	Non-Normal
Temperature	Non-Normal	Normal	Normal	Normal	Normal	Normal	Normal
Total Coliform	ND	ND	NA	ND	NA	ND	ND
TOC	ND	Normal	NA	Non-Normal	NA	Normal	Non-Normal
Vinyl Chloride	ND	ND	ND	Non-Normal	ND	Non-Normal	Non-Normal
Zinc - Dissolved	ND	ND	NA	ND	NA	ND	ND

Notes:

ND = Data set has four or fewer quarters with detects and statistical tests cannot be performed.

NA = Not analyzed per the SWHP

March 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10	Regulatory Level	Basis for Comparison
Ammonia (N)	ND to 40	ND to 40	ND to 40	26 to 40	24 to 94	None	
Arsenic - Dissolved	.085 to .098	.089 to .119	.787 to .989	.749 to 1.74	1.99 to 2.48	0.05 µg/L	Primary GW Standard
Barium - Dissolved	4.8 to 5	12.7 to 15.4	8.47 to 12.4	6.31 to 8.41	12.3 to 15.0	1000 µg/L	Primary GW Standard
Bicarbonate	36.1 to 44.3	96.2 to 119	97.6 to 137	83.2 to 107	142 to 166	None	
Calcium	10,461 to 11,392	38,063 to 46,630	24,969 to 33,297	18,847 to 23,755	35,300 to 39,700	None	
Carbonate	ND	ND	ND	ND	ND	None	
COD	ND	ND	ND	ND	ND to 10.2	None	
Chloride	2,910 to 4,620	2,840 to 3,380	1,800 to 2,300	2,110 to 2,350	5,656 to 8,845	250,000 µg/L	Secondary GW and DW Standard
Dissolved Oxygen	9.62 to 10.4	.100 to 1.16	0.02 to 0.43	0.15 to 2.62	0.01 to 0.47	None	
Iron - Dissolved	ND	ND	725 to 1,227	202 to 549	ND	300 µg/L	Secondary GW and DW Standard
Manganese - Dissolved	ND	2,899 to 4,191	539 to 657	2,168 to 3,345	4,321 to 4,984	50 µg/L	Secondary GW and DW Standard
Nitrate	322 to 641	ND to 28	ND	ND to 84	ND to 20	10,000 µg/L	Primary GW and DW Standard
Nitrite	ND to 4	ND	ND to 5	3 to 5	ND to 4	1,000 µg/L	Primary DW Standard
Oxidation-Reduction Potential	138 to 199	116 to 182	ND to 33	32.8 to 54.0	71.0 to 133	None	
pH - Field	6.1 to 6.3	6.0 to 6.2	6.5 to 6.7	6.5 to 6.7	6.4 to 6.6	6.5 - 8.5	Secondary GW Standard
pH - Laboratory	6.5 to 6.7	6.3 to 6.4	6.7 to 6.8	6.7 to 6.9	6.6 to 6.8	6.5 - 8.5	Secondary GW Standard

March 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10	Regulatory Level	Basis for Comparison
Potassium	ND to 650	500 to 814	804 to 1,400	602 to 958	925 to 1,158	None	
Sodium	4,335 to 4,663	8,256 to 9,328	6,654 to 7,890	7,023 to 8,052	9,319 to 10,892	20,000 µg/L	Secondary DW Standard
Specific Conductance	122 to 131	295 to 434	199 to 347	178 to 219	337 to 402	700 µmhos/cm	Secondary DW Standard
Sulfate	3,700 to 4,360	13,605 to 18,268	6,710 to 10,200	4,050 to 4,945	7,190 to 9,630	250,000 µg/L	Secondary GW and DW Standard
Temperature	11.4 to 12.6	11.9 to 12.7	11.7 to 12.6	11.1 to 12.1	11.6 to 12.33	None	
Total Coliform	ND	ND	ND	ND	ND	1cfu/100mL	Primary GW and DW Standard
TOC	ND	2,251 to 2,902	1460 to 1910	273 to 853	2,800 to 3,260	None	
Vinyl Chloride	ND	ND	ND	ND to 0.04	ND to 0.02	0.02 µg/L	Primary GW Standard
Zinc - Dissolved	ND	ND	ND	ND	ND	5,000 µg/L	Secondary GW and DW Standard

Notes:

All concentrations reported as µg/L unless otherwise noted.

NA = Not analyzed per the SWHP

ND = Data all non-detects or fewer than 5 detections

= 95% Lower CI Exceeds Regulatory Level (Exceedence)

= 95% Upper CI Exceeds Regulatory Level but Lower CI Does Not (No Exceedence, No Compliance)

= 95% Upper CI Does not Exceed Regulatory Level (Compliance)

= No Regulatory Level

Normally Distributed Data - Parametric Confidence Interval - Data not Transformed

Non-Normally Distributed Data - Non-Parametric Confidence Interval - Log Base-10 Transformed Data

Non-Detects treated as 0

June 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10	Regulatory Level	Basis for Comparison
Ammonia (N)	ND to 47	ND to 40	ND to 13	ND to 34	19 to 36	None	
Arsenic - Dissolved	0.087 to 0.098	0.09 to 0.118	0.802 to 1.00	0.773 to 1.74	1.96 to 2.44	0.05 µg/L	Primary GW Standard
Barium - Dissolved	ND to 4	12.5 to 15.1	3.77 to 12.64	6.48 to 8.55	12.5 to 15.1	1000 µg/L	Primary GW Standard
Bicarbonate	36.1 to 44.3	96.2 to 119	97.7 to 137	83.2 to 107	142 to 166	None	
Calcium	10,448 to 11,341	37,026 to 45,791	25,383 to 33,345	17,000 to 27,200	35,300 to 40,300	None	
Carbonate	ND	ND	ND	ND	ND	None	
COD	ND	ND	ND	ND	ND to 11.4	None	
Chloride	2,910 to 4,620	2,840 to 3,420	1,800 to 2,300	2,110 to 2,400	5,771 to 8,798	250,000 µg/L	Secondary GW and DW Standard
Dissolved Oxygen	9.65 to 10.4	0.11 to 0.94	0.03 to 0.40	0.15 to 2.62	0.03 to 0.27	None	
Iron - Dissolved	ND	ND	738 to 1214	290 to 549	ND	300 µg/L	Secondary GW and DW Standard
Manganese - Dissolved	ND	2,963 to 4,197	500 to 665	2,235 to 3,364	4,373 to 5,023	50 µg/L	Secondary GW and DW Standard
Nitrate	232 to 643	ND to 28	ND to 10	12 to 84	ND to 16	10,000 µg/L	Primary GW and DW Standard
Nitrite	ND to 3	ND	ND to 3	ND to 4	ND to 2	1,000 µg/L	Primary DW Standard
Oxidation-Reduction Potential	142 to 202	121 to 184	ND to 27.8	32.8 to 54.0	93.9 to 128	None	
pH - Field	6.1 to 6.3	6.0 to 6.2	6.5 to 6.7	6.5 to 6.7	6.4 to 6.6	6.5 - 8.5	Secondary GW Standard
pH - Laboratory	6.5 to 6.7	6.3 to 6.4	6.7 to 6.8	6.7 to 6.9	6.6 to 6.8	6.5 - 8.5	Secondary GW Standard

June 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10	Regulatory Level	Basis for Comparison
Potassium	ND to 650	500 to 814	804 to 1,400	602 to 958	925 to 1,180	None	
Sodium	4,347 to 4,660	8,146 to 9,228	6,664 to 7,842	7,060 to 8,040	9,366 to 10,863	20,000 µg/L	Secondary DW Standard
Specific Conductance	121 to 131	295 to 394	201 to 343	178 to 226	337 to 411	700 µmhos/cm	Secondary DW Standard
Sulfate	3,640 to 4,360	13,552 to 18,018	6,710 to 10,600	4,104 to 4,964	7,190 to 9,800	250,000 µg/L	Secondary GW and DW Standard
Temperature	11.3 to 12.5	11.9 to 12.7	11.7 to 12.6	11.0 to 12.0	11.3 to 12.1	None	
Total Coliform	ND	ND	ND	ND	ND	1cfu/100mL	Primary GW and DW Standard
TOC	ND	2,225 to 2,857	1460 to 2010	273 to 1160	2,800 to 3,340	None	
Vinyl Chloride	ND	ND	ND	ND to 0.04	ND to 0.02	0.02 µg/L	Primary GW Standard
Zinc - Dissolved	ND	ND	ND	ND	ND	5,000 µg/L	Secondary GW and DW Standard

Notes:

All concentrations reported as µg/L unless otherwise noted.

NA = Not analyzed per the SWHP

ND = Data all non-detects or fewer than 5 detections

= 95% Lower CI Exceeds Regulatory Level (Exceedence)

= 95% Upper CI Exceeds Regulatory Level but Lower CI Does Not (No Exceedence, No Compliance)

= 95% Upper CI Does not Exceed Regulatory Level (Compliance)

= No Regulatory Level

Normally Distributed Data - Parametric Confidence Interval - Data not Transformed

Non-Normally Distributed Data - Non-Parametric Confidence Interval - Log Base-10 Transformed Data

Non-Detects treated as 0

September 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10	Regulatory Level	Basis for Comparison
Ammonia (N)	ND to 40	ND to 40	13 to 40	29 to 42	25 to 94	None	
Arsenic - Dissolved	0.09 to 0.103	0.094 to 0.113	0.852 to 1.05	0.85 to 1.8	1.89 to 2.35	0.05 µg/L	Primary GW Standard
Barium - Dissolved	4.4 to 5	12.6 to 15.2	10 to 15	6.88 to 8.43	12.8 to 15.3	1000 µg/L	Primary GW Standard
Bicarbonate	35.9 to 44.7	90.9 to 133	100 to 141	80.7 to 105	140 to 167	None	
Calcium	10,200 to 11,400	33,700 to 49,000	30,000 to 35,900	18,300 to 27,200	35,200 to 40,300	None	
Carbonate	ND	ND	ND	ND	ND	None	
COD	ND	ND	ND	ND	13.0	None	
Chloride	3,420 to 4,500	2,840 to 3,510	1,940 to 2,400	2,150 to 2,620	5,368 to 7,900	250,000 µg/L	Secondary GW and DW Standard
Dissolved Oxygen	9.75 to 10.2	0.11 to 0.60	.07 to .320	0.30 to 1.73	0.07 to 0.260	None	
Iron - Dissolved	ND	ND	850 to 1,256	320 to 549	ND	300 µg/L	Secondary GW and DW Standard
Manganese - Dissolved	ND	3,309 to 4,550	536 to 690	2,270 to 3,100	4,394 to 5,006	50 µg/L	Secondary GW and DW Standard
Nitrate	263 to 670	ND to 28	ND to 20	29 to 142	ND to 82	10,000 µg/L	Primary GW and DW Standard
Nitrite	2 to 10	ND	2 to 10	3 to 10	2 to 10	1,000 µg/L	Primary DW Standard
Oxidation-Reduction Potential	164 to 213	139 to 232	10.8 to 34.9	41.7 to 54	94.6 to 134.9	None	
pH - Field	6.0 to 6.3	6.0 to 6.1	6.4 to 6.6	6.5 to 6.6	6.4 to 6.5	6.5 - 8.5	Secondary GW Standard
pH - Laboratory	6.4 to 6.6	6.2 to 6.3	6.6 to 6.7	6.6 to 6.8	6.6 to 6.7	6.5 - 8.5	Secondary GW Standard

September 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-6	MW-8	MW-10	Regulatory Level	Basis for Comparison
Potassium	590 to 700	600 to 965	1,230 to 1,490	900 to 1,030	1,040 to 1,210	None	
Sodium	4,413 to 4,665	8,097 to 9,257	6,848 to 7,827	7,068 to 7,951	9,267 to 10,595	20,000 µg/L	Secondary DW Standard
Specific Conductance	117 to 130	324 to 401	267 to 340	198 to 243	365 to 408	700 µmhos/cm	Secondary DW Standard
Sulfate	3,640 to 4,490	14,147 to 18,096	7,250 to 11,000	4,211 to 4,970	7,680 to 16,100	250,000 µg/L	Secondary GW and DW Standard
Temperature	11.2 to 11.9	11.9 to 12.6	11.5 to 12.3	10.8 to 11.8	11.2 to 11.9	None	
Total Coliform	ND	ND	ND	ND	ND	1cfu/100mL	Primary GW and DW Standard
TOC	ND	2,319 to 2,887	1,741 to 2,083	733 to 1,063	2,800 to 3,340	None	
Vinyl Chloride	ND	ND	ND	ND to 0.05	ND to 0.02	0.02 µg/L	Primary GW Standard
Zinc - Dissolved	ND	ND	ND	ND	ND	5,000 µg/L	Secondary GW and DW Standard

Notes:

All concentrations reported as µg/L unless otherwise noted.

NA = Not analyzed per the SWHP

ND = Data all non-detects or fewer than 5 detections

= 95% Lower CI Exceeds Regulatory Level (Exceedence)

= 95% Upper CI Exceeds Regulatory Level but Lower CI Does Not (No Exceedence, No Compliance)

= 95% Upper CI Does not Exceed Regulatory Level (Compliance)

= No Regulatory Level

Normally Distributed Data - Parametric Confidence Interval - Data not Transformed

Non-Normally Distributed Data - Non-Parametric Confidence Interval - Log Base-10 Transformed Data

Non-Detects treated as 0

December 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10	Regulatory Level	Basis for Comparison
Ammonia (N)	11 to 40	ND to 40	NA	13 to 42	NA	30 to 44	28 to 98	None	
Arsenic - Dissolved	0.103 to 0.085	0.089 to 0.118	0.124 to 0.189	0.894 to 1.10	0.278 to 0.553	1.23 to 1.82	1.81 to 2.78	0.05 µg/L	Primary GW Standard
Barium - Dissolved	4.4 to 5.0	12.7 to 15.7	NA	8.0 to 15	NA	6.7 to 8.6	12.8 to 15.5	1000 µg/L	Primary GW Standard
Bicarbonate (mg of CaCO ₃ /L)	36.7 to 46.9	102 to 160	NA	101 to 148	NA	86.0 to 121	147 to 177	None	
Calcium	10,607 to 11,479	36,858 to 47,090	NA	26,168 to 34,542	NA	19,785 to 25,175	35,300 to 40,300	None	
Carbonate (mg of CaCO ₃ /L)	ND	ND	NA	ND	NA	ND	ND	None	
COD	ND	ND	NA	ND	NA	ND	ND to 13.0	None	
Chloride	3,759 to 4,766	2,840 to 3,510	NA	1,800 to 2,570	NA	2,000 to 2,440	5,076 to 8,078	250,000 µg/L	Secondary GW and DW Standard
Dissolved Oxygen (mg/L)	9.57 to 10.2	0.36 to 1.16	7.67 to 11.1	0.20 to 0.43	6.50 to 9.68	0.94 to 2.20	0.15 to 0.47	None	
Iron - Dissolved	ND	ND	ND	832 to 1,250	ND	320 to 549	ND	300 µg/L	Secondary GW and DW Standard
Manganese - Dissolved	ND	3,726 to 5,143	ND	553 to 691	ND	2,261 to 3,092	4,331 to 4,979	50 µg/L	Secondary GW and DW Standard
Nitrate	232 to 703	ND to 28	NA	ND to 20	NA	20 to 142	ND to 82	10,000 µg/L	Primary GW and DW Standard
Nitrite	ND to 3	ND	NA	ND to 3	NA	ND to 3	ND	1,000 µg/L	Primary DW Standard
Oxidation-Reduction Potential	151 to 208	130 to 224	79 to 178	ND to 34.9	65.0 to 121	38.3 to 52.6	57.1 to 135	None	
pH - Field	6.1 to 6.4	6.0 to 6.2	6.4 to 6.7	6.5 to 6.7	6.6 to 6.8	6.5 to 6.7	6.4 to 6.6	6.5 - 8.5	Secondary GW Standard
pH - Laboratory	6.4 to 6.6	6.2 to 6.4	6.5 to 6.8	6.6 to 6.8	6.5 to 6.9	6.6 to 6.8	6.6 to 6.7	6.5 - 8.5	Secondary GW Standard

December 2017 Results of 95% Confidence Interval Evaluations

Constituent or Parameter	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8	MW-10	Regulatory Level	Basis for Comparison
Potassium	ND to 641	ND to 835	NA	565 to 1,310	NA	600 to 993	735 to 1,200	None	
Sodium	4,389 to 4,683	8,249 to 9,542	NA	6,829 to 7,996	NA	7,182 to 8,217	8,928 to 10,458	20,000 µg/L	Secondary DW Standard
Specific Conductance (µmhos/cm)	119 to 127	318 to 399	111 to 146	201 to 343	99 to 106	192 to 241	360 to 411	700 µmhos/cm	Secondary DW Standard
Sulfate	3,870 to 4,327	13,625 to 18,509	NA	6,490 to 10,200	NA	4,108 to 4,880	7,630 to 15,200	250,000 µg/L	Secondary GW and DW Standard
Temperature (°C)	10.8 to 12.4	11.7 to 12.6	10.6 to 13.0	11.4 to 12.2	9.18 to 11.7	10.7 to 11.8	11.0 to 11.9	None	
Total Coliform (count)	ND	ND	NA	ND	NA	ND	ND	1/100mL	Primary GW and DW Standard
TOC	ND	2,338 to 3,010	NA	1,510 to 2,140	NA	732 to 1,111	2,870 to 3,400	None	
Vinyl Chloride	ND	ND	ND	ND	ND	ND to 0.04	ND	0.02 µg/L	Primary GW Standard
Zinc - Dissolved	ND	ND	NA	ND	NA	ND	ND	5,000 µg/L	Secondary GW and DW Standard

Notes:

All concentrations reported as µg/L unless otherwise noted.

NA = Not analyzed per the SWHP

ND = Data all non-detects or 4 or fewer detections

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= 95% Upper CI Exceeds Regulatory Level but Lower CI Does Not (No Exceedence, No Compliance)

= 95% Upper CI Does not Exceed Regulatory Level (No Exceedence)

= No Regulatory Level

Normally Distributed Data - Parametric Confidence Interval - Data not Transformed

Non-Normally Distributed Data - Non-Parametric Confidence Interval - Log Base-10 Transformed Data

Non-Detects treated as 0

Appendix D:
Inspection, Maintenance, and Engineering Summary for 2017

Inspection, Maintenance, and Engineering Summary for 2017

The bulleted items below present a summary of the inspection, maintenance, and engineering tasks that were performed by SWD during 2017 at the Olalla Landfill.

- EPI conducted groundwater and landfill gas monitoring activities in all four quarters of 2017. The results are discussed in this report.
- EPI continued reporting and data analysis in accordance with Section IV of the SWHP and the CAP. The results are discussed in this report.
- SWD supported KPHD in quarterly inspections conducted at the Landfill. After the inspections, KPHD stated that no problems were noted during the inspections.
- SWD conducted regular inspections of the Landfill and its engineered systems including evaluation of the drainage systems and potential erosion areas. During 2017, all systems were operating as designed.
- SWD worked with other divisions in KCPW to maintain the systems at the Landfill including maintenance of the cap, stormwater drainage systems, and the stormwater detention pond. During 2017, routine maintenance was required including mowing of the cap and removal of vegetation.

**Appendix E:
Activities Planned for 2018**

Activities Planned for 2018

The bulleted items below present a summary of the planned inspections, maintenance and engineering activities planned for 2018 by SWD at the Olalla Landfill.

- Quarterly monitoring, sampling, and reporting will continue in accordance with Section IV of the SWHP and the CAP. SWD will continue to contract with EPI for monitoring and sampling activities for 2018.
- EPI will continue to conduct the reporting and data analysis in accordance with Section IV of the SWHP and the CAP.
- Regular inspections of the Landfill and its engineered systems will be conducted.
- SWD will continue to support KPHD in their quarterly inspections of the Landfill.
- SWD will continue to work with other divisions in the KCPW to maintain the systems at the Landfill including maintenance of the cap, stormwater drainage systems and the stormwater detention pond.

Attachment 1:
2017 Quarterly Monitoring Analytical Data Sheets
(Provided on attached CD ROM)

Attachment 1A
March 2017 Analytical Data Sheets



27 March 2017

Doug Kunkel
Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

RE: Olalla Landfill

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
17C0128

Associated SDG ID(s)
N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Mark Harris, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number: 17C0128	Turn-around Requested: Standard	Page: 1 of 1
ARI Client Company: Environmental Partners, Inc.	Phone: 425-395-0010	Date: 3/9/17
Client Contact: Deag Kankol		Ice Present?
Client Project Name: Olalla Landfill		No. of Coolers: 2
Client Project #: 450405.0	Samplers: Eric Caddy	Cooler Temps:

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments
					VOCs and V.H.C. Chloride	Dissolved Metals	Total Metals	Alk/Carb/ Total Carb	NO ₃ , NO ₂ , SO ₄ , pH	Ammonia/TOC COD	Total Coliform	Fecal Coliform	
Olalla-GW-MW1-3/17	3/8/17	0910	water	11	X	X	X	X	X	X	X		
Olalla-GW-MW3-3/17	"	10:38	↓	11	X	X	X	X	X	X	X		
Olalla-GW-MW10-3/17	"	12:17		11	X	X	X	X	X	X	X		
Olalla-GW-MW6-3/17	"	13:18		11	X	X	X	X	X	X	X		
Olalla-GW-MW8-3/17	"	14:43		11	X	X	X	X	X	X	X		
Olalla-GW-MW9-3/17	"	—		11	X	X	X	X	X	X	X		
Olalla-SW2-3/17	"	08:00		water	3				X	X			X
Trip blank	"	—	water	4	X								

Comments/Special Instructions See Mark Harris for full list of analytes.	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>Brittney Hall</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Eric Caddy	Printed Name: Brittney Hall	Printed Name:	Printed Name:
	Company: EPI	Company: ARI	Company:	Company:
	Date & Time: 3/9/17 0805	Date & Time: 3/9/17 805² B.H.	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Environmental Partners, Inc

Project Name: Olalla Landfill

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 17C0128

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)
Time: 8:25 3.2 1.0

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005276

Cooler Accepted by: B.H. Date: 3/9/17 Time: 8:25

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA 3/6/17

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

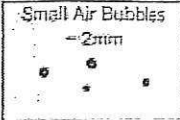
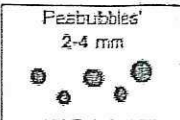
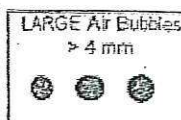
Samples Logged by: B.H. Date: 3/9/17 Time: 9:27

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
<u>Olalla-GW-MW3-3/14</u>	<u>↳ Olalla-GW-MW3-3/17</u>		
<u>Olalla-MW6-3/17</u>	<u>Olalla-GW-MW6-3/17</u>		
<u>Olalla-GW-MW9-3/17</u>	<u>↳ Olalla-GW-MW9-3/17</u>		

Additional Notes, Discrepancies, & Resolutions:
Trip blank labels missing sample ID.

By: B.H. Date: 3/9/17

			Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)



WORK ORDER

17C0128

Client: Environmental Partners, Inc.	Project Manager: Mark Harris
Project: Olalla Landfill	Project Number: [none]

Preservation Confirmation

Container ID	Container Type	pH
17C0128-01 A	VOA Vial, Clear, 40 mL, HCL	
17C0128-01 B	VOA Vial, Clear, 40 mL, HCL	
17C0128-01 C	VOA Vial, Clear, 40 mL, HCL	
17C0128-01 D	VOA Vial, Clear, 40 mL, HCL	
17C0128-01 E	VOA Vial, Clear, 40 mL, HCL	
17C0128-01 F	Corning Plastic, 125 mL, Na2S2O3	
17C0128-01 G	Glass NM, Amber, 500 mL, 9N H2SO4	L2 Pass
17C0128-01 H	Small OJ, 500 mL	
17C0128-01 I	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17C0128-01 J	Large OJ, 1000 mL	
17C0128-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17C0128-03 A	VOA Vial, Clear, 40 mL, HCL	
17C0128-03 B	VOA Vial, Clear, 40 mL, HCL	
17C0128-03 C	VOA Vial, Clear, 40 mL, HCL	
17C0128-03 D	VOA Vial, Clear, 40 mL, HCL	
17C0128-03 E	VOA Vial, Clear, 40 mL, HCL	
17C0128-03 F	Corning Plastic, 125 mL, Na2S2O3	
17C0128-03 G	Glass NM, Amber, 500 mL, 9N H2SO4	L2 Pass
17C0128-03 H	Small OJ, 500 mL	
17C0128-03 I	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17C0128-03 J	Large OJ, 1000 mL	
17C0128-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17C0128-05 A	VOA Vial, Clear, 40 mL, HCL	
17C0128-05 B	VOA Vial, Clear, 40 mL, HCL	
17C0128-05 C	VOA Vial, Clear, 40 mL, HCL	
17C0128-05 D	VOA Vial, Clear, 40 mL, HCL	
17C0128-05 E	VOA Vial, Clear, 40 mL, HCL	
17C0128-05 F	Corning Plastic, 125 mL, Na2S2O3	
17C0128-05 G	Glass NM, Amber, 500 mL, 9N H2SO4	L2 Pass
17C0128-05 H	Small OJ, 500 mL	
17C0128-05 I	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass

B.H.
Reviewed By

3/9/17
Date



WORK ORDER

17C0128

Client: Environmental Partners, Inc.	Project Manager: Mark Harris
Project: Olalla Landfill	Project Number: [none]

17C0128-05 J	Large OJ, 1000 mL	
17C0128-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17C0128-07 A	VOA Vial, Clear, 40 mL, HCL	
17C0128-07 B	VOA Vial, Clear, 40 mL, HCL	
17C0128-07 C	VOA Vial, Clear, 40 mL, HCL	
17C0128-07 D	VOA Vial, Clear, 40 mL, HCL	
17C0128-07 E	VOA Vial, Clear, 40 mL, HCL	
17C0128-07 F	Corning Plastic, 125 mL, Na2S2O3	
17C0128-07 G	Glass NM, Amber, 500 mL, 9N H2SO4	L2 Pass
17C0128-07 H	Small OJ, 500 mL	
17C0128-07 I	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17C0128-07 J	Large OJ, 1000 mL	
17C0128-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17C0128-09 A	VOA Vial, Clear, 40 mL, HCL	
17C0128-09 B	VOA Vial, Clear, 40 mL, HCL	
17C0128-09 C	VOA Vial, Clear, 40 mL, HCL	
17C0128-09 D	VOA Vial, Clear, 40 mL, HCL	
17C0128-09 E	VOA Vial, Clear, 40 mL, HCL	
17C0128-09 F	Corning Plastic, 125 mL, Na2S2O3	
17C0128-09 G	Glass NM, Amber, 500 mL, 9N H2SO4	L2 Pass
17C0128-09 H	Small OJ, 500 mL	
17C0128-09 I	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17C0128-09 J	Large OJ, 1000 mL	
17C0128-10 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17C0128-11 A	VOA Vial, Clear, 40 mL, HCL	
17C0128-11 B	VOA Vial, Clear, 40 mL, HCL	
17C0128-11 C	VOA Vial, Clear, 40 mL, HCL	
17C0128-11 D	VOA Vial, Clear, 40 mL, HCL	
17C0128-11 E	VOA Vial, Clear, 40 mL, HCL	
17C0128-11 F	Corning Plastic, 125 mL, Na2S2O3	
17C0128-11 G	Glass NM, Amber, 500 mL, 9N H2SO4	L2 Pass
17C0128-11 H	Small OJ, 500 mL	
17C0128-11 I	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17C0128-11 J	Large OJ, 1000 mL	

B.H.
Reviewed By

3/9/17
Date



WORK ORDER

17C0128

Client: Environmental Partners, Inc.		Project Manager: Mark Harris
Project: Olalla Landfill		Project Number: [none]
17C0128-12 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17C0128-13 A	Miscellaneous Container	
17C0128-13 B	Miscellaneous Container	
17C0128-13 C	Corning Plastic, 125 mL, Na2S2O3	
17C0128-14 A	VOA Vial, Clear, 40 mL, HCL	
17C0128-14 B	VOA Vial, Clear, 40 mL, HCL	
17C0128-14 C	VOA Vial, Clear, 40 mL, HCL	
17C0128-14 D	VOA Vial, Clear, 40 mL, HCL	

B.H.
Preservation Confirmed By

3/9/17
Date

B.H.
Reviewed By

3/9/17
Date



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Olalla-GW-MW1-3/17	17C0128-01	Water	08-Mar-2017 09:10	09-Mar-2017 08:25
Olalla-GW-MW1-3/17	17C0128-02	Water	08-Mar-2017 09:10	09-Mar-2017 08:25
Olalla-GW-MW3-3/17	17C0128-03	Water	08-Mar-2017 10:38	09-Mar-2017 08:25
Olalla-GW-MW3-3/17	17C0128-04	Water	08-Mar-2017 10:38	09-Mar-2017 08:25
Olalla-GW-MW10-3/17	17C0128-05	Water	08-Mar-2017 12:17	09-Mar-2017 08:25
Olalla-GW-MW10-3/17	17C0128-06	Water	08-Mar-2017 12:17	09-Mar-2017 08:25
Olalla-GW-MW6-3/17	17C0128-07	Water	08-Mar-2017 13:18	09-Mar-2017 08:25
Olalla-GW-MW6-3/17	17C0128-08	Water	08-Mar-2017 13:18	09-Mar-2017 08:25
Olalla-GW-MW8-3/17	17C0128-09	Water	08-Mar-2017 14:43	09-Mar-2017 08:25
Olalla-GW-MW8-3/17	17C0128-10	Water	08-Mar-2017 14:43	09-Mar-2017 08:25
Olalla-GW-MW9-3/17	17C0128-11	Water	08-Mar-2017 00:00	09-Mar-2017 08:25
Olalla-GW-MW9-3/17	17C0128-12	Water	08-Mar-2017 00:00	09-Mar-2017 08:25
Olalla-SW2-3/17	17C0128-13	Water	08-Mar-2017 08:00	09-Mar-2017 08:25
Trip blank	17C0128-14	Water	08-Mar-2017 00:00	09-Mar-2017 08:25



Environmental Partners, Inc.
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Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Case Narrative

Client: Environmental Partners, Inc.

Project: Olalla Landfill

Workorder: 17C0128

Sample receipt

7 samples and a trip blank were received 09-Mar-2017 08:25 under ARI work order 17C0128. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260C

These samples were prepared and analyzed within the recommended holding time.

The percent relative standard deviations (%RSDs) for all compounds were within acceptable QC limits for the ICAL that was analyzed in conjunction with these samples.

The percent differences (%Ds) for all compounds were within acceptable QC limits for the ICV that was analyzed in conjunction with these samples.

The %Ds for all compounds were within acceptable QC limits for the CCAL that was analyzed in conjunction with these samples.

The areas for all internal standards were within acceptable QC limits.

The percent recoveries for all surrogates were within acceptable QC limits.

No target compounds were detected in the method blank above the LOQs.

The percent recovery for hexachloro-1,3-butadiene was high following the analysis of the LCSD associated with these samples. Since this compound was not detected in any sample associated with this LCSD, the high bias does not compromise any LOQ. No corrective actions were taken. The percent recoveries and RPDs were within established QC limits for all remaining compounds.

Vinyl Chloride - EPA Method 8260C-SIM (Selected Ion Monitoring)

These samples were prepared and analyzed within the recommended holding time.

The percent relative standard deviation (%RSD) for vinyl chloride was within acceptable QC limits for the ICAL that was analyzed in conjunction with these samples.

The percent difference (%D) for vinyl chloride was within acceptable QC limits for the ICV that was analyzed in conjunction with these samples.



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The %D for vinyl chloride was within acceptable QC limits for the CCAL that was analyzed in conjunction with these samples .

The areas for all internal standards were within acceptable QC limits.

The percent recoveries for all surrogates were within acceptable QC limits.

Vinyl chloride was not detected in the method blank above the LOQ.

The percent recoveries and RPD for vinyl chloride were within established QC limits for the LCS/LCSD associated with these samples.

Total and Dissolved Metals - EPA Methods 6010C/200.8

These samples were digested and analyzed within the recommended holding times.

The percent relative standard deviations (%RSDs) for all elements were within acceptable QC limits for the ICAL that was analyzed in conjunction with these samples.

The percent differences (%Ds) for all elements were within acceptable QC limits for the ICV that was analyzed in conjunction with these samples.

The %Ds for all elements were within acceptable QC limits for the CCALs that were analyzed in conjunction with these samples.

The areas for all internal standards were within acceptable QC limits.

No target elements were detected in the method blanks above the LOQs.

The percent recoveries for all elements were within acceptable QC limits for the LCSs.

A matrix spike (MS) was prepared and analyzed for dissolved arsenic in conjunction with sample 'Olalla-GW-MW1-3/17'. The percent recovery for dissolved arsenic was within acceptable QC limits for the MS.

A matrix duplicate (MD) was prepared and analyzed for dissolved arsenic in conjunction with sample 'Olalla-GW-MW1-3/17'. The RPD for dissolved arsenic was within acceptable QC limits for the MD.

Wet Chemistry

It was noted upon sample receipt that the holding times for pH, total coliform and fecal coliform had expired for all samples. All samples were prepared and analyzed for all expired parameters as quickly as possible. The samples were prepared and analyzed within the recommended holding times for all remaining compounds.

All initial and continuing calibrations were within method requirements.



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No target compounds were detected in the method blanks above the LOQs.

The percent recoveries for all compounds were within acceptable QC limits for the LCSs.

The percent recovery for alkalinity was within acceptable QC limits for the RM.

A matrix spike (MS) was prepared and analyzed for TOC in conjunction with sample 'Olalla-GW-MW1-3/17'. The percent recovery for TOC was within acceptable QC limits for the MS.

Matrix duplicates (MDs) were prepared and analyzed for pH, alkalinity and TOC in conjunction with sample 'Olalla-GW-MW1-3/17'. The RPDs for all compounds were within acceptable QC limits for the MDs.



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Project: Olalla Landfill
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Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW1-3/17
17C0128-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 09:10
Analyzed: 03/10/2017 14:16

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0275 Sample Size: 10 mL
Prepared: 03/10/2017 11:22 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U



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Reported:
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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 09:10
Analyzed: 03/10/2017 14:16

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U



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Reported:
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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 09:10
Analyzed: 03/10/2017 14:16

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	108	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	96.9	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	102	%	



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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT2

Sampled: 03/08/2017 09:10
Analyzed: 03/14/2017 14:45

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0362 Sample Size: 10 mL
Prepared: 03/14/2017 08:46 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	95.5 %		



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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 09:10
Analyzed: 03/15/2017 20:55

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFC0295 Sample Size: 25 mL
Prepared: 03/13/2017 07:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	8.87	mg/L	
Potassium	7440-09-7	1	0.500	0.640	mg/L	
Sodium	7440-23-5	1	0.500	4.39	mg/L	



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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 03/08/2017 09:10

Instrument: LACHAT2

Analyzed: 03/10/2017 09:50

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0263

Prepared: 03/10/2017 07:56

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.68	mg/L	



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Reported:
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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 03/08/2017 09:10
Analyzed: 03/09/2017 13:58

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/09/2017 11:39 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	2	0.0300	1.62	mg/L	

Instrument: LACHAT2

Analyzed: 03/09/2017 13:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0246 Sample Size: 10 mL
Prepared: 03/09/2017 11:39 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg/L	U



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Reported:
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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 03/08/2017 09:10

Instrument: LACHAT2

Analyzed: 03/22/2017 15:20

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0567

Prepared: 03/22/2017 11:10

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	3.25	mg/L	



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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 03/08/2017 09:10
Analyzed: 03/13/2017 16:22

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0302 Sample Size: 2 mL
Prepared: 03/13/2017 09:28 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 03/08/2017 09:10

Instrument: TOC-LCSH

Analyzed: 03/14/2017 01:27

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0323

Sample Size: 20 mL

Prepared: 03/13/2017 12:28

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	ND	mg/L	U



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Reported:
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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 03/08/2017 09:10

Instrument: Accumet AR60

Analyzed: 03/09/2017 11:33

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0245

Sample Size: 100 mL

Prepared: 03/09/2017 11:22

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.0	44.5	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.0	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	44.5	mg/L CaCO3	



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Reported:
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Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 03/08/2017 09:10
Analyzed: 03/09/2017 14:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0244 Sample Size: 50 mL
Prepared: 03/09/2017 10:52 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.27	pH Units	H



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Reported:
27-Mar-2017 09:19

Olalla-GW-MW1-3/17
17C0128-01 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 03/08/2017 09:10
Analyzed: 03/13/2017 11:39

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0303 Sample Size: 10 mL
Prepared: 03/13/2017 08:16 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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Issaquah, WA 98027

Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW1-3/17
17C0128-01 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 03/08/2017 09:10
Analyzed: 03/10/2017 11:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0241 Sample Size: 100 mL
Prepared: 03/09/2017 11:35 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
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Olalla-GW-MW1-3/17
17C0128-01RE1 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 03/08/2017 09:10

Instrument: LACHAT2

Analyzed: 03/09/2017 13:58

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0246

Prepared: 03/09/2017 11:39

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		2	0.020	1.62	mg/L	D



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Olalla-GW-MW1-3/17
17C0128-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 03/08/2017 09:10
Instrument: ICPMS2 Analyzed: 03/15/2017 17:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Olalla-GW-MW1-3/17
17C0128-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 03/08/2017 09:10
Analyzed: 03/15/2017 17:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFC0557 Sample Size: 100 mL
Prepared: 03/22/2017 06:19 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.0936	ug/L	



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Olalla-GW-MW1-3/17
17C0128-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 09:10
Analyzed: 03/13/2017 15:40

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFC0265 Sample Size: 50 mL
Prepared: 03/10/2017 08:30 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 10:38
Analyzed: 03/10/2017 14:42

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0275 Sample Size: 10 mL
Prepared: 03/10/2017 11:22 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 10:38
Analyzed: 03/10/2017 14:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 10:38
Analyzed: 03/10/2017 14:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	97.3	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT2

Sampled: 03/08/2017 10:38
Analyzed: 03/14/2017 15:05

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0362 Sample Size: 10 mL
Prepared: 03/14/2017 08:46 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	96.3 %		



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 10:38
Analyzed: 03/15/2017 20:59

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFC0295 Sample Size: 25 mL
Prepared: 03/13/2017 07:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	33.7	mg/L	
Potassium	7440-09-7	1	0.500	0.806	mg/L	
Sodium	7440-23-5	1	0.500	8.40	mg/L	



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 03/08/2017 10:38

Instrument: LACHAT2

Analyzed: 03/10/2017 09:59

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0263

Prepared: 03/10/2017 07:56

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.68	mg/L	



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 03/08/2017 10:38
Analyzed: 03/09/2017 13:35

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/09/2017 11:39 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	

Instrument: LACHAT2

Analyzed: 03/09/2017 13:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0246
Prepared: 03/09/2017 11:39 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg/L	U



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 03/08/2017 10:38

Instrument: LACHAT2

Analyzed: 03/22/2017 15:21

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0567

Prepared: 03/22/2017 11:10

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	15.0	mg/L	



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 03/08/2017 10:38
Analyzed: 03/13/2017 16:22

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0302 Sample Size: 2 mL
Prepared: 03/13/2017 09:28 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: EPA 9060A Sampled: 03/08/2017 10:38
Instrument: TOC-LCSH Analyzed: 03/14/2017 02:37

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0323 Sample Size: 20 mL
Prepared: 03/13/2017 12:28 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	2.40	mg/L	



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 03/08/2017 10:38

Instrument: Accumet AR60

Analyzed: 03/09/2017 11:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0245 Sample Size: 100 mL
Prepared: 03/09/2017 11:22 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.0	165	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.0	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	165	mg/L CaCO3	



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 03/08/2017 10:38
Analyzed: 03/09/2017 14:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0244 Sample Size: 50 mL
Prepared: 03/09/2017 10:52 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.13	pH Units	H



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 03/08/2017 10:38
Analyzed: 03/13/2017 11:40

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0303 Sample Size: 10 mL
Prepared: 03/13/2017 08:16 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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Olalla-GW-MW3-3/17
17C0128-03 (Water)

Microbiology

Method: SM 9222B Sampled: 03/08/2017 10:38
Instrument: N/A Analyzed: 03/10/2017 11:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0241 Sample Size: 100 mL
Prepared: 03/09/2017 11:35 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Olalla-GW-MW3-3/17
17C0128-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 03/08/2017 10:38
Analyzed: 03/15/2017 17:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Olalla-GW-MW3-3/17
17C0128-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 03/08/2017 10:38
Analyzed: 03/15/2017 17:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFC0557 Sample Size: 100 mL
Prepared: 03/22/2017 06:19 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.0994	ug/L	



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Olalla-GW-MW3-3/17
17C0128-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 10:38
Analyzed: 03/13/2017 12:40

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFC0265 Sample Size: 50 mL
Prepared: 03/10/2017 08:30 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0117	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	5.21	mg/L	



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Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW10-3/17
17C0128-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 12:17
Analyzed: 03/10/2017 15:07

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0275 Sample Size: 10 mL
Prepared: 03/10/2017 11:22 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 12:17
Analyzed: 03/10/2017 15:07

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 12:17
Analyzed: 03/10/2017 15:07

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	103	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	97.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	98.5	%	



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT2

Sampled: 03/08/2017 12:17
Analyzed: 03/14/2017 15:25

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0362 Sample Size: 10 mL
Prepared: 03/14/2017 08:46 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	22.7	ng/L	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	95.6 %		



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 12:17
Analyzed: 03/15/2017 21:04

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFC0295 Sample Size: 25 mL
Prepared: 03/13/2017 07:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	39.4	mg/L	
Potassium	7440-09-7	1	0.500	1.31	mg/L	
Sodium	7440-23-5	1	0.500	10.7	mg/L	



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 03/08/2017 12:17

Instrument: LACHAT2

Analyzed: 03/10/2017 10:00

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0263

Prepared: 03/10/2017 07:56

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	9.53	mg/L	



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 03/08/2017 12:17
Analyzed: 03/09/2017 13:36

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/09/2017 11:39 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	

Instrument: LACHAT2

Analyzed: 03/09/2017 13:36

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0246
Prepared: 03/09/2017 11:39 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg/L	U



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 03/08/2017 12:17

Instrument: LACHAT2

Analyzed: 03/22/2017 15:22

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0567

Prepared: 03/22/2017 11:10

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	9.37	mg/L	



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 03/08/2017 12:17
Analyzed: 03/13/2017 16:22

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0302 Sample Size: 2 mL
Prepared: 03/13/2017 09:28 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: EPA 9060A Sampled: 03/08/2017 12:17
Instrument: TOC-LCSH Analyzed: 03/14/2017 02:56

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0323 Sample Size: 20 mL
Prepared: 03/13/2017 12:28 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	3.63	mg/L	



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 03/08/2017 12:17

Instrument: Accumet AR60

Analyzed: 03/09/2017 11:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0245 Sample Size: 100 mL
Prepared: 03/09/2017 11:22 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.0	228	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.0	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	228	mg/L CaCO3	



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 03/08/2017 12:17
Analyzed: 03/09/2017 14:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0244 Sample Size: 50 mL
Prepared: 03/09/2017 10:52 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.39	pH Units	H



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 03/08/2017 12:17
Analyzed: 03/13/2017 11:41

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0303 Sample Size: 10 mL
Prepared: 03/13/2017 08:16 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.094	mg-N/L	



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Olalla-GW-MW10-3/17
17C0128-05 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 03/08/2017 12:17
Analyzed: 03/10/2017 11:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0241 Sample Size: 100 mL
Prepared: 03/09/2017 11:35 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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Olalla-GW-MW10-3/17
17C0128-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 03/08/2017 12:17
Analyzed: 03/15/2017 17:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Olalla-GW-MW10-3/17
17C0128-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 03/08/2017 12:17
Analyzed: 03/15/2017 17:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFC0557 Sample Size: 100 mL
Prepared: 03/22/2017 06:19 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.06	ug/L	



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Olalla-GW-MW10-3/17
17C0128-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 12:17
Analyzed: 03/13/2017 12:44

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFC0265 Sample Size: 50 mL
Prepared: 03/10/2017 08:30 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0165	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	5.15	mg/L	



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 13:18
Analyzed: 03/10/2017 15:33

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0275 Sample Size: 10 mL
Prepared: 03/10/2017 11:22 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 13:18
Analyzed: 03/10/2017 15:33

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	2.37	ug/L	
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U



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Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 13:18
Analyzed: 03/10/2017 15:33

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>105</i>	<i>%</i>	
<i>Surrogate: Toluene-d8</i>			<i>80-120 %</i>	<i>99.0</i>	<i>%</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>			<i>80-120 %</i>	<i>95.8</i>	<i>%</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			<i>80-120 %</i>	<i>103</i>	<i>%</i>	



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT2

Sampled: 03/08/2017 13:18
Analyzed: 03/14/2017 15:44

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0362 Sample Size: 10 mL
Prepared: 03/14/2017 08:46 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	94.9 %		



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 13:18
Analyzed: 03/15/2017 21:08

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFC0295 Sample Size: 25 mL
Prepared: 03/13/2017 07:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	23.0	mg/L	
Potassium	7440-09-7	1	0.500	1.11	mg/L	
Sodium	7440-23-5	1	0.500	5.86	mg/L	



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 03/08/2017 13:18

Instrument: LACHAT2

Analyzed: 03/10/2017 10:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0263

Prepared: 03/10/2017 07:56

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	3.38	mg/L	



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 03/08/2017 13:18
Analyzed: 03/09/2017 13:37

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/09/2017 11:39 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	

Instrument: LACHAT2

Analyzed: 03/09/2017 13:37

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0246 Sample Size: 10 mL
Prepared: 03/09/2017 11:39 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg/L	U



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Reported:
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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 03/08/2017 13:18

Instrument: LACHAT2

Analyzed: 03/22/2017 15:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0567

Prepared: 03/22/2017 11:10

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	6.49	mg/L	



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 03/08/2017 13:18
Analyzed: 03/13/2017 16:23

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0302 Sample Size: 2 mL
Prepared: 03/13/2017 09:28 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 03/08/2017 13:18

Instrument: TOC-LCSH

Analyzed: 03/14/2017 03:23

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0323

Sample Size: 20 mL

Prepared: 03/13/2017 12:28

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	1.51	mg/L	



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 03/08/2017 13:18

Instrument: Accumet AR60

Analyzed: 03/09/2017 11:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0245 Sample Size: 100 mL
Prepared: 03/09/2017 11:22 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.0	139	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.0	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	139	mg/L CaCO3	



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 03/08/2017 13:18
Analyzed: 03/09/2017 14:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0244 Sample Size: 50 mL
Prepared: 03/09/2017 10:52 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.58	pH Units	H



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 03/08/2017 13:18
Analyzed: 03/13/2017 11:50

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0303 Sample Size: 10 mL
Prepared: 03/13/2017 08:16 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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Olalla-GW-MW6-3/17
17C0128-07 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 03/08/2017 13:18
Analyzed: 03/10/2017 11:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0241 Sample Size: 100 mL
Prepared: 03/09/2017 11:35 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Olalla-GW-MW6-3/17
17C0128-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 03/08/2017 13:18
Instrument: ICPMS2 Analyzed: 03/15/2017 19:09

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	581	ug/L	



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Olalla-GW-MW6-3/17
17C0128-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 03/08/2017 13:18
Analyzed: 03/15/2017 19:09

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFC0557 Sample Size: 100 mL
Prepared: 03/22/2017 06:19 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.844	ug/L	



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Olalla-GW-MW6-3/17
17C0128-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 13:18
Analyzed: 03/13/2017 15:58

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFC0265 Sample Size: 50 mL
Prepared: 03/10/2017 08:30 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0108	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.500	mg/L	



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Olalla-GW-MW8-3/17
17C0128-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 14:43
Analyzed: 03/10/2017 15:59

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0275 Sample Size: 10 mL
Prepared: 03/10/2017 11:22 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.67	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U



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Olalla-GW-MW8-3/17
17C0128-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 14:43
Analyzed: 03/10/2017 15:59

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U



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Olalla-GW-MW8-3/17
17C0128-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 14:43
Analyzed: 03/10/2017 15:59

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	0.21	ug/L	
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>104</i>	<i>%</i>	
<i>Surrogate: Toluene-d8</i>			<i>80-120 %</i>	<i>101</i>	<i>%</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>			<i>80-120 %</i>	<i>101</i>	<i>%</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			<i>80-120 %</i>	<i>101</i>	<i>%</i>	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-09 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT2

Sampled: 03/08/2017 14:43
Analyzed: 03/14/2017 16:04

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0362 Sample Size: 10 mL
Prepared: 03/14/2017 08:46 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	71.4	ng/L	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	98.0 %		



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Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 14:43
Analyzed: 03/15/2017 21:12

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFC0295 Sample Size: 25 mL
Prepared: 03/13/2017 07:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	28.7	mg/L	
Potassium	7440-09-7	1	0.500	0.993	mg/L	
Sodium	7440-23-5	1	0.500	8.51	mg/L	



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Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 03/08/2017 14:43

Instrument: LACHAT2

Analyzed: 03/10/2017 10:02

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0263

Prepared: 03/10/2017 07:56

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.33	mg/L	



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Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 03/08/2017 14:43
Analyzed: 03/09/2017 14:00

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/09/2017 11:39 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.084	mg/L	

Instrument: LACHAT2

Analyzed: 03/09/2017 14:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0246
Prepared: 03/09/2017 11:39 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.084	mg/L	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg/L	U



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Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 03/08/2017 14:43

Instrument: LACHAT2

Analyzed: 03/22/2017 15:25

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0567

Prepared: 03/22/2017 11:10

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	5.02	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah, WA 98027	Project: Olalla Landfill Project Number: 450405.0 Project Manager: Doug Kunkel	Reported: 27-Mar-2017 09:19
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Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: EPA 410.4 Sampled: 03/08/2017 14:43
Instrument: UV1800-1 Analyzed: 03/13/2017 16:23

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0302 Sample Size: 2 mL
Prepared: 03/13/2017 09:28 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 03/08/2017 14:43

Instrument: TOC-LCSH

Analyzed: 03/14/2017 03:49

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0323

Prepared: 03/13/2017 12:28

Sample Size: 20 mL

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	1.16	mg/L	



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Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 03/08/2017 14:43

Instrument: Accumet AR60

Analyzed: 03/09/2017 11:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0245
Prepared: 03/09/2017 11:22

Sample Size: 100 mL
Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.0	164	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.0	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	164	mg/L CaCO3	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah, WA 98027	Project: Olalla Landfill Project Number: 450405.0 Project Manager: Doug Kunkel	Reported: 27-Mar-2017 09:19
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Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00 Sampled: 03/08/2017 14:43
Instrument: Accumet AR60 Analyzed: 03/09/2017 14:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0244 Sample Size: 50 mL
Prepared: 03/09/2017 10:52 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.16	pH Units	H



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Reported:
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Olalla-GW-MW8-3/17
17C0128-09 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LACHAT2

Sampled: 03/08/2017 14:43
Analyzed: 03/13/2017 11:51

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0303 Sample Size: 10 mL
Prepared: 03/13/2017 08:16 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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Olalla-GW-MW8-3/17
17C0128-09 (Water)

Microbiology

Method: SM 9222B Sampled: 03/08/2017 14:43
Instrument: N/A Analyzed: 03/10/2017 11:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0241 Sample Size: 100 mL
Prepared: 03/09/2017 11:35 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 03/08/2017 14:43
Analyzed: 03/15/2017 19:13

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	549	ug/L	



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Reported:
27-Mar-2017 09:19

Olalla-GW-MW8-3/17
17C0128-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 03/08/2017 14:43
Analyzed: 03/15/2017 19:13

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFC0557 Sample Size: 100 mL
Prepared: 03/22/2017 06:19 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.49	ug/L	



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Reported:
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Olalla-GW-MW8-3/17
17C0128-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 14:43
Analyzed: 03/13/2017 16:02

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFC0265 Sample Size: 50 mL
Prepared: 03/10/2017 08:30 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0064	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.32	mg/L	



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Reported:
27-Mar-2017 09:19

Olalla-GW-MW9-3/17
17C0128-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 00:00
Analyzed: 03/10/2017 16:24

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0275 Sample Size: 10 mL
Prepared: 03/10/2017 11:22 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U



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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 00:00
Analyzed: 03/10/2017 16:24

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U



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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 00:00
Analyzed: 03/10/2017 16:24

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	108	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	96.5	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.8	%	



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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT2

Sampled: 03/08/2017 00:00
Analyzed: 03/14/2017 16:24

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0362 Sample Size: 10 mL
Prepared: 03/14/2017 08:46 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>96.9 %</i>		



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Reported:
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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 00:00
Analyzed: 03/15/2017 21:16

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFC0295 Sample Size: 25 mL
Prepared: 03/13/2017 07:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	31.7	mg/L	
Potassium	7440-09-7	1	0.500	0.810	mg/L	
Sodium	7440-23-5	1	0.500	8.17	mg/L	



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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 03/08/2017 00:00

Instrument: LACHAT2

Analyzed: 03/10/2017 10:04

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0263

Prepared: 03/10/2017 07:56

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.59	mg/L	



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Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 03/08/2017 00:00
Analyzed: 03/09/2017 13:39

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/09/2017 11:39 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	

Instrument: LACHAT2

Analyzed: 03/09/2017 13:39

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0246
Prepared: 03/09/2017 11:39 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg/L	U



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Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 03/08/2017 00:00

Instrument: LACHAT2

Analyzed: 03/22/2017 15:26

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0567

Prepared: 03/22/2017 11:10

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	14.7	mg/L	



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Reported:
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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 03/08/2017 00:00
Analyzed: 03/13/2017 16:24

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0302 Sample Size: 2 mL
Prepared: 03/13/2017 09:28 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
27-Mar-2017 09:19

Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 03/08/2017 00:00

Instrument: TOC-LCSH

Analyzed: 03/14/2017 04:16

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0323

Sample Size: 20 mL

Prepared: 03/13/2017 12:28

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	2.34	mg/L	



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Reported:
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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 03/08/2017 00:00

Instrument: Accumet AR60

Analyzed: 03/09/2017 11:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0245 Sample Size: 100 mL
Prepared: 03/09/2017 11:22 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.0	147	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.0	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	147	mg/L CaCO3	



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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 03/08/2017 00:00
Analyzed: 03/09/2017 14:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0244 Sample Size: 50 mL
Prepared: 03/09/2017 10:52 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.55	pH Units	H



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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LACHAT2

Sampled: 03/08/2017 00:00
Analyzed: 03/13/2017 11:52

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0303 Sample Size: 10 mL
Prepared: 03/13/2017 08:16 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah, WA 98027	Project: Olalla Landfill Project Number: 450405.0 Project Manager: Doug Kunkel	Reported: 27-Mar-2017 09:19
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Olalla-GW-MW9-3/17
17C0128-11 (Water)

Microbiology

Method: SM 9222B Sampled: 03/08/2017 00:00
Instrument: N/A Analyzed: 03/10/2017 11:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0241 Sample Size: 100 mL
Prepared: 03/09/2017 11:35 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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Olalla-GW-MW9-3/17
17C0128-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 03/08/2017 00:00
Analyzed: 03/15/2017 19:18

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Reported:
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Olalla-GW-MW9-3/17
17C0128-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 03/08/2017 00:00
Analyzed: 03/15/2017 19:18

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFC0376 Sample Size: 25 mL
Prepared: 03/15/2017 07:04 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFC0583 Sample Size: 100 mL
Prepared: 03/23/2017 06:11 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.0978	ug/L	



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Reported:
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Olalla-GW-MW9-3/17
17C0128-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 03/08/2017 00:00
Analyzed: 03/13/2017 13:14

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFC0265 Sample Size: 50 mL
Prepared: 03/10/2017 08:30 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0120	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	5.15	mg/L	



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Reported:
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Olalla-SW2-3/17
17C0128-13 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 03/08/2017 08:00

Instrument: LACHAT2

Analyzed: 03/10/2017 10:05

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0263

Prepared: 03/10/2017 07:56

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	ND	mg/L	U



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Reported:
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Olalla-SW2-3/17
17C0128-13 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 03/08/2017 08:00
Analyzed: 03/09/2017 13:41

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/09/2017 11:39 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	

Instrument: LACHAT2

Analyzed: 03/09/2017 13:41

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0246
Prepared: 03/09/2017 11:39 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg/L	U



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Reported:
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Olalla-SW2-3/17
17C0128-13 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 03/08/2017 08:00

Instrument: LACHAT2

Analyzed: 03/22/2017 15:27

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFC0567

Prepared: 03/22/2017 11:10

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	3.36	mg/L	



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Reported:
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Olalla-SW2-3/17
17C0128-13 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 03/08/2017 08:00

Instrument: Accumet AR60

Analyzed: 03/09/2017 11:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0245 Sample Size: 100 mL
Prepared: 03/09/2017 11:22 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.0	20.2	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.0	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	20.2	mg/L CaCO3	



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Reported:
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Olalla-SW2-3/17
17C0128-13 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 03/08/2017 08:00
Analyzed: 03/09/2017 14:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0244 Sample Size: 50 mL
Prepared: 03/09/2017 10:52 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	7.04	pH Units	H



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Reported:
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Olalla-SW2-3/17
17C0128-13 (Water)

Microbiology

Method: SM 9222D
Instrument: N/A

Sampled: 03/08/2017 08:00
Analyzed: 03/10/2017 11:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFC0240 Sample Size: 100 mL
Prepared: 03/09/2017 11:34 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
27-Mar-2017 09:19

Trip blank
17C0128-14 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 00:00
Analyzed: 03/10/2017 12:57

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0275 Sample Size: 10 mL
Prepared: 03/10/2017 11:22 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U



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Reported:
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Trip blank
17C0128-14 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 00:00
Analyzed: 03/10/2017 12:57

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U



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Trip blank
17C0128-14 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 03/08/2017 00:00
Analyzed: 03/10/2017 12:57

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	97.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	95.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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Trip blank
17C0128-14 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT2

Sampled: 03/08/2017 00:00
Analyzed: 03/14/2017 16:44

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFC0362 Sample Size: 10 mL
Prepared: 03/14/2017 08:46 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>98.0 %</i>		



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Reported:
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Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0275-BLK1)		Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 12:05								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0275-BLK1)				Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 12:05						
Toluene	ND	0.20	ug/L							U
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U



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Reported:
27-Mar-2017 09:19

Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0275-BLK1)										
						Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 12:05				
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>		5.03	ug/L	5.00		101 %	80-129			
<i>Surrogate: Toluene-d8</i>		4.97	ug/L	5.00		99.4 %	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>		4.91	ug/L	5.00		98.2 %	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>		4.94	ug/L	5.00		98.8 %	80-120			

LCS (BFC0275-BS1)

Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 09:42

Chloromethane	8.89	0.50	ug/L	10.0		88.9 %	60-138			
Vinyl Chloride	9.06	0.20	ug/L	10.0		90.6 %	66-133			
Bromomethane	9.21	1.00	ug/L	10.0		92.1 %	72-131			
Chloroethane	8.39	0.20	ug/L	10.0		83.9 %	60-155			
Trichlorofluoromethane	10.2	0.20	ug/L	10.0		102 %	80-129			
Acrolein	40.6	5.00	ug/L	50.0		81.2 %	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.0	0.20	ug/L	10.0		100 %	76-129			
Acetone	46.3	5.00	ug/L	50.0		92.6 %	58-142			
1,1-Dichloroethene	9.10	0.20	ug/L	10.0		91.0 %	69-135			
Bromoethane	9.41	0.20	ug/L	10.0		94.1 %	78-128			
Iodomethane	9.08	1.00	ug/L	10.0		90.8 %	56-147			
Methylene Chloride	8.29	1.00	ug/L	10.0		82.9 %	65-135			
Acrylonitrile	8.34	1.00	ug/L	10.0		83.4 %	64-134			
Carbon Disulfide	9.02	0.20	ug/L	10.0		90.2 %	78-125			
trans-1,2-Dichloroethene	9.61	0.20	ug/L	10.0		96.1 %	78-128			
Vinyl Acetate	8.92	0.20	ug/L	10.0		89.2 %	55-138			
1,1-Dichloroethane	9.19	0.20	ug/L	10.0		91.9 %	76-124			
2-Butanone	43.4	5.00	ug/L	50.0		86.8 %	61-140			
2,2-Dichloropropane	10.1	0.20	ug/L	10.0		101 %	78-125			
cis-1,2-Dichloroethene	9.10	0.20	ug/L	10.0		91.0 %	80-121			
Chloroform	9.69	0.20	ug/L	10.0		96.9 %	80-122			
Bromochloromethane	9.28	0.20	ug/L	10.0		92.8 %	80-121			



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Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFC0275-BS1)				Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 09:42						
1,1,1-Trichloroethane	10.2	0.20	ug/L	10.0		102 %	79-123			
1,1-Dichloropropene	9.95	0.20	ug/L	10.0		99.5 %	80-120			
Carbon tetrachloride	10.8	0.20	ug/L	10.0		108 %	53-137			
1,2-Dichloroethane	9.62	0.20	ug/L	10.0		96.2 %	75-123			
Benzene	9.55	0.20	ug/L	10.0		95.5 %	80-120			
Trichloroethene	9.96	0.20	ug/L	10.0		99.6 %	80-120			
1,2-Dichloropropane	9.50	0.20	ug/L	10.0		95.0 %	80-120			
Bromodichloromethane	10.0	0.20	ug/L	10.0		100 %	80-121			
Dibromomethane	9.31	0.20	ug/L	10.0		93.1 %	80-120			
2-Chloroethyl vinyl ether	9.28	1.00	ug/L	10.0		92.8 %	74-127			
4-Methyl-2-Pentanone	44.3	5.00	ug/L	50.0		88.7 %	67-133			
cis-1,3-Dichloropropene	9.73	0.20	ug/L	10.0		97.3 %	80-124			
Toluene	10.0	0.20	ug/L	10.0		100 %	80-120			
trans-1,3-Dichloropropene	9.99	0.20	ug/L	10.0		99.9 %	71-127			
2-Hexanone	42.7	5.00	ug/L	50.0		85.3 %	69-133			
1,1,2-Trichloroethane	9.56	0.20	ug/L	10.0		95.6 %	80-121			
1,3-Dichloropropane	9.11	0.20	ug/L	10.0		91.1 %	80-120			
Tetrachloroethene	9.69	0.20	ug/L	10.0		96.9 %	80-120			
Dibromochloromethane	9.62	0.20	ug/L	10.0		96.2 %	65-135			
1,2-Dibromoethane	9.54	0.20	ug/L	10.0		95.4 %	80-121			
Chlorobenzene	9.77	0.20	ug/L	10.0		97.7 %	80-120			
Ethylbenzene	9.62	0.20	ug/L	10.0		96.2 %	80-120			
1,1,1,2-Tetrachloroethane	9.64	0.20	ug/L	10.0		96.4 %	80-120			
m,p-Xylene	19.3	0.40	ug/L	20.0		96.5 %	80-121			
o-Xylene	9.72	0.20	ug/L	10.0		97.2 %	80-121			
Xylenes, total	29.0	0.60	ug/L	30.0		96.7 %	76-127			
Styrene	9.92	0.20	ug/L	10.0		99.2 %	80-124			
Bromoform	10.5	0.20	ug/L	10.0		105 %	51-134			
1,1,2,2-Tetrachloroethane	9.11	0.20	ug/L	10.0		91.1 %	77-123			
1,2,3-Trichloropropane	9.40	0.50	ug/L	10.0		94.0 %	76-125			
trans-1,4-Dichloro 2-Butene	9.47	1.00	ug/L	10.0		94.7 %	55-129			
n-Propylbenzene	10.7	0.20	ug/L	10.0		107 %	78-130			
Bromobenzene	9.83	0.20	ug/L	10.0		98.3 %	80-120			
Isopropyl Benzene	10.4	0.20	ug/L	10.0		104 %	80-128			
2-Chlorotoluene	10.2	0.20	ug/L	10.0		102 %	78-122			



Environmental Partners, Inc.
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Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFC0275-BS1)						Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 09:42				
4-Chlorotoluene	10.3	0.20	ug/L	10.0		103 %	80-121			
t-Butylbenzene	10.6	0.20	ug/L	10.0		106 %	78-125			
1,3,5-Trimethylbenzene	10.4	0.20	ug/L	10.0		104 %	80-129			
1,2,4-Trimethylbenzene	10.4	0.20	ug/L	10.0		104 %	80-127			
s-Butylbenzene	10.9	0.20	ug/L	10.0		109 %	78-129			
4-Isopropyl Toluene	10.9	0.20	ug/L	10.0		109 %	79-130			
1,3-Dichlorobenzene	9.73	0.20	ug/L	10.0		97.3 %	80-120			
1,4-Dichlorobenzene	9.67	0.20	ug/L	10.0		96.7 %	80-120			
n-Butylbenzene	11.3	0.20	ug/L	10.0		113 %	74-129			
1,2-Dichlorobenzene	9.65	0.20	ug/L	10.0		96.5 %	80-120			
1,2-Dibromo-3-chloropropane	10.1	0.50	ug/L	10.0		101 %	62-123			
1,2,4-Trichlorobenzene	11.0	0.50	ug/L	10.0		110 %	64-124			
Hexachloro-1,3-Butadiene	11.9	0.50	ug/L	10.0		119 %	58-123			
Naphthalene	11.6	0.50	ug/L	10.0		116 %	50-134			
1,2,3-Trichlorobenzene	11.4	0.50	ug/L	10.0		114 %	49-133			
Dichlorodifluoromethane	11.0	0.20	ug/L	10.0		110 %	48-147			
Methyl tert-butyl Ether	9.26	0.50	ug/L	10.0		92.6 %	71-132			
2-Pentanone	46.5	5.00	ug/L	50.0		92.9 %	69-134			
<i>Surrogate: Dibromofluoromethane</i>		4.97	ug/L	5.00		99.5 %	80-120			
<i>Surrogate: 1,2-Dichloroethane-d4</i>		4.98	ug/L	5.00		99.6 %	80-129			
<i>Surrogate: Toluene-d8</i>		5.18	ug/L	5.00		104 %	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>		4.95	ug/L	5.00		99.0 %	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>		4.98	ug/L	5.00		99.7 %	80-120			
LCS Dup (BFC0275-BS1)						Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 10:08				
Chloromethane	9.36	0.50	ug/L	10.0		93.6 %	60-138	5.17	30	
Vinyl Chloride	9.47	0.20	ug/L	10.0		94.7 %	66-133	4.48	30	
Bromomethane	9.53	1.00	ug/L	10.0		95.3 %	72-131	3.34	30	
Chloroethane	8.88	0.20	ug/L	10.0		88.8 %	60-155	5.59	30	
Trichlorofluoromethane	10.6	0.20	ug/L	10.0		106 %	80-129	3.79	30	
Acrolein	44.7	5.00	ug/L	50.0		89.3 %	52-144	9.50	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.84	0.20	ug/L	10.0		98.4 %	76-129	1.58	30	
Acetone	45.1	5.00	ug/L	50.0		90.1 %	58-142	2.72	30	
1,1-Dichloroethene	9.51	0.20	ug/L	10.0		95.1 %	69-135	4.33	30	



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Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BFC0275-BSD1)				Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 10:08						
Bromoethane	9.52	0.20	ug/L	10.0		95.2 %	78-128	1.15	30	
Iodomethane	9.59	1.00	ug/L	10.0		95.9 %	56-147	5.45	30	
Methylene Chloride	8.64	1.00	ug/L	10.0		86.4 %	65-135	4.14	30	
Acrylonitrile	9.18	1.00	ug/L	10.0		91.8 %	64-134	9.64	30	
Carbon Disulfide	9.52	0.20	ug/L	10.0		95.2 %	78-125	5.30	30	
trans-1,2-Dichloroethene	10.1	0.20	ug/L	10.0		101 %	78-128	5.19	30	
Vinyl Acetate	9.86	0.20	ug/L	10.0		98.6 %	55-138	10.00	30	
1,1-Dichloroethane	9.74	0.20	ug/L	10.0		97.4 %	76-124	5.88	30	
2-Butanone	49.2	5.00	ug/L	50.0		98.5 %	61-140	12.60	30	
2,2-Dichloropropane	10.9	0.20	ug/L	10.0		109 %	78-125	8.05	30	
cis-1,2-Dichloroethene	9.94	0.20	ug/L	10.0		99.4 %	80-121	8.81	30	
Chloroform	10.4	0.20	ug/L	10.0		104 %	80-122	6.90	30	
Bromochloromethane	10.1	0.20	ug/L	10.0		101 %	80-121	8.04	30	
1,1,1-Trichloroethane	11.0	0.20	ug/L	10.0		110 %	79-123	7.46	30	
1,1-Dichloropropene	10.1	0.20	ug/L	10.0		101 %	80-120	1.50	30	
Carbon tetrachloride	10.6	0.20	ug/L	10.0		106 %	53-137	1.91	30	
1,2-Dichloroethane	10.1	0.20	ug/L	10.0		101 %	75-123	5.29	30	
Benzene	9.73	0.20	ug/L	10.0		97.3 %	80-120	1.90	30	
Trichloroethene	10.4	0.20	ug/L	10.0		104 %	80-120	3.85	30	
1,2-Dichloropropane	9.56	0.20	ug/L	10.0		95.6 %	80-120	0.63	30	
Bromodichloromethane	10.1	0.20	ug/L	10.0		101 %	80-121	0.30	30	
Dibromomethane	9.42	0.20	ug/L	10.0		94.2 %	80-120	1.11	30	
2-Chloroethyl vinyl ether	9.80	1.00	ug/L	10.0		98.0 %	74-127	5.43	30	
4-Methyl-2-Pentanone	48.4	5.00	ug/L	50.0		96.7 %	67-133	8.72	30	
cis-1,3-Dichloropropene	9.73	0.20	ug/L	10.0		97.3 %	80-124	0.06	30	
Toluene	9.94	0.20	ug/L	10.0		99.4 %	80-120	0.89	30	
trans-1,3-Dichloropropene	10.4	0.20	ug/L	10.0		104 %	71-127	3.60	30	
2-Hexanone	48.6	5.00	ug/L	50.0		97.2 %	69-133	13.10	30	
1,1,2-Trichloroethane	9.50	0.20	ug/L	10.0		95.0 %	80-121	0.71	30	
1,3-Dichloropropane	9.65	0.20	ug/L	10.0		96.5 %	80-120	5.77	30	
Tetrachloroethene	9.87	0.20	ug/L	10.0		98.7 %	80-120	1.88	30	
Dibromochloromethane	10.1	0.20	ug/L	10.0		101 %	65-135	4.51	30	
1,2-Dibromoethane	9.99	0.20	ug/L	10.0		99.9 %	80-121	4.54	30	
Chlorobenzene	10.0	0.20	ug/L	10.0		100 %	80-120	2.51	30	
Ethylbenzene	10.1	0.20	ug/L	10.0		101 %	80-120	4.80	30	



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Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 10:08										
LCS Dup (BFC0275-BSD1)										
1,1,1,2-Tetrachloroethane	10.3	0.20	ug/L	10.0		103 %	80-120	6.82	30	
m,p-Xylene	20.0	0.40	ug/L	20.0		99.8 %	80-121	3.38	30	
o-Xylene	9.97	0.20	ug/L	10.0		99.7 %	80-121	2.55	30	
Xylenes, total	29.9	0.60	ug/L	30.0		99.8 %	76-127	3.10	30	
Styrene	10.2	0.20	ug/L	10.0		102 %	80-124	2.94	30	
Bromoform	11.7	0.20	ug/L	10.0		117 %	51-134	10.80	30	
1,1,2,2-Tetrachloroethane	10.2	0.20	ug/L	10.0		102 %	77-123	11.40	30	
1,2,3-Trichloropropane	10.3	0.50	ug/L	10.0		103 %	76-125	9.34	30	
trans-1,4-Dichloro 2-Butene	10.8	1.00	ug/L	10.0		108 %	55-129	13.30	30	
n-Propylbenzene	11.1	0.20	ug/L	10.0		111 %	78-130	3.79	30	
Bromobenzene	10.5	0.20	ug/L	10.0		105 %	80-120	6.45	30	
Isopropyl Benzene	10.9	0.20	ug/L	10.0		109 %	80-128	4.38	30	
2-Chlorotoluene	10.7	0.20	ug/L	10.0		107 %	78-122	4.40	30	
4-Chlorotoluene	10.8	0.20	ug/L	10.0		108 %	80-121	5.02	30	
t-Butylbenzene	11.0	0.20	ug/L	10.0		110 %	78-125	4.08	30	
1,3,5-Trimethylbenzene	11.0	0.20	ug/L	10.0		110 %	80-129	5.47	30	
1,2,4-Trimethylbenzene	11.0	0.20	ug/L	10.0		110 %	80-127	5.00	30	
s-Butylbenzene	11.4	0.20	ug/L	10.0		114 %	78-129	4.65	30	
4-Isopropyl Toluene	11.3	0.20	ug/L	10.0		113 %	79-130	3.01	30	
1,3-Dichlorobenzene	10.3	0.20	ug/L	10.0		103 %	80-120	5.59	30	
1,4-Dichlorobenzene	10.3	0.20	ug/L	10.0		103 %	80-120	6.38	30	
n-Butylbenzene	11.8	0.20	ug/L	10.0		118 %	74-129	4.42	30	
1,2-Dichlorobenzene	10.2	0.20	ug/L	10.0		102 %	80-120	5.56	30	
1,2-Dibromo-3-chloropropane	11.0	0.50	ug/L	10.0		110 %	62-123	8.45	30	
1,2,4-Trichlorobenzene	12.1	0.50	ug/L	10.0		121 %	64-124	9.91	30	
Hexachloro-1,3-Butadiene	12.6	0.50	ug/L	10.0		126 %	58-123	6.15	30	*
Naphthalene	13.1	0.50	ug/L	10.0		131 %	50-134	12.50	30	
1,2,3-Trichlorobenzene	13.1	0.50	ug/L	10.0		131 %	49-133	14.00	30	
Dichlorodifluoromethane	10.7	0.20	ug/L	10.0		107 %	48-147	2.47	30	
Methyl tert-butyl Ether	10.3	0.50	ug/L	10.0		103 %	71-132	10.50	30	
2-Pentanone	50.3	5.00	ug/L	50.0		101 %	69-134	7.90	30	
Surrogate: Dibromofluoromethane		5.13	ug/L	5.00		103 %	80-120			
Surrogate: 1,2-Dichloroethane-d4		5.13	ug/L	5.00		103 %	80-129			
Surrogate: Toluene-d8		5.11	ug/L	5.00		102 %	80-120			



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Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
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Volatile Organic Compounds - Quality Control

Batch BFC0275 - EPA 5030 (Purge and Trap)

Instrument: NT3

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BFC0275-BSD1)				Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 10:08						
Surrogate: 4-Bromofluorobenzene		5.00	ug/L	5.00		99.9 %	80-120			
Surrogate: 1,2-Dichlorobenzene-d4		5.11	ug/L	5.00		102 %	80-120			



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Reported:
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Volatile Organic Compounds - SIM - Quality Control

Batch BFC0362 - EPA 5030 (Purge and Trap)

Instrument: NT2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0362-BLK1)				Prepared: 14-Mar-2017 Analyzed: 14-Mar-2017 10:53						
Vinyl chloride	ND	20.0	ng/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>		455	ng/L	500		91.1 %	80-129			
LCS (BFC0362-BS1)				Prepared: 14-Mar-2017 Analyzed: 14-Mar-2017 09:49						
Vinyl chloride	934		ng/L	1000		93.4 %	76-120			
<i>Surrogate: 1,2-Dichloroethane-d4</i>		508	ng/L	500		102 %	80-129			
LCS Dup (BFC0362-BSD1)				Prepared: 14-Mar-2017 Analyzed: 14-Mar-2017 10:33						
Vinyl chloride	882		ng/L	1000		88.2 %	76-120	5.80	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		497	ng/L	500		99.3 %	80-129			



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Metals and Metallic Compounds - Quality Control

Batch BFC0295 - TWC EPA 3010A

Instrument: ICP2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0295-BLK1)		Prepared: 13-Mar-2017 Analyzed: 15-Mar-2017 13:17								
Calcium	ND	0.0500	mg/L							U
Potassium	ND	0.500	mg/L							U
Sodium	ND	0.500	mg/L							U
Sodium	ND	50.0	mg/L							U
LCS (BFC0295-BS1)		Prepared: 13-Mar-2017 Analyzed: 15-Mar-2017 13:58								
Calcium	9.01	0.0500	mg/L	10.0		90.1 %	80-120			
Potassium	9.33	0.500	mg/L	10.0		93.3 %	80-120			
Sodium	9.43	0.500	mg/L	10.0		94.3 %	80-120			
Sodium	ND	50.0	mg/L	10.0		99.2 %	80-120			U



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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFC0265 - WMN (No Prep)

Instrument: ICP2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0265-BLK1)		Prepared: 10-Mar-2017 Analyzed: 13-Mar-2017 15:19								
Barium	ND	0.0030	mg/L							U
Manganese	ND	0.0010	mg/L							U
LCS (BFC0265-BS1)		Prepared: 10-Mar-2017 Analyzed: 13-Mar-2017 13:43								
Barium	2.11		mg/L	2.00		106 %	80-120			
LCS (BFC0265-BS2)		Prepared: 10-Mar-2017 Analyzed: 15-Mar-2017 12:28								
Manganese	0.493		mg/L	0.500		98.5 %	80-120			



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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFC0376 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0376-BLK1)					Prepared: 15-Mar-2017 Analyzed: 15-Mar-2017 16:59						
Iron	54	ND	20.0	ug/L							U
Iron	57	ND	20.0	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFC0376-BS1)					Prepared: 15-Mar-2017 Analyzed: 15-Mar-2017 17:19						
Iron	54	5070	20.0	ug/L	5000		101 %	80-120			
Iron	57	4990	20.0	ug/L	5000		99.9 %	80-120			
Zinc	66	84.1	4.00	ug/L	80.0		105 %	80-120			
Zinc	67	78.4	4.00	ug/L	80.0		98.0 %	80-120			



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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFC0557 - RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x

Instrument: ICPMS2

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0557-BLK1)					Prepared: 22-Mar-2017 Analyzed: 22-Mar-2017 18:41						
Arsenic	75a	ND	0.0400	ug/L							U
LCS (BFC0557-BS1)					Prepared: 22-Mar-2017 Analyzed: 22-Mar-2017 19:00						
Arsenic	75a	4.84	0.0400	ug/L	5.00		96.9 %	80-120			
Duplicate (BFC0557-DUP1)					Source: 17C0128-02 Prepared: 22-Mar-2017 Analyzed: 22-Mar-2017 18:46						
Arsenic	75a	0.101	0.0400	ug/L		0.0936			7.41	20	
Matrix Spike (BFC0557-MS1)					Source: 17C0128-02 Prepared: 22-Mar-2017 Analyzed: 22-Mar-2017 18:56						
Arsenic	75a	4.43	0.0400	ug/L	5.00	0.0936	86.6 %	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFC0583 - RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x

Instrument: ICPMS2

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0583-BLK1)					Prepared: 23-Mar-2017 Analyzed: 23-Mar-2017 17:48						
Arsenic	75a	ND	0.0400	ug/L							U
LCS (BFC0583-BS1)					Prepared: 23-Mar-2017 Analyzed: 23-Mar-2017 18:09						
Arsenic	75a	4.82	0.0400	ug/L	5.00		96.4 %	80-120			
Duplicate (BFC0583-DUP1)					Source: 17C0128-12 Prepared: 23-Mar-2017 Analyzed: 23-Mar-2017 17:53						
Arsenic	75a	0.104	0.0400	ug/L		0.0978			6.53	20	
Matrix Spike (BFC0583-MS1)					Source: 17C0128-12 Prepared: 23-Mar-2017 Analyzed: 23-Mar-2017 18:03						
Arsenic	75a	4.44	0.0400	ug/L	5.00	0.0978	86.8 %	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Wet Chemistry - Quality Control

Batch BFC0244 - No Prep Wet Chem

Instrument: Accumet AR60

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFC0244-BS1)					Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 14:45					
pH	7.00	0.01	pH Units	7.00		100 %	0-200			
Duplicate (BFC0244-DUP1)					Source: 17C0128-01 Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 14:45					
pH	6.30	0.01	pH Units		6.27			0.48	20	H



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Wet Chemistry - Quality Control

Batch BFC0245 - No Prep Wet Chem

Instrument: Accumet AR60

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0245-BLK1)		Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 11:33								
Alkalinity, Total	ND	1.00	mg/L CaCO3							U
Duplicate (BFC0245-DUP1)		Source: 17C0128-01		Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 11:33						
Alkalinity, Total	44.6	1.00	mg/L CaCO3		44.5			0.22	20	
Reference (BFC0245-SRM1)		SRM: E002024		Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 11:33						
Alkalinity, Total	44.1	1.00	mg/L CaCO3	44.1		100 %	83.68-108			



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Wet Chemistry - Quality Control

Batch BFC0246 - No Prep Wet Chem

Instrument: LCHAT2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0246-BLK1)		Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 13:12								
Nitrate + Nitrite as N	ND	0.010	mg/L							U
Nitrite-N	ND	0.010	mg/L							U
LCS (BFC0246-BS1)		Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 13:14								
Nitrate + Nitrite as N	0.497	0.010	mg/L	0.500		99 %	90-110			
LCS (BFC0246-BS2)		Prepared: 09-Mar-2017 Analyzed: 09-Mar-2017 13:15								
Nitrite-N	0.487	0.010	mg/L	0.500		97.4 %	75-125			



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Wet Chemistry - Quality Control

Batch BFC0263 - No Prep Wet Chem

Instrument: LCHAT2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0263-BLK1)					Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 09:39					
Chloride	ND	1.00	mg/L							U
LCS (BFC0263-BS1)					Prepared: 10-Mar-2017 Analyzed: 10-Mar-2017 09:41					
Chloride	4.88	1.00	mg/L	5.00		97.5 %	90-110			



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Wet Chemistry - Quality Control

Batch BFC0302 - No Prep Wet Chem

Instrument: UV1800-1

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0302-BLK1)		Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 16:10								
COD	ND	10.0	mg/L							U
DL (BFC0302-BLK2)		Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 16:24								
COD	ND	10.0	mg/L							U
LCS (BFC0302-BS1)		Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 16:11								
COD	104	10.0	mg/L	100		104 %	90-110			
DL (BFC0302-BS2)		Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 16:25								
COD	103	10.0	mg/L	100		103 %	90-110			



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Wet Chemistry - Quality Control

Batch BFC0303 - No Prep Wet Chem

Instrument: LCHAT2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0303-BLK1)					Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 11:31					
Ammonia-N	ND	0.040	mg-N/L							U
LCS (BFC0303-BS1)					Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 11:33					
Ammonia-N	0.535	0.040	mg-N/L	0.500		107 %	90-110			



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Wet Chemistry - Quality Control

Batch BFC0323 - No Prep Wet Chem

Instrument: TOC-LCSH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0323-BLK1)		Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 20:13								
Total Organic Carbon	ND	0.50	mg/L							U
LCS (BFC0323-BS1)		Prepared: 13-Mar-2017 Analyzed: 13-Mar-2017 20:51								
Total Organic Carbon	20.0	0.50	mg/L	20.0		100 %	90-110			
Duplicate (BFC0323-DUP1)		Source: 17C0128-01		Prepared: 13-Mar-2017 Analyzed: 14-Mar-2017 01:49						
Total Organic Carbon	ND	0.50	mg/L		ND					U
Matrix Spike (BFC0323-MS1)		Source: 17C0128-01		Prepared: 13-Mar-2017 Analyzed: 14-Mar-2017 02:14						
Total Organic Carbon	15.9	0.50	mg/L	20.0	ND	78.2 %	75-125			

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Wet Chemistry - Quality Control

Batch BFC0567 - No Prep Wet Chem

Instrument: LCHAT2

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0567-BLK1)					Prepared: 22-Mar-2017 Analyzed: 22-Mar-2017 15:04					
Sulfate	ND	2.00	mg/L							U
LCS (BFC0567-BS1)					Prepared: 22-Mar-2017 Analyzed: 22-Mar-2017 15:03					
Sulfate	15.7	2.00	mg/L	15.0		105 %	90-110			



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Microbiology - Quality Control

Batch BFC0240 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0240-BLK1)						Prepared: 09-Mar-2017 Analyzed: 10-Mar-2017 11:34				
Fecal Coliforms	ND		1 CFU/100 ml							U



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Microbiology - Quality Control

Batch BFC0241 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFC0241-BLK1)						Prepared: 09-Mar-2017 Analyzed: 10-Mar-2017 11:01				
Total Coliforms	ND		1 CFU/100 ml							U



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Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
Nitrite-N	WADOE,NELAP,DoD-ELAP
EPA 375.2 in Water	
Sulfate	WADOE,NELAP
EPA 410.4 in Water	
COD	DoD-ELAP,NELAP,WADOE
EPA 6010C in Water	
Calcium	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Sodium	WADOE,NELAP,DoD-ELAP
Sodium-1	DoD-ELAP
Barium	WADOE,NELAP
Manganese	WADOE,NELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE



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Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260C-SIM in Water

Acrylonitrile	NELAP,CALAP,WADOE
Vinyl chloride	NELAP,CALAP,WADOE
1,1-Dichloroethene	NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	NELAP,CALAP,WADOE
Trichloroethene	NELAP,CALAP,WADOE
Tetrachloroethene	NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,CALAP,WADOE
1,2-Dichloroethane	NELAP,CALAP,WADOE
Benzene	NELAP,CALAP,WADOE

EPA 9060A in Water



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Project: Olalla Landfill
Project Number: 450405.0
Project Manager: Doug Kunkel

Reported:
27-Mar-2017 09:19

Total Organic Carbon	DoD-ELAP,WADOE,NELAP
SM 2320 B-97 in Water	
Alkalinity, Bicarbonate	NELAP,WADOE,WA-DW,DoD-ELAP
Alkalinity, Carbonate	WADOE,WA-DW,DoD-ELAP,NELAP
Alkalinity, Hydroxide	WADOE,WA-DW,DoD-ELAP,NELAP
Alkalinity, Total	DoD-ELAP,WADOE,WA-DW,NELAP
SM 4500-H+ B-00 in Water	
pH	WADOE,NELAP
SM 4500-NH3 H-97 in Water	
Ammonia-N	WADOE,DoD-ELAP,NELAP
SM 9222B in Water	
Total Coliforms	WADOE
SM 9222D in Water	
Fecal Coliforms	WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/06/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	03/30/2017
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2017
WADOE	WA Dept of Ecology	C558	06/30/2017
WA-DW	Ecology - Drinking Water	C558	06/30/2017



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Reported:
27-Mar-2017 09:19

Notes and Definitions

- * Flagged value is not within established control limits.
- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- E The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
- H Hold time violation - Hold time was exceeded.
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the applicable reporting or detection limit.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

Attachment 1B
June 2017 Analytical Data Sheets



11 July 2017

Doug Kunkel
Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

RE: Olalla Landfill

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
17F0344

Associated SDG ID(s)
N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number: 17F0344	Turn-around Requested: Standard	Page: 1 of 1
ABI Client Company: Environmental Partners, Inc.	Phone: 425-395-006	Date: 6/21/17
Client Contact: Doug Kunkel	No. of Coolers:	Ice Present? No
Client Project Name: Olalla Land fill	Cooler Temps:	

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments	
					Volatiles and VC by EPA	Dissolved Metals	Total Metals	Asbestos PCBs Chl, Sol Num	pH	Cod TOC	Total Col-form	Ammonia		Alk. Carb, bicarb
OL-MW1-6/17	6/20/17	0913	water	11	X	X	X	X	X	X	X	X	X	Dissolved metals
OL-MW3-6/17	6/20/17	1044	"	11	X	X	X	X	X	X	X	X	X	field filtered
OL-MW10-6/17	6/20/17	11:50	"	11	X	X	X	X	X	X	X	X	X	
OL-MW6-6/17	6/20/17	13:31	"	11	X	X	X	X	X	X	X	X	X	
OL-MW8-6/17	6/20/17	14:33	"	4	X	X	X	X	X	X	X	X	X	
OL-MW17-6/17	6/20/17	-	"	11	X	X	X	X	X	X	X	X	X	
Trip blank	6/20/17	-	"	2	X									-Volatiles only for T.B.
Comments/Special Instructions					Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>Shelly L Fishel</i>			Relinquished by: (Signature)			Received by: (Signature)		
					Printed Name: Eric Caddoy	Printed Name: Shelly L Fishel			Printed Name:			Printed Name:		
					Company: EPT	Company: ARI			Company:			Company:		
					Date & Time: 6/21/17 08:35	Date & Time: 6/21/17 0835			Date & Time:			Date & Time:		

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Environmental Partners Inc Project Name: Ojalla Landfill
 COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
 Assigned ARI Job No: 17F0344 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
 Were custody papers included with the cooler? YES NO
 Were custody papers properly filled out (ink, signed, etc.) YES NO
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.9 6.0
 Time: 0835
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D005200
 Cooler Accepted by: Shelby Kone Date: 06/21/17 Time: 0835

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
 Was sufficient ice used (if appropriate)? NA YES NO
 Were all bottles sealed in individual plastic bags? YES NO
 Did all bottles arrive in good condition (unbroken)? YES NO
 Were all bottle labels complete and legible? YES NO
 Did the number of containers listed on COC match with the number of containers received? YES NO
 Did all bottle labels and tags agree with custody papers? YES NO
 Were all bottles used correct for the requested analyses? YES NO
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
 Were all VOC vials free of air bubbles? NA YES NO
 Was sufficient amount of sample sent in each bottle? YES NO
 Date VOC Trip Blank was made at ARI..... NA 6/15/17
 Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: B.H Date: 6/21/17 Time: 13:05

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:
Both trip blanks had lg bubbles. OL-MW3-6/17, OL-MW10-6/17, and OL-MW6-6/17 had one vial with peabubbles.

By: B.H Date: 6/21/17

			Small → "sm" (<2 mm)
			Peabubbles → "pb" (2 to <4 mm)
			Large → "lg" (4 to <6 mm)
			Headspace → "hs" (>6 mm)



WORK ORDER

17F0344

Client: Environmental Partners, Inc. Project Manager: Mark Harris
Project: Olalla Landfill Project Number: 45405.0

Preservation Confirmation

Container ID	Container Type	pH
17F0344-01 A	VOA Vial, Clear, 40 mL, HCL	
17F0344-01 B	VOA Vial, Clear, 40 mL, HCL	
17F0344-01 C	VOA Vial, Clear, 40 mL, HCL	
17F0344-01 D	Corning Plastic, 125 mL, Na2S2O3	
17F0344-01 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2 P
17F0344-01 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2 P
17F0344-01 G	Small OJ, 500 mL	
17F0344-01 H	Small OJ, 500 mL	
17F0344-01 I	Small OJ, 500 mL, 9N H2SO4	L2 P
17F0344-01 J	HDPE NM, 500 mL, 1:1 HNO3	L2 P
17F0344-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 P
17F0344-03 A	VOA Vial, Clear, 40 mL, HCL	
17F0344-03 B	VOA Vial, Clear, 40 mL, HCL	
17F0344-03 C	VOA Vial, Clear, 40 mL, HCL	
17F0344-03 D	Corning Plastic, 125 mL, Na2S2O3	
17F0344-03 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2 P
17F0344-03 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2 P
17F0344-03 G	Small OJ, 500 mL	
17F0344-03 H	Small OJ, 500 mL	
17F0344-03 I	Small OJ, 500 mL, 9N H2SO4	L2 P
17F0344-03 J	HDPE NM, 500 mL, 1:1 HNO3	L2 P
17F0344-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 P
17F0344-05 A	VOA Vial, Clear, 40 mL, HCL	
17F0344-05 B	VOA Vial, Clear, 40 mL, HCL	
17F0344-05 C	VOA Vial, Clear, 40 mL, HCL	
17F0344-05 D	Corning Plastic, 125 mL, Na2S2O3	
17F0344-05 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2 P
17F0344-05 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2 P
17F0344-05 G	Small OJ, 500 mL	
17F0344-05 H	Small OJ, 500 mL	
17F0344-05 I	Small OJ, 500 mL, 9N H2SO4	L2 P

B.H.

6/21/17

P=Pass



WORK ORDER

17F0344

Client: Environmental Partners, Inc.		Project Manager: Mark Harris	
Project: Olalla Landfill		Project Number: 45405.0	
17F0344-05 J	HDPE NM, 500 mL, 1:1 HNO3	L2	P
17F0344-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
17F0344-07 A	VOA Vial, Clear, 40 mL, HCL		
17F0344-07 B	VOA Vial, Clear, 40 mL, HCL		
17F0344-07 C	VOA Vial, Clear, 40 mL, HCL		
17F0344-07 D	Corning Plastic, 125 mL, Na2S2O3		
17F0344-07 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2	P
17F0344-07 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2	P
17F0344-07 G	Small OJ, 500 mL		
17F0344-07 H	Small OJ, 500 mL		
17F0344-07 I	Small OJ, 500 mL, 9N H2SO4	L2	P
17F0344-07 J	HDPE NM, 500 mL, 1:1 HNO3	L2	P
17F0344-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
17F0344-09 A	VOA Vial, Clear, 40 mL, HCL		
17F0344-09 B	VOA Vial, Clear, 40 mL, HCL		
17F0344-09 C	VOA Vial, Clear, 40 mL, HCL		
17F0344-09 D	Corning Plastic, 125 mL, Na2S2O3		
17F0344-09 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2	P
17F0344-09 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2	P
17F0344-09 G	Small OJ, 500 mL		
17F0344-09 H	Small OJ, 500 mL		
17F0344-09 I	Small OJ, 500 mL, 9N H2SO4	L2	P
17F0344-09 J	HDPE NM, 500 mL, 1:1 HNO3	L2	P
17F0344-10 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
17F0344-11 A	VOA Vial, Clear, 40 mL, HCL		
17F0344-11 B	VOA Vial, Clear, 40 mL, HCL		
17F0344-11 C	VOA Vial, Clear, 40 mL, HCL		
17F0344-11 D	Corning Plastic, 125 mL, Na2S2O3		
17F0344-11 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2	P
17F0344-11 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2	P
17F0344-11 G	Small OJ, 500 mL		
17F0344-11 H	Small OJ, 500 mL		
17F0344-11 I	Small OJ, 500 mL, 9N H2SO4	L2	P
17F0344-11 J	HDPE NM, 500 mL, 1:1 HNO3	L2	P

B.A.
Reviewed By

6/21/17
Date



WORK ORDER

17F0344

Client: Environmental Partners, Inc.		Project Manager: Mark Harris
Project: Olalla Landfill		Project Number: 45405.0
17F0344-12 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	2 Pass
17F0344-13 A	VOA Vial, Clear, 40 mL, HCL	
17F0344-13 B	VOA Vial, Clear, 40 mL, HCL	

B.H.
Preservation Confirmed By

6/21/17
Date

B.H.
Reviewed By

6/21/17
Date



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OL-MW1-6/17	17F0344-01	Water	20-Jun-2017 09:13	21-Jun-2017 08:35
OL-MW1-6/17	17F0344-02	Water	20-Jun-2017 09:13	21-Jun-2017 08:35
OL-MW3-6/17	17F0344-03	Water	20-Jun-2017 10:44	21-Jun-2017 08:35
OL-MW3-6/17	17F0344-04	Water	20-Jun-2017 10:44	21-Jun-2017 08:35
OL-MW10-6/17	17F0344-05	Water	20-Jun-2017 11:50	21-Jun-2017 08:35
OL-MW10-6/17	17F0344-06	Water	20-Jun-2017 11:50	21-Jun-2017 08:35
OL-MW6-6/17	17F0344-07	Water	20-Jun-2017 13:31	21-Jun-2017 08:35
OL-MW6-6/17	17F0344-08	Water	20-Jun-2017 13:31	21-Jun-2017 08:35
OL-MW8-6/17	17F0344-09	Water	20-Jun-2017 14:33	21-Jun-2017 08:35
OL-MW8-6/17	17F0344-10	Water	20-Jun-2017 14:33	21-Jun-2017 08:35
OL-M17-6/17	17F0344-11	Water	20-Jun-2017 00:00	21-Jun-2017 08:35
OL-M17-6/17	17F0344-12	Water	20-Jun-2017 00:00	21-Jun-2017 08:35
Trip Blank	17F0344-13	Water	20-Jun-2017 00:00	21-Jun-2017 08:35



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Project: Olalla Landfill
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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Case Narrative

CASE NARRATIVE

Client: Environmental Partners, Inc.
Project: Olalla Landfill
Workorder: 17F0344

Sample receipt

Samples as listed on the preceding page were received 21-Jun-2017 08:35 under ARI workorder 17F0344. For details regarding sample receipt, please refer to the Cooler Receipt Form.

All sample analyses met the required quality parameters of the methods, the ARI Quality Assurance Program and any project-specific QAPP, with outliers or exceptions flagged on reports and noted below. These parameters include preparation and analysis within recommended holding times, initial and continuing calibrations, surrogate and spike percent recoveries, and method and/or instrument blanks.

Volatiles - EPA Method SW8260C

The calibration SFF0205-SCV1 had responses outside the 20% window, with 2-Chloroethyl vinyl ether and acrolein low of control limits, and chloromethane, t-butylbenzene and vinyl chloride high of control limits. The calibration SFF0318-ICV1 has response of 1,2-dibromo-3-chloropropate low of limits. Associated positive results have been "Q"-flagged.

Volatiles - EPA Method 8260C-SIM (Selected Ion Monitoring)

The vinyl chloride result for sample OL-MW8-6/17 has been "M" flagged, denoting an estimated value for a GC/MS analyte detected and confirmed by the analyst, but with low spectra match parameters.

Total Metals - EPA Method 6010C

There were no items of note.

Total Metals - EPA Method 6010C(dissolved)

There were no items of note.

Wet Chemistry

Samples were received outside the recommended holding time of 15 minutes for pH and 8 hours for coliforms. Results have been "H" flagged, noting the variance.



Conventional Laboratory Analyst Notes

ARI Job No.: 17F0344

Client ID: _____

Parameter: _____

Client Project: _____

List problems, concerns, corrective actions and any other pertinent information

Sample 01 preserved and samples 02, 03, and 04 were split and preserved to 42 ppt w/ 2 ml 9N H₂SO₄ (D004286)

Analyst Initials: RLM

Date: 6/21/17



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW1-6/17
17F0344-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 09:13

Instrument: NT3

Analyzed: 22-Jun-2017 13:29

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFF0610 Sample Size: 10 mL
Prepared: 22-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW1-6/17
17F0344-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 09:13

Instrument: NT3

Analyzed: 22-Jun-2017 13:29

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	0.29	ug/L	
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW1-6/17
17F0344-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 09:13

Instrument: NT3

Analyzed: 22-Jun-2017 13:29

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	106	%	
Surrogate: Toluene-d8		80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	93.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM

Sampled: 06/20/2017 09:13

Instrument: NT15

Analyzed: 23-Jun-2017 11:28

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Preparation Batch: BFF0669

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>94.1</i>	<i>%</i>	



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 06/20/2017 09:13

Instrument: ICP2

Analyzed: 30-Jun-2017 14:58

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0699

Sample Size: 50 mL

Prepared: 26-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	10.2	mg/L	
Potassium	7440-09-7	1	0.500	0.590	mg/L	
Sodium	7440-23-5	1	0.500	4.60	mg/L	



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 06/20/2017 09:13

Instrument: LCHAT1

Analyzed: 23-Jun-2017 12:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0666

Prepared: 23-Jun-2017

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	3.82	mg/L	



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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: EPA 353.2 Sampled: 06/20/2017 09:13
Instrument: [CALC] Analyzed: 26-Jun-2017 17:20

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Jun-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.67	mg/L	

Instrument: LACHAT2 Analyzed: 21-Jun-2017 15:13

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0595 Sample Size: 10 mL
Prepared: 21-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0657 Sample Size: 10 mL
Prepared: 26-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.670	mg-N/L	



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/20/2017 09:13

Instrument: LCHAT1

Analyzed: 23-Jun-2017 16:24

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0682

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	3.27	mg/L	



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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: EPA 410.4 Sampled: 06/20/2017 09:13
Instrument: UV1800-1 Analyzed: 24-Jun-2017 16:52

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0690 Sample Size: 2 mL
Prepared: 24-Jun-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: EPA 9060A Sampled: 06/20/2017 09:13
Instrument: TOC-LCSH Analyzed: 25-Jun-2017 00:26

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0695 Sample Size: 20 mL
Prepared: 24-Jun-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	ND	mg/L	U



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 06/20/2017 09:13

Instrument: Accumet AR60

Analyzed: 27-Jun-2017 10:32

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0759

Sample Size: 100 mL

Prepared: 27-Jun-2017

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	48.8	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	48.8	mg/L CaCO3	



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 06/20/2017 09:13
Analyzed: 21-Jun-2017 14:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0594 Sample Size: 50 mL
Prepared: 21-Jun-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.26	pH Units	H



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97

Sampled: 06/20/2017 09:13

Instrument: LCHAT2

Analyzed: 29-Jun-2017 12:04

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0765

Sample Size: 10 mL

Prepared: 27-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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Reported:
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OL-MW1-6/17
17F0344-01 (Water)

Microbiology

Method: SM 9222B

Sampled: 06/20/2017 09:13

Instrument: N/A

Analyzed: 22-Jun-2017 15:52

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0596

Prepared: 21-Jun-2017

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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OL-MW1-6/17
17F0344-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 06/20/2017 09:13
Instrument: ICPMS2 Analyzed: 05-Jul-2017 13:42

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFF0744 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Reported:
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OL-MW1-6/17
17F0344-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 09:13

Instrument: ICPMS2

Analyzed: 28-Jun-2017 17:40

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFF0739 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.112	ug/L	



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OL-MW1-6/17
17F0344-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/20/2017 09:13

Instrument: ICP2

Analyzed: 06-Jul-2017 14:03

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BFF0742

Sample Size: 50 mL

Prepared: 27-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0044	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Reported:
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OL-MW1-6/17
17F0344-02RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 09:13

Instrument: ICPMS2

Analyzed: 07-Jul-2017 13:11

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFG0101 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 10:44

Instrument: NT3

Analyzed: 22-Jun-2017 13:54

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFF0610 Sample Size: 10 mL
Prepared: 22-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
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OL-MW3-6/17
17F0344-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 10:44

Instrument: NT3

Analyzed: 22-Jun-2017 13:54

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	0.26	ug/L	
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 10:44

Instrument: NT3

Analyzed: 22-Jun-2017 13:54

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	103	%	
Surrogate: Toluene-d8		80-120 %	99.2	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.8	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM

Sampled: 06/20/2017 10:44

Instrument: NT15

Analyzed: 23-Jun-2017 11:50

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Preparation Batch: BFF0669

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>96.7</i>	<i>%</i>	



Environmental Partners, Inc.
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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 06/20/2017 10:44

Instrument: ICP2

Analyzed: 30-Jun-2017 15:02

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0699

Sample Size: 50 mL

Prepared: 26-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	21.7	mg/L	
Potassium	7440-09-7	1	0.500	0.550	mg/L	
Sodium	7440-23-5	1	0.500	6.48	mg/L	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 06/20/2017 10:44

Instrument: LCHAT1

Analyzed: 23-Jun-2017 12:25

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0666

Prepared: 23-Jun-2017

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	3.51	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: EPA 353.2 Sampled: 06/20/2017 10:44
Instrument: [CALC] Analyzed: 26-Jun-2017 17:21

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Jun-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.0359	mg/L	

Instrument: LACHAT2 Analyzed: 21-Jun-2017 15:17

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0595 Sample Size: 10 mL
Prepared: 21-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0657 Sample Size: 10 mL
Prepared: 26-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.036	mg-N/L	



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/20/2017 10:44

Instrument: LACHAT1

Analyzed: 23-Jun-2017 16:28

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0682

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	12.6	mg/L	



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: EPA 410.4

Sampled: 06/20/2017 10:44

Instrument: UV1800-1

Analyzed: 24-Jun-2017 16:54

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0690

Sample Size: 2 mL

Prepared: 24-Jun-2017

Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 06/20/2017 10:44

Instrument: TOC-LCSH

Analyzed: 25-Jun-2017 01:30

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0695

Sample Size: 20 mL

Prepared: 24-Jun-2017

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	1.79	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 06/20/2017 10:44
Instrument: Accumet AR60 Analyzed: 27-Jun-2017 10:32

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0759 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	105	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	105	mg/L CaCO3	



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OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00 Sampled: 06/20/2017 10:44
Instrument: Accumet AR60 Analyzed: 21-Jun-2017 14:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0594 Sample Size: 50 mL
Prepared: 21-Jun-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.05	pH Units	H



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Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-03 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 06/20/2017 10:44
Analyzed: 29-Jun-2017 12:05

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0765 Sample Size: 10 mL
Prepared: 27-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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OL-MW3-6/17
17F0344-03 (Water)

Microbiology

Method: SM 9222B Sampled: 06/20/2017 10:44
Instrument: N/A Analyzed: 22-Jun-2017 15:52

Sample Preparation: Preparation Method: No Prep Wet Chem
 Preparation Batch: BFF0596 Sample Size: 100 mL
 Prepared: 21-Jun-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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OL-MW3-6/17
17F0344-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/20/2017 10:44

Instrument: ICPMS2

Analyzed: 05-Jul-2017 16:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFF0744 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 10:44

Instrument: ICPMS2

Analyzed: 28-Jun-2017 17:12

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFF0739 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.113	ug/L	



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/20/2017 10:44

Instrument: ICP2

Analyzed: 06-Jul-2017 12:52

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BFF0742

Sample Size: 50 mL

Prepared: 27-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0107	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	4.32	mg/L	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW3-6/17
17F0344-04RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 10:44

Instrument: ICPMS2

Analyzed: 07-Jul-2017 12:51

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFG0101 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 11:50

Instrument: NT3

Analyzed: 22-Jun-2017 14:20

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFF0610 Sample Size: 10 mL
Prepared: 22-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 11:50

Instrument: NT3

Analyzed: 22-Jun-2017 14:20

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	0.22	ug/L	
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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OL-MW10-6/17
17F0344-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 11:50

Instrument: NT3

Analyzed: 22-Jun-2017 14:20

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	104	%	
Surrogate: Toluene-d8		80-120 %	102	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.2	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	100	%	



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OL-MW10-6/17
17F0344-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM

Sampled: 06/20/2017 11:50

Instrument: NT15

Analyzed: 23-Jun-2017 12:12

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Preparation Batch: BFF0669

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>98.3</i>	<i>%</i>	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 06/20/2017 11:50

Instrument: ICP2

Analyzed: 30-Jun-2017 15:06

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0699

Sample Size: 50 mL

Prepared: 26-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	44.3	mg/L	
Potassium	7440-09-7	1	0.500	1.20	mg/L	
Sodium	7440-23-5	1	0.500	10.3	mg/L	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 06/20/2017 11:50

Instrument: LCHAT1

Analyzed: 23-Jun-2017 12:26

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0666

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	7.97	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: EPA 353.2 Sampled: 06/20/2017 11:50
Instrument: [CALC] Analyzed: 26-Jun-2017 17:23

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Jun-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.136	mg/L	

Instrument: LACHAT2 Analyzed: 21-Jun-2017 15:18

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0595 Sample Size: 10 mL
Prepared: 21-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0657 Sample Size: 10 mL
Prepared: 26-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.136	mg-N/L	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/20/2017 11:50

Instrument: LACHAT1

Analyzed: 23-Jun-2017 16:29

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0682

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	17.3	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: EPA 410.4 Sampled: 06/20/2017 11:50
Instrument: UV1800-1 Analyzed: 24-Jun-2017 16:54

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0690 Sample Size: 2 mL
Prepared: 24-Jun-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	13.4	mg/L	



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 06/20/2017 11:50

Instrument: TOC-LCSH

Analyzed: 25-Jun-2017 01:52

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0695

Sample Size: 20 mL

Prepared: 24-Jun-2017

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	3.34	mg/L	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 06/20/2017 11:50

Instrument: Accumet AR60

Analyzed: 27-Jun-2017 14:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0759
Prepared: 27-Jun-2017

Sample Size: 100 mL
Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	225	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	225	mg/L CaCO3	



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Reported:
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OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 06/20/2017 11:50
Analyzed: 21-Jun-2017 14:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0594 Sample Size: 50 mL
Prepared: 21-Jun-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.37	pH Units	H



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OL-MW10-6/17
17F0344-05 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97 Sampled: 06/20/2017 11:50
Instrument: LCHAT2 Analyzed: 29-Jun-2017 12:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0765 Sample Size: 10 mL
Prepared: 27-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.087	mg-N/L	



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OL-MW10-6/17
17F0344-05 (Water)

Microbiology

Method: SM 9222B Sampled: 06/20/2017 11:50
Instrument: N/A Analyzed: 22-Jun-2017 15:52

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0596 Sample Size: 100 mL
Prepared: 21-Jun-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/20/2017 11:50

Instrument: ICPMS2

Analyzed: 05-Jul-2017 13:47

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFF0744 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 11:50

Instrument: ICPMS2

Analyzed: 28-Jun-2017 17:17

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFF0739 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.55	ug/L	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/20/2017 11:50

Instrument: ICP2

Analyzed: 06-Jul-2017 16:56

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BFF0742

Sample Size: 50 mL

Prepared: 27-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0181	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	5.66	mg/L	



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Reported:
11-Jul-2017 14:19

OL-MW10-6/17
17F0344-06RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 11:50

Instrument: ICPMS2

Analyzed: 07-Jul-2017 12:56

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFG0101 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW6-6/17
17F0344-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 13:31

Instrument: NT3

Analyzed: 22-Jun-2017 14:45

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFF0610 Sample Size: 10 mL
Prepared: 22-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project Manager: Doug Kunkel

Reported:
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OL-MW6-6/17
17F0344-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 13:31

Instrument: NT3

Analyzed: 22-Jun-2017 14:45

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	2.13	ug/L	
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	0.25	ug/L	
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Olalla Landfill
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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW6-6/17
17F0344-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 13:31

Instrument: NT3

Analyzed: 22-Jun-2017 14:45

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	106	%	
Surrogate: Toluene-d8		80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	96.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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OL-MW6-6/17
17F0344-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM

Sampled: 06/20/2017 13:31

Instrument: NT15

Analyzed: 23-Jun-2017 12:34

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Preparation Batch: BFF0669

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>101</i>	<i>%</i>	



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Reported:
11-Jul-2017 14:19

OL-MW6-6/17
17F0344-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 06/20/2017 13:31

Instrument: ICP2

Analyzed: 30-Jun-2017 15:10

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0699

Sample Size: 50 mL

Prepared: 26-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	34.2	mg/L	
Potassium	7440-09-7	1	0.500	1.23	mg/L	
Sodium	7440-23-5	1	0.500	6.86	mg/L	



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Reported:
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OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 06/20/2017 13:31

Instrument: LCHAT1

Analyzed: 23-Jun-2017 12:28

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0666

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.94	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: EPA 353.2 Sampled: 06/20/2017 13:31
Instrument: [CALC] Analyzed: 26-Jun-2017 17:24

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Jun-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.0321	mg/L	

Instrument: LACHAT2 Analyzed: 21-Jun-2017 15:19

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0595 Sample Size: 10 mL
Prepared: 21-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0657 Sample Size: 10 mL
Prepared: 26-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.032	mg-N/L	



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Reported:
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OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/20/2017 13:31

Instrument: LCHAT1

Analyzed: 23-Jun-2017 16:30

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0682

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	15.1	mg/L	



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Reported:
11-Jul-2017 14:19

OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: EPA 410.4

Sampled: 06/20/2017 13:31

Instrument: UV1800-1

Analyzed: 24-Jun-2017 16:54

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0690

Sample Size: 2 mL

Prepared: 24-Jun-2017

Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
11-Jul-2017 14:19

OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 06/20/2017 13:31

Instrument: TOC-LCSH

Analyzed: 25-Jun-2017 02:18

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0695

Sample Size: 20 mL

Prepared: 24-Jun-2017

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	2.30	mg/L	



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Reported:
11-Jul-2017 14:19

OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 06/20/2017 13:31

Instrument: Accumet AR60

Analyzed: 27-Jun-2017 10:32

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0759

Sample Size: 100 mL

Prepared: 27-Jun-2017

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	171	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	171	mg/L CaCO3	



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OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00 Sampled: 06/20/2017 13:31
Instrument: Accumet AR60 Analyzed: 21-Jun-2017 14:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0594 Sample Size: 50 mL
Prepared: 21-Jun-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.47	pH Units	H



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OL-MW6-6/17
17F0344-07 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97

Sampled: 06/20/2017 13:31

Instrument: LCHAT2

Analyzed: 29-Jun-2017 12:07

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0765

Sample Size: 10 mL

Prepared: 27-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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OL-MW6-6/17
17F0344-07 (Water)

Microbiology

Method: SM 9222B Sampled: 06/20/2017 13:31
Instrument: N/A Analyzed: 22-Jun-2017 15:52

Sample Preparation: Preparation Method: No Prep Wet Chem
 Preparation Batch: BFF0596 Sample Size: 100 mL
 Prepared: 21-Jun-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	11	CFU/100 ml	H



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OL-MW6-6/17
17F0344-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/20/2017 13:31

Instrument: ICPMS2

Analyzed: 05-Jul-2017 13:52

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFF0744 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	965	ug/L	



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Reported:
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OL-MW6-6/17
17F0344-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 13:31

Instrument: ICPMS2

Analyzed: 28-Jun-2017 17:22

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFF0739 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.17	ug/L	



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OL-MW6-6/17
17F0344-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/20/2017 13:31

Instrument: ICP2

Analyzed: 06-Jul-2017 14:12

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BFF0742

Sample Size: 50 mL

Prepared: 27-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0162	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	1.05	mg/L	



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OL-MW6-6/17
17F0344-08RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED Sampled: 06/20/2017 13:31
Instrument: ICPMS2 Analyzed: 07-Jul-2017 13:46

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFG0101 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 14:33

Instrument: NT3

Analyzed: 22-Jun-2017 15:11

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFF0610 Sample Size: 10 mL
Prepared: 22-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.61	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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OL-MW8-6/17
17F0344-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 14:33

Instrument: NT3

Analyzed: 22-Jun-2017 15:11

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	0.43	ug/L	
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 14:33

Instrument: NT3

Analyzed: 22-Jun-2017 15:11

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	107	%	
Surrogate: Toluene-d8		80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	97.3	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



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OL-MW8-6/17
17F0344-09 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM

Sampled: 06/20/2017 14:33

Instrument: NT15

Analyzed: 23-Jun-2017 12:57

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Preparation Batch: BFF0669

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	59.5	ng/L	M
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>98.1</i>	<i>%</i>	



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 06/20/2017 14:33

Instrument: ICP2

Analyzed: 30-Jun-2017 15:15

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0699

Sample Size: 50 mL

Prepared: 26-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	31.5	mg/L	
Potassium	7440-09-7	1	0.500	1.03	mg/L	
Sodium	7440-23-5	1	0.500	7.81	mg/L	



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 06/20/2017 14:33

Instrument: LCHAT1

Analyzed: 23-Jun-2017 12:29

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0666

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	3.23	mg/L	



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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: EPA 353.2 Sampled: 06/20/2017 14:33
Instrument: [CALC] Analyzed: 26-Jun-2017 17:25

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Jun-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.142	mg/L	

Instrument: LACHAT2 Analyzed: 21-Jun-2017 15:20

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0595 Sample Size: 10 mL
Prepared: 21-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0657 Sample Size: 10 mL
Prepared: 26-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.142	mg-N/L	



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/20/2017 14:33

Instrument: LCHAT1

Analyzed: 23-Jun-2017 16:31

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0682

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	5.30	mg/L	



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: EPA 410.4

Sampled: 06/20/2017 14:33

Instrument: UV1800-1

Analyzed: 24-Jun-2017 16:55

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0690

Sample Size: 2 mL

Prepared: 24-Jun-2017

Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 06/20/2017 14:33

Instrument: TOC-LCSH

Analyzed: 25-Jun-2017 02:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0695

Sample Size: 20 mL

Prepared: 24-Jun-2017

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	1.37	mg/L	



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 06/20/2017 14:33

Instrument: Accumet AR60

Analyzed: 27-Jun-2017 10:32

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0759
Prepared: 27-Jun-2017

Sample Size: 100 mL
Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	157	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	157	mg/L CaCO3	



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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 06/20/2017 14:33
Analyzed: 21-Jun-2017 14:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0594 Sample Size: 50 mL
Prepared: 21-Jun-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.50	pH Units	H



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Reported:
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OL-MW8-6/17
17F0344-09 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97

Sampled: 06/20/2017 14:33

Instrument: LCHAT2

Analyzed: 29-Jun-2017 12:09

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0765

Sample Size: 10 mL

Prepared: 27-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.042	mg-N/L	



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OL-MW8-6/17
17F0344-09 (Water)

Microbiology

Method: SM 9222B Sampled: 06/20/2017 14:33
Instrument: N/A Analyzed: 22-Jun-2017 15:52

Sample Preparation: Preparation Method: No Prep Wet Chem
 Preparation Batch: BFF0596 Sample Size: 100 mL
 Prepared: 21-Jun-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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OL-MW8-6/17
17F0344-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8

Sampled: 06/20/2017 14:33

Instrument: ICPMS2

Analyzed: 05-Jul-2017 15:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFF0744 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	1480	ug/L	



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Project Manager: Doug Kunkel

Reported:
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OL-MW8-6/17
17F0344-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 14:33

Instrument: ICPMS2

Analyzed: 28-Jun-2017 17:26

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFF0739 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	2.66	ug/L	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW8-6/17
17F0344-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/20/2017 14:33

Instrument: ICP2

Analyzed: 06-Jul-2017 14:16

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BFF0742

Sample Size: 50 mL

Prepared: 27-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0107	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	3.70	mg/L	



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

OL-MW8-6/17
17F0344-10RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 14:33

Instrument: ICPMS2

Analyzed: 07-Jul-2017 13:51

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFG0101 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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OL-M17-6/17
17F0344-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 00:00

Instrument: NT3

Analyzed: 22-Jun-2017 15:37

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFF0610 Sample Size: 10 mL
Prepared: 22-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project Manager: Doug Kunkel

Reported:
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OL-M17-6/17
17F0344-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 00:00

Instrument: NT3

Analyzed: 22-Jun-2017 15:37

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	2.20	ug/L	
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	0.22	ug/L	
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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OL-M17-6/17
17F0344-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 00:00

Instrument: NT3

Analyzed: 22-Jun-2017 15:37

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	103	%	
Surrogate: Toluene-d8		80-120 %	101	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	96.2	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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OL-M17-6/17
17F0344-11 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM

Sampled: 06/20/2017 00:00

Instrument: NT15

Analyzed: 23-Jun-2017 13:19

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Preparation Batch: BFF0669

Sample Size: 10 mL

Prepared: 23-Jun-2017

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>102</i>	<i>%</i>	



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Reported:
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OL-M17-6/17
17F0344-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 06/20/2017 00:00

Instrument: ICP2

Analyzed: 30-Jun-2017 15:19

Sample Preparation:

Preparation Method: TWC EPA 3010A

Preparation Batch: BFF0699

Sample Size: 50 mL

Prepared: 26-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	34.3	mg/L	
Potassium	7440-09-7	1	0.500	1.21	mg/L	
Sodium	7440-23-5	1	0.500	6.91	mg/L	



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Reported:
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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 06/20/2017 00:00

Instrument: LCHAT1

Analyzed: 23-Jun-2017 12:30

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0666

Prepared: 23-Jun-2017

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.91	mg/L	



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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: EPA 353.2 Sampled: 06/20/2017 00:00
Instrument: [CALC] Analyzed: 26-Jun-2017 17:26

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 26-Jun-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.0333	mg/L	

Instrument: LACHAT2 Analyzed: 21-Jun-2017 15:28

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0595 Sample Size: 10 mL
Prepared: 21-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0657 Sample Size: 10 mL
Prepared: 26-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.033	mg-N/L	



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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: EPA 375.2 Sampled: 06/20/2017 00:00
Instrument: LCHAT1 Analyzed: 23-Jun-2017 16:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0682 Sample Size: 10 mL
Prepared: 23-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	15.1	mg/L	



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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: EPA 410.4 Sampled: 06/20/2017 00:00
Instrument: UV1800-1 Analyzed: 24-Jun-2017 16:55

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0690 Sample Size: 2 mL
Prepared: 24-Jun-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 06/20/2017 00:00

Instrument: TOC-LCSH

Analyzed: 25-Jun-2017 02:58

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0695

Sample Size: 20 mL

Prepared: 24-Jun-2017

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	2.19	mg/L	



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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: SM 2320 B-97 Sampled: 06/20/2017 00:00
Instrument: Accumet AR60 Analyzed: 27-Jun-2017 14:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0759 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	174	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	174	mg/L CaCO3	



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Reported:
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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 06/20/2017 00:00
Analyzed: 21-Jun-2017 14:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFF0594 Sample Size: 50 mL
Prepared: 21-Jun-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.52	pH Units	H



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OL-M17-6/17
17F0344-11 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97 Sampled: 06/20/2017 00:00
Instrument: LCHAT2 Analyzed: 29-Jun-2017 12:10

Sample Preparation: Preparation Method: No Prep Wet Chem
 Preparation Batch: BFF0765 Sample Size: 10 mL
 Prepared: 27-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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OL-M17-6/17
17F0344-11 (Water)

Microbiology

Method: SM 9222B

Sampled: 06/20/2017 00:00

Instrument: N/A

Analyzed: 22-Jun-2017 15:52

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BFF0596

Prepared: 21-Jun-2017

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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OL-M17-6/17
17F0344-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 06/20/2017 00:00
Instrument: ICPMS2 Analyzed: 05-Jul-2017 15:43

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFF0744 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	944	ug/L	



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Reported:
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OL-M17-6/17
17F0344-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 00:00

Instrument: ICPMS2

Analyzed: 28-Jun-2017 17:31

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFF0739 Sample Size: 100 mL
Prepared: 27-Jun-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.17	ug/L	



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Reported:
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OL-M17-6/17
17F0344-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/20/2017 00:00

Instrument: ICP2

Analyzed: 06-Jul-2017 14:20

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BFF0742

Sample Size: 50 mL

Prepared: 27-Jun-2017

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0147	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	1.02	mg/L	



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Reported:
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OL-M17-6/17
17F0344-12RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/20/2017 00:00

Instrument: ICPMS2

Analyzed: 07-Jul-2017 13:55

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFG0101 Sample Size: 25 mL
Prepared: 27-Jun-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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Trip Blank
17F0344-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 00:00

Instrument: NT3

Analyzed: 22-Jun-2017 13:03

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFF0610 Sample Size: 10 mL
Prepared: 22-Jun-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Trip Blank
17F0344-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 00:00

Instrument: NT3

Analyzed: 22-Jun-2017 13:03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	0.68	ug/L	
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
11-Jul-2017 14:19

Trip Blank
17F0344-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/20/2017 00:00

Instrument: NT3

Analyzed: 22-Jun-2017 13:03

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	105	%	
Surrogate: Toluene-d8		80-120 %	99.8	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.9	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Reported:
11-Jul-2017 14:19

Volatile Organic Compounds - Quality Control

Batch BFF0610 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0610-BLK1)		Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 11:43								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Volatile Organic Compounds - Quality Control

Batch BFF0610 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0610-BLK1)		Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 11:43								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Volatile Organic Compounds - Quality Control

Batch BFF0610 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0610-BLK1)										
Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 11:43										
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4		5.14	ug/L	5.00		103	80-129			
Surrogate: Toluene-d8		4.94	ug/L	5.00		98.7	80-120			
Surrogate: 4-Bromofluorobenzene		4.89	ug/L	5.00		97.9	80-120			
Surrogate: 1,2-Dichlorobenzene-d4		5.04	ug/L	5.00		101	80-120			

LCS (BFF0610-BS1)										
Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 09:33										
Chloromethane	9.55	0.50	ug/L	10.0		95.5	60-138			
Vinyl Chloride	9.37	0.20	ug/L	10.0		93.7	66-133			
Bromomethane	10.1	1.00	ug/L	10.0		101	72-131			
Chloroethane	9.44	0.20	ug/L	10.0		94.4	60-155			
Trichlorofluoromethane	11.4	0.20	ug/L	10.0		114	80-129			
Acrolein	42.1	5.00	ug/L	50.0		84.3	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.2	0.20	ug/L	10.0		102	76-129			
Acetone	45.2	5.00	ug/L	50.0		90.5	58-142			
1,1-Dichloroethene	10.2	0.20	ug/L	10.0		102	69-135			
Bromoethane	10.0	0.20	ug/L	10.0		100	78-128			
Iodomethane	10.1	1.00	ug/L	10.0		101	56-147			
Methylene Chloride	10.5	1.00	ug/L	10.0		105	65-135			
Acrylonitrile	8.52	1.00	ug/L	10.0		85.2	64-134			
Carbon Disulfide	9.95	0.20	ug/L	10.0		99.5	78-125			
trans-1,2-Dichloroethene	10.4	0.20	ug/L	10.0		104	78-128			
Vinyl Acetate	9.52	0.20	ug/L	10.0		95.2	55-138			
1,1-Dichloroethane	10.4	0.20	ug/L	10.0		104	76-124			
2-Butanone	43.2	5.00	ug/L	50.0		86.4	61-140			
2,2-Dichloropropane	11.8	0.20	ug/L	10.0		118	78-125			
cis-1,2-Dichloroethene	10.5	0.20	ug/L	10.0		105	80-121			
Chloroform	10.6	0.20	ug/L	10.0		106	80-122			
Bromochloromethane	10.3	0.20	ug/L	10.0		103	80-121			
1,1,1-Trichloroethane	10.6	0.20	ug/L	10.0		106	79-123			
1,1-Dichloropropene	10.4	0.20	ug/L	10.0		104	80-120			



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Reported:
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Volatile Organic Compounds - Quality Control

Batch BFF0610 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFF0610-BS1)										
						Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 09:33				
Carbon tetrachloride	10.5	0.20	ug/L	10.0		105	53-137			
1,2-Dichloroethane	9.70	0.20	ug/L	10.0		97.0	75-123			
Benzene	10.2	0.20	ug/L	10.0		102	80-120			
Trichloroethene	10.4	0.20	ug/L	10.0		104	80-120			
1,2-Dichloropropane	9.83	0.20	ug/L	10.0		98.3	80-120			
Bromodichloromethane	10.2	0.20	ug/L	10.0		102	80-121			
Dibromomethane	9.63	0.20	ug/L	10.0		96.3	80-120			
2-Chloroethyl vinyl ether	9.11	1.00	ug/L	10.0		91.1	74-127			
4-Methyl-2-Pentanone	43.1	5.00	ug/L	50.0		86.1	67-133			
cis-1,3-Dichloropropene	10.2	0.20	ug/L	10.0		102	80-124			
Toluene	10.2	0.20	ug/L	10.0		102	80-120			
trans-1,3-Dichloropropene	10.2	0.20	ug/L	10.0		102	71-127			
2-Hexanone	41.1	5.00	ug/L	50.0		82.2	69-133			
1,1,2-Trichloroethane	9.43	0.20	ug/L	10.0		94.3	80-121			
1,3-Dichloropropane	9.23	0.20	ug/L	10.0		92.3	80-120			
Tetrachloroethene	10.2	0.20	ug/L	10.0		102	80-120			
Dibromochloromethane	9.53	0.20	ug/L	10.0		95.3	65-135			
1,2-Dibromoethane	9.35	0.20	ug/L	10.0		93.5	80-121			
Chlorobenzene	9.86	0.20	ug/L	10.0		98.6	80-120			
Ethylbenzene	10.2	0.20	ug/L	10.0		102	80-120			
1,1,1,2-Tetrachloroethane	9.96	0.20	ug/L	10.0		99.6	80-120			
m,p-Xylene	20.7	0.40	ug/L	20.0		103	80-121			
o-Xylene	10.0	0.20	ug/L	10.0		100	80-121			
Xylenes, total	30.7	0.60	ug/L	30.0		102	76-127			
Styrene	10.7	0.20	ug/L	10.0		107	80-124			
Bromoform	9.36	0.20	ug/L	10.0		93.6	51-134			
1,1,1,2,2-Tetrachloroethane	8.76	0.20	ug/L	10.0		87.6	77-123			
1,2,3-Trichloropropane	8.45	0.50	ug/L	10.0		84.5	76-125			
trans-1,4-Dichloro 2-Butene	9.18	1.00	ug/L	10.0		91.8	55-129			
n-Propylbenzene	10.5	0.20	ug/L	10.0		105	78-130			
Bromobenzene	9.55	0.20	ug/L	10.0		95.5	80-120			
Isopropyl Benzene	10.3	0.20	ug/L	10.0		103	80-128			
2-Chlorotoluene	10.1	0.20	ug/L	10.0		101	78-122			
4-Chlorotoluene	10.2	0.20	ug/L	10.0		102	80-121			
t-Butylbenzene	10.1	0.20	ug/L	10.0		101	78-125			



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Volatile Organic Compounds - Quality Control

Batch BFF0610 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFF0610-BS1)										
					Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 09:33					
1,3,5-Trimethylbenzene	10.4	0.20	ug/L	10.0		104	80-129			
1,2,4-Trimethylbenzene	10.4	0.20	ug/L	10.0		104	80-127			
s-Butylbenzene	10.5	0.20	ug/L	10.0		105	78-129			
4-Isopropyl Toluene	10.5	0.20	ug/L	10.0		105	79-130			
1,3-Dichlorobenzene	9.75	0.20	ug/L	10.0		97.5	80-120			
1,4-Dichlorobenzene	9.51	0.20	ug/L	10.0		95.1	80-120			
n-Butylbenzene	10.7	0.20	ug/L	10.0		107	74-129			
1,2-Dichlorobenzene	9.42	0.20	ug/L	10.0		94.2	80-120			
1,2-Dibromo-3-chloropropane	7.53	0.50	ug/L	10.0		75.3	62-123			Q
1,2,4-Trichlorobenzene	9.13	0.50	ug/L	10.0		91.3	64-124			
Hexachloro-1,3-Butadiene	10.5	0.50	ug/L	10.0		105	58-123			
Naphthalene	8.99	0.50	ug/L	10.0		89.9	50-134			
1,2,3-Trichlorobenzene	8.23	0.50	ug/L	10.0		82.3	49-133			
Dichlorodifluoromethane	8.87	0.20	ug/L	10.0		88.7	48-147			
Methyl tert-butyl Ether	9.48	0.50	ug/L	10.0		94.8	71-132			
2-Pentanone	41.1	5.00	ug/L	50.0		82.2	69-134			
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Surrogate: 1,2-Dichloroethane-d4		5.03	ug/L	5.00		101	80-129			
Surrogate: Toluene-d8		5.08	ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene		4.97	ug/L	5.00		99.5	80-120			
Surrogate: 1,2-Dichlorobenzene-d4		4.77	ug/L	5.00		95.5	80-120			

LCS Dup (BFF0610-BSD1)

Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 09:59

Chloromethane	9.90	0.50	ug/L	10.0		99.0	60-138	3.63	30	
Vinyl Chloride	9.76	0.20	ug/L	10.0		97.6	66-133	4.11	30	
Bromomethane	9.47	1.00	ug/L	10.0		94.7	72-131	6.68	30	
Chloroethane	9.23	0.20	ug/L	10.0		92.3	60-155	2.21	30	
Trichlorofluoromethane	11.2	0.20	ug/L	10.0		112	80-129	2.37	30	
Acrolein	46.1	5.00	ug/L	50.0		92.1	52-144	8.92	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.7	0.20	ug/L	10.0		107	76-129	4.75	30	
Acetone	49.1	5.00	ug/L	50.0		98.2	58-142	8.21	30	
1,1-Dichloroethene	10.8	0.20	ug/L	10.0		108	69-135	5.50	30	
Bromoethane	10.3	0.20	ug/L	10.0		103	78-128	2.22	30	
Iodomethane	10.4	1.00	ug/L	10.0		104	56-147	2.21	30	
Methylene Chloride	10.8	1.00	ug/L	10.0		108	65-135	2.47	30	
Acrylonitrile	9.73	1.00	ug/L	10.0		97.3	64-134	13.30	30	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Volatile Organic Compounds - Quality Control

Batch BFF0610 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BFF0610-BSD1)										
					Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 09:59					
Carbon Disulfide	10.4	0.20	ug/L	10.0		104	78-125	4.21	30	
trans-1,2-Dichloroethene	10.5	0.20	ug/L	10.0		105	78-128	0.87	30	
Vinyl Acetate	10.3	0.20	ug/L	10.0		103	55-138	8.28	30	
1,1-Dichloroethane	10.6	0.20	ug/L	10.0		106	76-124	1.84	30	
2-Butanone	47.9	5.00	ug/L	50.0		95.8	61-140	10.30	30	
2,2-Dichloropropane	12.0	0.20	ug/L	10.0		120	78-125	2.22	30	
cis-1,2-Dichloroethene	10.6	0.20	ug/L	10.0		106	80-121	1.20	30	
Chloroform	10.9	0.20	ug/L	10.0		109	80-122	2.47	30	
Bromochloromethane	10.5	0.20	ug/L	10.0		105	80-121	1.76	30	
1,1,1-Trichloroethane	10.9	0.20	ug/L	10.0		109	79-123	2.90	30	
1,1-Dichloropropene	10.8	0.20	ug/L	10.0		108	80-120	3.05	30	
Carbon tetrachloride	10.9	0.20	ug/L	10.0		109	53-137	3.45	30	
1,2-Dichloroethane	10.6	0.20	ug/L	10.0		106	75-123	8.52	30	
Benzene	10.8	0.20	ug/L	10.0		108	80-120	5.29	30	
Trichloroethene	11.1	0.20	ug/L	10.0		111	80-120	6.62	30	
1,2-Dichloropropane	10.7	0.20	ug/L	10.0		107	80-120	8.67	30	
Bromodichloromethane	10.8	0.20	ug/L	10.0		108	80-121	5.79	30	
Dibromomethane	10.4	0.20	ug/L	10.0		104	80-120	7.50	30	
2-Chloroethyl vinyl ether	10.2	1.00	ug/L	10.0		102	74-127	11.60	30	
4-Methyl-2-Pentanone	49.3	5.00	ug/L	50.0		98.6	67-133	13.50	30	
cis-1,3-Dichloropropene	11.1	0.20	ug/L	10.0		111	80-124	8.00	30	
Toluene	10.8	0.20	ug/L	10.0		108	80-120	5.74	30	
trans-1,3-Dichloropropene	11.3	0.20	ug/L	10.0		113	71-127	10.20	30	
2-Hexanone	48.7	5.00	ug/L	50.0		97.3	69-133	16.90	30	
1,1,2-Trichloroethane	10.7	0.20	ug/L	10.0		107	80-121	12.80	30	
1,3-Dichloropropane	10.3	0.20	ug/L	10.0		103	80-120	11.40	30	
Tetrachloroethene	10.9	0.20	ug/L	10.0		109	80-120	6.03	30	
Dibromochloromethane	10.6	0.20	ug/L	10.0		106	65-135	10.50	30	
1,2-Dibromoethane	10.4	0.20	ug/L	10.0		104	80-121	10.70	30	
Chlorobenzene	10.7	0.20	ug/L	10.0		107	80-120	7.96	30	
Ethylbenzene	10.7	0.20	ug/L	10.0		107	80-120	4.21	30	
1,1,1,2-Tetrachloroethane	10.6	0.20	ug/L	10.0		106	80-120	6.36	30	
m,p-Xylene	22.3	0.40	ug/L	20.0		111	80-121	7.41	30	
o-Xylene	10.7	0.20	ug/L	10.0		107	80-121	6.75	30	
Xylenes, total	33.0	0.60	ug/L	30.0		110	76-127	7.19	30	



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Volatile Organic Compounds - Quality Control

Batch BFF0610 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Prepared: 22-Jun-2017 Analyzed: 22-Jun-2017 09:59										
LCS Dup (BFF0610-BSD1)										
Styrene	11.5	0.20	ug/L	10.0		115	80-124	7.76	30	
Bromoform	10.8	0.20	ug/L	10.0		108	51-134	14.00	30	
1,1,2,2-Tetrachloroethane	9.89	0.20	ug/L	10.0		98.9	77-123	12.10	30	
1,2,3-Trichloropropane	9.59	0.50	ug/L	10.0		95.9	76-125	12.60	30	
trans-1,4-Dichloro 2-Butene	10.4	1.00	ug/L	10.0		104	55-129	12.60	30	
n-Propylbenzene	11.1	0.20	ug/L	10.0		111	78-130	5.23	30	
Bromobenzene	10.2	0.20	ug/L	10.0		102	80-120	6.61	30	
Isopropyl Benzene	10.9	0.20	ug/L	10.0		109	80-128	5.95	30	
2-Chlorotoluene	10.7	0.20	ug/L	10.0		107	78-122	5.50	30	
4-Chlorotoluene	10.9	0.20	ug/L	10.0		109	80-121	6.31	30	
t-Butylbenzene	10.7	0.20	ug/L	10.0		107	78-125	5.79	30	
1,3,5-Trimethylbenzene	11.0	0.20	ug/L	10.0		110	80-129	5.49	30	
1,2,4-Trimethylbenzene	11.0	0.20	ug/L	10.0		110	80-127	5.75	30	
s-Butylbenzene	11.1	0.20	ug/L	10.0		111	78-129	5.87	30	
4-Isopropyl Toluene	11.1	0.20	ug/L	10.0		111	79-130	5.08	30	
1,3-Dichlorobenzene	10.5	0.20	ug/L	10.0		105	80-120	7.40	30	
1,4-Dichlorobenzene	10.3	0.20	ug/L	10.0		103	80-120	8.37	30	
n-Butylbenzene	11.2	0.20	ug/L	10.0		112	74-129	4.74	30	
1,2-Dichlorobenzene	10.2	0.20	ug/L	10.0		102	80-120	7.89	30	
1,2-Dibromo-3-chloropropane	8.71	0.50	ug/L	10.0		87.1	62-123	14.60	30	Q
1,2,4-Trichlorobenzene	10.5	0.50	ug/L	10.0		105	64-124	13.70	30	
Hexachloro-1,3-Butadiene	10.9	0.50	ug/L	10.0		109	58-123	3.59	30	
Naphthalene	10.2	0.50	ug/L	10.0		102	50-134	12.90	30	
1,2,3-Trichlorobenzene	10.2	0.50	ug/L	10.0		102	49-133	21.60	30	
Dichlorodifluoromethane	9.57	0.20	ug/L	10.0		95.7	48-147	7.67	30	
Methyl tert-butyl Ether	10.2	0.50	ug/L	10.0		102	71-132	6.92	30	
2-Pentanone	48.1	5.00	ug/L	50.0		96.1	69-134	15.70	30	
Surrogate: 1,2-Dichloroethane-d4		4.86	ug/L	5.00		97.2	80-129			
Surrogate: Toluene-d8		5.05	ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene		5.06	ug/L	5.00		101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4		4.87	ug/L	5.00		97.5	80-120			



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Volatile Organic Compounds - SIM - Quality Control

Batch BFF0669 - EPA 5030 (Purge and Trap)

Instrument: NT15 Analyst: VTS

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0669-BLK1)				Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 10:52						
Vinyl chloride	ND	20.0	ng/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>		965	ng/L	1000		96.5	80-129			
LCS (BFF0669-BS1)				Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 10:08						
Vinyl chloride	816	20.0	ng/L	1000		81.6	76-120			
<i>Surrogate: 1,2-Dichloroethane-d4</i>		883	ng/L	1000		88.3	80-129			
LCS Dup (BFF0669-BSD1)				Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 10:30						
Vinyl chloride	834	20.0	ng/L	1000		83.4	76-120	2.26	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		958	ng/L	1000		95.8	80-129			



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Reported:
11-Jul-2017 14:19

Metals and Metallic Compounds - Quality Control

Batch BFF0699 - TWC EPA 3010A

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0699-BLK1)		Prepared: 26-Jun-2017 Analyzed: 26-Jun-2017 16:07								
Calcium	ND	0.0500	mg/L							U
Potassium	ND	0.500	mg/L							U
Sodium	ND	0.500	mg/L							U
Sodium	ND	50.0	mg/L							U
LCS (BFF0699-BS1)		Prepared: 26-Jun-2017 Analyzed: 26-Jun-2017 16:25								
Calcium	10.1	0.0500	mg/L	10.0		101	80-120			
Potassium	9.98	0.500	mg/L	10.0		99.8	80-120			
Sodium	10.0	0.500	mg/L	10.0		100	80-120			
Sodium	ND	50.0	mg/L	10.0		97.6	80-120			U



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Reported:
11-Jul-2017 14:19

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFF0739 - RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0739-BLK1)						Prepared: 27-Jun-2017 Analyzed: 28-Jun-2017 17:08					
Arsenic, Dissolved	75a	ND	0.0400	ug/L							U
LCS (BFF0739-BS1)						Prepared: 27-Jun-2017 Analyzed: 28-Jun-2017 17:49					
Arsenic, Dissolved	75a	5.04	0.0400	ug/L	5.00		101	80-120			
Duplicate (BFF0739-DUP1)						Source: 17F0344-02 Prepared: 27-Jun-2017 Analyzed: 28-Jun-2017 17:35					
Arsenic, Dissolved	75a	0.112	0.0400	ug/L		0.112			0.36	20	
Matrix Spike (BFF0739-MS1)						Source: 17F0344-02 Prepared: 27-Jun-2017 Analyzed: 28-Jun-2017 17:44					
Arsenic, Dissolved	75a	4.85	0.0400	ug/L	5.00	0.112	94.8	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFF0742 - WMN (No Prep)

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0742-BLK1) Prepared: 27-Jun-2017 Analyzed: 06-Jul-2017 12:44										
Barium, Dissolved	ND	0.0030	mg/L							U
Manganese, Dissolved	ND	0.0010	mg/L							U
LCS (BFF0742-BS1) Prepared: 27-Jun-2017 Analyzed: 06-Jul-2017 13:01										
Barium, Dissolved	2.34		mg/L	2.00		117	80-120			
Manganese, Dissolved	0.575		mg/L	0.500		115	80-120			
Duplicate (BFF0742-DUP1) Source: 17F0344-04 Prepared: 27-Jun-2017 Analyzed: 06-Jul-2017 12:48										
Barium, Dissolved	0.0104	0.0030	mg/L		0.0107			2.68	20	
Manganese, Dissolved	4.48	0.0010	mg/L		4.32			3.70	20	
Matrix Spike (BFF0742-MS1) Source: 17F0344-04 Prepared: 27-Jun-2017 Analyzed: 06-Jul-2017 12:56										
Barium, Dissolved	2.37		mg/L	2.00	0.0107	118	75-125			
Manganese, Dissolved	4.92		mg/L	0.500	4.32	121	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Environmental Partners, Inc.
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Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFF0744 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0744-BLK1)			Prepared: 27-Jun-2017 Analyzed: 05-Jul-2017 15:33								
Iron, Dissolved	54	ND	20.0	ug/L							U
Iron, Dissolved	57	ND	20.0	ug/L							U
Zinc, Dissolved	66	11.9	4.00	ug/L							
Zinc, Dissolved	67	11.1	4.00	ug/L							
LCS (BFF0744-BS1)			Prepared: 27-Jun-2017 Analyzed: 05-Jul-2017 16:17								
Iron, Dissolved	54	5140	20.0	ug/L	5000		103	80-120			
Iron, Dissolved	57	5000	20.0	ug/L	5000		100	80-120			
Zinc, Dissolved	66	80.8	4.00	ug/L	80.0		101	80-120			B
Zinc, Dissolved	67	79.8	4.00	ug/L	80.0		99.8	80-120			B
Duplicate (BFF0744-DUP1)			Source: 17F0344-04			Prepared: 27-Jun-2017 Analyzed: 05-Jul-2017 16:02					
Iron, Dissolved	54	ND	20.0	ug/L		ND					U
Zinc, Dissolved	66	ND	4.00	ug/L		1.30					U
Matrix Spike (BFF0744-MS1)			Source: 17F0344-04			Prepared: 27-Jun-2017 Analyzed: 05-Jul-2017 16:12					
Iron, Dissolved	54	4670	20.0	ug/L	5000	ND	93.4	75-125			
Zinc, Dissolved	66	77.9	4.00	ug/L	80.0	1.30	95.7	75-125			B

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Environmental Partners, Inc.
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Reported:
11-Jul-2017 14:19

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFG0101 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFG0101-BLK1)			Prepared: 07-Jul-2017 Analyzed: 07-Jul-2017 12:37								
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFG0101-BS1)			Prepared: 07-Jul-2017 Analyzed: 07-Jul-2017 13:21								
Zinc, Dissolved	66	86.1	4.00	ug/L	80.0		108	80-120			
Zinc, Dissolved	67	79.4	4.00	ug/L	80.0		99.2	80-120			
Duplicate (BFG0101-DUP1)			Source: 17F0344-02RE1			Prepared: 07-Jul-2017 Analyzed: 07-Jul-2017 13:06					
Zinc, Dissolved	66	ND	4.00	ug/L		ND					U
Matrix Spike (BFG0101-MS1)			Source: 17F0344-02RE1			Prepared: 07-Jul-2017 Analyzed: 07-Jul-2017 13:16					
Zinc, Dissolved	66	86.0	4.00	ug/L	80.0	ND	107	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project: Olalla Landfill
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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Wet Chemistry - Quality Control

Batch BFF0594 - No Prep Wet Chem

Instrument: Accumet AR60 Analyst: U

QC Sample/Alyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFF0594-BS1)					Prepared: 21-Jun-2017 Analyzed: 21-Jun-2017 14:35					
pH	7.03	0.01	pH Units	7.00		100	0-200			
Duplicate (BFF0594-DUP1)					Source: 17F0344-01 Prepared: 21-Jun-2017 Analyzed: 21-Jun-2017 14:35					
pH	6.28	0.01	pH Units		6.26			0.32	20	H



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Reported:
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Wet Chemistry - Quality Control

Batch BFF0595 - No Prep Wet Chem

Instrument: LCHAT2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0595-BLK1)										
					Prepared: 21-Jun-2017 Analyzed: 21-Jun-2017 15:11					
Nitrite-N	ND	0.010	mg-N/L							U
LCS (BFF0595-BS1)										
					Prepared: 21-Jun-2017 Analyzed: 21-Jun-2017 15:12					
Nitrite-N	0.493	0.010	mg-N/L	0.500		98.6	75-125			
Duplicate (BFF0595-DUP1)										
		Source: 17F0344-01			Prepared: 21-Jun-2017 Analyzed: 21-Jun-2017 15:14					
Nitrite-N	ND	0.010	mg-N/L		ND					U
Matrix Spike (BFF0595-MS1)										
		Source: 17F0344-01			Prepared: 21-Jun-2017 Analyzed: 21-Jun-2017 15:15					
Nitrite-N	0.487	0.010	mg-N/L	0.500	ND	97.5	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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Wet Chemistry - Quality Control

Batch BFF0657 - No Prep Wet Chem

Instrument: LCHAT2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0657-BLK1)		Prepared: 26-Jun-2017 Analyzed: 26-Jun-2017 17:19								
Nitrate + Nitrite as N	ND	0.010	mg-N/L							U
LCS (BFF0657-BS1)		Prepared: 26-Jun-2017 Analyzed: 26-Jun-2017 17:09								
Nitrate + Nitrite as N	0.502	0.010	mg-N/L	0.500		100	90-110			



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Reported:
11-Jul-2017 14:19

Wet Chemistry - Quality Control

Batch BFF0666 - No Prep Wet Chem

Instrument: LCHAT1 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0666-BLK1)										
					Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 12:22					
Chloride	ND	1.00	mg/L							U
LCS (BFF0666-BS1)										
					Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 12:24					
Chloride	4.79	1.00	mg/L	5.00		95.8	90-110			
Duplicate (BFF0666-DUP1)										
		Source: 17F0344-01			Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 12:19					
Chloride	3.88	1.00	mg/L		3.82			1.67	20	
Matrix Spike (BFF0666-MS1)										
		Source: 17F0344-01			Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 12:20					
Chloride	9.19	1.00	mg/L	5.00	3.82	107	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Reported:
11-Jul-2017 14:19

Wet Chemistry - Quality Control

Batch BFF0682 - No Prep Wet Chem

Instrument: LCHAT1 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0682-BLK1)										
					Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 16:09					
Sulfate	ND	2.00	mg/L							U
LCS (BFF0682-BS1)										
					Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 16:44					
Sulfate	15.0	2.00	mg/L	15.0		100	90-110			
Duplicate (BFF0682-DUP1)										
		Source: 17F0344-01			Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 16:25					
Sulfate	3.45	2.00	mg/L		3.27			5.50	20	
Matrix Spike (BFF0682-MS1)										
		Source: 17F0344-01			Prepared: 23-Jun-2017 Analyzed: 23-Jun-2017 16:26					
Sulfate	19.5	2.00	mg/L	15.0	3.27	108	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Wet Chemistry - Quality Control

Batch BFF0690 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0690-BLK1) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 16:51										
COD	ND	10.0	mg/L							U
Calibration Blank (BFF0690-BLK2) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 16:55										
COD	ND	10.0	mg/L							U
Calibration Blank (BFF0690-BLK3) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 17:00										
COD	ND	10.0	mg/L							U
Calibration Blank (BFF0690-BLK4) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 17:01										
COD	ND	10.0	mg/L							U
LCS (BFF0690-BS1) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 16:51										
COD	101	10.0	mg/L	100		101	90-110			
Calibration Check (BFF0690-BS2) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 16:56										
COD	105	10.0	mg/L	100		105	90-110			
Calibration Check (BFF0690-BS3) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 17:00										
COD	103	10.0	mg/L	100		103	90-110			
Calibration Check (BFF0690-BS4) Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 17:01										
COD	105	10.0	mg/L	100		105	90-110			
Duplicate (BFF0690-DUP1) Source: 17F0344-01 Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 16:53										
COD	ND	10.0	mg/L		ND					U
Matrix Spike (BFF0690-MS1) Source: 17F0344-01 Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 16:53										
COD	102	20.0	mg/L	100	ND	102	90-110			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Reported:
11-Jul-2017 14:19

Wet Chemistry - Quality Control

Batch BFF0695 - No Prep Wet Chem

Instrument: TOC-LCSH Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0695-BLK1)					Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 21:03					
Total Organic Carbon	ND	0.50	mg/L							U
LCS (BFF0695-BS1)					Prepared: 24-Jun-2017 Analyzed: 24-Jun-2017 21:22					
Total Organic Carbon	21.9	0.50	mg/L	20.0		110	90-110			



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Project: Olalla Landfill
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Reported:
11-Jul-2017 14:19

Wet Chemistry - Quality Control

Batch BFF0759 - No Prep Wet Chem

Instrument: Accumet AR60 Analyst: U

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0759-BLK1)		Prepared: 27-Jun-2017 Analyzed: 27-Jun-2017 10:32								
Alkalinity, Total	ND	1.00	mg/L CaCO3							U
Blank (BFF0759-BLK2)		Prepared: 27-Jun-2017 Analyzed: 27-Jun-2017 14:30								
Alkalinity, Total	ND	1.00	mg/L CaCO3							U
Reference (BFF0759-SRM1)		Prepared: 27-Jun-2017 Analyzed: 27-Jun-2017 14:30								
Alkalinity, Total	108	1.00	mg/L CaCO3	108		99.9	30.37-108.33			



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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Wet Chemistry - Quality Control

Batch BFF0765 - No Prep Wet Chem

Instrument: LCHAT2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0765-BLK1)					Prepared: 27-Jun-2017 Analyzed: 29-Jun-2017 11:42					
Ammonia-N	ND	0.040	mg-N/L							U
LCS (BFF0765-BS1)					Prepared: 27-Jun-2017 Analyzed: 29-Jun-2017 11:30					
Ammonia-N	0.544	0.040	mg-N/L	0.500		109	90-110			



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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Microbiology - Quality Control

Batch BFF0596 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFF0596-BLK1)						Prepared: 21-Jun-2017 Analyzed: 22-Jun-2017 15:52				
Total Coliforms	ND	1	CFU/100 ml							U



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Project Manager: Doug Kunkel

Reported:
11-Jul-2017 14:19

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
Nitrite-N	WADOE,NELAP,DoD-ELAP
EPA 375.2 in Water	
Sulfate	WADOE,NELAP
EPA 410.4 in Water	
COD	DoD-ELAP,NELAP,WADOE
EPA 6010C in Water	
Calcium	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Sodium	WADOE,NELAP,DoD-ELAP
Sodium-1	DoD-ELAP
Barium	WADOE,NELAP
Manganese	WADOE,NELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260C-SIM in Water

Acrylonitrile	NELAP,CALAP,WADOE
Vinyl chloride	NELAP,CALAP,WADOE
1,1-Dichloroethene	NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	NELAP,CALAP,WADOE
Trichloroethene	NELAP,CALAP,WADOE
Tetrachloroethene	NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,CALAP,WADOE
1,2-Dichloroethane	NELAP,CALAP,WADOE
Benzene	NELAP,CALAP,WADOE

EPA 9060A in Water

Total Organic Carbon	DoD-ELAP,WADOE,NELAP
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SM 2320 B-97 in Water

Alkalinity, Bicarbonate	NELAP,WADOE,WA-DW,DoD-ELAP
Alkalinity, Carbonate	WADOE,WA-DW,DoD-ELAP,NELAP



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 11-Jul-2017 14:19
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Alkalinity, Hydroxide WADOE,WA-DW,DoD-ELAP,NELAP
Alkalinity, Total DoD-ELAP,WADOE,WA-DW,NELAP

SM 4500-H+ B-00 in Water

pH WADOE,NELAP

SM 4500-NH3 H-97 in Water

Ammonia-N WADOE,DoD-ELAP,NELAP

SM 9222B in Water

Total Coliforms WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	09/01/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



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Notes and Definitions

- U This analyte is not detected above the applicable reporting or detection limit.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- M Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
- J Estimated concentration value detected below the reporting limit.
- H Hold time violation - Hold time was exceeded.
- D The reported value is from a dilution
- B This analyte was detected in the method blank.
- * Flagged value is not within established control limits.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

Attachment 1C
September 2017 Analytical Data Sheets



27 September 2017

Doug Kunkel
Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

RE: Olalla Landfill

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
17I0119

Associated SDG ID(s)
N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number: 17I0119	Turn-around Requested: Standard	Page: 1 of 1
ARI Client Company: Environmental Partners, Inc.	Phone: 425-395-0016	Date: 9/13/17
Client Contact: Doug Kunkel 425-395-0016	No. of Coolers: 2	Ice Present? Y Cooler Temps:

Client Project Name: Olalla Landfill	Analysis Requested	Notes/Comments								
Client Project #: 45405.0	<table border="1"> <tr> <td>Volatiles</td> <td>VOCs by SIM</td> <td>Dissolved Metals</td> <td>Total Metals</td> <td>Nitrates, Nitrites, Chlorides, Sulfates and others</td> <td>COD</td> <td>Toc</td> <td>Total Coliform</td> </tr> </table>	Volatiles	VOCs by SIM	Dissolved Metals	Total Metals	Nitrates, Nitrites, Chlorides, Sulfates and others	COD	Toc	Total Coliform	
Volatiles	VOCs by SIM	Dissolved Metals	Total Metals	Nitrates, Nitrites, Chlorides, Sulfates and others	COD	Toc	Total Coliform			
Samplers: Eric Caddley										

Sample ID	Date	Time	Matrix	No. Containers	Volatiles	VOCs by SIM	Dissolved Metals	Total Metals	Nitrates, Nitrites, Chlorides, Sulfates and others	COD	Toc	Total Coliform	Notes/Comments
OL-MW-01	9/12/17	0930	water	9	X	X	X	X	X	X	X	X	500 full bot
OL-MW-03		10:51			X	X	X	X	X	X	X	X	in email
OL-MW-10		12:11			X	X	X	X	X	X	X	X	
OL-MW-06		13:11			X	X	X	X	X	X	X	X	
OL-MW-08		14:22			X	X	X	X	X	X	X	X	
OL-MW-12		-			X	X	X	X	X	X	X	X	
Trip blank		-		2	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Eric Caddley	Printed Name: Brittney Hall	Printed Name:	Printed Name:
	Company: EPI	Company: ARI	Company:	Company:
	Date & Time: 9/13/17 08:30	Date & Time: 9/13/17 8:30	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: EPI

Project Name: Olalla Landfill

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 17I0119

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) #1 #2

Time: 8:30 0.3 0.6

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D005206

Cooler Accepted by: B.H. Date: 9/13/17 Time: 8:30

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI..... NA 9/17/17

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: B.H. Date: 9/13/17 Time: 9:00

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:
Trip blanks(x2) had lg bubbles.

By: B.H. Date: 9/13/17

			Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)



WORK ORDER

17I0119

Client: Environmental Partners, Inc. Project Manager: Susan Dunnihoo
Project: Olalla Landfill Project Number: 45405.0

Preservation Confirmation

Container ID	Container Type	pH
17I0119-01 A	VOA Vial, Clear, 40 mL, HCL	
17I0119-01 B	VOA Vial, Clear, 40 mL, HCL	
17I0119-01 C	VOA Vial, Clear, 40 mL, HCL	
17I0119-01 D	Corning Plastic, 125 mL, Na2S2O3	
17I0119-01 E	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-01 F	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-01 G	Small OJ, 500 mL	
17I0119-01 H	HDPE NM, 500 mL, 1:1 HNO3	7.2 Pass
17I0119-02 A	VOA Vial, Clear, 40 mL, HCL	
17I0119-02 B	VOA Vial, Clear, 40 mL, HCL	
17I0119-02 C	VOA Vial, Clear, 40 mL, HCL	
17I0119-02 D	Corning Plastic, 125 mL, Na2S2O3	
17I0119-02 E	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-02 F	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-02 G	Small OJ, 500 mL	
17I0119-02 H	HDPE NM, 500 mL, 1:1 HNO3	7.2 Pass
17I0119-03 A	VOA Vial, Clear, 40 mL, HCL	
17I0119-03 B	VOA Vial, Clear, 40 mL, HCL	
17I0119-03 C	VOA Vial, Clear, 40 mL, HCL	
17I0119-03 D	Corning Plastic, 125 mL, Na2S2O3	
17I0119-03 E	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-03 F	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-03 G	Small OJ, 500 mL	
17I0119-03 H	HDPE NM, 500 mL, 1:1 HNO3	7.2 Pass
17I0119-04 A	VOA Vial, Clear, 40 mL, HCL	
17I0119-04 B	VOA Vial, Clear, 40 mL, HCL	
17I0119-04 C	VOA Vial, Clear, 40 mL, HCL	
17I0119-04 D	Corning Plastic, 125 mL, Na2S2O3	
17I0119-04 E	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-04 F	Glass NM, Amber, 250 mL, 9N H2SO4	7.2 Pass
17I0119-04 G	Small OJ, 500 mL	

Reviewed By B.H.

Date 9/13/17



WORK ORDER

17I0119

Client: Environmental Partners, Inc.		Project Manager: Susan Dunnihoo
Project: Olalla Landfill		Project Number: 45405.0
17I0119-04 H	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17I0119-05 A	VOA Vial, Clear, 40 mL, HCL	
17I0119-05 B	VOA Vial, Clear, 40 mL, HCL	
17I0119-05 C	VOA Vial, Clear, 40 mL, HCL	
17I0119-05 D	Corning Plastic, 125 mL, Na2S2O3	
17I0119-05 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2 Pass
17I0119-05 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2 Pass
17I0119-05 G	Small OJ, 500 mL	
17I0119-05 H	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17I0119-06 A	VOA Vial, Clear, 40 mL, HCL	
17I0119-06 B	VOA Vial, Clear, 40 mL, HCL	
17I0119-06 C	VOA Vial, Clear, 40 mL, HCL	
17I0119-06 D	Corning Plastic, 125 mL, Na2S2O3	
17I0119-06 E	Glass NM, Amber, 250 mL, 9N H2SO4	L2 Pass
17I0119-06 F	Glass NM, Amber, 250 mL, 9N H2SO4	L2 Pass
17I0119-06 G	Small OJ, 500 mL	
17I0119-06 H	HDPE NM, 500 mL, 1:1 HNO3	L2 Pass
17I0119-07 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17I0119-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17I0119-09 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17I0119-10 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17I0119-11 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17I0119-12 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2 Pass
17I0119-13 A	VOA Vial, Clear, 40 mL, HCL	
17I0119-13 B	VOA Vial, Clear, 40 mL, HCL	

B.H.
Preservation Confirmed By

9/13/17
Date

B.H.
Reviewed By

9/13/17
Date



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
OL-MW-01	17I0119-01	Water	12-Sep-2017 09:30	13-Sep-2017 08:30
OL-MW-03	17I0119-02	Water	12-Sep-2017 10:51	13-Sep-2017 08:30
OL-MW-10	17I0119-03	Water	12-Sep-2017 12:11	13-Sep-2017 08:30
OL-MW-06	17I0119-04	Water	12-Sep-2017 13:11	13-Sep-2017 08:30
OL-MW-08	17I0119-05	Water	12-Sep-2017 14:22	13-Sep-2017 08:30
OL-MW-12	17I0119-06	Water	12-Sep-2017 00:00	13-Sep-2017 08:30
OL-MW-01	17I0119-07	Water	12-Sep-2017 09:30	13-Sep-2017 08:30
OL-MW-03	17I0119-08	Water	12-Sep-2017 10:51	13-Sep-2017 08:30
OL-MW-10	17I0119-09	Water	12-Sep-2017 12:11	13-Sep-2017 08:30
OL-MW-06	17I0119-10	Water	12-Sep-2017 13:11	13-Sep-2017 08:30
OL-MW-08	17I0119-11	Water	12-Sep-2017 14:22	13-Sep-2017 08:30
OL-MW-12	17I0119-12	Water	12-Sep-2017 00:00	13-Sep-2017 08:30
Trip Blank	17I0119-13	Water	12-Sep-2017 00:00	13-Sep-2017 08:30



Environmental Partners, Inc.
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Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of 1,1,2,2- Tetrachloroethane and 2-Pentanone which are out of control low and Trichlorofluoromethane, Carbon Tetrachloride, Hexachloro-1,3-Butadiene and 1,2-Dichloroethane are out of control high. All associated samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits with the exception of 1,1,2,2- Tetrachloroethane which is out of control low and Hexachloro-1,3-Butadiene and 1,2-Dichloroethane are out of control high and flagged on the associated forms.

Volatiles - EPA Method 8260C-SIM (Selected Ion Monitoring)

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total and Dissolved Metals - EPA Method 6010C and 200.8

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



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The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times with the exception of pH which was sent to the lab outside of the holding time.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits.



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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OL-MW-01
17I0119-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 09:30
Analyzed: 20-Sep-2017 16:33

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BF10441 Sample Size: 10 mL
Prepared: 20-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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OL-MW-01
17I0119-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 09:30
Analyzed: 20-Sep-2017 16:33

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Reported:
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OL-MW-01
17I0119-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 09:30
Analyzed: 20-Sep-2017 16:33

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	113	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	97.1	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	118	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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Reported:
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OL-MW-01
17I0119-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 09/12/2017 09:30
Analyzed: 19-Sep-2017 15:22

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFI0415 Sample Size: 10 mL
Prepared: 19-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>115</i>	<i>%</i>	



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Reported:
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OL-MW-01
17I0119-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 09:30
Analyzed: 15-Sep-2017 13:52

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BF10264 Sample Size: 25 mL
Prepared: 14-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	11.0	mg/L	
Potassium	7440-09-7	1	0.500	0.511	mg/L	
Sodium	7440-23-5	1	0.500	4.23	mg/L	



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Reported:
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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: EPA 325.2
Instrument: LCHAT1

Sampled: 09/12/2017 09:30
Analyzed: 15-Sep-2017 16:11

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10316 Sample Size: 10 mL
Prepared: 15-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	3.53	mg/L	



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Reported:
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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 09/12/2017 09:30
Analyzed: 14-Sep-2017 17:40

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Sep-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.553	mg/L	

Instrument: LACHAT2

Analyzed: 14-Sep-2017 17:40

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0251
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.553	mg-N/L	

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0255
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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Reported:
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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 09/12/2017 09:30
Analyzed: 13-Sep-2017 14:04

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10240 Sample Size: 10 mL
Prepared: 13-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	4.58	mg/L	



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Reported:
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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 09/12/2017 09:30
Analyzed: 20-Sep-2017 18:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10258 Sample Size: 2 mL
Prepared: 13-Sep-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 09/12/2017 09:30
Analyzed: 20-Sep-2017 18:39

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10444 Sample Size: 20 mL
Prepared: 20-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	ND	mg/L	U



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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: SM 2320 B-97
Instrument: Accumet AR60

Sampled: 09/12/2017 09:30
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10246 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	51.1	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	51.1	mg/L CaCO3	



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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00 Sampled: 09/12/2017 09:30
Instrument: Accumet AR60 Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10245 Sample Size: 50 mL
Prepared: 13-Sep-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.40	pH Units	H



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Reported:
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OL-MW-01
17I0119-01 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT1

Sampled: 09/12/2017 09:30
Analyzed: 22-Sep-2017 18:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10541 Sample Size: 10 mL
Prepared: 22-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 27-Sep-2017 12:18
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OL-MW-01
17I0119-01 (Water)

Microbiology

Method: SM 9222B Sampled: 09/12/2017 09:30
Instrument: N/A Analyzed: 14-Sep-2017 09:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10235 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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OL-MW-03
17I0119-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 10:51
Analyzed: 20-Sep-2017 16:59

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BF10441 Sample Size: 10 mL
Prepared: 20-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

OL-MW-03
17I0119-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 10:51
Analyzed: 20-Sep-2017 16:59

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Reported:
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OL-MW-03
17I0119-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 10:51
Analyzed: 20-Sep-2017 16:59

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	106	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.3	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	114	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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OL-MW-03
17I0119-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 09/12/2017 10:51
Analyzed: 19-Sep-2017 15:42

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFI0415 Sample Size: 10 mL
Prepared: 19-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>119</i>	<i>%</i>	



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Reported:
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OL-MW-03
17I0119-02 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 10:51
Analyzed: 19-Sep-2017 14:55

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BF10264 Sample Size: 25 mL
Prepared: 14-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	60.9	mg/L	
Potassium	7440-09-7	1	0.500	0.965	mg/L	
Sodium	7440-23-5	1	0.500	11.7	mg/L	



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Reported:
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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: EPA 325.2
Instrument: LCHAT1

Sampled: 09/12/2017 10:51
Analyzed: 15-Sep-2017 16:12

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10316 Sample Size: 10 mL
Prepared: 15-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.45	mg/L	



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Reported:
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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 09/12/2017 10:51
Analyzed: 14-Sep-2017 17:41

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Sep-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT2

Analyzed: 14-Sep-2017 17:41

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0251
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0255
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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Reported:
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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 09/12/2017 10:51
Analyzed: 13-Sep-2017 14:05

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10240 Sample Size: 10 mL
Prepared: 13-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	20.2	mg/L	



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Reported:
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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 09/12/2017 10:51
Analyzed: 20-Sep-2017 18:46

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10258 Sample Size: 2 mL
Prepared: 13-Sep-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 09/12/2017 10:51
Analyzed: 20-Sep-2017 19:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10444 Sample Size: 20 mL
Prepared: 20-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	3.43	mg/L	



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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: SM 2320 B-97
Instrument: Accumet AR60

Sampled: 09/12/2017 10:51
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10246 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	272	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	272	mg/L CaCO3	



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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 09/12/2017 10:51
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10245 Sample Size: 50 mL
Prepared: 13-Sep-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.22	pH Units	H



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OL-MW-03
17I0119-02 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT1

Sampled: 09/12/2017 10:51
Analyzed: 22-Sep-2017 18:07

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10541 Sample Size: 10 mL
Prepared: 22-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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OL-MW-03
17I0119-02 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 09/12/2017 10:51
Analyzed: 14-Sep-2017 09:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10235 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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OL-MW-10
17I0119-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 12:11
Analyzed: 20-Sep-2017 17:25

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BF10441 Sample Size: 10 mL
Prepared: 20-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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OL-MW-10
17I0119-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 12:11
Analyzed: 20-Sep-2017 17:25

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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OL-MW-10
17I0119-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 12:11
Analyzed: 20-Sep-2017 17:25

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	101	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.6	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	116	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 09/12/2017 12:11
Analyzed: 19-Sep-2017 16:02

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFI0415 Sample Size: 10 mL
Prepared: 19-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>121</i>	<i>%</i>	



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 12:11
Analyzed: 19-Sep-2017 14:59

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BF10264 Sample Size: 25 mL
Prepared: 14-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	34.4	mg/L	
Potassium	7440-09-7	1	0.500	1.04	mg/L	
Sodium	7440-23-5	1	0.500	8.14	mg/L	



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: EPA 325.2
Instrument: LCHAT1

Sampled: 09/12/2017 12:11
Analyzed: 15-Sep-2017 16:13

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10316 Sample Size: 10 mL
Prepared: 15-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.58	mg/L	



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 09/12/2017 12:11
Analyzed: 14-Sep-2017 17:42

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Sep-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT2

Analyzed: 14-Sep-2017 17:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0251
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0255
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 09/12/2017 12:11
Analyzed: 13-Sep-2017 14:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10240 Sample Size: 10 mL
Prepared: 13-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	17.6	mg/L	



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Reported:
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OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 09/12/2017 12:11
Analyzed: 20-Sep-2017 18:46

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10258 Sample Size: 2 mL
Prepared: 13-Sep-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 09/12/2017 12:11
Analyzed: 20-Sep-2017 20:07

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10444 Sample Size: 20 mL
Prepared: 20-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	3.06	mg/L	



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: SM 2320 B-97
Instrument: Accumet AR60

Sampled: 09/12/2017 12:11
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10246 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	167	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	167	mg/L CaCO3	



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 09/12/2017 12:11
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10245 Sample Size: 50 mL
Prepared: 13-Sep-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.55	pH Units	H



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT1

Sampled: 09/12/2017 12:11
Analyzed: 22-Sep-2017 18:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10541 Sample Size: 10 mL
Prepared: 22-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.098	mg-N/L	



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Reported:
27-Sep-2017 12:18

OL-MW-10
17I0119-03 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 09/12/2017 12:11
Analyzed: 14-Sep-2017 09:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10235 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
27-Sep-2017 12:18

OL-MW-06
17I0119-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 13:11
Analyzed: 20-Sep-2017 17:51

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BF10441 Sample Size: 10 mL
Prepared: 20-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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OL-MW-06
17I0119-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 13:11
Analyzed: 20-Sep-2017 17:51

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	1.76	ug/L	
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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OL-MW-06
17I0119-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 13:11
Analyzed: 20-Sep-2017 17:51

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	114	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.4	%	



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OL-MW-06
17I0119-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 09/12/2017 13:11
Analyzed: 19-Sep-2017 16:22

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFI0415 Sample Size: 10 mL
Prepared: 19-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>122</i>	<i>%</i>	



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27-Sep-2017 12:18

OL-MW-06
17I0119-04 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 13:11
Analyzed: 19-Sep-2017 15:21

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BF10264 Sample Size: 25 mL
Prepared: 14-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	35.9	mg/L	
Potassium	7440-09-7	1	0.500	1.31	mg/L	
Sodium	7440-23-5	1	0.500	7.02	mg/L	



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OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: EPA 325.2
Instrument: LCHAT1

Sampled: 09/12/2017 13:11
Analyzed: 15-Sep-2017 16:26

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10316 Sample Size: 10 mL
Prepared: 15-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.61	mg/L	



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Reported:
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OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 09/12/2017 13:11
Analyzed: 14-Sep-2017 17:44

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Sep-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT2

Analyzed: 14-Sep-2017 17:44

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0251
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0255
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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Reported:
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OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 09/12/2017 13:11
Analyzed: 13-Sep-2017 14:11

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10240 Sample Size: 10 mL
Prepared: 13-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	8.82	mg/L	



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OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 09/12/2017 13:11
Analyzed: 20-Sep-2017 18:46

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10258 Sample Size: 2 mL
Prepared: 13-Sep-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
27-Sep-2017 12:18

OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 09/12/2017 13:11
Analyzed: 20-Sep-2017 20:26

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10444 Sample Size: 20 mL
Prepared: 20-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	2.14	mg/L	



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Reported:
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OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: SM 2320 B-97
Instrument: Accumet AR60

Sampled: 09/12/2017 13:11
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10246 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	181	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	181	mg/L CaCO3	



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Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 09/12/2017 13:11
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10245 Sample Size: 50 mL
Prepared: 13-Sep-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.42	pH Units	H



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Reported:
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OL-MW-06
17I0119-04 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT1

Sampled: 09/12/2017 13:11
Analyzed: 22-Sep-2017 18:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10541 Sample Size: 10 mL
Prepared: 22-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.042	mg-N/L	



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OL-MW-06
17I0119-04 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 09/12/2017 13:11
Analyzed: 14-Sep-2017 09:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10235 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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OL-MW-08
17I0119-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 14:22
Analyzed: 20-Sep-2017 18:16

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BF10441 Sample Size: 10 mL
Prepared: 20-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.40	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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OL-MW-08
17I0119-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 14:22
Analyzed: 20-Sep-2017 18:16

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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OL-MW-08
17I0119-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 14:22
Analyzed: 20-Sep-2017 18:16

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	117	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.3	%	



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OL-MW-08
17I0119-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 09/12/2017 14:22
Analyzed: 19-Sep-2017 16:42

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFI0415 Sample Size: 10 mL
Prepared: 19-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	29.0	ng/L	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>125</i>	<i>%</i>	



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OL-MW-08
17I0119-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 14:22
Analyzed: 19-Sep-2017 15:25

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BF10264 Sample Size: 25 mL
Prepared: 14-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	21.6	mg/L	
Potassium	7440-09-7	1	0.500	0.884	mg/L	
Sodium	7440-23-5	1	0.500	7.12	mg/L	



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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: EPA 325.2
Instrument: LCHAT1

Sampled: 09/12/2017 14:22
Analyzed: 15-Sep-2017 16:28

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10316 Sample Size: 10 mL
Prepared: 15-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.84	mg/L	



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Reported:
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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 09/12/2017 14:22
Analyzed: 14-Sep-2017 17:45

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Sep-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.115	mg/L	

Instrument: LACHAT2

Analyzed: 14-Sep-2017 17:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0251
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.115	mg-N/L	

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0255
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 09/12/2017 14:22
Analyzed: 13-Sep-2017 14:13

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10240 Sample Size: 10 mL
Prepared: 13-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	4.88	mg/L	



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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 09/12/2017 14:22
Analyzed: 20-Sep-2017 18:46

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10258 Sample Size: 2 mL
Prepared: 13-Sep-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 09/12/2017 14:22
Analyzed: 21-Sep-2017 20:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10444 Sample Size: 20 mL
Prepared: 20-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.93	mg/L	



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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: SM 2320 B-97
Instrument: Accumet AR60

Sampled: 09/12/2017 14:22
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10246 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	115	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	115	mg/L CaCO3	



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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 09/12/2017 14:22
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10245 Sample Size: 50 mL
Prepared: 13-Sep-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.51	pH Units	H



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OL-MW-08
17I0119-05 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT1

Sampled: 09/12/2017 14:22
Analyzed: 22-Sep-2017 18:11

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10541 Sample Size: 10 mL
Prepared: 22-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.045	mg-N/L	



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OL-MW-08
17I0119-05 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 09/12/2017 14:22
Analyzed: 14-Sep-2017 09:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10235 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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OL-MW-12
17I0119-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 00:00
Analyzed: 20-Sep-2017 18:42

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BF10441 Sample Size: 10 mL
Prepared: 20-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.39	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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OL-MW-12
17I0119-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 00:00
Analyzed: 20-Sep-2017 18:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Reported:
27-Sep-2017 12:18

OL-MW-12
17I0119-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 00:00
Analyzed: 20-Sep-2017 18:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	109	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	96.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	113	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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OL-MW-12
17I0119-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 09/12/2017 00:00
Analyzed: 19-Sep-2017 17:03

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFI0415 Sample Size: 10 mL
Prepared: 19-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	27.6	ng/L	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	124	%	



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Reported:
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OL-MW-12
17I0119-06 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 00:00
Analyzed: 19-Sep-2017 15:29

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BF10264 Sample Size: 25 mL
Prepared: 14-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	22.2	mg/L	
Potassium	7440-09-7	1	0.500	0.933	mg/L	
Sodium	7440-23-5	1	0.500	7.25	mg/L	



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Reported:
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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: EPA 325.2
Instrument: LCHAT1

Sampled: 09/12/2017 00:00
Analyzed: 15-Sep-2017 16:29

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10316 Sample Size: 10 mL
Prepared: 15-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.88	mg/L	



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Reported:
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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 09/12/2017 00:00
Analyzed: 14-Sep-2017 17:46

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Sep-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.119	mg/L	

Instrument: LACHAT2

Analyzed: 14-Sep-2017 17:46

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0251
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.119	mg-N/L	

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFI0255
Prepared: 13-Sep-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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Reported:
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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 09/12/2017 00:00
Analyzed: 13-Sep-2017 14:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10240 Sample Size: 10 mL
Prepared: 13-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	4.80	mg/L	



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Reported:
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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 09/12/2017 00:00
Analyzed: 20-Sep-2017 18:47

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10258 Sample Size: 2 mL
Prepared: 13-Sep-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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Reported:
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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 09/12/2017 00:00
Analyzed: 21-Sep-2017 20:53

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10444 Sample Size: 20 mL
Prepared: 20-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.93	mg/L	



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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 09/12/2017 00:00

Instrument: Accumet AR60

Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10246
Prepared: 13-Sep-2017

Sample Size: 100 mL
Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	114	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	114	mg/L CaCO3	



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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 09/12/2017 00:00
Analyzed: 13-Sep-2017 11:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10245 Sample Size: 50 mL
Prepared: 13-Sep-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.51	pH Units	H



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OL-MW-12
17I0119-06 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT1

Sampled: 09/12/2017 00:00
Analyzed: 22-Sep-2017 18:12

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10541 Sample Size: 10 mL
Prepared: 22-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.044	mg-N/L	



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OL-MW-12
17I0119-06 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 09/12/2017 00:00
Analyzed: 14-Sep-2017 09:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BF10235 Sample Size: 100 mL
Prepared: 13-Sep-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Reported:
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OL-MW-01
17I0119-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 09/12/2017 09:30
Analyzed: 22-Sep-2017 16:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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OL-MW-01
17I0119-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 09/12/2017 09:30
Analyzed: 25-Sep-2017 15:34

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFI0296 Sample Size: 100 mL
Prepared: 15-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.0992	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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OL-MW-01
17I0119-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 09:30
Analyzed: 22-Sep-2017 09:09

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BF10272
Prepared: 14-Sep-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0031	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Reported:
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OL-MW-03
17I0119-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS1

Sampled: 09/12/2017 10:51
Analyzed: 18-Sep-2017 17:33

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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OL-MW-03
17I0119-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 09/12/2017 10:51
Analyzed: 25-Sep-2017 15:47

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFI0296 Sample Size: 100 mL
Prepared: 15-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.0800	0.191	ug/L	D

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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OL-MW-03
17I0119-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 10:51
Analyzed: 22-Sep-2017 09:13

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFI0272
Prepared: 14-Sep-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0187	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	8.11	mg/L	



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Reported:
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OL-MW-10
17I0119-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 09/12/2017 12:11
Analyzed: 22-Sep-2017 16:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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OL-MW-10
17I0119-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 09/12/2017 12:11
Analyzed: 25-Sep-2017 15:51

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFI0296 Sample Size: 100 mL
Prepared: 15-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.0800	1.64	ug/L	D

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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OL-MW-10
17I0119-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 12:11
Analyzed: 22-Sep-2017 09:17

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BF10272
Prepared: 14-Sep-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0116	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	3.95	mg/L	



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Reported:
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OL-MW-06
17I0119-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 09/12/2017 13:11
Analyzed: 22-Sep-2017 16:31

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	1240	ug/L	



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OL-MW-06
17I0119-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 09/12/2017 13:11
Analyzed: 25-Sep-2017 16:35

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFI0296 Sample Size: 100 mL
Prepared: 15-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.0800	1.37	ug/L	D

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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OL-MW-06
17I0119-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 13:11
Analyzed: 22-Sep-2017 09:21

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BF10272
Prepared: 14-Sep-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0150	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.778	mg/L	



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OL-MW-08
17I0119-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 09/12/2017 14:22
Analyzed: 22-Sep-2017 17:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BF10301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	336	ug/L	



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Reported:
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OL-MW-08
17I0119-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 09/12/2017 14:22
Analyzed: 25-Sep-2017 16:39

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFI0296 Sample Size: 100 mL
Prepared: 15-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.0800	2.28	ug/L	D

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

OL-MW-08
17I0119-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 14:22
Analyzed: 22-Sep-2017 09:25

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BF10272
Prepared: 14-Sep-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0050	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.59	mg/L	



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Reported:
27-Sep-2017 12:18

OL-MW-12
17I0119-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 09/12/2017 00:00
Analyzed: 22-Sep-2017 16:36

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	394	ug/L	



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Reported:
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OL-MW-12
17I0119-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 09/12/2017 00:00
Analyzed: 25-Sep-2017 16:43

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BFI0296 Sample Size: 100 mL
Prepared: 15-Sep-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.0800	2.12	ug/L	D

Instrument: ICPMS2 Analyzed: 22-Sep-2017 16:36

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFI0301 Sample Size: 25 mL
Prepared: 15-Sep-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Reported:
27-Sep-2017 12:18

OL-MW-12
17I0119-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 09/12/2017 00:00
Analyzed: 22-Sep-2017 09:28

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BFI0272
Prepared: 14-Sep-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0075	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.61	mg/L	



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Reported:
27-Sep-2017 12:18

Trip Blank
17I0119-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 00:00
Analyzed: 20-Sep-2017 12:13

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BF10441 Sample Size: 10 mL
Prepared: 20-Sep-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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Trip Blank
17I0119-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 00:00
Analyzed: 20-Sep-2017 12:13

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Trip Blank
17I0119-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 09/12/2017 00:00
Analyzed: 20-Sep-2017 12:13

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	110	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	118	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	98.0	%	



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Reported:
27-Sep-2017 12:18

Volatile Organic Compounds - Quality Control

Batch BFI0441 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0441-BLK1)		Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 11:47								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Reported:
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Volatile Organic Compounds - Quality Control

Batch BFI0441 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0441-BLK1)		Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 11:47								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Volatile Organic Compounds - Quality Control

Batch BF10441 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BF10441-BLK1)										
					Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 11:47					
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>										
		5.43	ug/L	5.00		109	80-129			
<i>Surrogate: Toluene-d8</i>										
		4.92	ug/L	5.00		98.4	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>										
		5.89	ug/L	5.00		118	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>										
		4.88	ug/L	5.00		97.5	80-120			
LCS (BF10441-BS1)										
					Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 09:11					
Chloromethane	11.8	0.50	ug/L	10.0		118	60-138			
Vinyl Chloride	10.9	0.20	ug/L	10.0		109	66-133			
Bromomethane	10.1	1.00	ug/L	10.0		101	72-131			
Chloroethane	10.5	0.20	ug/L	10.0		105	60-155			
Trichlorofluoromethane	12.5	0.20	ug/L	10.0		125	80-129			Q
Acrolein	54.3	5.00	ug/L	50.0		109	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.7	0.20	ug/L	10.0		107	76-129			
Acetone	45.5	5.00	ug/L	50.0		90.9	58-142			
1,1-Dichloroethene	11.4	0.20	ug/L	10.0		114	69-135			
Bromoethane	10.7	0.20	ug/L	10.0		107	78-128			
Iodomethane	9.37	1.00	ug/L	10.0		93.7	56-147			
Methylene Chloride	8.76	1.00	ug/L	10.0		87.6	65-135			
Acrylonitrile	9.08	1.00	ug/L	10.0		90.8	64-134			
Carbon Disulfide	8.83	0.20	ug/L	10.0		88.3	78-125			
trans-1,2-Dichloroethene	8.97	0.20	ug/L	10.0		89.7	78-128			
Vinyl Acetate	9.56	0.20	ug/L	10.0		95.6	55-138			
1,1-Dichloroethane	10.2	0.20	ug/L	10.0		102	76-124			
2-Butanone	41.3	5.00	ug/L	50.0		82.7	61-140			
2,2-Dichloropropane	11.4	0.20	ug/L	10.0		114	78-125			
cis-1,2-Dichloroethene	8.39	0.20	ug/L	10.0		83.9	80-121			
Chloroform	9.33	0.20	ug/L	10.0		93.3	80-122			
Bromochloromethane	9.13	0.20	ug/L	10.0		91.3	80-121			
1,1,1-Trichloroethane	11.3	0.20	ug/L	10.0		113	79-123			
1,1-Dichloropropene	10.3	0.20	ug/L	10.0		103	80-120			



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Reported:
27-Sep-2017 12:18

Volatile Organic Compounds - Quality Control

Batch BF10441 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BF10441-BS1)		Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 09:11								
Carbon tetrachloride	12.9	0.20	ug/L	10.0		129	53-137			Q
1,2-Dichloroethane	12.0	0.20	ug/L	10.0		120	75-123			
Benzene	8.94	0.20	ug/L	10.0		89.4	80-120			
Trichloroethene	10.6	0.20	ug/L	10.0		106	80-120			
1,2-Dichloropropane	10.1	0.20	ug/L	10.0		101	80-120			
Bromodichloromethane	9.72	0.20	ug/L	10.0		97.2	80-121			
Dibromomethane	9.23	0.20	ug/L	10.0		92.3	80-120			
2-Chloroethyl vinyl ether	9.35	1.00	ug/L	10.0		93.5	74-127			
4-Methyl-2-Pentanone	47.5	5.00	ug/L	50.0		94.9	67-133			
cis-1,3-Dichloropropene	9.38	0.20	ug/L	10.0		93.8	80-124			
Toluene	9.79	0.20	ug/L	10.0		97.9	80-120			
trans-1,3-Dichloropropene	9.70	0.20	ug/L	10.0		97.0	71-127			
2-Hexanone	42.4	5.00	ug/L	50.0		84.8	69-133			
1,1,2-Trichloroethane	8.92	0.20	ug/L	10.0		89.2	80-121			
1,3-Dichloropropane	8.19	0.20	ug/L	10.0		81.9	80-120			
Tetrachloroethene	10.5	0.20	ug/L	10.0		105	80-120			
Dibromochloromethane	9.43	0.20	ug/L	10.0		94.3	65-135			
1,2-Dibromoethane	9.65	0.20	ug/L	10.0		96.5	80-121			
Chlorobenzene	9.50	0.20	ug/L	10.0		95.0	80-120			
Ethylbenzene	9.39	0.20	ug/L	10.0		93.9	80-120			
1,1,1,2-Tetrachloroethane	10.5	0.20	ug/L	10.0		105	80-120			
m,p-Xylene	19.3	0.40	ug/L	20.0		96.6	80-121			
o-Xylene	9.69	0.20	ug/L	10.0		96.9	80-121			
Xylenes, total	29.0	0.60	ug/L	30.0		96.7	76-127			
Styrene	9.42	0.20	ug/L	10.0		94.2	80-124			
Bromoform	9.06	0.20	ug/L	10.0		90.6	51-134			
1,1,1,2,2-Tetrachloroethane	6.68	0.20	ug/L	10.0		66.8	77-123			*, Q
1,2,3-Trichloropropane	8.38	0.50	ug/L	10.0		83.8	76-125			
trans-1,4-Dichloro 2-Butene	8.84	1.00	ug/L	10.0		88.4	55-129			
n-Propylbenzene	8.92	0.20	ug/L	10.0		89.2	78-130			
Bromobenzene	8.77	0.20	ug/L	10.0		87.7	80-120			
Isopropyl Benzene	8.90	0.20	ug/L	10.0		89.0	80-128			
2-Chlorotoluene	8.93	0.20	ug/L	10.0		89.3	78-122			
4-Chlorotoluene	8.75	0.20	ug/L	10.0		87.5	80-121			
t-Butylbenzene	9.58	0.20	ug/L	10.0		95.8	78-125			



Environmental Partners, Inc.
1180 NW Maple St., Suite 210
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Volatile Organic Compounds - Quality Control

Batch BF10441 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BF10441-BS1)										
					Prepared: 20-Sep-2017	Analyzed: 20-Sep-2017 09:11				
1,3,5-Trimethylbenzene	9.22	0.20	ug/L	10.0		92.2	80-129			
1,2,4-Trimethylbenzene	9.25	0.20	ug/L	10.0		92.5	80-127			
s-Butylbenzene	9.41	0.20	ug/L	10.0		94.1	78-129			
4-Isopropyl Toluene	9.81	0.20	ug/L	10.0		98.1	79-130			
1,3-Dichlorobenzene	8.74	0.20	ug/L	10.0		87.4	80-120			
1,4-Dichlorobenzene	8.82	0.20	ug/L	10.0		88.2	80-120			
n-Butylbenzene	9.41	0.20	ug/L	10.0		94.1	74-129			
1,2-Dichlorobenzene	8.35	0.20	ug/L	10.0		83.5	80-120			
1,2-Dibromo-3-chloropropane	9.06	0.50	ug/L	10.0		90.6	62-123			
1,2,4-Trichlorobenzene	10.1	0.50	ug/L	10.0		101	64-124			
Hexachloro-1,3-Butadiene	17.3	0.50	ug/L	10.0		173	58-123			*, Q
Naphthalene	8.50	0.50	ug/L	10.0		85.0	50-134			
1,2,3-Trichlorobenzene	9.86	0.50	ug/L	10.0		98.6	49-133			
Dichlorodifluoromethane	10.2	0.20	ug/L	10.0		102	48-147			
Methyl tert-butyl Ether	8.51	0.50	ug/L	10.0		85.1	71-132			
2-Pentanone	39.1	5.00	ug/L	50.0		78.3	69-134			Q
<i>Surrogate: 1,2-Dichloroethane-d4</i>										
		5.08	ug/L	5.00		102	80-129			
<i>Surrogate: Toluene-d8</i>										
		4.85	ug/L	5.00		97.0	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>										
		5.81	ug/L	5.00		116	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>										
		4.83	ug/L	5.00		96.6	80-120			

LCS Dup (BF10441-BSD1)										
					Prepared: 20-Sep-2017	Analyzed: 20-Sep-2017 09:37				
Chloromethane	11.4	0.50	ug/L	10.0		114	60-138	3.60	30	
Vinyl Chloride	10.7	0.20	ug/L	10.0		107	66-133	2.01	30	
Bromomethane	10.1	1.00	ug/L	10.0		101	72-131	0.52	30	
Chloroethane	10.3	0.20	ug/L	10.0		103	60-155	2.34	30	
Trichlorofluoromethane	12.4	0.20	ug/L	10.0		124	80-129	0.90	30	Q
Acrolein	59.9	5.00	ug/L	50.0		120	52-144	9.75	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.5	0.20	ug/L	10.0		105	76-129	1.88	30	
Acetone	50.7	5.00	ug/L	50.0		101	58-142	10.80	30	
1,1-Dichloroethene	11.2	0.20	ug/L	10.0		112	69-135	2.10	30	
Bromoethane	10.6	0.20	ug/L	10.0		106	78-128	0.95	30	
Iodomethane	10.1	1.00	ug/L	10.0		101	56-147	7.17	30	
Methylene Chloride	8.86	1.00	ug/L	10.0		88.6	65-135	1.06	30	
Acrylonitrile	9.58	1.00	ug/L	10.0		95.8	64-134	5.36	30	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Volatile Organic Compounds - Quality Control

Batch BF10441 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BF10441-BSD1)										
					Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 09:37					
Carbon Disulfide	8.86	0.20	ug/L	10.0		88.6	78-125	0.28	30	
trans-1,2-Dichloroethene	8.82	0.20	ug/L	10.0		88.2	78-128	1.66	30	
Vinyl Acetate	10.1	0.20	ug/L	10.0		101	55-138	5.89	30	
1,1-Dichloroethane	10.4	0.20	ug/L	10.0		104	76-124	2.18	30	
2-Butanone	44.2	5.00	ug/L	50.0		88.5	61-140	6.77	30	
2,2-Dichloropropane	11.5	0.20	ug/L	10.0		115	78-125	0.43	30	
cis-1,2-Dichloroethene	8.78	0.20	ug/L	10.0		87.8	80-121	4.52	30	
Chloroform	9.30	0.20	ug/L	10.0		93.0	80-122	0.32	30	
Bromochloromethane	9.45	0.20	ug/L	10.0		94.5	80-121	3.42	30	
1,1,1-Trichloroethane	11.3	0.20	ug/L	10.0		113	79-123	0.40	30	
1,1-Dichloropropene	10.5	0.20	ug/L	10.0		105	80-120	2.12	30	
Carbon tetrachloride	13.4	0.20	ug/L	10.0		134	53-137	3.86	30	Q
1,2-Dichloroethane	13.4	0.20	ug/L	10.0		134	75-123	10.90	30	*
Benzene	9.50	0.20	ug/L	10.0		95.0	80-120	6.09	30	
Trichloroethene	10.7	0.20	ug/L	10.0		107	80-120	0.81	30	
1,2-Dichloropropane	10.5	0.20	ug/L	10.0		105	80-120	4.12	30	
Bromodichloromethane	10.6	0.20	ug/L	10.0		106	80-121	8.32	30	
Dibromomethane	10.1	0.20	ug/L	10.0		101	80-120	9.24	30	
2-Chloroethyl vinyl ether	10.1	1.00	ug/L	10.0		101	74-127	8.05	30	
4-Methyl-2-Pentanone	52.6	5.00	ug/L	50.0		105	67-133	10.20	30	
cis-1,3-Dichloropropene	10.0	0.20	ug/L	10.0		100	80-124	6.55	30	
Toluene	10.1	0.20	ug/L	10.0		101	80-120	3.48	30	
trans-1,3-Dichloropropene	10.8	0.20	ug/L	10.0		108	71-127	10.80	30	
2-Hexanone	46.5	5.00	ug/L	50.0		93.0	69-133	9.19	30	
1,1,2-Trichloroethane	9.85	0.20	ug/L	10.0		98.5	80-121	9.86	30	
1,3-Dichloropropane	8.57	0.20	ug/L	10.0		85.7	80-120	4.54	30	
Tetrachloroethene	10.7	0.20	ug/L	10.0		107	80-120	1.87	30	
Dibromochloromethane	10.1	0.20	ug/L	10.0		101	65-135	6.81	30	
1,2-Dibromoethane	10.3	0.20	ug/L	10.0		103	80-121	6.08	30	
Chlorobenzene	9.81	0.20	ug/L	10.0		98.1	80-120	3.20	30	
Ethylbenzene	9.62	0.20	ug/L	10.0		96.2	80-120	2.33	30	
1,1,1,2-Tetrachloroethane	10.9	0.20	ug/L	10.0		109	80-120	3.47	30	
m,p-Xylene	19.5	0.40	ug/L	20.0		97.5	80-121	0.93	30	
o-Xylene	9.63	0.20	ug/L	10.0		96.3	80-121	0.65	30	
Xylenes, total	29.1	0.60	ug/L	30.0		97.1	76-127	0.41	30	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Volatile Organic Compounds - Quality Control

Batch BFI0441 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 09:37										
LCS Dup (BFI0441-bsd1)										
Styrene	9.94	0.20	ug/L	10.0		99.4	80-124	5.44	30	
Bromoform	10.1	0.20	ug/L	10.0		101	51-134	11.30	30	
1,1,2,2-Tetrachloroethane	7.54	0.20	ug/L	10.0		75.4	77-123	12.00	30	*, Q
1,2,3-Trichloropropane	8.34	0.50	ug/L	10.0		83.4	76-125	0.42	30	
trans-1,4-Dichloro 2-Butene	9.58	1.00	ug/L	10.0		95.8	55-129	8.04	30	
n-Propylbenzene	9.27	0.20	ug/L	10.0		92.7	78-130	3.85	30	
Bromobenzene	9.24	0.20	ug/L	10.0		92.4	80-120	5.24	30	
Isopropyl Benzene	9.44	0.20	ug/L	10.0		94.4	80-128	5.80	30	
2-Chlorotoluene	9.43	0.20	ug/L	10.0		94.3	78-122	5.54	30	
4-Chlorotoluene	9.28	0.20	ug/L	10.0		92.8	80-121	5.86	30	
t-Butylbenzene	10.1	0.20	ug/L	10.0		101	78-125	5.38	30	
1,3,5-Trimethylbenzene	9.69	0.20	ug/L	10.0		96.9	80-129	4.98	30	
1,2,4-Trimethylbenzene	9.87	0.20	ug/L	10.0		98.7	80-127	6.53	30	
s-Butylbenzene	9.90	0.20	ug/L	10.0		99.0	78-129	5.01	30	
4-Isopropyl Toluene	10.5	0.20	ug/L	10.0		105	79-130	7.03	30	
1,3-Dichlorobenzene	9.31	0.20	ug/L	10.0		93.1	80-120	6.31	30	
1,4-Dichlorobenzene	9.34	0.20	ug/L	10.0		93.4	80-120	5.78	30	
n-Butylbenzene	9.65	0.20	ug/L	10.0		96.5	74-129	2.53	30	
1,2-Dichlorobenzene	9.16	0.20	ug/L	10.0		91.6	80-120	9.29	30	
1,2-Dibromo-3-chloropropane	10.6	0.50	ug/L	10.0		106	62-123	15.50	30	
1,2,4-Trichlorobenzene	11.6	0.50	ug/L	10.0		116	64-124	13.70	30	
Hexachloro-1,3-Butadiene	17.9	0.50	ug/L	10.0		179	58-123	3.60	30	*, Q
Naphthalene	9.58	0.50	ug/L	10.0		95.8	50-134	11.90	30	
1,2,3-Trichlorobenzene	12.5	0.50	ug/L	10.0		125	49-133	23.80	30	
Dichlorodifluoromethane	9.93	0.20	ug/L	10.0		99.3	48-147	2.36	30	
Methyl tert-butyl Ether	9.08	0.50	ug/L	10.0		90.8	71-132	6.49	30	
2-Pentanone	41.6	5.00	ug/L	50.0		83.2	69-134	6.09	30	Q
Surrogate: 1,2-Dichloroethane-d4		5.44	ug/L	5.00		109	80-129			
Surrogate: Toluene-d8		4.80	ug/L	5.00		95.9	80-120			
Surrogate: 4-Bromofluorobenzene		5.83	ug/L	5.00		117	80-120			
Surrogate: 1,2-Dichlorobenzene-d4		4.82	ug/L	5.00		96.4	80-120			



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Volatile Organic Compounds - SIM - Quality Control

Batch BFI0415 - EPA 5030 (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0415-BLK1)				Prepared: 19-Sep-2017 Analyzed: 19-Sep-2017 14:12						
Vinyl chloride	ND	20.0	ng/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>		5880	ng/L	5000		118	80-129			
LCS (BFI0415-BS1)				Prepared: 19-Sep-2017 Analyzed: 19-Sep-2017 12:41						
Vinyl chloride	1710	20.0	ng/L	2000		85.7	76-120			
<i>Surrogate: 1,2-Dichloroethane-d4</i>		5620	ng/L	5000		112	80-129			
LCS Dup (BFI0415-BSD1)				Prepared: 19-Sep-2017 Analyzed: 19-Sep-2017 13:52						
Vinyl chloride	1850	20.0	ng/L	2000		92.7	76-120	7.88	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		5640	ng/L	5000		113	80-129			



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Metals and Metallic Compounds - Quality Control

Batch BFI0264 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0264-BLK1)		Prepared: 14-Sep-2017 Analyzed: 15-Sep-2017 13:20								
Calcium	ND	0.0500	mg/L							U
Potassium	ND	0.500	mg/L							U
Sodium	ND	0.500	mg/L							U
Sodium	ND	50.0	mg/L							U
LCS (BFI0264-BS1)		Prepared: 14-Sep-2017 Analyzed: 15-Sep-2017 14:01								
Calcium	10.2	0.0500	mg/L	10.0		102	80-120			
Potassium	10.2	0.500	mg/L	10.0		102	80-120			
Sodium	10.0	0.500	mg/L	10.0		100	80-120			
Sodium	ND	50.0	mg/L	10.0		106	80-120			U
Duplicate (BFI0264-DUP1)		Source: 17I0119-01		Prepared: 14-Sep-2017 Analyzed: 15-Sep-2017 13:48						
Calcium	11.4	0.0500	mg/L		11.0			3.35	20	
Potassium	0.569	0.500	mg/L		0.511			10.80	20	
Sodium	4.36	0.500	mg/L		4.23			3.04	20	
Sodium	ND	50.0	mg/L		4.63			5.01	20	U
Matrix Spike (BFI0264-MS1)		Source: 17I0119-01		Prepared: 14-Sep-2017 Analyzed: 15-Sep-2017 13:57						
Calcium	21.8	0.0500	mg/L	10.0	11.0	108	75-125			
Potassium	11.0	0.500	mg/L	10.0	0.511	105	75-125			
Sodium	14.8	0.500	mg/L	10.0	4.23	105	75-125			
Sodium	ND	50.0	mg/L	10.0	4.63	105	75-125			U

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFI0272 - WMN (No Prep)

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0272-BLK1)		Prepared: 14-Sep-2017 Analyzed: 22-Sep-2017 10:46								
Barium, Dissolved	ND	0.0030	mg/L							U
Manganese, Dissolved	ND	0.0010	mg/L							U
LCS (BFI0272-BS1)		Prepared: 14-Sep-2017 Analyzed: 22-Sep-2017 10:23								
Barium, Dissolved	2.10	0.0030	mg/L	2.00		105	80-120			
Manganese, Dissolved	0.496	0.0010	mg/L	0.500		99.2	80-120			



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 27-Sep-2017 12:18
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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFI0296 - RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x

Instrument: ICPMS1 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0296-BLK1)			Prepared: 15-Sep-2017 Analyzed: 25-Sep-2017 15:25								
Arsenic, Dissolved	75a	ND	0.0400	ug/L							U
LCS (BFI0296-BS1)			Prepared: 15-Sep-2017 Analyzed: 25-Sep-2017 15:43								
Arsenic, Dissolved	75a	5.23	0.0400	ug/L	5.00		105	80-120			
Duplicate (BFI0296-DUP1)			Source: 17I0119-07		Prepared: 15-Sep-2017 Analyzed: 25-Sep-2017 15:29						
Arsenic, Dissolved	75a	0.107	0.0400	ug/L		0.0992			7.57	20	
Matrix Spike (BFI0296-MS1)			Source: 17I0119-07		Prepared: 15-Sep-2017 Analyzed: 25-Sep-2017 15:38						
Arsenic, Dissolved	75a	4.83	0.0400	ug/L	5.00	0.0992	94.6	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Environmental Partners, Inc.
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Reported:
27-Sep-2017 12:18

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFI0301 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0301-BLK1)			Prepared: 15-Sep-2017 Analyzed: 22-Sep-2017 17:00								
Iron, Dissolved	54	ND	20.0	ug/L							U
Iron, Dissolved	57	ND	20.0	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFI0301-BS1)			Prepared: 15-Sep-2017 Analyzed: 22-Sep-2017 16:16								
Iron, Dissolved	54	4980	20.0	ug/L	5000		99.5	80-120			
Iron, Dissolved	57	5000	20.0	ug/L	5000		99.9	80-120			
Zinc, Dissolved	66	82.8	4.00	ug/L	80.0		104	80-120			
Zinc, Dissolved	67	80.9	4.00	ug/L	80.0		101	80-120			



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Reported:
27-Sep-2017 12:18

Wet Chemistry - Quality Control

Batch BFI0240 - No Prep Wet Chem

Instrument: LCHAT1 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0240-BLK1)					Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 13:51					
Sulfate	ND	2.00	mg/L							U
LCS (BFI0240-BS1)					Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 13:52					
Sulfate	14.9	2.00	mg/L	15.0		99.6	90-110			



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Reported:
27-Sep-2017 12:18

Wet Chemistry - Quality Control

Batch BFI0245 - No Prep Wet Chem

Instrument: Accumet AR60 Analyst: U

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFI0245-BS1)					Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 11:25					
pH	6.99	0.01	pH Units	7.00		99.9	0-200			
Duplicate (BFI0245-DUP1)					Source: 17I0119-01 Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 11:25					
pH	6.40	0.01	pH Units		6.40			0.00		H



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
27-Sep-2017 12:18

Wet Chemistry - Quality Control

Batch BFI0246 - No Prep Wet Chem

Instrument: Accumet AR60 Analyst: U

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0246-BLK1)		Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 11:25								
Alkalinity, Total	ND	1.00	mg/L CaCO3							U
Blank (BFI0246-BLK2)		Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 14:00								
Alkalinity, Total	ND	1.00	mg/L CaCO3							U
Reference (BFI0246-SRM1)		Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 14:00								
Alkalinity, Total	102	1.00	mg/L CaCO3	108		94.1	90.37-108.33			



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 27-Sep-2017 12:18
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Wet Chemistry - Quality Control

Batch BFI0251 - No Prep Wet Chem

Instrument: LCHAT2 Analyst: SK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0251-BLK1)						Prepared: 13-Sep-2017 Analyzed: 14-Sep-2017 17:07				
Nitrate + Nitrite as N	ND	0.010	mg-N/L							U
LCS (BFI0251-BS1)						Prepared: 13-Sep-2017 Analyzed: 14-Sep-2017 17:10				
Nitrate + Nitrite as N	0.487	0.010	mg-N/L	0.500		97.4	90-110			



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Project Number: 45405.0
Project Manager: Doug Kunkel

Reported:
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Wet Chemistry - Quality Control

Batch BFI0255 - No Prep Wet Chem

Instrument: LCHAT2 Analyst: RLM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0255-BLK1)					Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 16:25					
Nitrite-N	ND	0.010	mg-N/L							U
LCS (BFI0255-BS2)					Prepared: 13-Sep-2017 Analyzed: 13-Sep-2017 16:30					
Nitrite-N	0.494	0.010	mg-N/L	0.500		98.8	75-125			



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Reported:
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Wet Chemistry - Quality Control

Batch BFI0258 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: GM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0258-BLK1)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:36					
COD	ND	10.0	mg/L							U
Calibration Blank (BFI0258-BLK2)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:44					
COD	ND	10.0	mg/L							U
Calibration Blank (BFI0258-BLK3)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:47					
COD	ND	10.0	mg/L							U
Calibration Blank (BFI0258-BLK4)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:52					
COD	ND	10.0	mg/L							U
LCS (BFI0258-BS1)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:36					
COD	99.2	10.0	mg/L	100		99.2	90-110			
Calibration Check (BFI0258-BS2)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:45					
COD	101	10.0	mg/L	100		101	90-110			
Calibration Check (BFI0258-BS3)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:47					
COD	101	10.0	mg/L	100		101	90-110			
Calibration Check (BFI0258-BS4)										
					Prepared: 13-Sep-2017 Analyzed: 20-Sep-2017 18:52					
COD	101	10.0	mg/L	100		101	90-110			



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Wet Chemistry - Quality Control

Batch BFI0316 - No Prep Wet Chem

Instrument: LCHAT1 Analyst: UW

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0316-BLK1)					Prepared: 15-Sep-2017 Analyzed: 15-Sep-2017 15:45					
Chloride	ND	1.00	mg/L							U
LCS (BFI0316-BS1)					Prepared: 15-Sep-2017 Analyzed: 15-Sep-2017 15:46					
Chloride	5.15	1.00	mg/L	5.00		103	90-110			



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Reported:
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Wet Chemistry - Quality Control

Batch BFI0444 - No Prep Wet Chem

Instrument: TOC-LCSH Analyst: CDE

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0444-BLK1)		Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 17:54								
Total Organic Carbon	ND	0.50	mg/L							U
LCS (BFI0444-BS1)		Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 18:13								
Total Organic Carbon	19.4	0.50	mg/L	20.0		97.2	90-110			
Duplicate (BFI0444-DUP1)		Source: 17I0119-01		Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 18:56						
Total Organic Carbon	ND	0.50	mg/L		ND					U
Matrix Spike (BFI0444-MS1)		Source: 17I0119-01		Prepared: 20-Sep-2017 Analyzed: 20-Sep-2017 19:22						
Total Organic Carbon	19.8	0.50	mg/L	25.0	ND	79.0	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Wet Chemistry - Quality Control

Batch BFI0541 - No Prep Wet Chem

Instrument: LCHAT1 Analyst: SK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
NH3 Blank (BFI0541-BLK2)						Prepared: 22-Sep-2017 Analyzed: 22-Sep-2017 18:02				
Ammonia-N	ND	0.040	mg-N/L							U
LCS (BFI0541-BS1)						Prepared: 22-Sep-2017 Analyzed: 22-Sep-2017 17:41				
Ammonia-N	0.544	0.040	mg-N/L	0.500		109	90-110			



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Microbiology - Quality Control

Batch BFI0235 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFI0235-BLK1)						Prepared: 13-Sep-2017 Analyzed: 14-Sep-2017 09:30				
Total Coliforms	ND	1	CFU/100 ml							U



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Reported:
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Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
Nitrite-N	WADOE,NELAP,DoD-ELAP
EPA 375.2 in Water	
Sulfate	WADOE,NELAP
EPA 410.4 in Water	
COD	DoD-ELAP,NELAP,WADOE
EPA 6010C in Water	
Calcium	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Sodium	WADOE,NELAP,DoD-ELAP
Sodium-1	DoD-ELAP
Barium	WADOE,NELAP
Manganese	WADOE,NELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260C-SIM in Water

Acrylonitrile	NELAP,CALAP,WADOE
Vinyl chloride	NELAP,CALAP,WADOE
1,1-Dichloroethene	NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	NELAP,CALAP,WADOE
Trichloroethene	NELAP,CALAP,WADOE
Tetrachloroethene	NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,CALAP,WADOE
1,2-Dichloroethane	NELAP,CALAP,WADOE
Benzene	NELAP,CALAP,WADOE

EPA 9060A in Water

Total Organic Carbon	DoD-ELAP,WADOE,NELAP
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SM 2320 B-97 in Water

Alkalinity, Bicarbonate	NELAP,WADOE,WA-DW,DoD-ELAP
Alkalinity, Carbonate	WADOE,WA-DW,DoD-ELAP,NELAP



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: 45405.0 Project Manager: Doug Kunkel	Reported: 27-Sep-2017 12:18
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Alkalinity, Hydroxide WADOE,WA-DW,DoD-ELAP,NELAP
Alkalinity, Total DoD-ELAP,WADOE,WA-DW,NELAP

SM 4500-H+ B-00 in Water

pH WADOE,NELAP

SM 4500-NH3 H-97 in Water

Ammonia-N WADOE,DoD-ELAP,NELAP

SM 9222B in Water

Total Coliforms WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	09/01/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



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Reported:
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Notes and Definitions

- U This analyte is not detected above the applicable reporting or detection limit.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- J Estimated concentration value detected below the reporting limit.
- H Hold time violation - Hold time was exceeded.
- D The reported value is from a dilution
- * Flagged value is not within established control limits.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

Attachment 1D
December 2017 Analytical Data Sheets



11 January 2018

Doug Kunkel
Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah, WA 98027

RE: Olalla Landfill

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
17L0359

Associated SDG ID(s)
N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number: 17L0359	Turn-around Requested: Standard	Page: 1 of 1
ABI Client Company: Environmental Partners, Inc.	Phone: 425-395-0010	Date: 12/20/17
Client Contact: Doug Kunkel		Ice Present?
Client Project Name: Olalla Landfill		No. of Coolers:
Client Project #: 45405.0	Samplers: Eric Caddey 425-281-3629	Cooler Temps:

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments		
					VOCs	Vinyl chloride	Dist. Metals	Total metals	Chemistry - Ni, Mn, Zn, Pb, Cd, Cr, Co, Cu, Fe, Ni, Pb, Zn, Ag, Hg, Se, As, Sb, Bi, Mo, Sn, Ti, V, W, Y, Zr, Ba, Sr, Ba, Sr, Ca, Mg, Na, K, Li, Rb, Cs, Fr, Be, B, Al, Ga, In, Tl, Sn, Pb, Bi, Po, At, Rn, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, Lr	pH	CO2/TOC	Total Coliform		WTRate - Ni, Trogan	Focal Coliform
MW-1-12/17	12/19/17	09:44	water	10	X	X	X	X	X	X	X	X	X		
MW-5A-12/17		10:42	water	4		X	X				X				
MW-3-12/17		11:50	water	10	X	X	X	X	X	X	X	X	X		
MW-10-12/17		12:45	water	10	X	X	X	X	X	X	X	X	X		
MW-6-12/17		13:28	water	10	X	X	X	X	X	X	X	X	X		
MW-8-12/17		14:15	water	10	X	X	X	X	X	X	X	X	X		
MW-7-12/17		14:55	water	4		X	X				X				
MW-13-12/17		—	water	10	X	X	X	X	X	X	X	X	X		
Trip blank		—	water	3	X										
SW-2-12/17		08:25	water	3							X		X	X	

Comments/Special Instructions	Relinquished by: (Signature) [Signature]	Received by: (Signature) [Signature]	Relinquished by: (Signature) [Signature]	Received by: (Signature) [Signature]
	Printed Name: Eric Caddey	Printed Name: Brandon Fisk	Printed Name:	Printed Name:
	Company: EPI	Company: ARI	Company:	Company:
	Date & Time: 12/20/17 0805	Date & Time: 12/20/17 805	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Environmental Partners Inc

Project Name: Olalla

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 17L0359

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)
Time: 2.5 2.4

If cooler temperature is out of compliance fill out form 00070F
Temp Gun ID#: P002565

Cooler Accepted by: BF Date: BF 12/20/17 Time: 805

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? NA YES NO

Date VOC Trip Blank was made at ARI: NA

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: BF Date: 12/20/17 Time: 835

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

MW-7 - sample labels missing sample times
1 TB and had a pb
BF

By: BF Date: 12/20/17

Small Air Bubbles - 2mm 	Peabubbles 2-4 mm 	LARGE Air Bubbles > 4 mm 	Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)



WORK ORDER

17L0359

Client: Environmental Partners, Inc.	Project Manager: Kelly Bottem
Project: Olalla Landfill	Project Number: [none]

Analysis groups included in this work order

Nitrate-N Calc EPA 353.2

Nitrite-N, EPA 353.2

Nitrate + Nitrite-N, EPA 35



WORK ORDER

17L0359

Client: Environmental Partners, Inc.	Project Manager: Kelly Bottom
Project: Olalla Landfill	Project Number: [none]

17L0359-06 H	Glass NM, Amber, 250 mL, 9N H2SO4	< 2	P
17L0359-06 I	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	P
17L0359-07 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	P
17L0359-08 A	VOA Vial, Clear, 40 mL, HCL		
17L0359-08 B	VOA Vial, Clear, 40 mL, HCL		
17L0359-08 C	VOA Vial, Clear, 40 mL, HCL		
17L0359-08 D	VOA Vial, Clear, 40 mL, HCL		
17L0359-08 E	VOA Vial, Clear, 40 mL, HCL		
17L0359-08 F	Miscellaneous Container		
17L0359-08 G	Small OJ, 500 mL		
17L0359-08 H	Glass NM, Amber, 250 mL, 9N H2SO4	< 2	P
17L0359-08 I	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	P
17L0359-09 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	P
17L0359-10 A	VOA Vial, Clear, 40 mL, HCL		
17L0359-10 B	VOA Vial, Clear, 40 mL, HCL		
17L0359-10 C	VOA Vial, Clear, 40 mL, HCL		
17L0359-10 D	VOA Vial, Clear, 40 mL, HCL		
17L0359-10 E	VOA Vial, Clear, 40 mL, HCL		
17L0359-10 F	Miscellaneous Container		
17L0359-10 G	Small OJ, 500 mL		
17L0359-10 H	Glass NM, Amber, 250 mL, 9N H2SO4	< 2	P
17L0359-10 I	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	P
17L0359-11 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	P
17L0359-12 A	VOA Vial, Clear, 40 mL, HCL		
17L0359-12 B	VOA Vial, Clear, 40 mL, HCL		
17L0359-12 C	Small OJ, 500 mL		
17L0359-12 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	P
17L0359-13 A	VOA Vial, Clear, 40 mL, HCL		
17L0359-13 B	VOA Vial, Clear, 40 mL, HCL		
17L0359-13 C	VOA Vial, Clear, 40 mL, HCL		
17L0359-13 D	VOA Vial, Clear, 40 mL, HCL		
17L0359-13 E	VOA Vial, Clear, 40 mL, HCL		
17L0359-13 F	Miscellaneous Container		
17L0359-13 G	Small OJ, 500 mL		



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1-12/17	17L0359-01	Water	19-Dec-2017 09:44	20-Dec-2017 08:05
MW-1-12/17	17L0359-02	Water	19-Dec-2017 09:44	20-Dec-2017 08:05
MW-5A-12/17	17L0359-03	Water	19-Dec-2017 10:42	20-Dec-2017 08:05
MW-3-12/17	17L0359-04	Water	19-Dec-2017 11:50	20-Dec-2017 08:05
MW-3-12/17	17L0359-05	Water	19-Dec-2017 11:50	20-Dec-2017 08:05
MW-10-12/17	17L0359-06	Water	19-Dec-2017 12:45	20-Dec-2017 08:05
MW-10-12/17	17L0359-07	Water	19-Dec-2017 12:45	20-Dec-2017 08:05
MW-6-12/17	17L0359-08	Water	19-Dec-2017 13:28	20-Dec-2017 08:05
MW-6-12/17	17L0359-09	Water	19-Dec-2017 13:28	20-Dec-2017 08:05
MW-8-12/17	17L0359-10	Water	19-Dec-2017 14:15	20-Dec-2017 08:05
MW-8-12/17	17L0359-11	Water	19-Dec-2017 14:15	20-Dec-2017 08:05
MW-7-12/17	17L0359-12	Water	19-Dec-2017 14:55	20-Dec-2017 08:05
MW-13-12/17	17L0359-13	Water	19-Dec-2017 00:00	20-Dec-2017 08:05
MW-13-12/17	17L0359-14	Water	19-Dec-2017 00:00	20-Dec-2017 08:05
Trip Blanks	17L0359-15	Water	19-Dec-2017 00:00	20-Dec-2017 08:05
SW-2-12/17	17L0359-16	Water	19-Dec-2017 08:25	20-Dec-2017 08:05



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of 1,2-Dibromo-3-Chloropropane, 1,2,4-Trichlorobenzene and 1,2,3-Trichlorobenzene which were out of control low. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits with the exception of 1,2,3-Trichlorobenzene RPD which was out of control high.

Volatiles - EPA Method 8260C-SIM (Selected Ion Monitoring)

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Total Metals - EPA Method 6010C

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



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Project Manager: Doug Kunkel

Reported:
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Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times with the exception of pH and Total Coliform which were outside of recommended holding time upon sample receipt.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

MW-1-12/17
17L0359-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 09:44
Analyzed: 20-Dec-2017 17:51

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0507 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

MW-1-12/17
17L0359-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 09:44
Analyzed: 20-Dec-2017 17:51

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

MW-1-12/17
17L0359-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 09:44
Analyzed: 20-Dec-2017 17:51

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	110	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	94.1	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	100	%	



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Reported:
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MW-1-12/17
17L0359-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 09:44
Analyzed: 20-Dec-2017 17:54

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	ND	ng/L	U
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	ND	ng/L	U
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	95.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	101	%	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-1-12/17
17L0359-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 12/19/2017 09:44
Instrument: ICPMS2 Analyzed: 02-Jan-2018 15:47

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-1-12/17
17L0359-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 09:44
Analyzed: 02-Jan-2018 18:09

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.116	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



Environmental Partners, Inc.
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Project Number: [none]
Project Manager: Doug Kunkel

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MW-1-12/17
17L0359-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 09:44
Analyzed: 04-Jan-2018 14:43

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0033	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-1-12/17
17L0359-01 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 12/19/2017 09:44
Analyzed: 20-Dec-2017 12:05

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 20-Dec-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	2	0.0300	1.50	mg/L	

Instrument: LCHAT2

Analyzed: 20-Dec-2017 11:41

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502
Prepared: 20-Dec-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-1-12/17
17L0359-01 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 12/19/2017 09:44
Analyzed: 27-Dec-2017 10:12

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0585 Sample Size: 2 mL
Prepared: 26-Dec-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

1
17L0359-01 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 12/19/2017 09:44
Analyzed: 21-Dec-2017 15:45

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0521 Sample Size: 20 mL
Prepared: 20-Dec-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	ND	mg/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-1-12/17
17L0359-01 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/19/2017 09:44

Instrument: Accumet AR60

Analyzed: 20-Dec-2017 16:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0517 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	46.0	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	46.0	mg/L CaCO3	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-1-12/17
17L0359-01 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 09:44
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.38	pH Units	H



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MW-1-12/17
17L0359-01 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 12/19/2017 09:44
Analyzed: 30-Dec-2017 12:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0653 Sample Size: 10 mL
Prepared: 29-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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MW-1-12/17
17L0359-01 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 12/19/2017 09:44
Analyzed: 21-Dec-2017 11:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0498 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-1-12/17
17L0359-01RE1 (Water)

Wet Chemistry

Method: EPA 325.2
Instrument: LCHAT1

Sampled: 12/19/2017 09:44
Analyzed: 21-Dec-2017 14:53

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	3.00	mg/L	



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MW-1-12/17
17L0359-01RE1 (Water)

Wet Chemistry

Method: EPA 353.2 Sampled: 12/19/2017 09:44
Instrument: LCHAT2 Analyzed: 20-Dec-2017 12:05

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		2	0.020	1.50	mg-N/L	D



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MW-1-12/17
17L0359-01RE1 (Water)

Wet Chemistry

Method: EPA 375.2 Sampled: 12/19/2017 09:44
Instrument: LCHAT1 Analyzed: 21-Dec-2017 14:53

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	3.96	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-1-12/17
17L0359-02 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 09:44
Analyzed: 22-Dec-2017 16:03

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFL0524 Sample Size: 25 mL
Prepared: 21-Dec-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	9.89	mg/L	
Potassium	7440-09-7	1	0.500	0.520	mg/L	
Sodium	7440-23-5	1	0.500	3.80	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-5A-12/17
17L0359-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 10:42
Analyzed: 20-Dec-2017 18:15

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	ND	ng/L	U
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	ND	ng/L	U
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	101	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.0	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	101	%	



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MW-5A-12/17
17L0359-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 12/19/2017 10:42
Instrument: ICPMS2 Analyzed: 02-Jan-2018 15:51

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-5A-12/17
17L0359-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 10:42
Analyzed: 02-Jan-2018 17:39

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.197	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-5A-12/17
17L0359-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 10:42
Analyzed: 04-Jan-2018 14:47

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0032	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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MW-5A-12/17
17L0359-03 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 10:42
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.40	pH Units	H



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 11:50
Analyzed: 20-Dec-2017 18:16

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0507 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 11:50
Analyzed: 20-Dec-2017 18:16

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 11:50
Analyzed: 20-Dec-2017 18:16

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	110	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	97.3	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	94.4	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	100	%	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 11:50
Analyzed: 20-Dec-2017 18:35

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	204	ng/L	
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	ND	ng/L	U
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	95.2	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	100	%	



Environmental Partners, Inc.
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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 12/19/2017 11:50
Analyzed: 02-Jan-2018 15:56

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 11:50
Analyzed: 02-Jan-2018 17:44

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.125	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 11:50
Analyzed: 04-Jan-2018 14:52

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0191	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	7.65	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-3-12/17
17L0359-04 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 12/19/2017 11:50

Instrument: LCHAT1

Analyzed: 21-Dec-2017 14:27

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.88	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-3-12/17
17L0359-04 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 12/19/2017 11:50
Analyzed: 20-Dec-2017 11:46

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 20-Dec-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LCHAT2

Analyzed: 20-Dec-2017 11:46

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502
Prepared: 20-Dec-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 12/19/2017 11:50
Analyzed: 21-Dec-2017 14:27

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	23.8	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-3-12/17
17L0359-04 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 12/19/2017 11:50
Analyzed: 27-Dec-2017 10:12

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0585 Sample Size: 2 mL
Prepared: 26-Dec-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	11.6	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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1
17L0359-04 (Water)

Wet Chemistry

Method: EPA 9060A
Instrument: TOC-LCSH

Sampled: 12/19/2017 11:50
Analyzed: 21-Dec-2017 16:03

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0521 Sample Size: 20 mL
Prepared: 20-Dec-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	3.56	mg/L	



Environmental Partners, Inc.
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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-04 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/19/2017 11:50

Instrument: Accumet AR60

Analyzed: 20-Dec-2017 16:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0517
Prepared: 20-Dec-2017

Sample Size: 100 mL
Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	265	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	265	mg/L CaCO3	



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MW-3-12/17
17L0359-04 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 11:50
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.27	pH Units	H



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MW-3-12/17
17L0359-04 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 12/19/2017 11:50
Analyzed: 30-Dec-2017 12:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0653 Sample Size: 10 mL
Prepared: 29-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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MW-3-12/17
17L0359-04 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 12/19/2017 11:50
Analyzed: 21-Dec-2017 11:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0498 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-3-12/17
17L0359-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 11:50
Analyzed: 22-Dec-2017 16:07

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFL0524 Sample Size: 25 mL
Prepared: 21-Dec-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	56.5	mg/L	
Potassium	7440-09-7	1	0.500	0.835	mg/L	
Sodium	7440-23-5	1	0.500	10.3	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-10-12/17
17L0359-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 12:45
Analyzed: 20-Dec-2017 18:42

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0507 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



Environmental Partners, Inc.
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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-10-12/17
17L0359-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 12:45
Analyzed: 20-Dec-2017 18:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-10-12/17
17L0359-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 12:45
Analyzed: 20-Dec-2017 18:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	109	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	97.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	93.5	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	102	%	



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Project Manager: Doug Kunkel

Reported:
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MW-10-12/17
17L0359-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 12:45
Analyzed: 20-Dec-2017 18:55

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	ND	ng/L	U
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	ND	ng/L	U
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	95.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	102	%	



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MW-10-12/17
17L0359-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 12/19/2017 12:45
Instrument: ICPMS2 Analyzed: 02-Jan-2018 16:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-10-12/17
17L0359-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 12:45
Analyzed: 02-Jan-2018 17:49

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.55	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-10-12/17
17L0359-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 12:45
Analyzed: 04-Jan-2018 14:56

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0148	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	4.47	mg/L	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

MW-10-12/17
17L0359-06 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 12/19/2017 12:45
Analyzed: 20-Dec-2017 11:59

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 20-Dec-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT2

Analyzed: 20-Dec-2017 11:59

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502
Prepared: 20-Dec-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-10-12/17
17L0359-06 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 12/19/2017 12:45
Analyzed: 21-Dec-2017 14:28

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	6.02	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-10-12/17
17L0359-06 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 12/19/2017 12:45
Analyzed: 27-Dec-2017 10:13

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0585 Sample Size: 2 mL
Prepared: 26-Dec-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.7	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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1
17L0359-06 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 12/19/2017 12:45

Instrument: TOC-LCSH

Analyzed: 21-Dec-2017 17:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0521 Sample Size: 20 mL
Prepared: 20-Dec-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	3.46	mg/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-10-12/17
17L0359-06 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/19/2017 12:45

Instrument: Accumet AR60

Analyzed: 20-Dec-2017 16:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0517
Prepared: 20-Dec-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	199	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	199	mg/L CaCO3	



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MW-10-12/17
17L0359-06 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 12:45
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.46	pH Units	H



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MW-10-12/17
17L0359-06 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 12/19/2017 12:45
Analyzed: 30-Dec-2017 12:16

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0653 Sample Size: 10 mL
Prepared: 29-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.085	mg-N/L	



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MW-10-12/17
17L0359-06 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 12/19/2017 12:45
Analyzed: 21-Dec-2017 11:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0498 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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MW-10-12/17
17L0359-06RE1 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 12/19/2017 12:45

Instrument: LCHAT1

Analyzed: 21-Dec-2017 14:56

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	2	2.00	14.8	mg/L	D



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Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-10-12/17
17L0359-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 12:45
Analyzed: 22-Dec-2017 16:12

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFL0524 Sample Size: 25 mL
Prepared: 21-Dec-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	39.7	mg/L	
Potassium	7440-09-7	1	0.500	1.04	mg/L	
Sodium	7440-23-5	1	0.500	8.13	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-6-12/17
17L0359-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 13:28
Analyzed: 20-Dec-2017 19:07

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0507 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-6-12/17
17L0359-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 13:28
Analyzed: 20-Dec-2017 19:07

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	2.28	ug/L	
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Project Manager: Doug Kunkel

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MW-6-12/17
17L0359-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 13:28
Analyzed: 20-Dec-2017 19:07

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.2	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	93.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	97.7	%	



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Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-6-12/17
17L0359-08 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 13:28
Analyzed: 20-Dec-2017 19:15

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	33.0	ng/L	
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	ND	ng/L	U
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	71.6	ng/L	
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	106	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	96.0	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	101	%	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

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MW-6-12/17
17L0359-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 12/19/2017 13:28
Analyzed: 02-Jan-2018 16:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	978	ug/L	



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Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-6-12/17
17L0359-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 13:28
Analyzed: 02-Jan-2018 17:53

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.18	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Project Number: [none]
Project Manager: Doug Kunkel

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MW-6-12/17
17L0359-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 13:28
Analyzed: 04-Jan-2018 15:00

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0121	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.731	mg/L	



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MW-6-12/17
17L0359-08 (Water)

Wet Chemistry

Method: EPA 325.2 Sampled: 12/19/2017 13:28
Instrument: LCHAT1 Analyzed: 21-Dec-2017 14:29

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	4.57	mg/L	



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MW-6-12/17
17L0359-08 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 12/19/2017 13:28
Analyzed: 20-Dec-2017 12:01

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 20-Dec-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LCHAT2 Analyzed: 20-Dec-2017 12:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502
Prepared: 20-Dec-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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Project Manager: Doug Kunkel

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MW-6-12/17
17L0359-08 (Water)

Wet Chemistry

Method: EPA 375.2
Instrument: LCHAT1

Sampled: 12/19/2017 13:28
Analyzed: 21-Dec-2017 14:29

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	5.78	mg/L	



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MW-6-12/17
17L0359-08 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 12/19/2017 13:28
Analyzed: 27-Dec-2017 10:13

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0585 Sample Size: 2 mL
Prepared: 26-Dec-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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17L0359-08 (Water)

Wet Chemistry

Method: EPA 9060A Sampled: 12/19/2017 13:28
Instrument: TOC-LCSH Analyzed: 21-Dec-2017 17:28

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0521 Sample Size: 20 mL
Prepared: 20-Dec-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	1.91	mg/L	



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MW-6-12/17
17L0359-08 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/19/2017 13:28

Instrument: Accumet AR60

Analyzed: 20-Dec-2017 16:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0517
Prepared: 20-Dec-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	156	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	156	mg/L CaCO3	



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MW-6-12/17
17L0359-08 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 13:28
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.49	pH Units	H



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MW-6-12/17
17L0359-08 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 12/19/2017 13:28
Analyzed: 30-Dec-2017 12:17

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0653
Prepared: 29-Dec-2017

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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MW-6-12/17
17L0359-08 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 12/19/2017 13:28
Analyzed: 21-Dec-2017 11:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0498 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-6-12/17
17L0359-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 13:28
Analyzed: 22-Dec-2017 16:16

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFL0524 Sample Size: 25 mL
Prepared: 21-Dec-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	31.5	mg/L	
Potassium	7440-09-7	1	0.500	1.10	mg/L	
Sodium	7440-23-5	1	0.500	6.18	mg/L	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-8-12/17
17L0359-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 14:15
Analyzed: 20-Dec-2017 19:32

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0507 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.52	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-8-12/17
17L0359-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 14:15
Analyzed: 20-Dec-2017 19:32

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-8-12/17
17L0359-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 14:15
Analyzed: 20-Dec-2017 19:32

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	108	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	95.2	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	102	%	



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Reported:
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MW-8-12/17
17L0359-10 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 14:15
Analyzed: 20-Dec-2017 19:36

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	63.1	ng/L	
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	637	ng/L	
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	62.8	ng/L	
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	96.1	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	101	%	



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MW-8-12/17
17L0359-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 Sampled: 12/19/2017 14:15
Instrument: ICPMS2 Analyzed: 02-Jan-2018 16:43

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	1460	ug/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-8-12/17
17L0359-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 14:15
Analyzed: 02-Jan-2018 17:58

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	2.38	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-8-12/17
17L0359-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 14:15
Analyzed: 04-Jan-2018 15:04

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0118	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	3.57	mg/L	



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MW-8-12/17
17L0359-10 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 12/19/2017 14:15

Instrument: LCHAT1

Analyzed: 21-Dec-2017 14:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	2.89	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-8-12/17
17L0359-10 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 12/19/2017 14:15
Analyzed: 20-Dec-2017 12:19

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 20-Dec-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.132	mg/L	

Instrument: LCHAT2

Analyzed: 20-Dec-2017 12:19

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502
Prepared: 20-Dec-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.133	mg-N/L	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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MW-8-12/17
17L0359-10 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/19/2017 14:15

Instrument: LCHAT1

Analyzed: 21-Dec-2017 14:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	5.41	mg/L	



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MW-8-12/17
17L0359-10 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 12/19/2017 14:15
Analyzed: 27-Dec-2017 10:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0585 Sample Size: 2 mL
Prepared: 26-Dec-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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17L0359-10 (Water)

Wet Chemistry

Method: EPA 9060A

Sampled: 12/19/2017 14:15

Instrument: TOC-LCSH

Analyzed: 21-Dec-2017 17:50

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0521 Sample Size: 20 mL
Prepared: 20-Dec-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	1.52	mg/L	



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MW-8-12/17
17L0359-10 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/19/2017 14:15

Instrument: Accumet AR60

Analyzed: 20-Dec-2017 16:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0517
Prepared: 20-Dec-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	179	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	179	mg/L CaCO3	



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MW-8-12/17
17L0359-10 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 14:15
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.55	pH Units	H



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MW-8-12/17
17L0359-10 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 12/19/2017 14:15
Analyzed: 30-Dec-2017 12:18

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0653 Sample Size: 10 mL
Prepared: 29-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	ND	mg-N/L	U



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MW-8-12/17
17L0359-10 (Water)

Microbiology

Method: SM 9222B
Instrument: N/A

Sampled: 12/19/2017 14:15
Analyzed: 21-Dec-2017 11:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0498 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-8-12/17
17L0359-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 14:15
Analyzed: 22-Dec-2017 16:24

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFL0524 Sample Size: 25 mL
Prepared: 21-Dec-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	33.6	mg/L	
Potassium	7440-09-7	1	0.500	1.00	mg/L	
Sodium	7440-23-5	1	0.500	8.93	mg/L	



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-7-12/17
17L0359-12 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 14:55
Analyzed: 20-Dec-2017 19:56

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	ND	ng/L	U
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	ND	ng/L	U
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	ND	ng/L	U
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			<i>80-129 %</i>	<i>108</i>	<i>%</i>	
<i>Surrogate: Toluene-d8</i>			<i>80-120 %</i>	<i>95.3</i>	<i>%</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>			<i>75-125 %</i>	<i>100</i>	<i>%</i>	



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MW-7-12/17
17L0359-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 12/19/2017 14:55
Analyzed: 02-Jan-2018 16:48

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-7-12/17
17L0359-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 14:55
Analyzed: 02-Jan-2018 18:38

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	0.347	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	ND	ug/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-7-12/17
17L0359-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 14:55
Analyzed: 04-Jan-2018 15:09

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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MW-7-12/17
17L0359-12 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 14:55
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.40	pH Units	H



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-13-12/17
17L0359-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 19:57

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0507 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-13-12/17
17L0359-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 19:57

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



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Project Number: [none]
Project Manager: Doug Kunkel

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MW-13-12/17
17L0359-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 19:57

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	111	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.1	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	94.8	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	97.9	%	



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MW-13-12/17
17L0359-13 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 20:16

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0518 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Acrylonitrile	107-13-1	1	50.0	ND	ng/L	U
Vinyl chloride	75-01-4	1	20.0	20.2	ng/L	
1,1-Dichloroethene	75-35-4	1	20.0	ND	ng/L	U
cis-1,2-Dichloroethene	156-59-2	1	20.0	ND	ng/L	U
trans-1,2-Dichloroethene	156-60-5	1	20.0	ND	ng/L	U
Trichloroethene	79-01-6	1	20.0	ND	ng/L	U
Tetrachloroethene	127-18-4	1	20.0	ND	ng/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	20.0	ND	ng/L	U
1,2-Dichloroethane	107-06-2	1	20.0	ND	ng/L	U
Benzene	71-43-2	1	20.0	ND	ng/L	U
Toluene	108-88-3	1	200	ND	ng/L	U
1,2-Dibromoethane	106-93-4	1	10.0	ND	ng/L	U
Ethylbenzene	100-41-4	1	200	ND	ng/L	U
m,p-Xylene	179601-23-1	1	400	ND	ng/L	U
o-Xylene	95-47-6	1	200	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	95.7	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	100	%	



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MW-13-12/17
17L0359-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8
Instrument: ICPMS2

Sampled: 12/19/2017 00:00
Analyzed: 02-Jan-2018 16:53

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	20.0	ND	ug/L	U



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

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MW-13-12/17
17L0359-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 12/19/2017 00:00
Analyzed: 02-Jan-2018 18:43

Sample Preparation: Preparation Method: RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x
Preparation Batch: BGA0002 Sample Size: 100 mL
Prepared: 02-Jan-2018 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0400	1.83	ug/L	

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGA0006 Sample Size: 25 mL
Prepared: 02-Jan-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Zinc, Dissolved	7440-66-6	1	4.00	4.93	ug/L	



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MW-13-12/17
17L0359-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 00:00
Analyzed: 04-Jan-2018 15:13

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGA0034
Prepared: 03-Jan-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.0030	0.0146	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	4.48	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-13-12/17
17L0359-13 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 12:21

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 20-Dec-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LCHAT2

Analyzed: 20-Dec-2017 12:21

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502
Prepared: 20-Dec-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



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MW-13-12/17
17L0359-13 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/19/2017 00:00

Instrument: LCHAT1

Analyzed: 21-Dec-2017 14:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	5.97	mg/L	



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MW-13-12/17
17L0359-13 (Water)

Wet Chemistry

Method: EPA 410.4
Instrument: UV1800-1

Sampled: 12/19/2017 00:00
Analyzed: 27-Dec-2017 10:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0585 Sample Size: 2 mL
Prepared: 26-Dec-2017 Final Volume: 2 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
COD		1	10.0	ND	mg/L	U



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17L0359-13 (Water)

Wet Chemistry

Method: EPA 9060A Sampled: 12/19/2017 00:00
Instrument: TOC-LCSH Analyzed: 21-Dec-2017 18:17

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0521 Sample Size: 20 mL
Prepared: 20-Dec-2017 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	3.47	mg/L	



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Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-13-12/17
17L0359-13 (Water)

Wet Chemistry

Method: SM 2320 B-97
Instrument: Accumet AR60

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 16:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0517
Prepared: 20-Dec-2017

Sample Size: 50 mL
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	203	mg/L CaCO3	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	203	mg/L CaCO3	



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MW-13-12/17
17L0359-13 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00 Sampled: 12/19/2017 00:00
Instrument: Accumet AR60 Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.53	pH Units	H



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MW-13-12/17
17L0359-13 (Water)

Wet Chemistry

Method: SM 4500-NH3 H-97
Instrument: LCHAT2

Sampled: 12/19/2017 00:00
Analyzed: 30-Dec-2017 12:20

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0653 Sample Size: 10 mL
Prepared: 29-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.082	mg-N/L	



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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MW-13-12/17
17L0359-13 (Water)

Microbiology

Method: SM 9222B Sampled: 12/19/2017 00:00
Instrument: N/A Analyzed: 21-Dec-2017 11:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0498 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Coliforms		1	1	ND	CFU/100 ml	H, U



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MW-13-12/17
17L0359-13RE1 (Water)

Wet Chemistry

Method: EPA 325.2

Sampled: 12/19/2017 00:00

Instrument: LCHAT1

Analyzed: 21-Dec-2017 14:57

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0542 Sample Size: 5 mL
Prepared: 21-Dec-2017 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	2	2.00	14.8	mg/L	D



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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MW-13-12/17
17L0359-14 (Water)

Metals and Metallic Compounds

Method: EPA 6010C
Instrument: ICP2

Sampled: 12/19/2017 00:00
Analyzed: 22-Dec-2017 16:20

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BFL0524 Sample Size: 25 mL
Prepared: 21-Dec-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Calcium	7440-70-2	1	0.0500	40.3	mg/L	
Potassium	7440-09-7	1	0.500	1.11	mg/L	
Sodium	7440-23-5	1	0.500	8.44	mg/L	



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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Trip Blanks
17L0359-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 20:23

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BFL0507 Sample Size: 10 mL
Prepared: 20-Dec-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Trip Blanks
17L0359-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 20:23

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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Trip Blanks
17L0359-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT3

Sampled: 12/19/2017 00:00
Analyzed: 20-Dec-2017 20:23

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	97.4	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	91.2	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	103	%	



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SW-2-12/17
17L0359-16 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC]

Sampled: 12/19/2017 08:25
Analyzed: 20-Dec-2017 12:04

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 20-Dec-2017 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LCHAT2 Analyzed: 20-Dec-2017 12:04

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0502
Prepared: 20-Dec-2017 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	ND	mg-N/L	U

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	ND	mg-N/L	U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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SW-2-12/17
17L0359-16 (Water)

Wet Chemistry

Method: SM 4500-H+ B-00
Instrument: Accumet AR60

Sampled: 12/19/2017 08:25
Analyzed: 20-Dec-2017 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0516 Sample Size: 50 mL
Prepared: 20-Dec-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
pH		1	0.01	6.50	pH Units	H



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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SW-2-12/17
17L0359-16 (Water)

Microbiology

Method: SM 9222D Sampled: 12/19/2017 08:25
Instrument: N/A Analyzed: 21-Dec-2017 11:50

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BFL0495 Sample Size: 100 mL
Prepared: 20-Dec-2017 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Fecal Coliforms		1	1	280	CFU/100 ml	H



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - Quality Control

Batch BFL0507 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0507-BLK1)										
Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 12:20										
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - Quality Control

Batch BFL0507 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0507-BLK1)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 12:20								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - Quality Control

Batch BFL0507 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0507-BLK1)										
Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 12:20										
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.24		ug/L	5.00		105	80-129			
Surrogate: Toluene-d8	4.99		ug/L	5.00		99.8	80-120			
Surrogate: 4-Bromofluorobenzene	4.76		ug/L	5.00		95.2	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.99		ug/L	5.00		99.8	80-120			

LCS (BFL0507-BS1)										
Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 10:13										
Chloromethane	10.7	0.50	ug/L	10.0		107	60-138			
Vinyl Chloride	10.6	0.20	ug/L	10.0		106	66-133			
Bromomethane	10.5	1.00	ug/L	10.0		105	72-131			
Chloroethane	9.63	0.20	ug/L	10.0		96.3	60-155			
Trichlorofluoromethane	10.8	0.20	ug/L	10.0		108	80-129			
Acrolein	47.0	5.00	ug/L	50.0		94.0	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.1	0.20	ug/L	10.0		101	76-129			
Acetone	46.7	5.00	ug/L	50.0		93.5	58-142			
1,1-Dichloroethene	10.3	0.20	ug/L	10.0		103	69-135			
Bromoethane	9.86	0.20	ug/L	10.0		98.6	78-128			
Iodomethane	9.90	1.00	ug/L	10.0		99.0	56-147			
Methylene Chloride	10.6	1.00	ug/L	10.0		106	65-135			
Acrylonitrile	9.16	1.00	ug/L	10.0		91.6	64-134			
Carbon Disulfide	10.5	0.20	ug/L	10.0		105	78-125			
trans-1,2-Dichloroethene	10.4	0.20	ug/L	10.0		104	78-128			
Vinyl Acetate	9.83	0.20	ug/L	10.0		98.3	55-138			
1,1-Dichloroethane	10.8	0.20	ug/L	10.0		108	76-124			
2-Butanone	47.8	5.00	ug/L	50.0		95.5	61-140			
2,2-Dichloropropane	11.0	0.20	ug/L	10.0		110	78-125			
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	80-121			
Chloroform	10.8	0.20	ug/L	10.0		108	80-122			
Bromochloromethane	10.2	0.20	ug/L	10.0		102	80-121			
1,1,1-Trichloroethane	10.9	0.20	ug/L	10.0		109	79-123			
1,1-Dichloropropene	10.8	0.20	ug/L	10.0		108	80-120			



Environmental Partners, Inc.
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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Volatile Organic Compounds - Quality Control

Batch BFL0507 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFL0507-BS1)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 10:13								
Carbon tetrachloride	10.6	0.20	ug/L	10.0		106	53-137			
1,2-Dichloroethane	10.0	0.20	ug/L	10.0		100	75-123			
Benzene	10.5	0.20	ug/L	10.0		105	80-120			
Trichloroethene	10.3	0.20	ug/L	10.0		103	80-120			
1,2-Dichloropropane	10.1	0.20	ug/L	10.0		101	80-120			
Bromodichloromethane	9.96	0.20	ug/L	10.0		99.6	80-121			
Dibromomethane	9.94	0.20	ug/L	10.0		99.4	80-120			
2-Chloroethyl vinyl ether	9.00	1.00	ug/L	10.0		90.0	74-127			
4-Methyl-2-Pentanone	46.8	5.00	ug/L	50.0		93.7	67-133			
cis-1,3-Dichloropropene	10.2	0.20	ug/L	10.0		102	80-124			
Toluene	10.2	0.20	ug/L	10.0		102	80-120			
trans-1,3-Dichloropropene	10.5	0.20	ug/L	10.0		105	71-127			
2-Hexanone	47.0	5.00	ug/L	50.0		93.9	69-133			
1,1,2-Trichloroethane	9.56	0.20	ug/L	10.0		95.6	80-121			
1,3-Dichloropropane	10.1	0.20	ug/L	10.0		101	80-120			
Tetrachloroethene	10.2	0.20	ug/L	10.0		102	80-120			
Dibromochloromethane	10.5	0.20	ug/L	10.0		105	65-135			
1,2-Dibromoethane	9.81	0.20	ug/L	10.0		98.1	80-121			
Chlorobenzene	10.3	0.20	ug/L	10.0		103	80-120			
Ethylbenzene	10.4	0.20	ug/L	10.0		104	80-120			
1,1,1,2-Tetrachloroethane	10.4	0.20	ug/L	10.0		104	80-120			
m,p-Xylene	21.2	0.40	ug/L	20.0		106	80-121			
o-Xylene	10.5	0.20	ug/L	10.0		105	80-121			
Xylenes, total	31.7	0.60	ug/L	30.0		106	76-127			
Styrene	10.8	0.20	ug/L	10.0		108	80-124			
Bromoform	9.81	0.20	ug/L	10.0		98.1	51-134			
1,1,1,2,2-Tetrachloroethane	9.60	0.20	ug/L	10.0		96.0	77-123			
1,2,3-Trichloropropane	9.44	0.50	ug/L	10.0		94.4	76-125			
trans-1,4-Dichloro 2-Butene	9.63	1.00	ug/L	10.0		96.3	55-129			
n-Propylbenzene	10.8	0.20	ug/L	10.0		108	78-130			
Bromobenzene	9.63	0.20	ug/L	10.0		96.3	80-120			
Isopropyl Benzene	10.7	0.20	ug/L	10.0		107	80-128			
2-Chlorotoluene	10.6	0.20	ug/L	10.0		106	78-122			
4-Chlorotoluene	10.5	0.20	ug/L	10.0		105	80-121			
t-Butylbenzene	10.4	0.20	ug/L	10.0		104	78-125			



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - Quality Control

Batch BFL0507 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFL0507-BS1)										
					Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 10:13					
1,3,5-Trimethylbenzene	10.7	0.20	ug/L	10.0		107	80-129			
1,2,4-Trimethylbenzene	10.6	0.20	ug/L	10.0		106	80-127			
s-Butylbenzene	10.6	0.20	ug/L	10.0		106	78-129			
4-Isopropyl Toluene	10.8	0.20	ug/L	10.0		108	79-130			
1,3-Dichlorobenzene	9.99	0.20	ug/L	10.0		99.9	80-120			
1,4-Dichlorobenzene	9.63	0.20	ug/L	10.0		96.3	80-120			
n-Butylbenzene	10.7	0.20	ug/L	10.0		107	74-129			
1,2-Dichlorobenzene	9.40	0.20	ug/L	10.0		94.0	80-120			
1,2-Dibromo-3-chloropropane	7.39	0.50	ug/L	10.0		73.9	62-123			Q
1,2,4-Trichlorobenzene	7.99	0.50	ug/L	10.0		79.9	64-124			Q
Hexachloro-1,3-Butadiene	9.95	0.50	ug/L	10.0		99.5	58-123			
Naphthalene	10.3	0.50	ug/L	10.0		103	50-134			
1,2,3-Trichlorobenzene	6.40	0.50	ug/L	10.0		64.0	49-133			Q
Dichlorodifluoromethane	11.1	0.20	ug/L	10.0		111	48-147			
Methyl tert-butyl Ether	10.1	0.50	ug/L	10.0		101	71-132			
2-Pentanone	45.4	5.00	ug/L	50.0		90.8	69-134			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.22		ug/L	5.00		104	80-129			
<i>Surrogate: Toluene-d8</i>	5.03		ug/L	5.00		101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.98		ug/L	5.00		99.5	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.84		ug/L	5.00		96.9	80-120			

LCS Dup (BFL0507-BSD1)										
					Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 10:38					
Chloromethane	10.4	0.50	ug/L	10.0		104	60-138	2.91	30	
Vinyl Chloride	10.4	0.20	ug/L	10.0		104	66-133	1.84	30	
Bromomethane	10.4	1.00	ug/L	10.0		104	72-131	0.96	30	
Chloroethane	9.70	0.20	ug/L	10.0		97.0	60-155	0.76	30	
Trichlorofluoromethane	10.5	0.20	ug/L	10.0		105	80-129	3.37	30	
Acrolein	50.6	5.00	ug/L	50.0		101	52-144	7.39	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.1	0.20	ug/L	10.0		101	76-129	0.11	30	
Acetone	48.9	5.00	ug/L	50.0		97.9	58-142	4.61	30	
1,1-Dichloroethene	10.1	0.20	ug/L	10.0		101	69-135	2.04	30	
Bromoethane	9.37	0.20	ug/L	10.0		93.7	78-128	5.08	30	
Iodomethane	9.65	1.00	ug/L	10.0		96.5	56-147	2.56	30	
Methylene Chloride	10.3	1.00	ug/L	10.0		103	65-135	2.98	30	
Acrylonitrile	9.91	1.00	ug/L	10.0		99.1	64-134	7.88	30	



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - Quality Control

Batch BFL0507 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BFL0507-BSD1)										
					Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 10:38					
Carbon Disulfide	10.1	0.20	ug/L	10.0		101	78-125	4.51	30	
trans-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	78-128	1.26	30	
Vinyl Acetate	10.3	0.20	ug/L	10.0		103	55-138	4.88	30	
1,1-Dichloroethane	10.5	0.20	ug/L	10.0		105	76-124	2.67	30	
2-Butanone	51.4	5.00	ug/L	50.0		103	61-140	7.39	30	
2,2-Dichloropropane	10.9	0.20	ug/L	10.0		109	78-125	0.96	30	
cis-1,2-Dichloroethene	9.97	0.20	ug/L	10.0		99.7	80-121	2.67	30	
Chloroform	10.7	0.20	ug/L	10.0		107	80-122	1.48	30	
Bromochloromethane	10.1	0.20	ug/L	10.0		101	80-121	1.33	30	
1,1,1-Trichloroethane	10.6	0.20	ug/L	10.0		106	79-123	2.67	30	
1,1-Dichloropropene	10.6	0.20	ug/L	10.0		106	80-120	2.42	30	
Carbon tetrachloride	10.5	0.20	ug/L	10.0		105	53-137	0.51	30	
1,2-Dichloroethane	10.4	0.20	ug/L	10.0		104	75-123	3.84	30	
Benzene	10.3	0.20	ug/L	10.0		103	80-120	1.60	30	
Trichloroethene	10.1	0.20	ug/L	10.0		101	80-120	1.57	30	
1,2-Dichloropropane	10.2	0.20	ug/L	10.0		102	80-120	1.06	30	
Bromodichloromethane	10.3	0.20	ug/L	10.0		103	80-121	3.08	30	
Dibromomethane	10.5	0.20	ug/L	10.0		105	80-120	5.08	30	
2-Chloroethyl vinyl ether	9.93	1.00	ug/L	10.0		99.3	74-127	9.75	30	
4-Methyl-2-Pentanone	50.9	5.00	ug/L	50.0		102	67-133	8.24	30	
cis-1,3-Dichloropropene	10.7	0.20	ug/L	10.0		107	80-124	4.97	30	
Toluene	10.2	0.20	ug/L	10.0		102	80-120	0.51	30	
trans-1,3-Dichloropropene	10.8	0.20	ug/L	10.0		108	71-127	2.98	30	
2-Hexanone	51.0	5.00	ug/L	50.0		102	69-133	8.18	30	
1,1,2-Trichloroethane	10.1	0.20	ug/L	10.0		101	80-121	5.75	30	
1,3-Dichloropropane	9.93	0.20	ug/L	10.0		99.3	80-120	1.64	30	
Tetrachloroethene	9.61	0.20	ug/L	10.0		96.1	80-120	5.60	30	
Dibromochloromethane	10.7	0.20	ug/L	10.0		107	65-135	2.28	30	
1,2-Dibromoethane	10.3	0.20	ug/L	10.0		103	80-121	4.84	30	
Chlorobenzene	9.95	0.20	ug/L	10.0		99.5	80-120	3.63	30	
Ethylbenzene	10.2	0.20	ug/L	10.0		102	80-120	1.43	30	
1,1,1,2-Tetrachloroethane	10.1	0.20	ug/L	10.0		101	80-120	2.36	30	
m,p-Xylene	20.6	0.40	ug/L	20.0		103	80-121	2.76	30	
o-Xylene	10.2	0.20	ug/L	10.0		102	80-121	3.15	30	
Xylenes, total	30.8	0.60	ug/L	30.0		103	76-127	2.89	30	



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1180 NW Maple St., Suite 310
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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - Quality Control

Batch BFL0507 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BFL0507-BSD1)				Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 10:38						
Styrene	10.6	0.20	ug/L	10.0		106	80-124	2.33	30	
Bromoform	10.6	0.20	ug/L	10.0		106	51-134	7.44	30	
1,1,2,2-Tetrachloroethane	10.5	0.20	ug/L	10.0		105	77-123	8.58	30	
1,2,3-Trichloropropane	10.5	0.50	ug/L	10.0		105	76-125	10.20	30	
trans-1,4-Dichloro 2-Butene	9.58	1.00	ug/L	10.0		95.8	55-129	0.54	30	
n-Propylbenzene	10.5	0.20	ug/L	10.0		105	78-130	3.36	30	
Bromobenzene	9.82	0.20	ug/L	10.0		98.2	80-120	1.90	30	
Isopropyl Benzene	10.4	0.20	ug/L	10.0		104	80-128	3.03	30	
2-Chlorotoluene	10.3	0.20	ug/L	10.0		103	78-122	2.10	30	
4-Chlorotoluene	10.2	0.20	ug/L	10.0		102	80-121	2.52	30	
t-Butylbenzene	10.2	0.20	ug/L	10.0		102	78-125	2.14	30	
1,3,5-Trimethylbenzene	10.5	0.20	ug/L	10.0		105	80-129	1.84	30	
1,2,4-Trimethylbenzene	10.4	0.20	ug/L	10.0		104	80-127	1.96	30	
s-Butylbenzene	10.4	0.20	ug/L	10.0		104	78-129	2.50	30	
4-Isopropyl Toluene	10.5	0.20	ug/L	10.0		105	79-130	2.84	30	
1,3-Dichlorobenzene	9.93	0.20	ug/L	10.0		99.3	80-120	0.63	30	
1,4-Dichlorobenzene	9.84	0.20	ug/L	10.0		98.4	80-120	2.18	30	
n-Butylbenzene	10.5	0.20	ug/L	10.0		105	74-129	2.46	30	
1,2-Dichlorobenzene	9.71	0.20	ug/L	10.0		97.1	80-120	3.17	30	
1,2-Dibromo-3-chloropropane	9.68	0.50	ug/L	10.0		96.8	62-123	26.80	30	Q
1,2,4-Trichlorobenzene	9.67	0.50	ug/L	10.0		96.7	64-124	19.10	30	Q
Hexachloro-1,3-Butadiene	10.0	0.50	ug/L	10.0		100	58-123	0.52	30	
Naphthalene	11.4	0.50	ug/L	10.0		114	50-134	10.10	30	
1,2,3-Trichlorobenzene	9.92	0.50	ug/L	10.0		99.2	49-133	43.10	30	*, Q
Dichlorodifluoromethane	10.5	0.20	ug/L	10.0		105	48-147	5.52	30	
Methyl tert-butyl Ether	10.6	0.50	ug/L	10.0		106	71-132	4.93	30	
2-Pentanone	49.5	5.00	ug/L	50.0		99.1	69-134	8.69	30	
Surrogate: 1,2-Dichloroethane-d4	5.13		ug/L	5.00		103	80-129			
Surrogate: Toluene-d8	5.09		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	4.98		ug/L	5.00		99.7	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.95		ug/L	5.00		98.9	80-120			



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - SIM - Quality Control

Batch BFL0518 - EPA 5030 (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0518-BLK1)										
Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 14:17										
Acrylonitrile	ND	50.0	ng/L							U
Vinyl chloride	ND	20.0	ng/L							U
1,1-Dichloroethene	ND	20.0	ng/L							U
cis-1,2-Dichloroethene	ND	20.0	ng/L							U
trans-1,2-Dichloroethene	ND	20.0	ng/L							U
Trichloroethene	ND	20.0	ng/L							U
Tetrachloroethene	ND	20.0	ng/L							U
1,1,2,2-Tetrachloroethane	ND	20.0	ng/L							U
1,2-Dichloroethane	ND	20.0	ng/L							U
Benzene	ND	20.0	ng/L							U
Toluene	ND	200	ng/L							U
1,2-Dibromoethane	ND	10.0	ng/L							U
Ethylbenzene	ND	200	ng/L							U
m,p-Xylene	ND	400	ng/L							U
o-Xylene	ND	200	ng/L							U
<hr/>										
Surrogate: 1,2-Dichloroethane-d4	4800		ng/L	5000		96.0	80-129			
Surrogate: Toluene-d8	5010		ng/L	5000		100	80-120			
Surrogate: 4-Bromofluorobenzene	5070		ng/L	5000		101	75-125			
<hr/>										
LCS (BFL0518-BS1)										
Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 12:44										
Acrylonitrile	1550	50.0	ng/L	2000		77.7	75-125			
Vinyl chloride	1710	20.0	ng/L	2000		85.5	76-120			
1,1-Dichloroethene	1630	20.0	ng/L	2000		81.5	80-120			
cis-1,2-Dichloroethene	1650	20.0	ng/L	2000		82.7	80-120			
trans-1,2-Dichloroethene	1590	20.0	ng/L	2000		79.6	80-120			
Trichloroethene	1660	20.0	ng/L	2000		83.0	80-120			
Tetrachloroethene	1730	20.0	ng/L	2000		86.5	80-122			
1,1,2,2-Tetrachloroethane	1620	20.0	ng/L	2000		80.8	80-128			
1,2-Dichloroethane	1460	20.0	ng/L	2000		73.0	80-128			
Benzene	1550	20.0	ng/L	2000		77.6	80-120			
Toluene	1850	200	ng/L	2000		92.4	80-120			
1,2-Dibromoethane	1640	10.0	ng/L	2000		81.8	80-120			
Ethylbenzene	1680	200	ng/L	2000		84.1	80-120			
m,p-Xylene	3450	400	ng/L	4000		86.3	80-120			
o-Xylene	1650	200	ng/L	2000		82.3	80-120			



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Volatile Organic Compounds - SIM - Quality Control

Batch BFL0518 - EPA 5030 (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFL0518-BS1)										
					Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 12:44					
Surrogate: 1,2-Dichloroethane-d4	4690		ng/L	5000		93.8	80-129			
Surrogate: Toluene-d8	5060		ng/L	5000		101	80-120			
Surrogate: 4-Bromofluorobenzene	5120		ng/L	5000		102	75-125			
LCS Dup (BFL0518-BSD1)										
					Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 13:56					
Acrylonitrile	1540	50.0	ng/L	2000		77.0	75-125	0.84	30	
Vinyl chloride	1710	20.0	ng/L	2000		85.4	76-120	0.01	30	
1,1-Dichloroethene	1590	20.0	ng/L	2000		79.3	80-120	2.72	30	
cis-1,2-Dichloroethene	1610	20.0	ng/L	2000		80.3	80-120	2.86	30	
trans-1,2-Dichloroethene	1560	20.0	ng/L	2000		78.1	80-120	1.91	30	
Trichloroethene	1620	20.0	ng/L	2000		80.9	80-120	2.58	30	
Tetrachloroethene	1730	20.0	ng/L	2000		86.5	80-122	0.01	30	
1,1,2,2-Tetrachloroethane	1600	20.0	ng/L	2000		80.1	80-128	0.87	30	
1,2-Dichloroethane	1440	20.0	ng/L	2000		72.1	80-128	1.27	30	
Benzene	1540	20.0	ng/L	2000		76.8	80-120	1.03	30	
Toluene	1870	200	ng/L	2000		93.3	80-120	0.97	30	
1,2-Dibromoethane	1630	10.0	ng/L	2000		81.4	80-120	0.42	30	
Ethylbenzene	1640	200	ng/L	2000		82.0	80-120	2.52	30	
m,p-Xylene	3400	400	ng/L	4000		84.9	80-120	1.62	30	
o-Xylene	1620	200	ng/L	2000		80.9	80-120	1.76	30	
Surrogate: 1,2-Dichloroethane-d4	4610		ng/L	5000		92.2	80-129			
Surrogate: Toluene-d8	5140		ng/L	5000		103	80-120			
Surrogate: 4-Bromofluorobenzene	5150		ng/L	5000		103	75-125			



Environmental Partners, Inc.
1180 NW Maple St., Suite 310
Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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Metals and Metallic Compounds - Quality Control

Batch BFL0524 - TWC EPA 3010A

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0524-BLK1)		Prepared: 21-Dec-2017 Analyzed: 22-Dec-2017 14:50								
Calcium	ND	0.0500	mg/L							U
Potassium	ND	0.500	mg/L							U
Sodium	ND	0.500	mg/L							U
Sodium	ND	50.0	mg/L							U
LCS (BFL0524-BS1)		Prepared: 21-Dec-2017 Analyzed: 22-Dec-2017 15:06								
Calcium	10.3	0.0500	mg/L	10.0		103	80-120			
Potassium	9.36	0.500	mg/L	10.0		93.6	80-120			
Sodium	9.86	0.500	mg/L	10.0		98.6	80-120			
Sodium	ND	50.0	mg/L	10.0		106	80-120			U



Environmental Partners, Inc. 1180 NW Maple St., Suite 310 Issaquah WA, 98027	Project: Olalla Landfill Project Number: [none] Project Manager: Doug Kunkel	Reported: 11-Jan-2018 15:52
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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGA0002 - RHN EPA 600/4-79-020 4.1.4 HNO3 matrix 5x

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGA0002-BLK1)						Prepared: 02-Jan-2018 Analyzed: 02-Jan-2018 17:34					
Arsenic, Dissolved	75a	ND	0.0400	ug/L							U
LCS (BGA0002-BS1)						Prepared: 02-Jan-2018 Analyzed: 02-Jan-2018 18:20					
Arsenic, Dissolved	75a	4.86	0.0400	ug/L	5.00		97.2	80-120			
Duplicate (BGA0002-DUP1)						Source: 17L0359-01 Prepared: 02-Jan-2018 Analyzed: 02-Jan-2018 18:04					
Arsenic, Dissolved	75a	0.102	0.0400	ug/L		0.116			12.90	20	
Matrix Spike (BGA0002-MS1)						Source: 17L0359-01 Prepared: 02-Jan-2018 Analyzed: 02-Jan-2018 18:14					
Arsenic, Dissolved	75a	4.76	0.0400	ug/L	5.00	0.116	92.9	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project Manager: Doug Kunkel

Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGA0006 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGA0006-BLK1)			Prepared: 02-Jan-2018 Analyzed: 02-Jan-2018 14:32								
Iron, Dissolved	54	ND	20.0	ug/L							U
Iron, Dissolved	57	ND	20.0	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BGA0006-BS1)			Prepared: 02-Jan-2018 Analyzed: 02-Jan-2018 15:14								
Iron, Dissolved	54	4700	20.0	ug/L	5000		93.9	80-120			
Iron, Dissolved	57	4580	20.0	ug/L	5000		91.7	80-120			
Zinc, Dissolved	66	86.5	4.00	ug/L	80.0		108	80-120			
Zinc, Dissolved	67	80.1	4.00	ug/L	80.0		100	80-120			



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGA0034 - WMN (No Prep)

Instrument: ICP2 Analyst: CC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGA0034-BLK1)		Prepared: 03-Jan-2018 Analyzed: 04-Jan-2018 12:39								
Barium, Dissolved	ND	0.0030	mg/L							U
Manganese, Dissolved	ND	0.0010	mg/L							U
LCS (BGA0034-BS1)		Prepared: 03-Jan-2018 Analyzed: 04-Jan-2018 12:57								
Barium, Dissolved	2.15	0.0030	mg/L	2.00		107	80-120			
Manganese, Dissolved	0.503	0.0010	mg/L	0.500		101	80-120			



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Issaquah WA, 98027

Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

Reported:
11-Jan-2018 15:52

Wet Chemistry - Quality Control

Batch BFL0502 - No Prep Wet Chem

Instrument: LCHAT2 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0502-BLK1)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 11:37								
Nitrate + Nitrite as N	ND	0.010	mg-N/L							U
Nitrite-N	ND	0.010	mg-N/L							U
LCS (BFL0502-BS1)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 11:38								
Nitrate + Nitrite as N	0.478	0.010	mg-N/L	0.500		95.7	90-110			
LCS (BFL0502-BS3)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 11:58								
Nitrite-N	0.495	0.010	mg-N/L	0.500		99.0	75-125			
Duplicate (BFL0502-DUP1)		Source: 17L0359-01		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 11:42						
Nitrite-N	ND	0.010	mg-N/L		ND					U
Duplicate (BFL0502-DUP2)		Source: 17L0359-01RE1		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 12:07						
Nitrate + Nitrite as N	1.50	0.020	mg-N/L		1.50			0.19	20	D
Matrix Spike (BFL0502-MS2)		Source: 17L0359-01		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 11:44						
Nitrite-N	0.504	0.010	mg-N/L	0.500	ND	101	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike (BFL0502-MS3)		Source: 17L0359-01RE1		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 12:08						
Nitrate + Nitrite as N	3.27	0.050	mg-N/L	2.00	1.50	88.5	75-125			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										



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Wet Chemistry - Quality Control

Batch BFL0516 - No Prep Wet Chem

Instrument: Accumet AR60 Analyst: U

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BFL0516-BS1)					Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 15:10					
pH	7.01	0.01	pH Units	7.00		100	0-200			
Duplicate (BFL0516-DUP1)					Source: 17L0359-01 Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 15:10					
pH	6.40	0.01	pH Units		6.38			0.31	20	H



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Wet Chemistry - Quality Control

Batch BFL0517 - No Prep Wet Chem

Instrument: Accumet AR60 Analyst: U

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0517-BLK1)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 15:15								
Alkalinity, Total	ND	1.00	mg/L CaCO3							U
Blank (BFL0517-BLK2)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 16:15								
Alkalinity, Total	ND	1.00	mg/L CaCO3							U
Reference (BFL0517-SRM1)		Prepared: 20-Dec-2017 Analyzed: 20-Dec-2017 15:15								
Alkalinity, Total	111	1.00	mg/L CaCO3	108		103	30.37-108.33			



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Wet Chemistry - Quality Control

Batch BFL0521 - No Prep Wet Chem

Instrument: TOC-LCSH Analyst: GM

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0521-BLK1)					Prepared: 20-Dec-2017 Analyzed: 21-Dec-2017 11:34					
Total Organic Carbon	ND	0.50	mg/L							U
LCS (BFL0521-BS1)					Prepared: 20-Dec-2017 Analyzed: 21-Dec-2017 12:45					
Total Organic Carbon	18.9	0.50	mg/L	20.0		94.4	90-110			



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Project: Olalla Landfill
Project Number: [none]
Project Manager: Doug Kunkel

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Wet Chemistry - Quality Control

Batch BFL0542 - No Prep Wet Chem

Instrument: LCHAT1 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0542-BLK1)		Prepared: 21-Dec-2017 Analyzed: 21-Dec-2017 14:21								
Chloride	ND	1.00	mg/L							U
Sulfate	ND	2.00	mg/L							U
LCS (BFL0542-BS1)		Prepared: 21-Dec-2017 Analyzed: 21-Dec-2017 14:22								
Chloride	5.03	1.00	mg/L	5.00		101	90-110			
Sulfate	14.8	2.00	mg/L	15.0		98.7	90-110			
Duplicate (BFL0542-DUP2)		Source: 17L0359-01RE1		Prepared: 21-Dec-2017 Analyzed: 21-Dec-2017 14:54						
Chloride	3.10	1.00	mg/L		3.00			3.41	20	
Sulfate	4.02	2.00	mg/L		3.96			1.60	20	
Matrix Spike (BFL0542-MS3)		Source: 17L0359-01RE1		Prepared: 21-Dec-2017 Analyzed: 21-Dec-2017 15:08						
Chloride	8.61	1.00	mg/L	5.00	3.00	112	75-125			
Sulfate	19.8	2.00	mg/L	15.0	3.96	105	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Wet Chemistry - Quality Control

Batch BFL0585 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0585-BLK1)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:07					
COD	ND	10.0	mg/L							U
Calibration Blank (BFL0585-BLK2)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:12					
COD	ND	10.0	mg/L							U
Calibration Blank (BFL0585-BLK3)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:16					
COD	ND	10.0	mg/L							U
DL (BFL0585-BLK4)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:17					
COD	ND	10.0	mg/L							U
LCS (BFL0585-BS1)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:08					
COD	107	10.0	mg/L	100		107	90-110			
Calibration Check (BFL0585-BS2)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:12					
COD	108	10.0	mg/L	100		108	90-110			
Calibration Check (BFL0585-BS3)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:16					
COD	108	10.0	mg/L	100		108	90-110			
DL (BFL0585-BS4)										
					Prepared: 26-Dec-2017 Analyzed: 27-Dec-2017 10:17					
COD	107	10.0	mg/L	100		107	90-110			



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Wet Chemistry - Quality Control

Batch BFL0653 - No Prep Wet Chem

Instrument: LCHAT2 Analyst: KK

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0653-BLK1)		Prepared: 29-Dec-2017 Analyzed: 30-Dec-2017 11:52								
Ammonia-N	ND	0.040	mg-N/L							U
LCS (BFL0653-BS1)		Prepared: 29-Dec-2017 Analyzed: 30-Dec-2017 11:53								
Ammonia-N	0.519	0.040	mg-N/L	0.500		104	90-110			



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Microbiology - Quality Control

Batch BFL0495 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0495-BLK1)						Prepared: 20-Dec-2017 Analyzed: 21-Dec-2017 11:50				
Fecal Coliforms	ND	1	CFU/100 ml							U



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Microbiology - Quality Control

Batch BFL0498 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFL0498-BLK1)						Prepared: 20-Dec-2017 Analyzed: 21-Dec-2017 11:00				
Total Coliforms	ND	1	CFU/100 ml							U



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Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 in Water	
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
Nitrite-N	WADOE,NELAP,DoD-ELAP
EPA 375.2 in Water	
Sulfate	WADOE,NELAP
EPA 410.4 in Water	
COD	DoD-ELAP,NELAP,WADOE
EPA 6010C in Water	
Calcium	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Sodium	WADOE,NELAP,DoD-ELAP
Sodium-1	DoD-ELAP
Barium	WADOE,NELAP
Manganese	WADOE,NELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260C-SIM in Water

Acrylonitrile	NELAP,CALAP,WADOE
Vinyl chloride	NELAP,CALAP,WADOE
1,1-Dichloroethene	NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	NELAP,CALAP,WADOE
Trichloroethene	NELAP,CALAP,WADOE
Tetrachloroethene	NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,CALAP,WADOE
1,2-Dichloroethane	NELAP,CALAP,WADOE
Benzene	NELAP,CALAP,WADOE

EPA 9060A in Water

Total Organic Carbon	DoD-ELAP,WADOE,NELAP
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SM 2320 B-97 in Water

Alkalinity, Bicarbonate	NELAP,WADOE,WA-DW,DoD-ELAP
Alkalinity, Carbonate	WADOE,WA-DW,DoD-ELAP,NELAP



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Alkalinity, Hydroxide WADOE,WA-DW,DoD-ELAP,NELAP
Alkalinity, Total DoD-ELAP,WADOE,WA-DW,NELAP

SM 4500-H+ B-00 in Water

pH WADOE,NELAP

SM 4500-NH3 H-97 in Water

Ammonia-N WADOE,DoD-ELAP,NELAP

SM 9222B in Water

Total Coliforms WADOE

SM 9222D in Water

Fecal Coliforms WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



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Notes and Definitions

- U This analyte is not detected above the applicable reporting or detection limit.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- J Estimated concentration value detected below the reporting limit.
- H Hold time violation - Hold time was exceeded.
- E The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
- D The reported value is from a dilution
- * Flagged value is not within established control limits.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.