South Park Landfill

March 2014 Interim Site-Wide Groundwater Monitoring Results

Prepared for

City of Seattle
South Park Property Development, LLC

June 2014

Aspect CONSULTING
BHC CONSULTANTS
HERRERA ENVIRONMENTAL CONSULTANTS
FLOYD | SNIDER
strategy • science • engineering
Two Union Square • 601 Union Street • Suite 600
Seattle, Washington 98101 • tel: 206.292.2078

LIMITATIONS

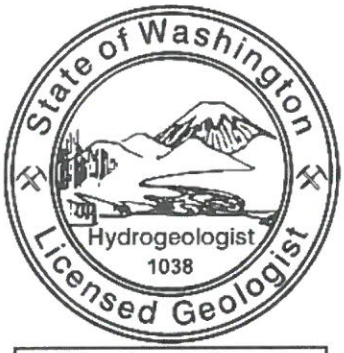
This report has been prepared for the exclusive use of City of Seattle; their authorized agents, and regulatory agencies. It has been prepared following the described methods and information available at the time of the work. No other party should use this report for any purpose other than that originally intended, unless Floyd|Snider agrees in advance to such reliance in writing. The information contained herein should not be utilized for any purpose or project except the one originally intended. Under no circumstances shall this document be altered, updated, or revised without written authorization of Floyd|Snider.

Work for this project was performed and this report prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

South Park Landfill March 2014 Interim Site-wide Groundwater Monitoring Results

CERTIFICATION

This document has been prepared for the City of Seattle under the direction of:



John Jacob Strunk

Name: John Strunk, LHG

Date: June 27, 2014

AUTHOR RECOGNITION

The following individuals have contributed to the preparation of this March 2014 Interim Site-wide Groundwater Monitoring Results:

Author	Company	Title
Stephen Bentsen, PE	Floyd|Snider	Project Manager, Engineer
Teri A. Floyd, PhD.	Floyd|Snider	Principal In Charge, Lead Chemist
John Strunk, LHG	Aspect Consulting, LLC	Lead Hydrogeologist
Seann McClure, LG	Aspect Consulting, LLC	Hydrogeologist

This page intentionally left blank.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Abbreviations/Acronyms

Acronym/ Abbreviation	Definition
AO	Agreed Order No. 6706
ARI	Analytical Resources, Inc.
CAP	Cleanup Action Plan
CKD	Cement kiln dust
DCE	Dichloroethene
DNAPL	Dense non-aqueous phase liquid
DO	Dissolved oxygen
Ecology	Washington State Department of Ecology
Glitsa	Glitsa American, Inc.
KIP	Kenyon Industrial Park
Landfill	South Park Landfill
LDPE	Low density polyethylene
LFG	Landfill gas
MTCA	Model Toxics Control Act
NAPL	Non-aqueous phase liquid
ORP	Oxidation reduction potential
PVC	Polyvinyl chloride
Redox	Reduction-oxidation
RI/FS	Remedial Investigation/Feasibility Study
SPPD	South Park Property Development, LLC
SRDS	South Recycling and Disposal Station
TCE	Trichloroethene
USEPA	U.S. Environmental Protection Agency

1.0 Introduction

This report provides the results of the March 2014 groundwater monitoring activities for the Interim Site-wide Groundwater Monitoring Program at the South Park Landfill (Landfill). The groundwater monitoring was conducted in accordance with the Interim Site-wide Groundwater Monitoring Plan (Floyd|Snider, 2012a), which provides groundwater monitoring prior to the completion and submittal of the Cleanup Action Plan (CAP) and development of a Long-term Site-wide Groundwater Monitoring Plan. The Interim Site-wide Groundwater Monitoring Program supplements the Draft South Park Landfill Remedial Investigation/Feasibility Study (RI/FS) (Floyd|Snider, 2012b), which is currently undergoing final revisions after being reviewed by the Washington State Department of Ecology (Ecology).

This report includes a brief description of the Landfill; a summary of the sampling methods and procedures; an update of groundwater flow directions; and the analytical results. The March 2014 sampling event discussed in this report is the third groundwater quality monitoring event conducted as described in the Interim Site-wide Groundwater Monitoring Plan (Floyd|Snider, 2012a).

1.1 SITE DESCRIPTION

The Landfill is a former municipal solid waste landfill located in the South Park neighborhood of Seattle, Washington. The Landfill is located in the Duwamish Valley, between State Routes 509 and 99, and received solid wastes from the 1930s until it was closed in 1966 under King County's Title 10 provisions for solid waste regulation. Soil, groundwater, surface water, and landfill gas (LFG) monitoring began at the Landfill in the late 1980s and groundwater and LFG monitoring continue through the present day. The Landfill consists of several parcels, including the approximately 20-acre South Park Property Development, LLC (SPPD), the South Recycling and Disposal Station (SRDS), the Kenyon Industrial Park (KIP), and several other smaller parcels. The SPPD parcel will be developed in 2013 as part of an interim action (Farallon, 2013).

In February 2007, the Landfill was added to Washington State's Hazardous Sites List, and an RI/FS was conducted under Model Toxics Control Act (MTCA) Agreed Order No. 6706 (Agreed Order [AO]) with Ecology. The RI/FS determined the nature and extent of contamination associated with the Landfill and evaluated potential remedial alternatives.

1.1.1 Monitoring Well Network

The monitoring wells included in the Interim Site-wide Groundwater Monitoring Program are illustrated on Figure 1.1. In addition to the proposed point of compliance (POC) wells (MW-08, MW-10, MW-18, MW-24, MW-25, MW-26, MW-27, MW-32, and MW-33), the monitoring well network also includes monitoring wells used to assess upgradient groundwater conditions (KMW-05, KMW-08, MW-12, MW-14, and MW-29); a monitoring well used to assess groundwater conditions along the northern edge of the KIP (KMW-03A); and downgradient monitoring wells used to assess groundwater conditions adjacent to the former Glitsa American, Inc. (Glitsa) property (MW-30 and MW-31). KMW-08 was sampled as a supplement to KMW-05 in assessing upgradient groundwater conditions because the groundwater in KMW-05 was dark brown, which may be indicative of the aqueous interaction of highly alkaline cement kiln dust (CKD) and organic rich soil. Several additional wells (MW-06, KMW-01A, KMW-02B, KMW-04, KMW-06, and KMW-07) and surface water monitoring locations (SG-1S and SG-2N) were

included in the monitoring network to measure groundwater and surface water levels for determining representative groundwater flow directions and gradients at the Landfill.

As discussed in Section 5.5 of the draft RI/FS, the monitoring wells are primarily completed in one of three groundwater zones of interest (Perched Zone, A-Zone, or B-Zone), all of which are part of the Shallow Aquifer. The Perched Zone is a thin discontinuous layer of groundwater that exists above the Silt Overbank Deposit, which can often be in contact with solid waste and is thus conceptually equivalent to leachate in those locations. The A-Zone is immediately below the Silt Overbank Deposit and is the critical zone where leachate (and perched water) can enter the groundwater system and move off-site. The B-Zone represents the base of the Shallow Aquifer, overlying finer grained estuarine deposits, where dense non-aqueous phase liquids (DNAPLs) would accumulate, if present. The completion zone for each well included in the monitoring well network is shown on Figure 1.1. Well construction logs are presented in Appendix A of the Interim Site-wide Groundwater Monitoring Plan.

2.0 Groundwater Level Monitoring

Water levels were measured in the monitoring wells and surface water monitoring locations at the Landfill in order to provide an indication of groundwater elevations, gradients, and flow directions for the March 2014 sampling event. Figure 1.1 provides the monitoring well and surface water monitoring locations.

2.1 MEASUREMENT PROCEDURE

Groundwater level measurements were conducted between March 17 and March 19, 2014, concurrent with groundwater sampling. Water level measurements were collected prior to the purging of the well for the collection of the groundwater samples. Groundwater levels were measured to a precision of 0.01 foot using an electric water level indicator. All groundwater level measurements were made relative to the surveyed top of the polyvinyl chloride (PVC) casing. Readings were recorded on a field form along with the measurement date and time (refer to Appendix A).

Due to the discoloration of the groundwater in KMW-05, an interface probe was used to confirm that no non-aqueous phase liquid (NAPL) was present within the well. No NAPL was detected in the well, and there was no noticeable petroleum-like odor. There were no indications of potential NAPL in any of the other monitoring wells.

Surface water levels were measured at two locations (SG-1S and SG-2N) in the West Ditch (refer to Figure 1.1). SG-1S is a permanent staff gage installed at the southern end of the West Ditch, and SG-2N is a surveyed measuring point from the top of a 2-inch-diameter PVC pipe set in concrete associated with a culvert at the northern end of the West Ditch. Due to the absence of the Silt Overbank Deposit in the northern portion of the West Ditch (refer to Section 5.5.4 of the RI/FS), surface water in the vicinity of SG-2N is expected to be in hydraulic continuity with groundwater in the A-zone of the Shallow Aquifer. Therefore, the surface water elevation at SG-2N is considered an expression of the groundwater elevation. However, the Silt Overbank Deposit is present in the vicinity of SG-1S, likely acting as an aquitard between the West Ditch and the underlying A-Zone of the Shallow Aquifer.

2.2 GROUNDWATER LEVELS AND FLOW DIRECTIONS

A shallow groundwater elevation and flow direction map for March 2014 is presented on Figure 2.1. Groundwater elevations at the two surface water locations and 23 monitoring wells with screens completed primarily in the A-Zone of the Shallow Aquifer were used for the contouring. The groundwater elevations were interpolated using triangulation, with linear interpolation to produce the contours.

The interpolated groundwater elevations were then used in a “raindrop” analysis, where virtual particles are placed on the map and their flow path is predicted based on the interpolated water table surface, to produce the inferred groundwater flow path lines depicted on Figure 2.1. Based on Figure 2.1, the groundwater flow direction in the vicinity of the Landfill is generally inferred to be to the northeast, toward the Duwamish River.

3.0 Groundwater Quality Monitoring

Groundwater samples were collected between March 17 and March 19, 2014, from the 17 monitoring wells (including KMW-08) according to low-flow sampling procedures as described in the Interim Site-wide Groundwater Monitoring Plan (Floyd|Snider, 2012a).

3.1 PROCEDURE

The wells were purged and sampled using either a dedicated bladder pump or a peristaltic pump with dedicated low density polyethylene (LDPE) and silicon tubing.

The wells were purged at a flow rate of less than 500 milliliters per minute until the field parameters stabilized or more than three casing volumes were purged from the well. The monitored field parameters included temperature, pH, conductivity, dissolved oxygen (DO), and oxidation reduction potential (ORP), which were recorded at 5-minute intervals using a calibrated multiparameter probe and flow-through cell. Stabilization was defined as three successive readings where DO varied by less than 10 percent and ORP varied by less than 10 millivolts (mV). Additional stability criteria included 0.5 degrees Celsius (°C) for temperature, 10 percent for conductivity, and 0.1 units for pH. Flow rate and depth to water were also measured during well purging. In addition, prior to sampling, a turbidity measurement was collected to evaluate the quality of dissolved/total metal analytical results. All field measurements were documented on the respective Groundwater Sampling Records for each well, which are provided in Appendix A. Purge water was placed in 55-gallon drums on-site, which were removed for off-site disposal on April 17, 2014.

Groundwater samples were collected from the discharge tubing in advance of the flow-through cell. All samples for analysis of dissolved metals (iron and manganese) were field filtered using disposable 0.45-micrometer filters. Samples were placed in containers provided by the laboratory, stored in coolers with ice, and delivered to Analytical Resources, Inc. (ARI) laboratory under industry-standard chain-of-custody procedures at the end of each sampling day. Groundwater samples were analyzed for the following parameters based on the Interim Site-wide Groundwater Monitoring Plan:

- cis-1,2–Dichloroethene (DCE), trichloroethene (TCE), and benzene by U.S. Environmental Protection Agency (USEPA) Method 8260C
- Vinyl chloride by USEPA Method 8260C SIM
- Dissolved iron and manganese by USEPA Method 6010B
- Total iron and manganese by USEPA Method 6010B

Benzene was analyzed only in MW-25 and the upgradient monitoring wells (KMW-05 and KMW-08) based on historical detections of benzene in MW-25 and KMW-05.

In addition, the groundwater samples were also analyzed for several parameters not included in the Interim Site-wide Groundwater Monitoring Plan, including geochemical indicator parameters, the sulfide-sulfate reduction-oxidation (redox) couple, and nitrogen redox couples:

- Major cations, including sodium, potassium, calcium, and magnesium, by USEPA Method 6010B
- Major anions, including alkalinity, carbonate, and bicarbonate, by SM 2320B

- Major anions, including chloride, sulfate, nitrate, and nitrite by USEPA Method 300.0
- Ammonia by USEPA 350.1M and sulfide by USEPA Method 376.2

Quality control/quality assurance measures included two field duplicates, one rinse blank, and three trip blanks (one submitted with each cooler containing samples for VOC analysis), which were submitted with the groundwater samples. The field duplicates were collected from MW-25 (identified as MW-60 in the laboratory report) and from KMW-08 (identified as MW-61 in the laboratory report), with the highest concentrations reported for MW-25 and KMW-08 (Figures 3.1, 3.2, and 3.3). The rinse blank is identified as MW-80 in the laboratory report. The chain-of-custodies and laboratory reports for the March 2014 sampling event are provided in Appendix B.

3.2 ANALYTICAL RESULTS

The results of the March 2014 sampling event were received from ARI on April 1, 2014 (Appendix B). Table 3.1 provides a summary of the analytical results and field parameters. Cleanup levels have not yet been established for this site but are expected to be based on drinking water use (MCTA Method B) as presented in the Draft Final Remedial Investigation/Feasibility Study submitted to Ecology in June 2014.

A Level I data validation of the analytical results was performed by Floyd|Snider ,and the data validation report is included as Appendix C. Results of the data validation indicated the need for one data qualifier, which is included in Table 3.1 and described in Attachment 2 of Appendix C.

The analytical results are spatially illustrated on Figures 3.1, 3.2, and 3.3. An analysis of major cations (sodium, potassium, calcium, and magnesium) and anions (chloride, sulfate, carbonate, and bicarbonate) is also shown on the trilinear plots in Figures 3.4 and 3.5.

4.0 References

Farallon Consulting, LLC (Farallon). 2013. *Interim Action Work Plan – South Park Landfill Site, Seattle, Washington*. Prepared for the South Park Property Development, LLC. 22 February.

Floyd|Snider. 2012a. *South Park Landfill Interim Site-wide Groundwater Monitoring Plan.* Prepared for the City of Seattle and South Park Property Development, LLC. 7 December.

———. 2012b. *Draft Remedial Investigation/Feasibility Study, South Park Landfill, Seattle, Washington*. Prepared for the City of Seattle and South Park Property Development, LLC. 16 April.

U.S. Environmental Protection Agency (USEPA). 1998. T*echnical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, EPA 600-R-98-128*. September.

Washington State Department of Ecology (Ecology). 2007. *Model Toxics Control Act (MTCA).* Chapter 173-340 Washington Administrative Code. 12 October.

South Park Landfill

March 2014 Interim Site-Wide Groundwater Monitoring Results

Table

Table 3.1
March 2014 Groundwater Sample Analytical Results

	Location	KMW-03A	KMW-05	KMW-08		MW-08	MW-10	MW-12	MW-14	MW-18	MW-24
	X-coord[1]	1270170.48	1269861.86	1269692.89	1269692.89	1271368.12	1270569.12	1269783.23	1269963.2	1271077.67	1271162.48
	Y-coord[1]	197585.09	197427.44	197356.14	197356.14	196837.87	197647.09	196963.92	196398.73	196350.26	197102.37
	Sample ID	SPL-GW-KMW03A-031714	SPL-GW-KMW05-031714	SPL-GW-KMW08-031714	SPL-GW-MW61-031714	SPL-GW-MW08-031914	SPL-GW-MW10-	SPL-GW-MW12-031814	SPL-GW-MW14-031814	SPL-GW-MW18-	SPL-GW-MW24-031914
	Sample Date	03/17/2014	03/17/2014	03/17/2014	03/17/2014	03/19/2014	03/17/2014	03/18/2014	03/18/2014	03/18/2014	03/19/2014
Analyte	**Units**										
Conventionals by USEPA 300.0, 350.1M, 376.2, and SM 2320											
Chloride	mg/L	15	150	14.7	15	190	25	20	20	13	42
Sulfate	mg/L	0.4	1,000	27.9	28	2.6	110	13	2	0.1 U	0.5
Sulfide	mg/L	0.05 U	28	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
N-Ammonia	mg-N/L	3.2	64	0.342	0.34	2.9	4.9	0.73	0.2	2	3.8
N-Nitrate	mg-N/L	0.1	2 U	0.1 U	0.1 U	0.1	0.1 U	0.1	0.1	0.1 U	0.1
N-Nitrite	mg-N/L	0.1 U	2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Alkalinity	mg/L $CaCO_3$	380	8,300	186	190	380	370	190	250	360	410
Bicarbonate	mg/L CaCO3	380	1 U	186	190	380	370	190	250	360	410
Carbonate	mg/L CaCO3	1 U	2,800	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hydroxide	mg/L CaCO3	1 U	5,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Metals by SW6010C											
Calcium, dissolved	mg/L	86	12	42	43	42.6	43	33	49	45	70
Iron, dissolved	mg/L	11	6.5	0.21	0.17	16.4	16	9	4.6	35	25
Iron, total	mg/L	11	6.9	0.3	0.31	21.3	21	11	5.8	33	26
Magnesium, dissolved	mg/L	26	0.5 U	10	9.9	47.2	47	17	28	42	29
Manganese, dissolved	mg/L	0.058	0.02	0.3	0.3	1.13	1.1	0.72	0.66	1.2	1.5
Manganese, total	mg/L	0.06	0.02	0.31	0.3	1.13	1.1	0.77	0.67	1.2	1.5
Potassium, dissolved	mg/L	14	4,400	29	29	16.7	17	4	4.9	14	13
Sodium, dissolved	mg/L	25	1,600	30	30	154	150	23	17	35	61
VOCs by SW8260C											
Benzene	µg/L		**7.4**	0.2 U	0.2 U						
cis-1,2-Dichloroethene	µg/L	0.2 U	2 U	0.2 U	0.2 U	0.2 U	1.9	4.5	0.2 U	0.2 U	0.2 U
Trichloroethene	µg/L	0.2 U	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3	0.2 U	0.2 U	0.2 U
VOCs by SW8260C-SIM											
Vinyl Chloride	µg/L	0.3	0.2 U	0.02 U	0.02 U	0.08	0.49	0.22	0.02 U	0.02 U	0.034
Field Parameters											
Dissolved Oxygen	mg\L	0.37	0.24	0.58	--	0.15	0.16	0.45	0.36	0.43	0.27
ORP	mV	-150	-150	130	--	-72	-110	70	24	-76	-77
pH	pH	7.5	13	6.3	--	6.9	6.9	6.4	6.5	6.5	6.7
Specific Conductance	µS/cm	740	30,000	450	--	1,300	1,000	410	510	750	900

		Proposed CUL (Potential Scenarios)	
Monitored Analytes	**Units**	**Drinking Water**	**Upgradient or Background**
Benzene	µg/L	5.0	--
cis-1,2-Dichloroethene	µg/L	16	--
Trichloroethene	µg/L	5.0	--
Vinyl chloride	µg/L	0.29	--
Iron	mg/L	--	27
Manganese	mg/L	--	2.1

Notes:

-- Not analyzed for.

1 Coordinates are in Washington State Plane North NAD 83 feet.

2 Result is from SW8260C analysis because the SW8260C-SIM result exceeded the instrument calibration range.

Qualifier:

U Analyte was not detected at given reporting limit.

Abbreviations:

$CaCO_3$ Calcium carbonate
CUL Cleanup level
µg/L Micrograms per liter
µS/cm Microsiemens per centimeter
mg/L Milligrams per liter
mg-N/L Milligrams per liter as nitrogen
mV Millivolt
NAD 83 North American Datum of 1983
ORP Oxidation reduction potential
USEPA U.S. Environmental Protection Agency
VOC Volatile organic compound

Table 3.1
March 2014 Groundwater Sample Analytical Results

	Location	MW-25		MW-26	MW-27	MW-29	MW-30	MW-31	MW-32	MW-33
	X-coord[1]	1270572.18	1270572.18	1271163.2	1271347.6	1270272.103	1270826.64	1270825.71	1270622.16	1270751.02
	Y-coord[1]	197667.54	197667.54	197122.51	196835.03	196033.286	197655.77	197660.37	197416.52	197257.91
	Sample ID	SPL-GW-MW25-031714	SPL-GW-MW60-031714	SPL-GW-MW26-031914	SPL-GW-MW27-031914	SPL-GW-MW29-031814	SPL-GW-MW30-031914	SPL-GW-MW31-031914	SPL-GW-MW32-031814	SPL-GW-MW33-031814
	Sample Date	03/17/2014	03/17/2014	03/19/2014	03/19/2014	03/18/2014	03/19/2014	03/19/2014	03/18/2014	03/18/2014
Analyte	**Units**									
Conventionals by EPA 300.0, 350.1M, 376.2, and SM 2320										
Chloride	mg/L	8.6	8.7	9.2	16	37	25	20	26	82
Sulfate	mg/L	7.7	7.7	8.9	6.9	290	21	0.4	71	0.1 U
Sulfide	mg/L	0.05 U	0.05 U	0.05 U	0.05 U	0.053	0.05 U	0.05 U	0.05 U	0.05 U
N-Ammonia	mg-N/L	2.9	2.9	0.084	0.47	0.98	0.4	1.6	9.3	15
N-Nitrate	mg-N/L	0.1	0.1	0.1	0.2	0.1 U	0.2	0.1	0.1	0.1 U
N-Nitrite	mg-N/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Alkalinity	mg/L CaCO3	170	170	52	99	390	190	95	610	270
Bicarbonate	mg/L CaCO3	170	170	52	99	390	190	95	610	270
Carbonate	mg/L CaCO3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hydroxide	mg/L CaCO3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Metals by SW6010C										
Calcium, dissolved	mg/L	30	30	13	25	190	60	14	87	37
Iron, dissolved	mg/L	11	12	6.2	1.7	26	2.8	7.5	29	19
Iron, total	mg/L	12	12	14	4	27	3.1	8.3	29	19
Magnesium, dissolved	mg/L	8.9	8.9	4.3	5.8	49	12	4.8	56	22
Manganese, dissolved	mg/L	0.92	0.94	0.15	0.17	2	0.09	0.31	2.9	2
Manganese, total	mg/L	0.92	0.92	0.15	0.18	2.1	0.09	0.3	2.9	2
Potassium, dissolved	mg/L	4.7	3.8	3.2	3.2	14	4.7	3	16	9.6
Sodium, dissolved	mg/L	32	32	9.8	18	30	17	29	110	260
VOCs by SW8260C										
Benzene	µg/L	0.2 U	0.2 U							
cis-1,2-Dichloroethene	µg/L	0.48	0.5	0.43	0.2 U	0.2 U	0.89	3.9	1.5	0.2 U
Trichloroethene	µg/L	0.2 U	0.2 U	0.42	0.2 U	0.2 U	0.49	0.2 U	0.2 U	0.2 U
VOCs by SW8260C-SIM										
Vinyl Chloride	µg/L	0.99	0.98	0.053	0.11	0.02 U	0.2	5.1	0.36	0.44
Field Parameters										
Dissolved Oxygen	mg\L	0.33	--	0.42	0.85	0.31	0.52	0.19	0.56	0.44
ORP	mV	-22	--	32	25	25	61	-22	-21	-24
pH	pH	6.3	--	6.2	6.6	6.4	6.5	6.6	6.6	6.5
Specific Conductance	µS/cm	380	--	170	250	1,300	500	270	1,300	1,500

		Proposed CUL (Potential Scenarios)	
Monitored Analytes	**Units**	**Drinking Water**	**Upgradient or Background**
Benzene	µg/L	5.0	--
cis-1,2-Dichloroethene	µg/L	16	--
Trichloroethene	µg/L	5.0	--
Vinyl chloride	µg/L	0.29	--
Iron	mg/L	--	27
Manganese	mg/L	--	2.1

Notes:

-- Not analyzed for.

1 Coordinates are in Washington State Plane North NAD 83 feet.

2 Result is from SW8260C analysis because the SW8260C-SIM result exceeded the instrument calibration range.

Qualifier:

U Analyte was not detected at given reporting limit.

Abbreviations:

$CaCO_3$ Calcium carbonate
CUL Cleanup level
µg/L Micrograms per liter
µS/cm Microsiemens per centimeter
mg/L Milligrams per liter
mg-N/L Milligrams per liter as nitrogen
mV Millivolt
NAD 83 North American Datum of 1983
ORP Oxidation reduction potential
USEPA U.S. Environmental Protection Agency
VOC Volatile organic compound

South Park Landfill

March 2014 Interim Site-Wide Groundwater Monitoring Results

Figures

Legend

- Monitoring Well: Perched Zone/A-Zone
- Monitoring Well: B-Zone
- Monitoring Well: Perched Zone/A-Zone Groundwater Elevation Only
- Monitoring Well: B-Zone Groundwater Elevation Only
- Surface Water Monitoring: Groundwater Elevation Only
- Monitoring Well: Zones Not Used in Site-wide Monitoring
- Piezometer
- Reconnaissance Groundwater Probe
- Proposed POC Well
- West Ditch
- Revised Landfill Boundary (Based on RI/FS)
- King County Tax Parcels
- Generalized Groundwater Flow

Notes:

· Aerial imagery provided by ESRI.
· 7901 = 7901 2nd Avenue, LLC
· KIP = Kenyon Industrial Park
· POC = Point of Compliance
· RI/FS = Remedial Investigation/Feasibility Study
· SPPD = South Park Property Development, LLC
· SRDS = South Recycling and Disposal Station

0 150 300 600
Scale in Feet

N

Upgradient Wells Representing Groundwater Quality Entering Site			Proposed POC Well
KMW-05	Upgradient	Perched Zone/A-Zone	No
KMW-08	Upgradient	A-Zone	No
MW-12	Upgradient	A-Zone	No
MW-14	Upgradient	A-Zone	No
MW-29	Upgradient	A-Zone	No
Downgradient Wells Representing Edge of Waste			
KMW-03A	Edge of waste	Perched Zone/A-Zone	No
MW-08	Downgradient	B-Zone	Yes
MW-10	Downgradient	B-Zone	Yes
MW-24	Downgradient	B-Zone	Yes
MW-26	Downgradient	A-Zone	Yes
MW-27	Downgradient	A-Zone	Yes
MW-18	Edge of waste	B-Zone	Yes
MW-25	Edge of waste	A-Zone	Yes
MW-32	Edge of waste	A-Zone	Yes
MW-33	Edge of waste	A-Zone	Yes
Wells Representing Conditions Near Former Glitsa Property			
MW-30	Downgradient	Perched Zone	No
MW-31	Downgradient	A-Zone	No

FLOYD | SNIDER
strategy • science • engineering
Aspect CONSULTING
BHC CONSULTANTS
HERRERA ENVIRONMENTAL CONSULTANTS

Interim Site-wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 1.1
March 2014 Groundwater Monitoring Locations

I:\GIS\Projects\COS-SPARK\MXD\May 2014 Groundwater Report\Figure 1 (Groundwater Monitoring Locations)Version2.mxd
6/3/2014

Legend

- Flow Path (Orange Denotes Start Point)
- 1-Foot Groundwater Elevation Contours

Monitoring Well Locations

- Not Included in Analysis
- Used for Contouring and Flow Path Analysis
- Revised Landfill Boundary (Based on RI/FS)
- Tax Parcels

Notes:

· Tax parcels provided by King County Geographic Information Systems Center.
· Aerial imagery provided by ESRI
· Water levels at MW-01, MW-04, MW-08, MW-10, MW-24, and MW-30 were not used in the creation of the groundwater elevation contour map.

SR 509
S KENYON ST
OCCIDENTAL AVE S
5TH AVE S
S SULLIVAN ST
S CLOVERDALE ST

KMW-07 13.43
KMW-06 7.91
KMW-03A 7.94
MW-25 5.79
MW-31 5.70
MW-30
FB-14
KMW-05 9.86
MW-32 5.77
KMW-08 13.30
KMW-04 7.93
KMW-02B 8.22
MW-33 5.94
SG-2N 9.23
KMW-01A 7.55
MW-26 5.88
MW-24
FB-07
FB-08
MW-12 12.30
FB-09
FB-10
FB-11
MW-27 5.98
MW-08
FB-13
MW-03
FB-12
SG-1S 9.54
MW-14 15.66
MW-18 6.09
MW-01
MW-29 10.66
MW-04
MW-06 7.14

14 12 9 8 10 11 14 13 15

0 100 200 400
Scale in Feet

FLOYD | SNIDER
strategy ▪ science ▪ engineering
Aspect CONSULTING
BHC CONSULTANTS
HERRERA ENVIRONMENTAL CONSULTANTS

Interim Site-wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 2.1
Groundwater Elevation Contour Map
March 2014

T:\projects_8\SouthPark_Landfill\Delivered\March2014Monitoring\Fig 2-1 GW Elevation Contour Map.mxd
5/1/2014

Legend

Well Locations:

- B-Zone Monitoring Well
- Perched Zone/A-Zone Monitoring Well
- Perched Zone Monitoring Well
- Kenyon Street Bus Yard Monitoring Well

Well Labels:

KMW-05
(March-2014)
TCE: 4U
cis-DCE: 4U
VC: 0.4U
Benz: 7.2

- *Well ID*
- *Sample Month-Year*
- *Trichloroethene in µg/L*
- *cis-1,2-Dichlorethene in µg/L*
- *Vinyl Chloride in µg/L*
- *Benzene in µg/L*

· Qualifier "U" = The analyte was not detected at the reported concentration.
· Qualifier "J" = The reported concentration is an estimate.
· Qualifier "JM" = Analyte was detected; the result should be considered an estimate due to poor spectral match.
· -- indicates parameter not analyzed.

Monitored Chemicals	Units	Proposed CUL (Potential Scenarios)		
		Drinking Water	Protection of Surface Water	Upgradient or Background
Benzene	µg/L	5	51	
cis-1,2-Dichloroethene	µg/L	16	900	
Trichloroethene	µg/L	4.9	30	
Vinyl chloride	µg/L	0.29	2.4	

Revised Landfill Boundary (based on RI/FS)

Tax Parcel

1,000-Foot Perimeter from Landfill Boundary

Notes:
· Tax parcels provided by King County Geographic Information Systems Center.
· Aerial imagery provided by ESRI
· CUL - Cleanup Level
· µg/L - Micrograms per liter
· RI/FS - Remedial Investigation/Feasibility Study

DUWAMISH WATERWAY

S HOLDEN ST
SR 509
S KENYON ST
5TH AVE S
OCCIDENTAL AVE S
SR 99 (W MARGINAL WAY S)
S SULLIVAN ST
S CLOVERDALE ST

BYMW-5 (Feb-2008) VC: 0.2U

BYMW-11 (July-2008) VC: 0.2U

KMW-03A (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.3 Benz: --

KMW-05 (March-2014) TCE:2U cis-DCE: 2U VC:0.2U Benz: 7.4

KMW-08 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.02U Benz: 0.2U

MW-10 (March-2014) TCE:0.2U cis-DCE: 1.9 VC:0.49 Benz: --

MW-12 (March-2014) TCE:0.3 cis-DCE: 4.5 VC:0.22 Benz: --

MW-14 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.02U Benz: --

MW-25 (March-2014) TCE:0.2U cis-DCE: 0.5 VC:0.99 Benz: 0.2U

MW-31 (March-2014) TCE:0.2U cis-DCE: 3.9 VC:5.1 Benz: --

MW-30 (March-2014) TCE:0.49 cis-DCE: 0.89 VC:0.2 Benz: --

MW-33 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.44 Benz: --

MW-32 (March-2014) TCE:0.2U cis-DCE: 1.5 VC:0.36 Benz: --

MW-29 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.02U Benz: --

MW-26 (March-2014) TCE:0.42 cis-DCE: 0.43 VC:0.053 Benz: --

MW-24 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.034 Benz: --

MW-27 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.11 Benz: --

MW-08 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.08 Benz: --

MW-18 (March-2014) TCE:0.2U cis-DCE: 0.2U VC:0.02U Benz: --

N

0 200 400 800

Scale in Feet

FLOYD | SNIDER
strategy • science • engineering
Aspect CONSULTING
BHC CONSULTANTS
HERRERA ENVIRONMENTAL CONSULTANTS

Interim Site-wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 3.1
Groundwater Sample Analytical Results
Benzene and Chlorinated Ethenes

T:\projects_8\SouthPark_Landfill\Delivered\March2014Monitoring\Fig 3-1 GW TPHs and Benzene.mxd
4/30/2014

Legend

Exploration Locations:

- B-Zone Monitoring Well
- Perched Zone/A-Zone Monitoring Well
- Perched Zone Monitoring Well

Location Labels:

KMW-07
(March-2014)
Fe (T/D): --/--
Mn (T/D): 252/202
DO: 0.33
pH: 6.72
ORP: 49.8
Cond: 621

- *Well ID*
- *Sample Month/Year*
- *Total/Dissolved Iron Concentration in mg/L*
- *Total/Dissolved Manganese Concentration in mg/L*
- *Dissolved Oxygen in mg/L*
- *pH*
- *Oxidation Reduction Potential in mV*
- *Specific Conductance in µS/cm*

· Qualifier "U" = The analyte was not detected at the reported concentration.
· -- indicates parameter not analyzed.

Monitored Chemicals	Units	Proposed CUL (Potential Scenarios)		
		Drinking Water	Protection of Surface Water	Upgradient or Background
Iron	mg/L			18
Manganese	mg/L			2

Revised Landfill Boundary (based on RI/FS)
Tax Parcel
1,000-Foot Perimter from Landfill Boundary

Notes:
· Tax parcels provided by King County Geographic Information Systems Center.
· Aerial imagery provided by ESRI
· CUL - Cleanup level
· µg/L - Micrograms per liter
· µS/cm - Microsiemens per centimeter
· mV - millivolts
· RI/FS - Remedial Investigation/Feasibility Study

DUWAMISH WATERWAY

S HOLDEN ST
S KENYON ST
S SULLIVAN ST
S CLOVERDALE ST
SR 509
1ST AVE S
5TH AVE S
SR 99 (W MARGINAL WAY S)

KMW-03A
(March-2014)
Fe(T/D):11.3/11.2
Mn(T/D): 0.06/0.058
DO:0.37
pH:7.5
ORP:-145.9
Sp.Cond:736

KMW-05
(March-2014)
Fe(T/D):6.9/6.5
Mn(T/D): 0.02/0.02
DO:0.24
pH:13.2
ORP:-145.4
Sp.Cond:30,339

KMW-08
(March-2014)
Fe(T/D):0.31/0.21
Mn(T/D): 0.305/0.298
DO:0.58
pH:6.33
ORP:130.3
Sp.Cond:454.9

MW-10
(March-2014)
Fe(T/D):29.6/29.7
Mn(T/D): 2.04/2.06
DO:0.16
pH:6.94
ORP:-112.6
Sp.Cond:1,020

MW-12
(March-2014)
Fe(T/D):11.1/9.01
Mn(T/D): 0.768/0.722
DO:0.45
pH:6.37
ORP:70.1
Sp.Cond:406.3

MW-14
(March-2014)
Fe(T/D):5.76/4.56
Mn(T/D): 0.669/0.656
DO:0.36
pH:6.5
ORP:24.2
Sp.Cond:513.2

MW-25
(March-2014)
Fe(T/D):11.6/11.5
Mn(T/D): 0.923/0.943
DO:0.33
pH:6.32
ORP:-21.9
Sp.Cond:384.7

MW-29
(March-2014)
Fe(T/D):26.6/26.4
Mn(T/D): 2.07/2.04
DO:0.31
pH:6.39
ORP:24.7
Sp.Cond:1,314

MW-32
(March-2014)
Fe(T/D):29/28.6
Mn(T/D): 2.9/2.87
DO:0.56
pH:6.55
ORP:-20.8
Sp.Cond:1,315

MW-30
(March-2014)
Fe(T/D):3.08/2.8
Mn(T/D): 0.09/0.09
DO:0.52
pH:6.45
ORP:60.8
Sp.Cond:503.8

MW-31
(March-2014)
Fe(T/D):8.29/7.54
Mn(T/D): 0.303/0.306
DO:0.19
pH:6.62
ORP:-21.9
Sp.Cond:268.8

MW-26
(March-2014)
Fe(T/D):13.9/6.18
Mn(T/D): 0.147/0.145
DO:0.42
pH:6.22
ORP:32.4
Sp.Cond:173.4

MW-08
(March-2014)
Fe(T/D):21.3/16.4
Mn(T/D): 1.13/1.13
DO:0.15
pH:6.86
ORP:-72
Sp.Cond:1,336

MW-33
(March-2014)
Fe(T/D):19.1/18.9
Mn(T/D): 2.03/1.95
DO:0.44
pH:6.51
ORP:-23.5
Sp.Cond:1,522

MW-24
(March-2014)
Fe(T/D):25.9/24.6
Mn(T/D): 1.47/1.45
DO:0.27
pH:6.71
ORP:-77.3
Sp.Cond:899

MW-27
(March-2014)
Fe(T/D):4.01/1.69
Mn(T/D): 0.177/0.167
DO:0.85
pH:6.59
ORP:25.4
Sp.Cond:251.4

MW-18
(March-2014)
Fe(T/D):33.3/34.8
Mn(T/D): 1.24/1.2
DO:0.43
pH:6.46
ORP:-0.1
Sp.Cond:745

N

0 200 400 800

Scale in Feet

FLOYD | SNIDER
strategy · science · engineering
Aspect CONSULTING
BHC CONSULTANTS
HERRERA ENVIRONMENTAL CONSULTANTS

Interim Site-wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 3.2
Groundwater Sample Analytical Results
Iron and Manganese

T:\projects_8\SouthPark_Landfill\Delivered\March2014Monitoring\Fig 3-2 GW Iron and Manganese.mxd
4/30/2014

Legend

Well Locations:

- B-Zone Monitoring Well
- Perched Zone/A-Zone Monitoring Well
- Perched Zone Monitoring Well

Well Labels:

MW-10	*Well ID*
(March-2014)	*Sample Month/Year*
Ammonia:3.04	*Ammonia in mg-N/L*
Nitrite:5U	*Nitrate as Nitrogen in mg/L*
Nitrate: *0.01U*	*Nitrate as Nitrogen in mg/L*
Sulfate: *17.8*	*Sulfate in mg/L*
Sulfide: *30.6*	*Sulfide in mg/L*
DO:1.2	*Dissolved Oxygen in mg/L*
ORP: *-55.2*	*Oxidation Reduction Potential in mV*

· Qualifier "U" = The analyte was not detected at the reported concentration.
· Qualifier "J" = The reported concentration is an estimate.
· *BLUE ITALICS* indicate favorable conditions for natural attenuation of hydrocarbon fuels or chlorinated solvents (values from USEPA/600/R-98/128 1998):
- Dissolved Oxygen: less than 0.5 mg/L
- Oxidation Reduction Potential: less than 50 mV
- Nitrate as Nitrogen: less than 1 mg/L
- Sulfate: less than 20 mg/L
- Sulfide: greater than 1 mg/L

- Revised Landfill Boundary (Based on RI/FS)
- 1,000-Foot Perimeter from Landfill Boundary
- Tax Parcel

Notes:
· Tax parcels provided by King County Geographic Information Systems Center.
· Aerial imagery provided by Esri
· Only well locations sampled for natural attenuation parameters are illustrated.
· µg/L - Micrograms per liter
· mg/L - Milligrams per liter
· mg-N/L - Milligrams per liter as nitrogen
· mV - millivolts
· USEPA - United States Environmental Protection Agency
· RI/FS - Remedial Investigation/Feasibility Study

MW-31 (March-2014) Ammonia:1.58 Nitrate:*0.1* Nitrite:0.1U Sulfate:*0.4* Sulfide:0.05U DO:*0.19* ORP:*-21.9*

MW-25 (March-2014) Ammonia:2.89 Nitrate:*0.1* Nitrite:0.1U Sulfate:*7.7* Sulfide:0.05U DO:*0.33* ORP:*-21.9*

MW-10 (March-2014) Ammonia:4.87 Nitrate:*0.1U* Nitrite:0.1U Sulfate:109 Sulfide:0.05U DO:*0.16* ORP:*-112.6*

KMW-03A (March-2014) Ammonia:3.17 Nitrate:*0.1* Nitrite:0.1U Sulfate:*0.4* Sulfide:0.05U DO:*0.37* ORP:*-145.9*

KMW-05 (March-2014) Ammonia:64.2 Nitrate:2U Nitrite:2U Sulfate:1,000 Sulfide:*28.1* DO:*0.24* ORP:*-145.4*

MW-30 (March-2014) Ammonia:0.396 Nitrate:*0.2* Nitrite:0.1U Sulfate:20.6 Sulfide:0.05U DO:0.52 ORP:60.8

MW-32 (March-2014) Ammonia:9.26 Nitrate:*0.1* Nitrite:0.1U Sulfate:71.3 Sulfide:0.05U DO:0.56 ORP:*-20.8*

MW-26 (March-2014) Ammonia:0.084 Nitrate:*0.1* Nitrite:0.1U Sulfate:*8.9* Sulfide:0.05U DO:*0.42* ORP:*32.4*

MW-24 (March-2014) Ammonia:3.8 Nitrate:*0.1* Nitrite:0.1U Sulfate:*0.5* Sulfide:0.05U DO:*0.27* ORP:*-77.3*

KMW-08 (March-2014) Ammonia:0.36 Nitrate:*0.1U* Nitrite:0.1U Sulfate:27.9 Sulfide:0.05U DO:0.58 ORP:130.3

MW-33 (March-2014) Ammonia:14.7 Nitrate:*0.1U* Nitrite:0.1U Sulfate:*0.1U* Sulfide:0.05U DO:*0.44* ORP:*-23.5*

MW-27 (March-2014) Ammonia:0.471 Nitrate:*0.2* Nitrite:0.1U Sulfate:*6.9* Sulfide:0.05U DO:0.85 ORP:*25.4*

MW-08 (March-2014) Ammonia:2.9 Nitrate:*0.1* Nitrite:0.1U Sulfate:*2.6* Sulfide:0.05U DO:*0.15* ORP:*-72*

MW-12 (March-2014) Ammonia:0.734 Nitrate:*0.1* Nitrite:0.1U Sulfate:*13.2* Sulfide:0.05U DO:*0.45* ORP:70.1

MW-14 (March-2014) Ammonia:0.204 Nitrate:*0.1* Nitrite:0.1U Sulfate:*2* Sulfide:0.05U DO:*0.36* ORP:*24.2*

MW-29 (March-2014) Ammonia:0.976 Nitrate:*0.1U* Nitrite:0.1U Sulfate:286 Sulfide:0.053 DO:*0.31* ORP:*24.7*

MW-18 (March-2014) Ammonia:1.98 Nitrate:*0.1U* Nitrite:0.1U Sulfate:*0.1U* Sulfide:0.05U DO:*0.43* ORP:*-0.1*

DUWAMISH WATERWAY
S HOLDEN ST
S KENYON ST
S KENYON ST
SR 509
1ST AVE S
OCCIDENTAL AVE S
2ND AVE S
5TH AVE S
5TH AVE S
SR 99 (W MARGINAL WAY S)
S SULLIVAN ST
S CLOVERDALE ST

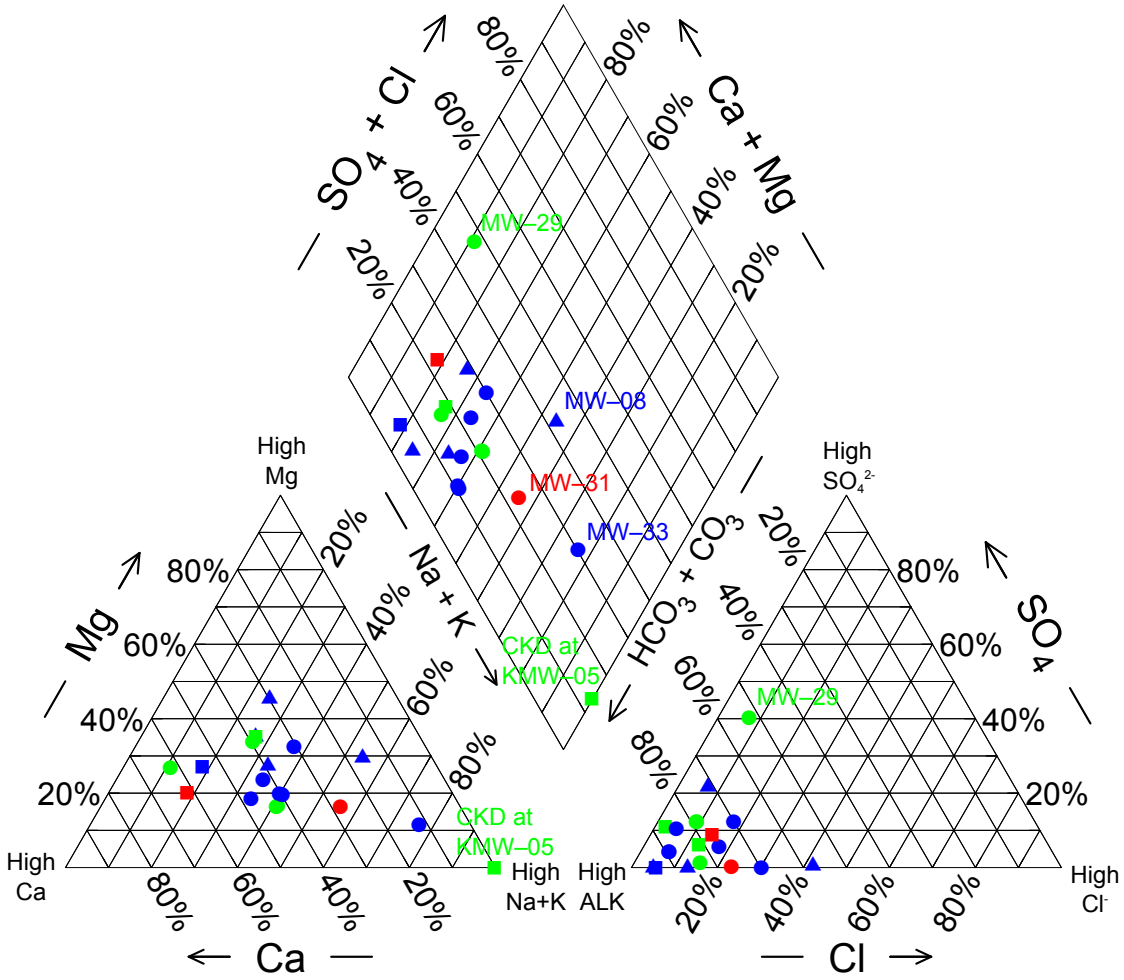
N
0 200 400 800
Scale in Feet

FLOYD | SNIDER
strategy • science • engineering
Aspect CONSULTING
BHC CONSULTANTS
HERRERA ENVIRONMENTAL CONSULTANTS

Interim Site-wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 3.3
Groundwater Sample Analytical Results
Long-term Groundwater Monitoring Parameters

T:\projects_8\SouthPark_Landfill\Delivered\March2014Monitoring\Fig 3-3 GW Natural Attenuation Params.mxd
4/30/2014



Legend

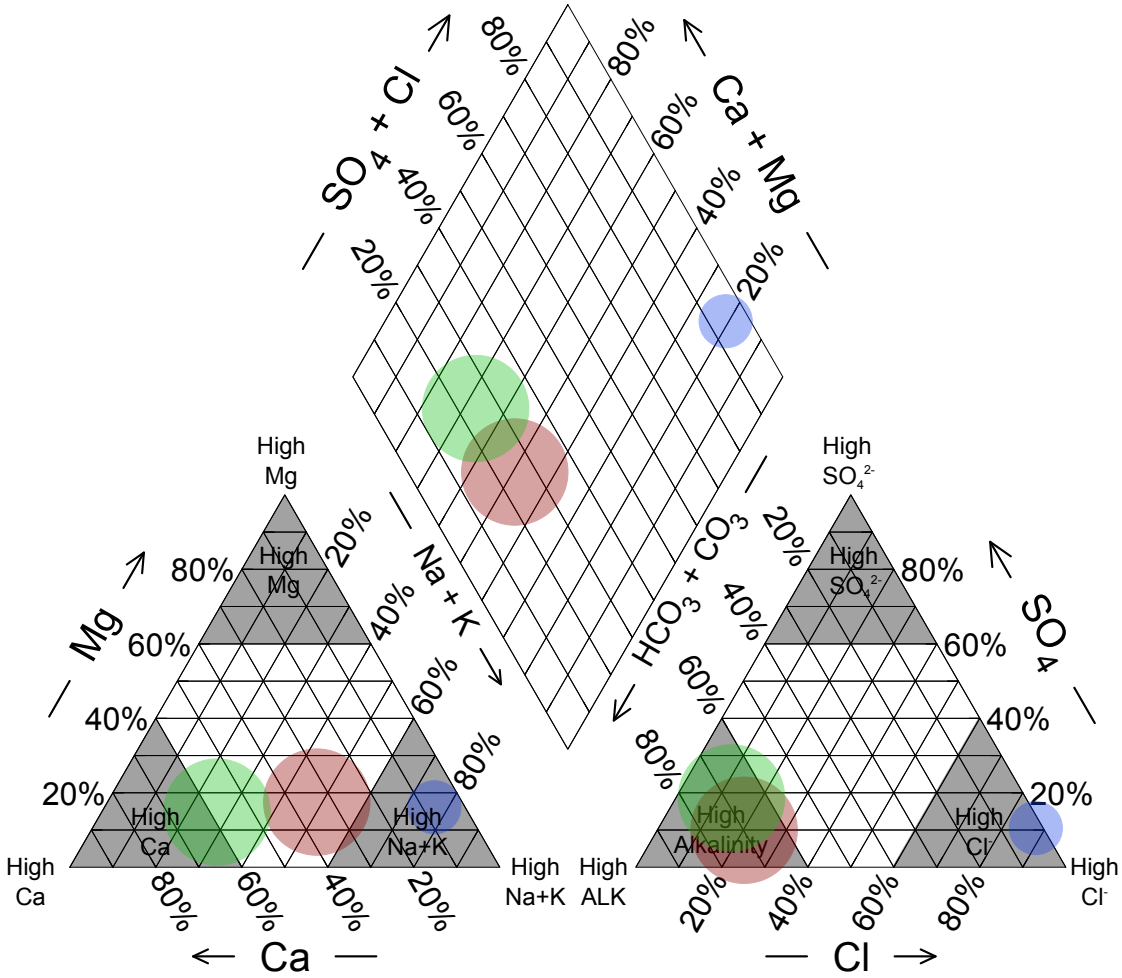
- Upgradient Perched and Perched/Shallow
  - KMW–05
  - MW–12
- Downgradient Perched and Perched/Shallow
  - KMW–03A
- Off-site Perched and Perched/Shallow
  - MW–30
- Upgradient Shallow
  - MW–14
  - MW–29
  - KMW–08
  - KMW–08Dup
- Downgradient Shallow
  - MW–25
  - MW–25Dup
  - MW–26
  - MW–27
  - MW–32
  - MW–33
- Off-site Shallow
  - MW–31
- Downgradient Deep
  - MW–08
  - MW–10
  - MW–18
  - MW–24

Note:
Companion information is provided on Figure 3.5.

FLOYD | SNIDER
strategy • science • engineering
Aspect CONSULTING
BHC CONSULTANTS
HERRERA ENVIRONMENTAL CONSULTANTS

Interim Site-Wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 3.4
March 2014 Groundwater Monitoring
Trilinear Plot of Major Cations and Anions



FLOYD | SNIDER
strategy • science • engineering

Aspect CONSULTING

BHC CONSULTANTS

HERRERA ENVIRONMENTAL CONSULTANTS

Interim Site-wide Groundwater Monitoring
South Park Landfill
Seattle, Washington

Figure 3.5
Trilinear Plot of Major Cations and Anions for Typical Waters

South Park Landfill

March 2014 Interim Site-Wide Groundwater Monitoring Results

Appendix A
Groundwater Sampling Field Forms

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Aspect Consulting	Phone: 206.780.7719	Date: 3/17/14	Ice Present? Y
Client Contact: John Strunk jstrunk@aspectconsulting.com		No. of Coolers: 3	Cooler Temps: 8.5, 7.4, 4.2
Client Project Name: South Park Landfill			
Client Project #: 100116	Samplers: SDM / SLO		

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

Sample ID	Date	Time	Matrix	No. Containers	VOC by 8260C Cis-1,2 - dichloroethene Trichloroethylene *See Notes	VOCs by 8260C SIM Vinylchloride	Dissolved Metals by 6010B Na, K, Ca, Mg, Fe, Mn	Total Metals by 6010B Fe, Mn	Major Anions by 300 Chloride, Sulfate, Nitrate Nitrite	Major Anions by SM 2320B Alkalinity, carbonate, Bicarbonate	Genral Chem by SM 4500 Ammonia, Sulfide	Benzene (As part of 8260C)	Notes/Comments
SPL-GW-KMW08-031714	3/17/14	1015	H2O	12	X	X	X	X	X	X	X	X	
SPL-GW-MW61-031714		1030			X	X	X	X	X	X	X	X	
SPL-GW-KMW03A-031714		12:00			X	X	X	X	X	X	X		
SPL-GW-KMW05-031714		13:15			X	X	X	X	X	X	X	X	
SPL-GW-MW25-031714		1445			X	X	X	X	X	X	X	X	
SPL-GW-MW-6D-031714		1550			X	X	X	X	X	X	X	X	
SPL-GW-MW10-031714		1510			X	X	X	X	X	X	X		
Trip Blank					X	X							in cooler w/all VOAs

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Sean McClure	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: Aspect Consulting	Company: ARI	Company:	Company:
	Date & Time: 3/17/14 16:10	Date & Time: 3/17/14 1610	Date & Time:	Date & Time:

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Aspect Consulting	Phone: 206.780.7719	Date: 3/18/14	Ice Present? Y
Client Contact: John Strunk jstrunk@aspectconsulting.com		No. of Coolers: 3	Cooler Temps: 4.0, 6.0, 2.9
Client Project Name: South Park Landfill			
Client Project #: 100116	Samplers: SDM & JLD		

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

Sample ID	Date	Time	Matrix	No. Containers	VOC by 8260C Cis-1,2 - dichloroethene Trichloroethylene *See Notes	VOCs by 8260C SIM Vinylchloride	Dissolved Metals by 6010B Na, K, Ca, Mg, Fe, Mn	Total Metals by 6010B Fe, Mn	Major Anions by 300 Chloride, Sulfate, Nitrate Nitrite	Major Anions by SM 2320B Alkalinity, carbonate, Bicarbonate	Genral Chem by SM 4500 Ammonia, Sulfide	Benzene (As part of 8260C)	Notes/Comments
SPL-GW-MW32-031814	3/18/14	0915	H2O	12	X	X	X	X	X	X	X		
SPL-GW-MW33-031814		0940		12	X	X	X	X	X	X	X		
SPL-GW-MW18-031814		1100		12	X	X	X	X	X	X	X		
SPL-GW-MW14-031814		1215		12	X	X	X	X	X	X	X		
SPL-GW-MW29-031814		1245		~~12~~ 12	X	X	X	X	X	X	X		
SPL-GW-MW12-031814		1330		12	X	X	X	X	X	X	X		
Trip Blank				2	X	X							in cooler w/ VOAs

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Seann McClure	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: Aspect Consulting	Company: ARI	Company:	Company:
	Date & Time: 3/18/14 14:20	Date & Time: 3/18/14 1420	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.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Aspect Consulting	Phone: 206.780.7719	Date: 3/19/14	Ice Present?
Client Contact: John Strunk jstrunk@aspectconsulting.com		No. of Coolers:	Cooler Temps:
Client Project Name: South Park Landfill			
Client Project #: 100116	Samplers: SDM / JLO		

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

Sample ID	Date	Time	Matrix	No. Containers	VOC by 8260C Cis-1,2 - dichloroethene Trichloroethylene *See Notes	VOCs by 8260C SIM Vinylchloride	Dissolved Metals by 6010B Na, K, Ca, Mg, Fe, Mn	Total Metals by 6010B Fe, Mn	Major Anions by 300 Chloride, Sulfate, Nitrate Nitrite	Major Anions by SM 2320B Alkalinity, carbonate, Bicarbonate	Genral Chem by SM 4500 Ammonia, Sulfide	Benzene (As part of 8260C)	Notes/Comments
~~Hide~~ SPL-GW-MW31-031914	3/19/14	1000	H2O	12	X	X	X	X	X	X	X		
SPL-GW-MW30-031914		1015		12	X	X	X	X	X	X	X		
SPL-GW-MW26-031914		1100		12	X	X	X	X	X	X	X		
SPL-GW-MW24-031914		1145		12	X	X	X	X	X	X	X		
SPL-GW-MW08-031914		1240		12	X	X	X	X	X	X	X		
SPL-GW-MW27-031914		1340		12	X	X	X	X	X	X	X		
SPL-GW-MW30-031914		1400		6	X	X							
Trip Blank				2	X	X							in coolers w/ VOAs

*For 8260C, please provide report for only the analytes listed. However please do dillutions and archive chromatographs for the full suite of analytes so additional analytes may be analyzed later if requested.

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Seann McClure	Printed Name: A. Vongardsen	Printed Name:	Printed Name:
	Company: Aspect Consulting	Company: ARI	Company:	Company:
	Date & Time: 3/19/14 14:35	Date & Time: 3/19/14 1435	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.

SGW

100116 SouthPark 3/17/14

WL- 3/17/14

ID	DTW	Date time	time
KMW-01A	8.09	3/17/14	1037
KMW-02B	9.83	3/17/14	1046
KMW-07	4.67	3/17/14	1053
KMW-04	9.99	3/17/14	1149
KMW-06	7.84	3/17/14	1310
SG-2N	2.88	3/17/14	1340
MW-6	9.31	3/18/14	1040
SG-1S	2.60	3/18/14	1150

1 full 55gallon Drum & 1 empty 55gallon drum left onsite @ end of day 3/19/14

13:30

KMW-06 monument has no lid

Aspect CONSULTING

Sample number: SPL-GW-KMW-08-031714

GROUNDWATER SAMPLING RECORD

WELL NUMBER: KMW-08 Page: 1 of 1

Project Name: South Park
Date: 3/17/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC (black mark)
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 10016
Starting Water Level (ft TOC): 4.77
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS ±0.1

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%		
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0 09:37		~0.16	4.78	12.6	376.7	1.12	6.26	155.8		
5 09:42		~0.16	4.78	12.9	378.5	0.55	6.26	151.4		
10 09:47		~0.16	4.77	12.8	395.0	0.64	6.29	146.8		
15 09:52		~0.16	4.78	13.2	405.9	0.80	6.30	142.6		
17 09:54		~0.16	4.78	13.2	412.9	0.77	6.31	141.3		
19 09:56		~0.16	4.77	13.1	422.5	0.74	6.31	139.5		
21 09:58		~0.16	4.78	13.0	429.8	0.71	6.32	137.5		
23 10:00		~0.16	4.79	13.0	434.9	0.68	6.32	136.2		
26 10:03		~0.18	4.77	13.0	439.4	0.65	6.33	134.4		
29 10:06		~0.18	4.78	13.1	445.9	0.62	6.33	133.3		
10:10		~0.18	4.80	13.1	454.9	0.58	6.33	130.7	1.89	Sample

Total Gallons Purged: 2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 4.79
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
10:15	40 mL	VOA	3	–	HCl, 2-no			collected field dup SPL-GW-MW01-031714 10:30
10:15	40 mL	VOA	3	–	HCl, 2-no			VOC 8260C + Benzene
10:15	500mL	HDPE	1	Yes	HNO3			VOC 8260C-SIM (VC)
10:15	500mL	HDPE	1	–	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
10:15	Small	OS	1	–	–			Total metals Fe, Mn
10:15	Small	OS	1	–	–			Anions Cl, NO3, NO2, SO4
10:15	500mL	HDPE	1	–	H2SO4			Alkalinity
10:15	500mL	HDPE	1	–	ZnAc			Ammonia (NH3
								Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 11F100633
Purging Equipment: peristaltic
Decon Equipment: alconox & dedicated tubing
Disposal of Discharged Water: Drums
Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-KMW-03A-031714

GROUNDWATER SAMPLING RECORD

WELL NUMBER: KMW-03A Page: 1 of 1

Project Name: South Park
Project Number: 100116
Date: 3/17/14
Sampled by: SDM, SLD
Measuring Point of Well:
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Starting Water Level (ft TOC): 8.89
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0 11:19		~0.28	8.89	13.4	701	0.42	6.78	86.8		
5 11:24		~0.28	8.90	13.7	741	0.35	7.45	-40.1		
10 11:29		~0.28	8.89	13.6	743	0.36	7.48	-102.9		
15 11:34		~0.28	8.90	13.6	736	0.37	7.49	-133.7		
20 11:39		~0.28	8.90	13.6	737	0.37	7.50	-143.0		
23 11:42		~0.28	8.90	13.6	736	0.37	7.50	-145.9	2.05	Sample

Total Gallons Purged: ~3.0
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 9.91
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
12:00	40 mL	VOA	3	–	1 HCl, 2 no			VOC 8260C
12:00	40 mL	VOA	3	–	1 HCl, 2 no			VOC 8260C-SIM (VC)
12:00	500mL	HDPE	1	(Yes)	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
12:00	500mL	HDPE	1 ✓	–	HNO3			Total metals Fe, Mn
12:00	Small	OS	1 ✓	–	–			Anions Cl, NO3, NO2, SO4
12:00	Small	OS	1 ✓	–	–			Alkalinity
12:00	500mL	HDPE	1 ✓	–	H2SO4			Ammonia (NH3
12:00	500mL	HDPE	1 ✓	–	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 11F100633
Purging Equipment: peristaltic
Decon Equipment: alconox & dedicated tubing
Disposal of Discharged Water: Drums
Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-KMW05-031714

GROUNDWATER SAMPLING RECORD

WELL NUMBER: KMW05 Page: ___ of ___

Project Name: South Park
Date: 3/17/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 100116
Starting Water Level (ft TOC): 5.47
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume ___ (ft Water) x ___ (Lpfv)(gpf) = ___ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

12:28 start pump

	Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
Criteria:			Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
0	12:33		~0.28	5.53	13.8	31057	0.25	13.23	-122.2		
5	12:38		~0.28	5.53	13.9	30998	0.25	13.22	-126.8		
10	12:43		~0.28	5.53	13.9	30728	0.24	13.21	-140.5		
15	12:48		~0.28	5.53	14.0	30364	0.24	13.20	-144.6		
20	12:53		~0.28	5.55	13.9	30413	0.24	13.20	-145.7		
25	12:58		~0.20	5.50	13.8	30339	0.24	13.20	-145.4	4.16	Sample

Total Gallons Purged: ~2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 5.51
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
13:15	40 mL	VOA	3 ✓	-	1 HCl, 2 no	Dark brown		VOC 8260C + Benzene
13:15	40 mL	VOA	3 ✓	-	1 HCl, 2 no			VOC 8260C-SIM (VC)
13:15	500mL	HDPE	1	Yes	HNO3			Dis Metals Ba, K, Ca, Mg, Fe, Mn
13:15	500mL	HDPE	1 ✓	-	HNO3			Total metals Fe, Mn
13:15	Small	OS	1 ✓	-	-			Anions Cl, NO3, NO2, SO4
13:15	Small	OS	1 ✓	-	-			Alkalinity
13:15	500mL	HDPE	1 ✓	-	H2SO4			Ammonia (NH3
13:15	500mL	HDPE	1 ✓	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 11F100633
Purging Equipment: peristaltic
Decon Equipment: Alconox + dedicated tubing
Disposal of Discharged Water: Drums
Observations/Comments: no interface detected w/ the interface probe

Aspect CONSULTING

Sample number: SPL-GW-~~KMW~~MW-25-031714

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-25 Page: 1 of 1

Project Name: South Park
Project Number: 100116
Date: ~~3~~ 3/17/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): 12.32
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

13:56 start pump

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0 14:00		0.28	12.32	13.6	368.3	0.67	6.06	11.1		
5 14:05		0.28	12.33	13.7	373.3	0.45	6.14	-0.2		
10 14:10		0.28	12.32	13.7	377.7	0.41	6.19	-6.1		
15 14:15		0.28	12.33	13.8	380.3	0.39	6.24	-10.4		
20 14:20		0.28	12.32	13.8	381.7	0.36	6.27	-13.1		
25 14:25		0.28	12.32	13.9	383.5	0.35	6.30	-16.8		
30 14:30		0.28	12.32	13.9	384.7	0.33	6.32	-21.9	1.07	Sample

Total Gallons Purged: ~5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 12.33
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
14:45	40 mL	VOA	3 ✓	-	HCl, 2-no			Field Dup SPL-GW-MW-60 15:00
14:45	40 mL	VOA	3 ✓	-	HCl, 2-no			VOC 8260C + Bnz
14:45	500mL	HDPE	1 ✓	Yes	HNO3			VOC 8260C-SIM (VC)
14:45	500mL	HDPE	1 ✓	-	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
14:45	Small	OS	1 ✓	-	-			Total metals Fe, Mn
14:45	Small	OS	1 ✓	-	-			Anions Cl, NO3, NO2, SO4
14:45	500mL	HDPE	1 ✓	-	H2SO4			Alkalinity
14:45	500mL	HDPE	1 ✓	-	ZnAc			Ammonia (NH3) Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 11F100633
Purging Equipment: QED pump
Decon Equipment: Alconox + dedicated tubing
Disposal of Discharged Water: drums on site
Observations/Comments:

13:15

Aspect CONSULTING

Sample number: SPL-GW-MW-10-031714

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-10 Page: 1 of 1

Project Name: South Park
Project Number: 10016
Date: 3/17/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): 14.60
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf
Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

14:10 start pump

	Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
Criteria:			Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
0	14:17		0.28	11.61	13.6	821	0.43	7.02	14.1		
5	14:22		0.28	11.60	13.6	1019	0.55	6.94	-80.3		
10	14:27		0.28	11.60	13.7	1026	0.28	6.94	-101.3		
15	14:32		0.28	11.61	13.6	1035	0.25	6.94	-106.7		
20	14:37		0.28	11.60	13.6	1030	0.23	6.94	-108.7		
	14:42		0.28	11.61	13.6	1030	0.21	6.94	-110.2		
	14:47			11.61	13.6	1025	0.17	6.94	-111.5		
	14:49			11.61	13.2	1022	0.16	6.94	-112.3		
	14:50			11.61	13.6	1020	0.16	6.94	-112.6	0.41	Sample

Total Gallons Purged:
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
15:10	40 mL	VOA	3	-	HCl, 2-no	clear	0.41	VOC 8260C
15:10	40 mL	VOA	3	-	HCl, 2-no			VOC 8260C-SIM (VC)
15:10	500mL	HDPE	1	Yes	HNO3			Dis Metals Ba, K, Ca, Mg, Fe, Mn
15:10	500mL	HDPE	1	-	HNO3			Total metals Fe, Mn
15:10	Small	OS	1	-	-			Anions Cl, NO3, NO2, SO4
15:10	Small	OS	1	-	-			Alkalinity
15:10	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
15:10	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI
Purging Equipment: peristaltic pump
Decon Equipment: Alconox & dedicated tubing
Disposal of Discharged Water: Drums on site
Observations/Comments:

14:05 MW60 15:10 MW-10 15:15

Aspect CONSULTING

Sample number: SPL-GW-MW-32-031814

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-32 Page: 1 of 1

Project Name: South Park
Date: 3/18/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 100116
Starting Water Level (ft TOC): 9.30
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0 08:31		~0.22	9.33	13°C	1315	0.84	6.43	57.8		
5 08:36		~0.22	9.33	13.2	1312	0.74	6.48	29.5		
10 08:41		~0.22	9.32	13.2	1314	0.66	6.53	0.7		
15 08:46		~0.22	9.33	13.2	1314	0.58	6.55	-12.4		
20 08:51		~0.22	9.36	13.2	1315	0.57	6.55	-18.7		
25 08:56		~0.20	9.37	13.1	1315	0.56	6.55	-20.8	16.2	Sample
		~~Dropped @ to 120 mL/min~~								

Total Gallons Purged: ~2.0
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 9.31
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
09:15	40 mL	VOA	3 ✓	-	HCl, 2-no			VOC 8260C
09:15	40 mL	VOA	3 ✓	-	HCl, 2-no			VOC 8260C-SIM (VC)
09:15	500mL	HDPE	1 ✓	(Yes)	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
09:15	500mL	HDPE	✓	-	HNO3			Total metals Fe, Mn
09:15	Small	OS	✓	-	-			Anions Cl, NO3, NO2, SO4
09:15	Small	OS	✓	-	-			Alkalinity
09:15	500mL	HDPE	✓	-	H2SO4			Ammonia (NH3
09:15	500mL	HDPE	✓	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI
Purging Equipment: QED pump
Decon Equipment: Alconox + dedicated tubing
Disposal of Discharged Water: Drums on site

Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-MW33-031814

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-33 Page: 1 of 1

Project Name: South Park
Date: 3/18/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 100116
Starting Water Level (ft TOC): 9.45
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na ±0.5	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0912		0.26								
0917			9.45	14.0	1514	0.57	6.52	-13.1	clear	Start pump
0922			9.45	14.0	1519	0.50	6.51	-17.2		
0927			9.44	14.0	1521	0.47	6.51	-20.4		
0932			9.45	14.1	1522	0.44	6.51	-23.5	4.81	Sample

Total Gallons Purged: ~20
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 9.45
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
0940	40 mL	VOA	3 ✓	-	1 HCl, 2 no	yellow	4.94	VOC 8260C
	40 mL	VOA	3 ✓	-	1 HCl, 2 no			VOC 8260C-SIM (VC)
	500mL	HDPE	1	Yes	HNO3			Dis Metals Mn, Ca, Mg, Fe, Mn
	500mL	HDPE	1	-	HNO3			Total metals Fe, Mn
	Small	OS	1 ✓	-	-			Anions Cl, NO3, NO2, SO4
	Small	OS	1 ✓	-	-			Alkalinity
	500mL	HDPE	1 ✓	-	H2SO4			Ammonia (NH3
METHODS	500mL	HDPE	1 ✓	-	ZnAc			Sulfide (NO headspace)

Parameters measured with (instrument model & serial number): YSI green
Purging Equipment: peristaltic
Decon Equipment: Alconox + DI new tubing
Disposal of Discharged Water: Drum onsite
Observations/Comments: peristaltic pump

Aspect CONSULTING

Sample number SPL-GW-MW18-031814

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW18 Page: 1 of 1

Project Name: South Park
Date: 3/18/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 100116
Starting Water Level (ft TOC): 13.81
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
10:16		0.30								
0 10:20		0.30	13.81	11.2	931	3.77	6.70	2.1		start pump
5 10:25		0.30	13.85	12.1	816	1.02	6.49	10.9		
10 10:30		0.30	13.81	12.1	765	0.71	6.47	8.8		
15 10:35		0.30	13.86	12.1	747	0.52	6.46	5.2		
20 10:40		0.30	13.87	12.1	745	0.46	6.46	1.5		
25 10:45		0.30	13.81	12.2	745	0.43	6.46	-0.1	2.20	Sample

Total Gallons Purged: ~2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 13.81
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
11:00	40 mL	VOA	3	–	1 HCl, 2-no			VOC 8260C
11:00	40 mL	VOA	3	–	1 HCl, 2-no			VOC 8760C-SIM (VC)
11:00	500mL	HDPE	1	(Yes)	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
11:00	500mL	HDPE	1 ✓	–	HNO3			Total metals Fe, Mn
11:00	Small	OS	1 ✓	–	–			Anions Cl, NO3, NO2, SO4
11:00	Small	OS	1 ✓	–	–			Alkalinity
11:00	500mL	HDPE	1 ✓	–	H2SO4			Ammonia (NH3
11:00	500mL	HDPE	1 ✓	–	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 11F100633
Purging Equipment: QED pump
Decon Equipment: alconox + dedicated tubing
Disposal of Discharged Water: Drums on site
Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-MW14-031814

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-~~13~~14 Page: 1 of 1

Project Name: South Park
Date: 3/18/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 10116
Starting Water Level (ft TOC): 2.86
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
11:27		~0.20	3.20							
0 11:35		~0.20	3.10	12.1	521.1	0.46	6.52	17.5		start pump
5 11:40		~0.20	3.14	12.1	514.9	0.43	6.51	21.7		
10 11:45		~0.20	3.16	12.2	513.2	0.38	6.50	23.4		
15 11.50		~0.20	3.16	12.2	513.2	0.36	6.50	24.2	6.65	Sample
20 11:55										

Total Gallons Purged: ~2.25
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 2.99
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
12:15	40mL	VOA	3✓	–	HCl, 2-no			VOC 8260C
12:15	40mL	VOA	3✓	–	HCl, 2-no			VOC 8260C-SIM (VC)
12:15	500mL	HDPE	1	(yes)	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
12:15	500mL	HDPE	1✓	–	HNO3			Total metals Fe, Mn
12:15	Small	OS	1✓	–	–			Anions Cl, NO3, NO2, SO4
12:15	Small	OS	1✓	–	–			Alkalinity
12:15	500mL	HDPE	1	–	H2SO4			Amonia (NH3
12:15	500mL	HDPE	1✓	–	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 11F100633
Purging Equipment: QED pump
Decon Equipment: alconox + dedicated tubing
Disposal of Discharged Water: Drums on site
Observations/Comments: Sulfur odor

Aspect CONSULTING

Sample number SPL-GW-MW29-031814

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-29 Page: 1 of 1

Project Name: South Park
Date: 3/18/14
Sampled by: SDM, SLO
Measuring Point of Well:
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 100116
Starting Water Level (ft TOC): ~~6.94~~ 5.78
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

2 equilibrated from 6.94 30 min after removing cap

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1159		0.26								
1204		0.22	7.10	13.5	1311	0.36	6.32	42.9	clear	Start pump
1209			7.17	13.3	1314	0.34	6.37	34.7		turned pump down
1214		~~0.22~~	7.24	13.3	1315	0.33	6.38	30.2		~~turned pump down~~
1219		"	7.25	13.2	1316	0.32	6.38	26.2		
1224		↓	7.27	13.3	1314	0.31	6.39	29.7	1.90	Sample

Total Gallons Purged: ~2 gallons
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC): 7.18

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
1245	40 mL	VOA	3	–	HCl, 2-no	yellow	1.90	VOC 8260C
↓	40 mL	VOA	3	–	HCl, 2-no	↓		VOC 8260C-SIM (VC)
	500mL	HDPE	1	Yes	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
	500mL	HDPE	1	–	HNO3			Total metals Fe, Mn
	Small	OS	1	–	–			Anions Cl, NO3, NO2, SO4
	Small	OS	1	–	–			Alkalinity
↓	500mL	HDPE	1	–	H2SO4			Ammonia (NH3)
METHODS	500mL	HDPE	1	–	ZnAc	↓		Sulfide (NO headspace)

Parameters measured with (instrument model & serial number): YSI green
Purging Equipment: peristaltic
Decon Equipment: Alconox + DI dedicated tubing
Disposal of Discharged Water: Drum on site
Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-MW12-031814

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW12 Page: 1 of 1

Project Name: South Park
Date: 3/18/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 100116
Starting Water Level (ft TOC): 7.18
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

	Criteria:	Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
	Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
	12:53		~0.22	7.22							
0	13:00		~0.22	7.22	11.9	403.6	0.65	6.40	69.9		Start pump
5	13:05		~0.22	7.21	11.8	406.3	0.46	6.37	70.8		
10	13:10		~0.22	7.22	11.8	406.0	0.47	6.37	70.4		
15	13:15		~0.22	7.21	11.8	406.3	0.45	6.37	70.1	3.09	Sample

Total Gallons Purged: ~2.25 gallons
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 7.22
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
13:30	40 mL	VOA	3	-	HCl, 2-no	yellow	3.09	VOC 8260C
13:30	40 mL	VOA	3	-	HCl, 2-no			VOC 8260C-SIM (VC)
13:30	500mL	HDPE	1	Yes	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
13:30	500mL	HDPE	1	-	HNO3			Total metals Fe, Mn
13:30	Small	OS	1	-	-			Anions Cl, NO3, NO2, SO4
13:30	Small	OS	1	-	-			Alkalinity
13:30	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
13:30	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 11F100633
Purging Equipment: QED pump
Decon Equipment: Alconox & dedicated tubing
Disposal of Discharged Water: Drums on site

Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-MW31-031914

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-31 Page: 1 of 1

Project Name: South Park
Project Number: 10016
Date: 3/19/14
Starting Water Level (ft TOC): 9.44
Sampled by: SDM, SLD
Casing Stickup (ft):
Measuring Point of Well: TOC
Total Depth (ft TOC):
Screened Interval (ft. TOC)
Casing Diameter (inches):
Filter Pack Interval (ft. TOC)

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf
Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
09:16		~0.28								start pump
09:20		~0.28	9.44	12.8	249.5	0.88	6.48	41.4		
09:25		~0.28	9.44	12.8	258.4	0.51	6.54	20.6		
09:30		~0.28	9.44	12.8	263.0	0.26	6.58	4.5		
09:35		~0.28	9.44	12.9	264.7	0.23	6.60	-6.6		
09:40		~0.28	9.44	12.9	268.4	0.21	6.61	-15.4		
09:43		~0.28	9.44	12.9	268.8	0.19	6.62	-21.9	10.6	Sample

Total Gallons Purged: ~2.5
Total Casing Volumes Removed: _____
Ending Water Level (ft TOC): 9.44
Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
10:00	40 mL	VOA	3 ✓	-	1 HCl, 2 no			VOC 8260C
10:00	40 mL	VOA	3 ✓	-	1 HCl, 2 no			VOC 8260C-SIM (VC)
10:00	500mL	HDPE	1 ✓	(Yes)	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
10:00	500 mL	HDPE	1 ✓	-	HNO3			Total metals Fe, Mn
10:00	Small	OS	1 ✓	-	-			Anions Cl, NO3, NO2, SO4
10:00	Small	OS	1 ✓	-	-			Alkalinity
10:00	500mL	HDPE	1 ✓	-	H2SO4			Ammonia (NH3
METHODS 10:00	500mL	HDPE	1 ✓	-	ZnAc			Sulfide (NO headspace)

Parameters measured with (instrument model & serial number): YSI 12G104202
Purging Equipment: QED pump
Decon Equipment: Alconox & dedicated tubing
Disposal of Discharged Water: Drums on site

Observations/Comments: _____

Aspect CONSULTING

Sample number SPL-GW-MW30-031914

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW30 Page: 1 of 1

Project Name: South Park
Project Number: 10016
Date: 3/19/14
Sampled by: SDM, SLD
Measuring Point of Well:
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): 8.37
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf
Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0948		~0.28								
0953		~0.28	8.50	10.6	552.7	0.39	6.44	89.8		Start pump
0958		~0.28	8.50	10.6	551.8	0.22	6.46	45.7		
1003		~0.30	8.50	10.6	544.1	0.23	6.42	54.1		
1008		~0.30	8.52	10.6	526.6	0.35	6.47	59.6		
1011		~0.30	8.52	10.5	511.2	0.47	6.46	60.4		
1014		~0.30	8.52	10.5	503.8	0.52	6.45	60.8	3.09	Sample

Total Gallons Purged: ~2.25
Total Casing Volumes Removed: _____
Ending Water Level (ft TOC): 8.45
Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
1015	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C
	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C-SIM (VC)
	500mL	HDPE	1	Yes	HNO3			Dis Metals Mn, Ca, Mg, Fe, Mn
	500mL	HDPE	1	-	HNO3			Total metals Fe, Mn
	Small	OS	1	-	-			Anions Cl, NO3, NO2, SO4
	Small	OS	1	-	-			Alkalinity
	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI white
Purging Equipment: Peristaltic
Decon Equipment: Alconox + DI distilled water
Disposal of Discharged Water: Drums on site
Observations/Comments:

Z:\Equipment\Field Forms\Groundwater Sampling Form.xlsx

Aspect CONSULTING

Sample number SPL-GW-MW26-031914

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-26 Page: 1 of 1

Project Name: South Park
Project Number: 100116
Date: 3/19/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): 7.99
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
10:37		0.26								
0 10:42		0.26	8.05	11.8	165.5	1.64	6.26	34.3		Start Pump
5 10:47		0.26	8.03	11.9	165.0	0.89	6.22	34.8		
10 10:52		0.26	7.99	11.9	168.9	0.61	6.22	34.2		
15 10:57		0.26	7.99	11.9	171.7	0.49	6.22	33.1		
20 11:02		0.26	7.99	11.9	172.0	0.46	6.22	32.9		
23 11:05		0.26	7.99	11.9	173.4	0.42	6.22	32.4	111	Sample

Total Gallons Purged: ~2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 8.01
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
11:00	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C
11:00	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C-SIM (VC)
11:00	500mL	HDPE	1	(Yes)	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
11:00	500mL	HDPE	1	-	HNO3			Total metals Fe, Mn
11:00	Small	OS	1	-	-			Anions Cl, NO3, NO2, SO4
11:00	Small	OS	1	-	-			Alkalinity
11:00	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
11:00	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 12G104 a02
Purging Equipment: QED pump
Decon Equipment: Alconox & dedicated tubing
Disposal of Discharged Water: Drums on site
Observations/Comments: Bollard has been hit (on ground); casing no longer protected

Aspect CONSULTING

Sample number SPL-GW-MW24-031914

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-24 Page: 1 of 1

Project Name: South Park
Date: 3/19/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 10016
Starting Water Level (ft TOC): 7.21
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
11:16		0.2								Start pump
0 11:21		0.28	7.24	11.6	759	1.46	6.64	42.8		
5 11:26		0.28	7.29	11.9	881	0.44	6.70	-29.4		
10 11:31		0.28	7.28	11.9	891	0.35	6.70	-58.5		
15 11:36		0.28	7.25	11.9	897	0.28	6.71	-72.0		
20 11:41		0.28	7.28	11.9	898	0.28	6.71	-75.8		
23 11:44		0.28	7.28	11.9	899	0.27	6.71	-77.3	20.7	Sample

Total Gallons Purged: ~2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 7.23
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
1145	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C
	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C-SIM (VC)
	500mL	HDPE	1	Yes	HNO3			Dis Metals Mn, Ca, Mg, Fe, Mn
	500mL	HDPE	1	-	HNO3			Total metals Fe, Mn
	Small	OS	1	-	-			Anions Cl, NO3, NO2, SO4
	Small	OS	1	-	-			Alkalinity
	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI white
Purging Equipment: QED pump
Decon Equipment: Dedicated QED Pump Tubing, Alconox + DI
Disposal of Discharged Water: Drums on site

Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-MW08-031914

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-08 Page: 1 of 1

Project Name: South Park
Date: 3/19/14
Sampled by: SDM, SLD
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 100116
Starting Water Level (ft TOC): 6.70
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
12:13		0.28								
0 12:18		0.28	6.70	11.3	1712	0.33	6.87	-64.9		start pump
5 12:23		0.28	6.66	11.3	1473	0.57	6.86	-66.1		
10 12:28		0.28	6.66	11.0	1400	0.15	6.85	-88.3		
15 12:33		0.28	6.66	11.2	1375	0.14	6.85	-80.1		
18 12:36		0.28	6.66	11.2	1339	0.14	6.85	-34.7		
21 12:39		0.28	6.66	11.2	1332	0.11	6.86	-3.3		shook flow
24 12:42		0.28	6.67	11.3	1330	0.12	6.86	-30.7		through cell.
27 12:45		0.28	6.67	11.4	1320	0.13	6.86	-37.7		ORP increasing.
30 12:48		0.28	6.71	11.4	1330	0.17	6.86	-55.0		Bubble?
33 12:51		0.28	6.71	11.4	1336	0.15	6.86	-64.4		
38 12:56								-72		Sample
13:00								-70	15.5	ORP taken w hand held
13:03								-72		" "
										" "

Total Gallons Purged: ~2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 6.68
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
1240	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C
	40 mL	VOA	3	-	1 HCl, 2-no			VOC 8260C-SIM (VC)
	500mL	HDPE	1	Yes	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
	500 mL	HDPE	1	-	HNO3			Total metals Fe, Mn
	Small	OS	1	-	-			Anions Cl, NO3, NO2, SO4
	Small	OS	1	-	-			Alkalinity
	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 12G104202
Purging Equipment: QED pump
Decon Equipment: alconox + dedicated tubing
Disposal of Discharged Water: Drums on site

Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-MW27-03191-4

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-27 Page: 1 of 1

Project Name: South Park
Date: 3/19/14
Sampled by: SDM, SLO
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 10016
Starting Water Level (ft TOC): 6.70
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): _____

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%		
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments	ORP Hach
1305		0.24								Start pump	
1310		0.24	7.70	9.8	200.7	3.7	6.61	-15.8			36
1315		0.24	7.72	9.9	200.6	2.63	6.56	10.2			70
1320		0.24	6.66	10.0	212.2	2.00	6.56	19.5			74
1325		0.24	6.68	10.0	230.5	1.41	6.57	24.7			76
1330		0.24	6.68	10.1	245.5	1.08	6.59	26.5			56
1335		0.24	6.68	10.2	250.4	0.93	6.59	26.1			38
1338		0.24	6.70	10.3	250.8	0.88	6.59	25.8			25
1341		0.24	6.70	10.2	251.4	0.85	6.59	25.4	277	Sample	29

Total Gallons Purged: ~2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC): 7.70
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
1340	40 mL	VOA	3	-	HCl, 2-no			VOC 8260C
	40 mL	VOA	3	-	HCl, 2-no			VOC 8260C-SIM (VC)
	500mL	HDPE	1	Yes	HNO3			Dis Metals Mn (Ba, K, Ca, Mg, Fe)
	500 mL	HDPE	1	-	HNO3			Total metals Fe, Mn
	Small	OS	1	-	-			Anions Cl, NO3, NO2, SO4
	Small	OS	1	-	-			Alkalinity
	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): YSI 12G104202
Purging Equipment: QED pump
Decon Equipment: alconox & dedicated tubing
Disposal of Discharged Water: Drums on Site
Observations/Comments:

Aspect CONSULTING

Sample number SPL-GW-MW80-031914

GROUNDWATER SAMPLING RECORD

WELL NUMBER: X Rinse Blank Page: ___ of ___

Project Name: South Park
Date: 3/19/14
Sampled by: SDM, SLD
Measuring Point of Well: ___
Screened Interval (ft. TOC) ___
Filter Pack Interval (ft. TOC) ___

Project Number: 100116
Starting Water Level (ft TOC): ___
Casing Stickup (ft): ___
Total Depth (ft TOC): ___
Casing Diameter (inches): ___

Casing Volume ___ (ft Water) x ___ (Lpfv)(gpf) = ___ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): ___

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
		Rinse Blank								
		No Parameters taken								

Total Gallons Purged: ___ Total Casing Volumes Removed: ___

Ending Water Level (ft TOC): ___ Ending Total Depth (ft TOC): ___

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance: Color	Appearance: Turbidity & Sediment	Remarks
14:00	40 mL	VOA	3	-	HCl, 2-no			VOC 8260C
1450	40 mL	VOA	3	-	HCl, 2-no			VOC 8260C-SIM (VC)
	500mL	HDPE	1	Yes	HNO3			Dis Metals Na, K, Ca, Mg, Fe, Mn
	500mL	HDPE	1	-	HNO3			Total Metals Fe, Mn
	250mL	0S	1	-	-			Anions Cl, NO3, NO2, SO4
	250mL	0S	1	-	-			Alkalinity
	500mL	HDPE	1	-	H2SO4			Ammonia (NH3
	500mL	HDPE	1	-	ZnAc			Sulfide (NO headspace)

METHODS

Parameters measured with (instrument model & serial number): NA

Purging Equipment: Peristaltic pump & new tubing Decon Equipment: NA

Disposal of Discharged Water: Drum on site

Observations/Comments: ___

South Park Landfill

March 2014 Interim Site-Wide Groundwater Monitoring Results

Appendix B
Laboratory Analytical Results

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 31, 2014

Stephen.Bentsen
Floyd Snider
601 Union Street, Suite 600
Seattle, WA 98101-2341

RE: Project: South Park Landfill
ARI Job No: YD18

Dear Stephen:

Please find enclosed analytical results and chain of custody documentation (COC) for the project referenced above. Analytical Resources, Incorporated (ARI) accepted seven water samples and a trip blank on March 17, 2014. The samples were in good condition with no discrepancies in paperwork.

The samples were analyzed for VOCs, SIM VOCs, Total and Dissolved Metals, Alkalinity, Nitrate, Nitrite, Ammonia, Chloride, Sulfate, Sulfide, as requested on the COC.

No analytical complications were noted for these analyses. Quality control results are included for your review.

A copy of the reports and all associated raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206-695-6211

Enclosures

cc: eFile YD18

KB/kb

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: Y016	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Aspect Consulting	Phone: 206.780.7719	Date: 3/17/14	Ice Present? Y
Client Contact: John Strunk jstrunk@aspectconsulting.com		No. of Coolers: 3	Cooler Temps: 5.8, 5.7, 4.2
Client Project Name: South Park Landfill			
Client Project #: 100116	Samplers: SM / SLO		

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

Sample ID	Date	Time	Matrix	No. Containers	VOC by 8260C Cis-1,2 - dichloroethene Trichloroethylene *See Notes	VOCs by 8260C SIM Vinylchloride	Dissolved Metals by 6010B Na, K, Ca, Mg, Fe, Mn	Total Metals by 6010B Fe, Mn	Major Anions by 300 Chloride, Sulfate, Nitrate Nitrite	Major Anions by SM 2320B Alkalinity, carbonate, Bicarbonate	Genral Chem by SM 4500 Ammonia, Sulfide	Benzene (As part of 8260C)	Notes/Comments
					Analysis Requested								*For 8260C, please provide report for only the analytes listed However please do dilutions and archive chromatographs for the full suite of analytes so additional analytes may be analyzed later if requested
SPL-GW-KMW08-031714	3/17/14	1015	H2O	12	X	X	X	X	X	X	X	X	
SPL-GW-MW61-031714		1030			X	X	X	X	X	X	X	X	
SPL-GW-KMW03A-031714		12:00			X	X	X	X	X	X	X		
SPL-GW-KMW05-031714		13:15			X	X	X	X	X	X	X	X	
SPL-GW-MW25-031714		1445			X	X	X	X	X	X	X	X	
SPL-GW-MW-60-031714		1550			X	X	X	X	X	X	X	X	
SPL-GW-MW10-031714		1510			X	X	X	X	X	X	X		
Trip Blank					X	X							in cooler w/all VOAs

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by (Signature)
	Printed Name: Sean McClure	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: Aspect Consulting	Company: ARI	Company	Company
	Date & Time: 3/17/14 16:10	Date & Time: 3/17/14 1610	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.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Aspect

Project Name: South Park Landfill

COC No(s): NA

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

Assigned ARI Job No. YQ18

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) 5.8 5.7 4.2

Time: 1610

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

Temp Gun ID#: 90627952

Cooler Accepted by: TS AV Date: 3.17.14 Time: 1610

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	3.11.14	

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

Samples Logged by: TS Date: 3-18-14 Time: 915

** ***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:

KMW-05 1 Lg 2 pb

By: TS Date: 3-18-14

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)

TD18.00603

PRESERVATION VERIFICATION 03/18/14
Page 1 of 2

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **YD18**

Inquiry Number: NONE
Analysis Requested: 03/18/14
Contact: Strunk, John
Client: Aspect Consulting
Logged by: TS
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 03/17/14

Project #: 100116
Project: South Park Landfill
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-4581 **YD18A**	SPL-GW-KMW08-031714			Pass			TOT Pass						Fail									
14-4582 **YD18B**	SPL-GW-MW61-031714			Pass			TOT Pass						Fail									
14-4583 **YD18C**	SPL-GW-KMW03A-031714			Pass			TOT Pass						Fail									
14-4584 **YD18D**	SPL-GW-KMW05-031714			Fail			TOT Fail		-				Fail						L2	NaHSO3	16mL	3/18/14
14-4585 **YD18E**	SPL-GW-MW25-031714			Pass			TOT Pass						Fail									
14-4586 **YD18F**	SPL-GW-MW60-031714			Pass			TOT Pass						Fail									
14-4587 **YD18G**	SPL-GW-MW10-031714			Pass			TOT Pass						Fail	-								
14-4588 **YD18H**	SPL-GW-KMW08-031714						DIS Pass									Y			L2			
14-4589 **YD18I**	SPL-GW-MW61-031714						DIS Pass									Y		CB 3/18/14				
14-4590 **YD18J**	SPL-GW-KMW03A-031714						DIS Pass									Y						
14-4591 **YD18K**	SPL-GW-KMW05-031714						DIS Fail									Y			L2	NaHSO3	16mL	3/18/14
14-4592 **YD18L**	SPL-GW-MW25-031714						DIS Pass									Y						
14-4593 **YD18M**	SPL-GW-MW60-031714						DIS Pass									Y						
14-4594 **YD18N**	SPL-GW-MW10-031714						DIS Pass									Y						

Preserve o.k. in IC6
CB 3/18/14

Checked By _____ Date _____

PRESERVATION VERIFICATION 03/18/14
Page 1 of 2

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **YD18**

Inquiry Number: NONE
Analysis Requested: 03/18/14
Contact: Strunk, John
Client: Aspect Consulting
Logged by: TS
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 03/17/14

Project #: 100116
Project: South Park Landfill
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-4581 **YD18A**	SPL-GW-KMW08-031714			Pass			TOT Pass						Fail					S-	>12		2 mL NaOH 6N	7-18-14 W
14-4582 **YD18B**	SPL-GW-MW61-031714			Pass			TOT Pass						Fail									
14-4583 **YD18C**	SPL-GW-KMW03A-031714			Pass			TOT Pass						Fail									
14-4584 **YD18D**	SPL-GW-KMW05-031714			Fail			TOT Fail		-				Fail									
14-4585 **YD18E**	SPL-GW-MW25-031714			Pass			TOT Pass						Fail									
14-4586 **YD18F**	SPL-GW-MW60-031714			Pass			TOT Pass						Fail									
14-4587 **YD18G**	SPL-GW-MW10-031714			Pass			TOT Pass						Fail	-								
14-4588 **YD18H**	SPL-GW-KMW08-031714						DIS Pass									Y						
14-4589 **YD18I**	SPL-GW-MW61-031714						DIS Pass									Y						
14-4590 **YD18J**	SPL-GW-KMW03A-031714						DIS Pass									Y						
14-4591 **YD18K**	SPL-GW-KMW05-031714						DIS Fail									Y						
14-4592 **YD18L**	SPL-GW-MW25-031714						DIS Pass									Y						
14-4593 **YD18M**	SPL-GW-MW60-031714						DIS Pass									Y						
14-4594 **YD18N**	SPL-GW-MW10-031714						DIS Pass									Y						

Checked By _____ Date _____

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: YD18
Client: Aspect Consulting
Project Event: 100116
Project Name: South Park Landfill

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	SPL-GW-KMW08-031714	YD18A	14-4581	Water	03/17/14 10:15	03/17/14 16:10
2.	SPL-GW-MW61-031714	YD18B	14-4582	Water	03/17/14 10:30	03/17/14 16:10
3.	SPL-GW-KMW03A-031714	YD18C	14-4583	Water	03/17/14 12:00	03/17/14 16:10
4.	SPL-GW-KMW05-031714	YD18D	14-4584	Water	03/17/14 13:15	03/17/14 16:10
5.	SPL-GW-MW25-031714	YD18E	14-4585	Water	03/17/14 14:45	03/17/14 16:10
6.	SPL-GW-MW60-031714	YD18F	14-4586	Water	03/17/14 15:50	03/17/14 16:10
7.	SPL-GW-MW10-031714	YD18G	14-4587	Water	03/17/14 15:10	03/17/14 16:10
8.	SPL-GW-KMW08-031714	YD18H	14-4588	Water	03/17/14 10:15	03/17/14 16:10
9.	SPL-GW-MW61-031714	YD18I	14-4589	Water	03/17/14 10:30	03/17/14 16:10
10.	SPL-GW-KMW03A-031714	YD18J	14-4590	Water	03/17/14 12:00	03/17/14 16:10
11.	SPL-GW-KMW05-031714	YD18K	14-4591	Water	03/17/14 13:15	03/17/14 16:10
12.	SPL-GW-MW25-031714	YD18L	14-4592	Water	03/17/14 14:45	03/17/14 16:10
13.	SPL-GW-MW60-031714	YD18M	14-4593	Water	03/17/14 15:50	03/17/14 16:10
14.	SPL-GW-MW10-031714	YD18N	14-4594	Water	03/17/14 15:10	03/17/14 16:10
15.	Trip Blanks	YD18O	14-4595	Water	03/17/14	03/17/14 16:10

Data Reporting Qualifiers

Effective 12/31/13

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-KMW08-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18A
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 17:26

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	95.5%
Bromofluorobenzene	92.2%
d4-1,2-Dichlorobenzene	99.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW61-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18B
LIMS ID: 14-4582
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 17:55

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	96.3%
Bromofluorobenzene	91.4%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-KMW03A-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18C
LIMS ID: 14-4583
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 18:24

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	96.7%
Bromofluorobenzene	94.7%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-KMW05-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18D
LIMS ID: 14-4584
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 18:53

Sample Amount: 1.00 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	2.0	< 2.0	U
79-01-6	Trichloroethene	2.0	< 2.0	U
71-43-2	**Benzene**	**2.0**	**7.4**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	97.4%
Bromofluorobenzene	93.3%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW25-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18E
LIMS ID: 14-4585
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 19:21

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**0.48**	
79-01-6	Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	97.3%
Bromofluorobenzene	92.8%
d4-1,2-Dichlorobenzene	99.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW60-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18F
LIMS ID: 14-4586
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 19:50

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**0.50**	
79-01-6	Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.0%
d8-Toluene	96.5%
Bromofluorobenzene	93.1%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW10-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18G
LIMS ID: 14-4587
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 20:19

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**1.9**	
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	97.5%
Bromofluorobenzene	93.7%
d4-1,2-Dichlorobenzene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18O
LIMS ID: 14-4595
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 12:35

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	98.9%
Bromofluorobenzene	93.8%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-032014A	Method Blank	10	101%	97.5%	93.4%	102%	0
LCS-032014A	Lab Control	10	99.9%	96.7%	95.7%	98.9%	0
LCSD-032014A	Lab Control Dup	10	101%	99.3%	95.8%	100%	0
YD18A	SPL-GW-KMW08-031714	10	102%	95.5%	92.2%	99.5%	0
YD18B	SPL-GW-MW61-031714	10	102%	96.3%	91.4%	101%	0
YD18C	SPL-GW-KMW03A-031714	10	102%	96.7%	94.7%	102%	0
YD18D	SPL-GW-KMW05-031714	10	103%	97.4%	93.3%	101%	0
YD18E	SPL-GW-MW25-031714	10	102%	97.3%	92.8%	99.8%	0
YD18F	SPL-GW-MW60-031714	10	99.0%	96.5%	93.1%	101%	0
YD18G	SPL-GW-MW10-031714	10	106%	97.5%	93.7%	104%	0
YD18O	Trip Blanks	10	103%	98.9%	93.8%	101%	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 14-4581 to 14-4595

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-032014A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-032014A
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT3/LH
LCSD: NT3/LH
Date Analyzed LCS: 03/20/14 10:09
LCSD: 03/20/14 10:38

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
cis-1,2-Dichloroethene	9.52	10.0	95.2%	9.60	10.0	96.0%	0.8%
Trichloroethene	9.89	10.0	98.9%	9.83	10.0	98.3%	0.6%
Benzene	10.2	10.0	102%	10.1	10.0	101%	1.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	99.9%	101%
d8-Toluene	96.7%	99.3%
Bromofluorobenzene	95.7%	95.8%
d4-1,2-Dichlorobenzene	98.9%	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-032014A**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-032014A
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 11:07

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	97.5%
Bromofluorobenzene	93.4%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-KMW08-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18A
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 14:37

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW61-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18B
LIMS ID: 14-4582
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 15:02

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	111%

FORM I

YD18:00022

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-KMW03A-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18C
LIMS ID: 14-4583
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 15:28

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.30**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%

FORM I

YD18.00023

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-KMW05-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18D
LIMS ID: 14-4584
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 15:54

Sample Amount: 1.00 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%

FORM I

YD18.6662

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW25-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18E
LIMS ID: 14-4585
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 16:19

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.99**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.8%

FORM I

YD18.00625

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW60-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18F
LIMS ID: 14-4586
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 16:45

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.98**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW10-031714**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18G
LIMS ID: 14-4587
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 17:10

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.49**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%

FORM I

YD18.00027

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: Trip Blanks**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD18O
LIMS ID: 14-4595
Matrix: Water
Data Release Authorized: MW
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 17:36

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%

ANALYTICAL RESOURCES INCORPORATED

SW8260-SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116

Client ID	DCE	TOT OUT
MB-031914	98.9%	0
LCS-031914	98.3%	0
LCSD-031914	97.1%	0
SPL-GW-KMW08-031714	105%	0
SPL-GW-MW61-031714	111%	0
SPL-GW-KMW03A-031714	106%	0
SPL-GW-KMW05-031714	104%	0
SPL-GW-MW25-031714	98.8%	0
SPL-GW-MW60-031714	100%	0
SPL-GW-MW10-031714	100%	0
Trip Blanks	101%	0

	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(78-126)	(80-129)

Prep Method: SW5030
Log Number Range: 14-4581 to 14-4595

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-031914
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-031914
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT7/LH
LCSD: NT7/LH
Date Analyzed LCS: 03/19/14 11:02
LCSD: 03/19/14 11:27

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	0.868	1.00	86.8%	0.823	1.00	82.3%	5.3%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	98.3%	97.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: MB-031914**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-031914
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 11:53

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.9%

FORM I

YD18.00031

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-KMW08-031714
SAMPLE

Lab Sample ID: YD18A
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**0.30**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.305**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-KMW08-031714
DUPLICATE

Lab Sample ID: YD18A
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Iron	6010C	0.30	0.30	0.0%	+/- 20%	
Manganese	6010C	0.305	0.299	2.0%	+/- 20%	

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-KMW08-031714
MATRIX SPIKE

Lab Sample ID: YD18A
LIMS ID: 14-4581
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Iron	6010C	0.30	2.33	2.00	102%	
Manganese	6010C	0.305	0.852	0.500	109%	

Reported in mg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW61-031714
SAMPLE

Lab Sample ID: YD18B
LIMS ID: 14-4582
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**0.31**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.302**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-KMW03A-031714
SAMPLE

Lab Sample ID: YD18C
LIMS ID: 14-4583
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**11.3**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.060**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-KMW05-031714
SAMPLE

Lab Sample ID: YD18D
LIMS ID: 14-4584
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.5	**6.9**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.01	**0.02**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW25-031714
SAMPLE

Lab Sample ID: YD18E
LIMS ID: 14-4585
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**11.6**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.923**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW60-031714
SAMPLE

Lab Sample ID: YD18F
LIMS ID: 14-4586
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**11.5**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.916**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW10-031714
SAMPLE

Lab Sample ID: YD18G
LIMS ID: 14-4587
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**29.6**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**2.04**	

U-Analyte undetected at given RL
RL-Reporting Limit

YD18:00040

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-KMW08-031714
SAMPLE

Lab Sample ID: YD18H
LIMS ID: 14-4588
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**42.4**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**0.21**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**10.0**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.298**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**29.3**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**29.8**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-KMW08-031714
DUPLICATE

Lab Sample ID: YD18H
LIMS ID: 14-4588
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Calcium	6010C	42.4	42.5	0.2%	+/- 20%	
Iron	6010C	0.21	0.21	0.0%	+/- 0.05	L
Magnesium	6010C	10.0	10.0	0.0%	+/- 20%	
Manganese	6010C	0.298	0.298	0.0%	+/- 20%	
Potassium	6010C	29.3	29.5	0.7%	+/- 20%	
Sodium	6010C	29.8	29.9	0.3%	+/- 20%	

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-KMW08-031714
MATRIX SPIKE

Lab Sample ID: YD18H
LIMS ID: 14-4588
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Calcium	6010C	42.4	52.4	10.0	100%	H
Iron	6010C	0.21	2.23	2.00	101%	
Magnesium	6010C	10.0	20.5	10.0	105%	
Manganese	6010C	0.298	0.843	0.500	109%	
Potassium	6010C	29.3	39.6	10.0	103%	
Sodium	6010C	29.8	40.5	10.0	107%	

Reported in mg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW61-031714
SAMPLE

Lab Sample ID: YD18I
LIMS ID: 14-4589
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**42.7**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**0.17**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**9.86**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.298**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**28.5**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**29.7**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-KMW03A-031714
SAMPLE

Lab Sample ID: YD18J
LIMS ID: 14-4590
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**85.8**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**11.2**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**25.7**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.058**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**14.1**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**24.5**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-KMW05-031714
SAMPLE

Lab Sample ID: YD18K
LIMS ID: 14-4591
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.5	**12.3**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.5	**6.5**	
6010C	03/20/14	6010C	03/24/14	7439-95-4	Magnesium	0.5	0.5	U
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.01	**0.02**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	5	**4,370**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	5	**1,620**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW25-031714
SAMPLE

Lab Sample ID: YD18L
LIMS ID: 14-4592
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**29.8**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**11.4**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**8.85**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.924**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**4.7**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**31.9**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW60-031714
SAMPLE

Lab Sample ID: YD18M
LIMS ID: 14-4593
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**30.0**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**11.5**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**8.92**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.943**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**3.8**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**31.6**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: SPL-GW-MW10-031714
SAMPLE

Lab Sample ID: YD18N
LIMS ID: 14-4594
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**77.5**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**29.7**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**43.3**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**2.06**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**10.6**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**55.4**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: YD18MB
LIMS ID: 14-4582
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	7439-89-6	Iron	0.05	0.05	U
3010A	03/20/14	6010C	03/24/14	7439-96-5	Manganese	0.001	0.001	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: YD18LCS
LIMS ID: 14-4582
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	6010C	2.01	2.00	100%	
Manganese	6010C	0.508	0.500	102%	

Reported in mg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS **Sample ID: METHOD BLANK**

Lab Sample ID: YD18MB
LIMS ID: 14-4589
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	7440-70-2	Calcium	0.05	0.05	U
6010C	03/20/14	6010C	03/24/14	7439-89-6	Iron	0.05	0.05	U
6010C	03/20/14	6010C	03/24/14	7439-95-4	Magnesium	0.05	0.05	U
6010C	03/20/14	6010C	03/24/14	7439-96-5	Manganese	0.001	0.001	U
6010C	03/20/14	6010C	03/24/14	7440-09-7	Potassium	0.5	0.5	U
6010C	03/20/14	6010C	03/24/14	7440-23-5	Sodium	0.5	0.5	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS **Sample ID: LAB CONTROL**

Lab Sample ID: YD18LCS
LIMS ID: 14-4589
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD18-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Calcium	6010C	9.78	10.0	97.8%	
Iron	6010C	1.98	2.00	99.0%	
Magnesium	6010C	10.0	10.0	100%	
Manganese	6010C	0.509	0.500	102%	
Potassium	6010C	9.9	10.0	99.0%	
Sodium	6010C	10.5	10.0	105%	

Reported in mg/L

N-Control limit not met
Control Limits: 80-120%

SAMPLE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Client ID: SPL-GW-KMW08-031714
ARI ID: 14-4581 YD18A

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	186
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	186
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/18/14 031814#1	EPA 300.0	mg/L	0.5	14.7
N-Nitrate	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.010	0.342
Sulfate	03/18/14 031814#1	EPA 300.0	mg/L	1.0	27.9
Sulfide	03/18/14 031814#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Client ID: SPL-GW-MW61-031714
ARI ID: 14-4582 YD18B

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	186
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	186
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/18/14 031814#1	EPA 300.0	mg/L	0.5	14.7
N-Nitrate	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.010	0.360
Sulfate	03/18/14 031814#1	EPA 300.0	mg/L	1.0	27.7
Sulfide	03/18/14 031814#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Client ID: SPL-GW-KMW03A-031714
ARI ID: 14-4583 YD18C

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	378
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	378
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/18/14 031814#1	EPA 300.0	mg/L	0.5	15.4
N-Nitrate	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.050	3.17
Sulfate	03/17/14 031714#1	EPA 300.0	mg/L	0.1	0.4
Sulfide	03/18/14 031814#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Client ID: SPL-GW-KMW05-031714
ARI ID: 14-4584 YD18D

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	8,290
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	2,820
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	5,460
Chloride	03/18/14 031814#1	EPA 300.0	mg/L	10.0	154
N-Nitrate	03/18/14 031814#1	EPA 300.0	mg-N/L	2.0	< 2.0 U
N-Nitrite	03/18/14 031814#1	EPA 300.0	mg-N/L	2.0	< 2.0 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	1.00	64.2
Sulfate	03/18/14 031814#1	EPA 300.0	mg/L	50.0	1,000
Sulfide	03/18/14 031814#1	EPA 376.2	mg/L	2.50	28.1

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Client ID: SPL-GW-MW25-031714
ARI ID: 14-4585 YD18E

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	169
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	169
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/18/14 031814#1	EPA 300.0	mg/L	0.2	8.6
N-Nitrate	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.050	2.87
Sulfate	03/18/14 031814#1	EPA 300.0	mg/L	0.2	7.7
Sulfide	03/18/14 031814#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Client ID: SPL-GW-MW60-031714
ARI ID: 14-4586 YD18F

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	169
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	169
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/18/14 031814#1	EPA 300.0	mg/L	0.2	8.7
N-Nitrate	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.050	2.89
Sulfate	03/18/14 031814#1	EPA 300.0	mg/L	0.2	7.7
Sulfide	03/18/14 031814#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Client ID: SPL-GW-MW10-031714
ARI ID: 14-4587 YD18G

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	372
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	372
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/18/14 031814#1	EPA 300.0	mg/L	1.0	25.0
N-Nitrate	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	03/17/14 031714#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.100	4.87
Sulfate	03/18/14 031814#1	EPA 300.0	mg/L	5.0	109
Sulfide	03/18/14 031814#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
Chloride	EPA 300.0	03/18/14	mg/L	< 0.1 U	
N-Nitrate	EPA 300.0	03/17/14	mg-N/L	< 0.1 U	
		03/18/14		< 0.1 U	
N-Nitrite	EPA 300.0	03/17/14	mg-N/L	< 0.1 U	
		03/18/14		< 0.1 U	
N-Ammonia	EPA 350.1M	03/24/14	mg-N/L	< 0.010 U	FB
Sulfate	EPA 300.0	03/17/14	mg/L	< 0.1 U	
		03/18/14		< 0.1 U	
Sulfide	EPA 376.2	03/18/14	mg/L	< 0.050 U	

FB Filtration Blank

LAB CONTROL RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide EPA 376.2	ICVL	03/18/14	mg/L	0.474	0.501	94.6%

STANDARD REFERENCE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Alkalinity ERA #P114506	SM 2320	03/25/14	mg/L CaCO3	56.0	59.8	93.6%
Chloride ERA 210312	EPA 300.0	03/18/14	mg/L	2.9	3.0	96.7%
N-Nitrate ERA #220912	EPA 300.0	03/17/14 03/18/14	mg-N/L	2.9 2.9	3.0 3.0	96.7% 96.7%
N-Nitrite ERA 490412	EPA 300.0	03/17/14 03/18/14	mg-N/L	2.9 2.9	3.0 3.0	96.7% 96.7%
N-Ammonia ERA #040912	EPA 350.1M	03/24/14	mg-N/L	0.482	0.500	96.4%
Sulfate ERA 240312	EPA 300.0	03/17/14 03/18/14	mg/L	2.9 2.9	3.0 3.0	96.7% 96.7%

REPLICATE RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: YD18A Client ID: SPL-GW-KMW08-031714						
Alkalinity	SM 2320	03/25/14	mg/L CaCO3	186	185	0.5%
Carbonate	SM 2320	03/25/14	mg/L CaCO3	< 1.0	< 1.0	NA
Bicarbonate	SM 2320	03/25/14	mg/L CaCO3	186	185	0.5%
Hydroxide	SM 2320	03/25/14	mg/L CaCO3	< 1.0	< 1.0	NA
Chloride	EPA 300.0	03/18/14	mg/L	14.7	14.7	0.0%
N-Nitrate	EPA 300.0	03/17/14	mg-N/L	< 0.1	< 0.1	NA
N-Nitrite	EPA 300.0	03/17/14	mg-N/L	< 0.1	< 0.1	NA
N-Ammonia	EPA 350.1M	03/24/14	mg-N/L	0.342	0.337	1.5%
Sulfate	EPA 300.0	03/18/14	mg/L	27.9	28.0	0.4%
Sulfide	EPA 376.2	03/18/14	mg/L	< 0.050	< 0.050	NA

MS/MSD RESULTS-CONVENTIONALS
YD18-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/17/14
Date Received: 03/17/14

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: YD18A Client ID: SPL-GW-KMW08-031714							
Chloride	EPA 300.0	03/18/14	mg/L	14.7	32.5	20.0	89.0%
N-Nitrate	EPA 300.0	03/17/14	mg-N/L	< 0.1	1.9	2.0	95.0%
N-Nitrite	EPA 300.0	03/17/14	mg-N/L	< 0.1	2.0	2.0	100.0%
N-Ammonia	EPA 350.1M	03/24/14	mg-N/L	0.342	0.826	0.500	96.8%
Sulfate	EPA 300.0	03/18/14	mg/L	27.9	71.5	40.0	109.0%
Sulfide	EPA 376.2	03/18/14	mg/L	< 0.050	0.475	0.500	95.0%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 31, 2014

Stephen.Bentsen
Floyd Snider
601 Union Street, Suite 600
Seattle, WA 98101-2341

RE: Project: South Park Landfill
ARI Job No: YD33

Dear Stephen:

Please find enclosed analytical results and chain of custody documentation (COC) for the project referenced above. Analytical Resources, Incorporated (ARI) accepted six water samples and a trip blank on March 18, 2014. The samples were in good condition with no discrepancies in paperwork.

The samples were analyzed for VOCs, SIM VOCs, Total and Dissolved Metals, Alkalinity, Nitrate, Nitrite, Ammonia, Chloride, Sulfate, Sulfide, as requested on the COC.

The chloride bracketing calibration blanks contained chloride contamination. The associated sample concentrations were greater then ten times the concentration found in the blanks therefore, no further action was taken.

No other analytical complications were noted for these analyses. Quality control results are included for your review.

A copy of the reports and all associated raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206-695-6211

Enclosures

cc: eFile YD33

KB/kb

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: Y033	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Aspect Consulting	Phone: 206.780.7719	Date: 3/18/14	Ice Present? Y
Client Contact: John Strunk jstrunk@aspectconsulting.com		No. of Coolers: 3	Cooler Temps: 4.0, 6.0, 2.9
Client Project Name: South Park Landfill			
Client Project #: 100116	Samplers: SDM & JLD		

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

Sample ID	Date	Time	Matrix	No. Containers	VOC by 8260C Cis-1,2 - dichloroethene Trichloroethylene *See Notes	VOCs by 8260C SIM Vinylchloride	Dissolved Metals by 6010B Na, K, Ca, Mg, Fe, Mn	Total Metals by 6010B Fe, Mn	Major Anions by 300 Chloride, Sulfate, Nitrate Nitrite	Major Anions by SM 2320B Alkalinity, carbonate, Bicarbonate	Genral Chem by SM 4500 Ammonia, Sulfide	Benzene (As part of 8260C)	Notes/Comments
SPL-GW-MW32-031814	3/18/14	0915	H2O	12	X	X	X	X	X	X	X		
SPL-GW-MW33-031814		0940		12	X	X	X	X	X	X	X		
SPL-GW-MW28-031814		1100		12	X	X	X	X	X	X	X		
SPL-GW-MW4-031814		1215		12	X	X	X	X	X	X	X		
SPL-GW-MW29-031814		1245		~~12~~ 12	X	X	X	X	X	X	X		
SPL-GW-MW12-031814		13:30		12	X	X	X	X	X	X	X		
Trip Blank				2	X	X							in cooler w/ VOAs

*For 8260C, please provide report for only the analytes listed. However please do dilutions and archive chromatographs for the full suite of analytes so additional analytes may be analyzed later if requested.

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Seann McClure	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
	Company: Aspect Consulting	Company: ARI	Company:	Company:
	Date & Time: 3/18/14 14:20	Date & Time: 3/18/14 1420	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.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Aspect

Project Name: South Park LF

COC No(s): _____ NA

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

Assigned ARI Job No.: Y033

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) 4.0 6.0 2.9 ___ ___ ___

Time: 1420

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

Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 3/18/14 Time: 1420

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 3-14-14

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

Samples Logged by: JS Date: 3-18-14 Time: 1526

***** 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: MW33 2"lg"

By: JS Date: 3-18-14

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)

YD33.66003

PRESERVATION VERIFICATION 03/18/14
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **YD33**

Inquiry Number: NONE
Analysis Requested: 03/18/14
Contact: Strunk, John
Client: Aspect Consulting
Logged by: TS
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 03/18/14

Project #: 100116
Project: South Park Landfill
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-4787 **YD33A**	SPL-GW-MW32-031814			f			f TOT						F					$S^{=}$	>12	3 mL NaOH6N		3-18-14 W
14-4788 **YD33B**	SPL-GW-MW33-031814			f			f TOT						F									
14-4789 **YD33C**	SPL-GW-MW18-031814			f			f TOT						F									
14-4790 **YD33D**	SPL-GW-MW14-031814			f			f TOT						F									
14-4791 **YD33E**	SPL-GW-MW29-031814			f			f TOT						F									
14-4792 **YD33F**	SPL-GW-MW12-031814			f			f TOT						F									
14-4793 **YD33G**	SPL-GW-MW32-031814						f DIS									Y						
14-4794 **YD33H**	SPL-GW-MW33-031814						f DIS									Y						
14-4795 **YD33I**	SPL-GW-MW18-031814						f DIS									Y						
14-4796 **YD33J**	SPL-GW-MW14-031814						f DIS									Y						
14-4797 **YD33K**	SPL-GW-MW29-031814						f DIS									Y						
14-4798 **YD33L**	SPL-GW-MW12-031814						f DIS									Y						

f = filt
F = Fe2

Checked By TS Date 3/18/14

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: YD33
Client: Aspect Consulting
Project Event: 100116
Project Name: South Park Landfill

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	SPL-GW-MW32-031814	YD33A	14-4787	Water	03/18/14 09:15	03/18/14 14:20
2.	SPL-GW-MW33-031814	YD33B	14-4788	Water	03/18/14 09:40	03/18/14 14:20
3.	SPL-GW-MW18-031814	YD33C	14-4789	Water	03/18/14 11:00	03/18/14 14:20
4.	SPL-GW-MW14-031814	YD33D	14-4790	Water	03/18/14 12:15	03/18/14 14:20
5.	SPL-GW-MW29-031814	YD33E	14-4791	Water	03/18/14 12:45	03/18/14 14:20
6.	SPL-GW-MW12-031814	YD33F	14-4792	Water	03/18/14 13:30	03/18/14 14:20
7.	SPL-GW-MW32-031814	YD33G	14-4793	Water	03/18/14 09:15	03/18/14 14:20
8.	SPL-GW-MW33-031814	YD33H	14-4794	Water	03/18/14 09:40	03/18/14 14:20
9.	SPL-GW-MW18-031814	YD33I	14-4795	Water	03/18/14 11:00	03/18/14 14:20
10.	SPL-GW-MW14-031814	YD33J	14-4796	Water	03/18/14 12:15	03/18/14 14:20
11.	SPL-GW-MW29-031814	YD33K	14-4797	Water	03/18/14 12:45	03/18/14 14:20
12.	SPL-GW-MW12-031814	YD33L	14-4798	Water	03/18/14 13:30	03/18/14 14:20
13.	Trip Blanks	YD33M	14-4799	Water	03/18/14	03/18/14 14:20

Data Reporting Qualifiers

Effective 12/31/13

Inorganic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Duplicate RPD is not within established control limits

B — Reported value is less than the CRDL but ≥ the Reporting Limit

N — Matrix Spike recovery not within established control limits

NA — Not Applicable, analyte not spiked

H — The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L — Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Flagged value is not within established control limits

B — Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J — Estimated concentration when the value is less than ARI's established reporting limits

D — The spiked compound was not detected due to sample extract dilution

E — Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW32-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33A
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 14:30

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**1.5**	
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	96.0%
Bromofluorobenzene	91.1%
d4-1,2-Dichlorobenzene	99.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW33-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33B
LIMS ID: 14-4788
Matrix: Water
Data Release Authorized:
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 14:59

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	97.4%
Bromofluorobenzene	93.6%
d4-1,2-Dichlorobenzene	99.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW18-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33C
LIMS ID: 14-4789
Matrix: Water
Data Release Authorized: MW
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 15:28

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	97.2%
Bromofluorobenzene	93.1%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW14-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33D
LIMS ID: 14-4790
Matrix: Water
Data Release Authorized: MW
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 15:58

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	96.7%
Bromofluorobenzene	92.3%
d4-1,2-Dichlorobenzene	99.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW29-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33E
LIMS ID: 14-4791
Matrix: Water
Data Release Authorized:
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 16:27

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	96.6%
Bromofluorobenzene	90.5%
d4-1,2-Dichlorobenzene	99.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW12-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33F
LIMS ID: 14-4792
Matrix: Water
Data Release Authorized:
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 16:56

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	4.5	
79-01-6	Trichloroethene	0.20	0.30	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	96.2%
Bromofluorobenzene	93.0%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33M
LIMS ID: 14-4799
Matrix: Water
Data Release Authorized:
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 12:06

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.3%
d8-Toluene	97.2%
Bromofluorobenzene	91.1%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-032014A**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-032014A
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT3/LH
Date Analyzed: 03/20/14 11:07

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	97.5%
Bromofluorobenzene	93.4%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-032014A	Method Blank	10	101%	97.5%	93.4%	102%	0
LCS-032014A	Lab Control	10	99.9%	96.7%	95.7%	98.9%	0
LCSD-032014A	Lab Control Dup	10	101%	99.3%	95.8%	100%	0
YD33A	SPL-GW-MW32-031814	10	101%	96.0%	91.1%	99.5%	0
YD33B	SPL-GW-MW33-031814	10	101%	97.4%	93.6%	99.5%	0
YD33C	SPL-GW-MW18-031814	10	102%	97.2%	93.1%	102%	0
YD33D	SPL-GW-MW14-031814	10	101%	96.7%	92.3%	99.5%	0
YD33E	SPL-GW-MW29-031814	10	105%	96.6%	90.5%	99.6%	0
YD33F	SPL-GW-MW12-031814	10	100%	96.2%	93.0%	102%	0
YD33M	Trip Blanks	10	99.3%	97.2%	91.1%	102%	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 14-4787 to 14-4799

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-032014A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-032014A
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/24/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT3/LH
LCSD: NT3/LH
Date Analyzed LCS: 03/20/14 10:09
LCSD: 03/20/14 10:38

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
cis-1,2-Dichloroethene	9.52	10.0	95.2%	9.60	10.0	96.0%	0.8%
Trichloroethene	9.89	10.0	98.9%	9.83	10.0	98.3%	0.6%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	99.9%	101%
d8-Toluene	96.7%	99.3%
Bromofluorobenzene	95.7%	95.8%
d4-1,2-Dichlorobenzene	98.9%	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW32-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33A
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 18:02

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.36**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW33-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33B
LIMS ID: 14-4788
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 18:27

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.44**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW18-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33C
LIMS ID: 14-4789
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 18:53

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW14-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33D
LIMS ID: 14-4790
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 19:19

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW29-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33E
LIMS ID: 14-4791
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 19:44

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW12-031814**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33F
LIMS ID: 14-4792
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 20:10

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.22**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: Trip Blanks**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD33M
LIMS ID: 14-4799
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 20:35

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: MB-031914**
 METHOD BLANK

Lab Sample ID: MB-031914
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill 100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT7/LH
Date Analyzed: 03/19/14 11:53

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.9%

ANALYTICAL RESOURCES INCORPORATED

SW8260-SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116

Client ID	DCE	TOT OUT
MB-031914	98.9%	0
LCS-031914	98.3%	0
LCSD-031914	97.1%	0
SPL-GW-MW32-031814	100%	0
SPL-GW-MW33-031814	108%	0
SPL-GW-MW18-031814	104%	0
SPL-GW-MW14-031814	104%	0
SPL-GW-MW29-031814	103%	0
SPL-GW-MW12-031814	102%	0
Trip Blanks	102%	0

	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(78-126)	(80-129)

Prep Method: SW5030
Log Number Range: 14-4787 to 14-4799

FORM-II SW8260-SIM

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-031914

LAB CONTROL SAMPLE

Lab Sample ID: LCS-031914
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/20/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT7/LH
LCSD: NT7/LH
Date Analyzed LCS: 03/19/14 11:02
LCSD: 03/19/14 11:27

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	0.868	1.00	86.8%	0.823	1.00	82.3%	5.3%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	98.3%	97.1%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW32-031814
SAMPLE

Lab Sample ID: YD33A
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**29.0**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**2.90**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW33-031814
SAMPLE

Lab Sample ID: YD33B
LIMS ID: 14-4788
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**19.1**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**2.03**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW18-031814
SAMPLE

Lab Sample ID: YD33C
LIMS ID: 14-4789
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**33.3**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**1.24**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW14-031814
SAMPLE

Lab Sample ID: YD33D
LIMS ID: 14-4790
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**5.76**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.669**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW29-031814
SAMPLE

Lab Sample ID: YD33E
LIMS ID: 14-4791
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**26.6**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**2.07**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW12-031814
SAMPLE

Lab Sample ID: YD33F
LIMS ID: 14-4792
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**11.1**	
3010A	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.768**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW32-031814
SAMPLE

Lab Sample ID: YD33G
LIMS ID: 14-4793
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**86.8**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**28.6**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**55.8**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**2.87**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**15.7**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**110**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW33-031814
SAMPLE

Lab Sample ID: YD33H
LIMS ID: 14-4794
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**37.0**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**18.9**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**21.7**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**1.95**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**9.6**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**264**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW18-031814
SAMPLE

Lab Sample ID: YD33I
LIMS ID: 14-4795
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**45.2**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**34.8**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**41.7**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**1.20**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**13.8**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**34.6**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW14-031814
SAMPLE

Lab Sample ID: YD33J
LIMS ID: 14-4796
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**48.9**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**4.56**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**28.0**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.656**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**4.9**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**17.0**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW29-031814
SAMPLE

Lab Sample ID: YD33K
LIMS ID: 14-4797
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**190**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**26.4**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**49.4**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**2.04**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**13.5**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**30.3**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW12-031814
SAMPLE

Lab Sample ID: YD33L
LIMS ID: 14-4798
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	**7440-70-2**	**Calcium**	0.05	**32.6**	
6010C	03/20/14	6010C	03/24/14	**7439-89-6**	**Iron**	0.05	**9.01**	
6010C	03/20/14	6010C	03/24/14	**7439-95-4**	**Magnesium**	0.05	**16.9**	
6010C	03/20/14	6010C	03/24/14	**7439-96-5**	**Manganese**	0.001	**0.722**	
6010C	03/20/14	6010C	03/24/14	**7440-09-7**	**Potassium**	0.5	**4.0**	
6010C	03/20/14	6010C	03/24/14	**7440-23-5**	**Sodium**	0.5	**22.6**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: YD33MB
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/20/14	6010C	03/24/14	7439-89-6	Iron	0.05	0.05	U
3010A	03/20/14	6010C	03/24/14	7439-96-5	Manganese	0.001	0.001	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: YD33LCS
LIMS ID: 14-4787
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	6010C	2.08	2.00	104%	
Manganese	6010C	0.530	0.500	106%	

Reported in mg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Sample ID: METHOD BLANK

Lab Sample ID: YD33MB
LIMS ID: 14-4793
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/20/14	6010C	03/24/14	7440-70-2	Calcium	0.05	0.05	U
6010C	03/20/14	6010C	03/24/14	7439-89-6	Iron	0.05	0.05	U
6010C	03/20/14	6010C	03/24/14	7439-95-4	Magnesium	0.05	0.05	U
6010C	03/20/14	6010C	03/24/14	7439-96-5	Manganese	0.001	0.001	U
6010C	03/20/14	6010C	03/24/14	7440-09-7	Potassium	0.5	0.5	U
6010C	03/20/14	6010C	03/24/14	7440-23-5	Sodium	0.5	0.5	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: LAB CONTROL

Lab Sample ID: YD33LCS
LIMS ID: 14-4793
Matrix: Water
Data Release Authorized:
Reported: 03/25/14

QC Report No: YD33-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Calcium	6010C	9.92	10.0	99.2%	
Iron	6010C	2.02	2.00	101%	
Magnesium	6010C	10.2	10.0	102%	
Manganese	6010C	0.519	0.500	104%	
Potassium	6010C	10.1	10.0	101%	
Sodium	6010C	10.7	10.0	107%	

Reported in mg/L

N-Control limit not met
Control Limits: 80-120%

SAMPLE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Client ID: SPL-GW-MW32-031814
ARI ID: 14-4787 YD33A

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	607
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	607
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/19/14 031914#1	EPA 300.0	mg/L	1.0	26.0
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.200	9.26
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	2.0	71.3
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Client ID: SPL-GW-MW33-031814
ARI ID: 14-4788 YD33B

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	268
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	268
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/19/14 031914#1	EPA 300.0	mg/L	2.0	81.7
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.200	14.7
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	0.1	< 0.1 U
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Client ID: SPL-GW-MW18-031814
ARI ID: 14-4789 YD33C

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	361
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	361
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/19/14 031914#1	EPA 300.0	mg/L	0.5	13.3
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.050	1.98
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	0.1	< 0.1 U
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Client ID: SPL-GW-MW14-031814
ARI ID: 14-4790 YD33D

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	246
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	246
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/19/14 031914#1	EPA 300.0	mg/L	0.5	19.6
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.010	0.204
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	0.1	2.0
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Client ID: SPL-GW-MW29-031814
ARI ID: 14-4791 YD33E

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	391
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	391
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/19/14 031914#1	EPA 300.0	mg/L	1.0	37.2
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.010	0.976
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	10.0	286
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	0.053

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Client ID: SPL-GW-MW12-031814
ARI ID: 14-4792 YD33F

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	186
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	186
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/19/14 031914#1	EPA 300.0	mg/L	0.5	20.1
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/24/14 032414#1	EPA 350.1M	mg-N/L	0.010	0.734
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	0.5	13.2
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
Chloride	EPA 300.0	03/19/14	mg/L	< 0.1 U	
N-Nitrate	EPA 300.0	03/19/14	mg-N/L	< 0.1 U	
N-Nitrite	EPA 300.0	03/19/14	mg-N/L	< 0.1 U	
N-Ammonia	EPA 350.1M	03/24/14	mg-N/L	< 0.010 U	FB
Sulfate	EPA 300.0	03/19/14	mg/L	< 0.1 U	
Sulfide	EPA 376.2	03/20/14	mg/L	< 0.050 U	

FB Filtration Blank

LAB CONTROL RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide EPA 376.2	ICVL	03/20/14	mg/L	0.504	0.501	100.6%

STANDARD REFERENCE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Alkalinity ERA #P114506	SM 2320	03/25/14	mg/L CaCO3	56.0	59.8	93.6%
Chloride ERA 210312	EPA 300.0	03/19/14	mg/L	2.9	3.0	96.7%
N-Nitrate ERA #220912	EPA 300.0	03/19/14	mg-N/L	2.9	3.0	96.7%
N-Nitrite ERA 490412	EPA 300.0	03/19/14	mg-N/L	2.8	3.0	93.3%
N-Ammonia ERA #040912	EPA 350.1M	03/24/14	mg-N/L	0.482	0.500	96.4%
Sulfate ERA 240312	EPA 300.0	03/19/14	mg/L	2.9	3.0	96.7%

REPLICATE RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: YD33A Client ID: SPL-GW-MW32-031814						
Sulfide	EPA 376.2	03/20/14	mg/L	< 0.050	< 0.050	NA

MS/MSD RESULTS-CONVENTIONALS
YD33-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/26/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/18/14
Date Received: 03/18/14

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: YD33A Client ID: SPL-GW-MW32-031814							
Sulfide	EPA 376.2	03/20/14	mg/L	< 0.050	0.470	0.500	94.0%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 1, 2014

Stephen.Bentsen
Floyd Snider
601 Union Street, Suite 600
Seattle, WA 98101-2341

RE: Project: South Park Landfill
ARI Job No: YD53

Dear Stephen:

Please find enclosed analytical results and chain of custody documentation (COC) for the project referenced above. Analytical Resources, Incorporated (ARI) accepted seven water samples and a trip blank on March 19, 2014. The samples were in good condition with no discrepancies in paperwork.

The samples were analyzed for VOCs, SIM VOCs, Total and Dissolved Metals, Alkalinity, Nitrate, Nitrite, Ammonia, Chloride, Sulfate, Sulfide, as requested on the COC.

The chloride bracketing calibration blanks contained chloride contamination. The associated sample concentrations were greater then ten times the concentration found in the blanks therefore, no further action was taken.

Sample SPL-GW-MW31-031914 contained an "E" value for the 8260 SIM analysis. The result for vinyl chloride was reported from the 8260 non SIM analysis.

No other analytical complications were noted for these analyses. Quality control results are included for your review.

A copy of the reports and all associated raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206-695-6211

Enclosures

cc: eFile YD53

KB/kb

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Aspect Consulting	Phone: 206.780.7719	Date: 3/19/14	Ice Present?
Client Contact: John Strunk jstrunk@aspectconsulting.com		No. of Coolers:	Cooler Temps:
Client Project Name: South Park Landfill			
Client Project #: 100116	Samplers: SDM / JLO		

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

Sample ID	Date	Time	Matrix	No. Containers	VOC by 8260C Cis-1,2 - dichloroethene Trichloroethylene *See Notes	VOCs by 8260C SIM Vinylchloride	Dissolved Metals by 6010B Na, K, Ca, Mg, Fe, Mn	Total Metals by 6010B Fe, Mn	Major Anions by 300 Chloride, Sulfate, Nitrate Nitrite	Major Anions by SM 2320B Alkalinity, carbonate, Bicarbonate	Genral Chem by SM 4500 Ammonia, Sulfide	Benzene (As part of 8260C)	Notes/Comments
~~Also~~ SPL-GW-MW31-031914	3/19/14	1000	H2O	12	X	X	X	X	X	X	X		
SPL-GW-MW30-031914		1015		12	X	X	X	X	X	X	X		
SPL-GW-MW26-031914		1100		12	X	X	X	X	X	X	X		
SPL-GW-MW24-031914		1145		12	X	X	X	X	X	X	X		
SPL-GW-MW08-031914		1240		12	X	X	X	X	X	X	X		
SPL-GW-MW27-031914		1340		12	X	X	X	X	X	X	X		
SPL-GW-MW30-031914		1400		6	X	X							
Trip Blank				2	X	X							in coolers w/ VOAs

*For 8260C, please provide report for only the analytes listed. However please do dilutions and archive chromatographs for the full suite of analytes so additional analytes may be analyzed later if requested.

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
	Printed Name: Seann McClure	Printed Name: A. Voigardsen	Printed Name:	Printed Name:
	Company: Aspect Consulting	Company: ARI	Company	Company:
	Date & Time: 3/19/14 14:35	Date & Time: 3/19/14 1435	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.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: YD53
Client: Aspect Consulting
Project Event: 100116
Project Name: South Park Landfill

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	SPL-GW-MW31-031914	YD53A	14-4863	Water	03/19/14 10:00	03/19/14 14:35
2.	SPL-GW-MW30-031914	YD53B	14-4864	Water	03/19/14 10:15	03/19/14 14:35
3.	SPL-GW-MW26-031914	YD53C	14-4865	Water	03/19/14 11:00	03/19/14 14:35
4.	SPL-GW-MW24-031914	YD53D	14-4866	Water	03/19/14 11:45	03/19/14 14:35
5.	SPL-GW-MW08-031914	YD53E	14-4867	Water	03/19/14 12:40	03/19/14 14:35
6.	SPL-GW-MW27-031914	YD53F	14-4868	Water	03/19/14 13:40	03/19/14 14:35
7.	SPL-GW-MW80-031914	YD53G	14-4869	Water	03/19/14 14:00	03/19/14 14:35
8.	Trip Blanks	YD53H	14-4870	Water	03/19/14	03/19/14 14:35
9.	SPL-GW-MW31-031914	YD53I	14-4871	Water	03/19/14 10:00	03/19/14 14:35
10.	SPL-GW-MW30-031914	YD53J	14-4872	Water	03/19/14 10:15	03/19/14 14:35
11.	SPL-GW-MW26-031914	YD53K	14-4873	Water	03/19/14 11:00	03/19/14 14:35
12.	SPL-GW-MW24-031914	YD53L	14-4874	Water	03/19/14 11:45	03/19/14 14:35
13.	SPL-GW-MW08-031914	YD53M	14-4875	Water	03/19/14 12:40	03/19/14 14:35
14.	SPL-GW-MW27-031914	YD53N	14-4876	Water	03/19/14 13:40	03/19/14 14:35

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Aspect

Project Name: South Park Landfill

COC No(s): _____ (NA)

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

Assigned ARI Job No: 1053

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): 3.1 5.2 4.1 ___ ___ ___

Time: 1435

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

Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 3/19/14 Time: 1435

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? (13)		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	3-11-14	

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

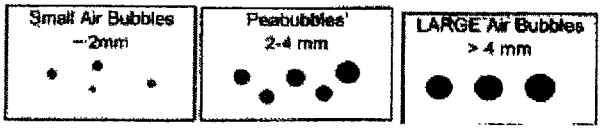
Samples Logged by: TS Date: 3-20-14 Time: 1032

***** 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:

By: Date:



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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW31-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53A
LIMS ID: 14-4863
Matrix: Water
Data Release Authorized:
Reported: 04/01/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PKC
Date Analyzed: 03/21/14 12:14

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
75-01-4	**Vinyl Chloride**	**0.20**	**5.1**	
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**3.9**	
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	98.1%
Bromofluorobenzene	94.6%
d4-1,2-Dichlorobenzene	99.8%

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW30-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53B
LIMS ID: 14-4864
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 12:42

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	0.89	
79-01-6	Trichloroethene	0.20	0.49	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	96.6%
Bromofluorobenzene	92.7%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW26-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53C
LIMS ID: 14-4865
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 13:12

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**0.43**	
79-01-6	**Trichloroethene**	**0.20**	**0.42**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	97.1%
Bromofluorobenzene	93.7%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW24-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53D
LIMS ID: 14-4866
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 13:41

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	97.3%
Bromofluorobenzene	91.0%
d4-1,2-Dichlorobenzene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW08-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53E
LIMS ID: 14-4867
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 14:10

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	98.6%
Bromofluorobenzene	93.5%
d4-1,2-Dichlorobenzene	99.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW27-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53F
LIMS ID: 14-4868
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 14:39

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	96.5%
Bromofluorobenzene	92.4%
d4-1,2-Dichlorobenzene	99.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: SPL-GW-MW80-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53G
LIMS ID: 14-4869
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 15:08

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	97.4%
Bromofluorobenzene	93.9%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53H
LIMS ID: 14-4870
Matrix: Water
Data Release Authorized: MW
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 15:37

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	96.4%
Bromofluorobenzene	93.0%
d4-1,2-Dichlorobenzene	98.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-032114A**
Page 1 of 1 **METHOD BLANK**

Lab Sample ID: MB-032114A
LIMS ID: 14-4863
Matrix: Water
Data Release Authorized: B
Reported: 04/01/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT3/PAB
Date Analyzed: 03/21/14 10:44

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
75-01-4	Vinyl Chloride	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	98.0%
Bromofluorobenzene	91.5%
d4-1,2-Dichlorobenzene	100%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-032114A	Method Blank	10	101%	98.0%	91.5%	100%	0
LCS-032114A	Lab Control	10	104%	98.2%	94.1%	99.7%	0
LCSD-032114A	Lab Control Dup	10	103%	96.0%	94.5%	101%	0
YD53A	SPL-GW-MW31-031914	10	100%	98.1%	94.6%	99.8%	0
YD53B	SPL-GW-MW30-031914	10	103%	96.6%	92.7%	102%	0
YD53C	SPL-GW-MW26-031914	10	101%	97.1%	93.7%	100%	0
YD53D	SPL-GW-MW24-031914	10	100%	97.3%	91.0%	103%	0
YD53E	SPL-GW-MW08-031914	10	102%	98.6%	93.5%	99.1%	0
YD53F	SPL-GW-MW27-031914	10	104%	96.5%	92.4%	99.7%	0
YD53G	SPL-GW-MW80-031914	10	104%	97.4%	93.9%	102%	0
YD53H	Trip Blanks	10	101%	96.4%	93.0%	98.6%	0

	LCS/MB LIMITS	QC LIMITS
SW8260C		
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 14-4863 to 14-4870

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-032114A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-032114A
LIMS ID: 14-4863
Matrix: Water
Data Release Authorized:
Reported: 04/01/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT3/PAB
LCSD: NT3/PAB
Date Analyzed LCS: 03/21/14 09:46
LCSD: 03/21/14 10:15

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	8.21	10.0	82.1%	9.13	10.0	91.3%	10.6%
cis-1,2-Dichloroethene	9.22	10.0	92.2%	9.70	10.0	97.0%	5.1%
Trichloroethene	9.38	10.0	93.8%	9.75	10.0	97.5%	3.9%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	104%	103%
d8-Toluene	98.2%	96.0%
Bromofluorobenzene	94.1%	94.5%
d4-1,2-Dichlorobenzene	99.7%	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW31-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53A
LIMS ID: 14-4863
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 16:05

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**5.7**	**E**

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW30-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53B
LIMS ID: 14-4864
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 16:31

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.20**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW26-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53C
LIMS ID: 14-4865
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 16:56

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.053**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW24-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53D
LIMS ID: 14-4866
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 17:22

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.034**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW08-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53E
LIMS ID: 14-4867
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 17:48

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.080**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW27-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53F
LIMS ID: 14-4868
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 18:13

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	**Vinyl Chloride**	**0.020**	**0.11**	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: SPL-GW-MW80-031914**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53G
LIMS ID: 14-4869
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 18:39

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM **Sample ID: Trip Blanks**
Page 1 of 1 **SAMPLE**

Lab Sample ID: YD53H
LIMS ID: 14-4870
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 15:40

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: MB-032014

METHOD BLANK

Lab Sample ID: MB-032014
LIMS ID: 14-4863
Matrix: Water
Data Release Authorized:
Reported: 03/21/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT7/LH
Date Analyzed: 03/20/14 15:14

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	107%

ANALYTICAL RESOURCES INCORPORATED

SW8260-SIM SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116

Client ID	DCE	TOT OUT
MB-032014	107%	0
LCS-032014	102%	0
LCSD-032014	104%	0
SPL-GW-MW31-031914	108%	0
SPL-GW-MW30-031914	105%	0
SPL-GW-MW26-031914	106%	0
SPL-GW-MW24-031914	105%	0
SPL-GW-MW08-031914	105%	0
SPL-GW-MW27-031914	107%	0
SPL-GW-MW80-031914	105%	0
Trip Blanks	103%	0

	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(78-126)	(80-129)

Prep Method: SW5030
Log Number Range: 14-4863 to 14-4870

YD53 : 66625

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-032014
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-032014 QC Report No: YD53-Aspect Consulting
LIMS ID: 14-4863 Project: South Park Landfill
Matrix: Water 100116
Data Release Authorized: Date Sampled: NA
Reported: 03/21/14 Date Received: NA

Instrument/Analyst LCS: NT7/LH Sample Amount LCS: 10.0 mL
LCSD: NT7/LH LCSD: 10.0 mL
Date Analyzed LCS: 03/20/14 14:24 Purge Volume LCS: 10.0 mL
LCSD: 03/20/14 14:50 LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	0.870	1.00	87.0%	0.877	1.00	87.7%	0.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	102%	104%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW31-031914
SAMPLE

Lab Sample ID: YD53A
LIMS ID: 14-4863
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**8.29**	
3010A	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.303**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW31-031914
DUPLICATE

Lab Sample ID: YD53A
LIMS ID: 14-4863
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Iron	6010C	8.29	8.32	0.4%	+/- 20%	
Manganese	6010C	0.303	0.302	0.3%	+/- 20%	

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: SPL-GW-MW31-031914**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: YD53A QC Report No: YD53-Aspect Consulting
LIMS ID: 14-4863 Project: South Park Landfill
Matrix: Water 100116
Data Release Authorized: Date Sampled: 03/19/14
Reported: 03/26/14 Date Received: 03/19/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Iron	6010C	8.29	10.4	2.00	106%	H
Manganese	6010C	0.303	0.816	0.500	103%	

Reported in mg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW30-031914
SAMPLE

Lab Sample ID: YD53B
LIMS ID: 14-4864
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**3.08**	
3010A	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.090**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW26-031914
SAMPLE

Lab Sample ID: YD53C
LIMS ID: 14-4865
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**13.9**	
3010A	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.147**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW24-031914
SAMPLE

Lab Sample ID: YD53D
LIMS ID: 14-4866
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**25.9**	
3010A	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**1.47**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW08-031914
SAMPLE

Lab Sample ID: YD53E
LIMS ID: 14-4867
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**21.3**	
3010A	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**1.13**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: SPL-GW-MW27-031914
SAMPLE

Lab Sample ID: YD53F
LIMS ID: 14-4868
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**4.01**	
3010A	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.177**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW31-031914
SAMPLE

Lab Sample ID: YD53I
LIMS ID: 14-4871
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/21/14	6010C	03/25/14	**7440-70-2**	**Calcium**	0.05	**13.6**	
6010C	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**7.54**	
6010C	03/21/14	6010C	03/25/14	**7439-95-4**	**Magnesium**	0.05	**4.80**	
6010C	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.306**	
6010C	03/21/14	6010C	03/25/14	**7440-09-7**	**Potassium**	0.5	**3.0**	
6010C	03/21/14	6010C	03/25/14	**7440-23-5**	**Sodium**	0.5	**29.2**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW31-031914
DUPLICATE

Lab Sample ID: YD53I
LIMS ID: 14-4871
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Calcium	6010C	13.6	13.6	0.0%	+/- 20%	
Iron	6010C	7.54	7.52	0.3%	+/- 20%	
Magnesium	6010C	4.80	4.77	0.6%	+/- 20%	
Manganese	6010C	0.306	0.305	0.3%	+/- 20%	
Potassium	6010C	3.0	3.0	0.0%	+/- 20%	
Sodium	6010C	29.2	29.3	0.3%	+/- 20%	

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: SPL-GW-MW31-031914
MATRIX SPIKE

Lab Sample ID: YD53I
LIMS ID: 14-4871
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Calcium	6010C	13.6	23.6	10.0	100%	
Iron	6010C	7.54	9.58	2.00	102%	
Magnesium	6010C	4.80	15.1	10.0	103%	
Manganese	6010C	0.306	0.830	0.500	105%	
Potassium	6010C	3.0	13.1	10.0	101%	
Sodium	6010C	29.2	39.2	10.0	100%	

Reported in mg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW30-031914
SAMPLE

Lab Sample ID: YD53J
LIMS ID: 14-4872
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/21/14	6010C	03/25/14	**7440-70-2**	**Calcium**	0.05	**60.0**	
6010C	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**2.80**	
6010C	03/21/14	6010C	03/25/14	**7439-95-4**	**Magnesium**	0.05	**11.9**	
6010C	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.090**	
6010C	03/21/14	6010C	03/25/14	**7440-09-7**	**Potassium**	0.5	**4.7**	
6010C	03/21/14	6010C	03/25/14	**7440-23-5**	**Sodium**	0.5	**17.4**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: SPL-GW-MW26-031914
SAMPLE

Lab Sample ID: YD53K
LIMS ID: 14-4873
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/21/14	6010C	03/25/14	**7440-70-2**	**Calcium**	0.05	**12.7**	
6010C	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**6.18**	
6010C	03/21/14	6010C	03/25/14	**7439-95-4**	**Magnesium**	0.05	**4.29**	
6010C	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.145**	
6010C	03/21/14	6010C	03/25/14	**7440-09-7**	**Potassium**	0.5	**3.2**	
6010C	03/21/14	6010C	03/25/14	**7440-23-5**	**Sodium**	0.5	**9.8**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW24-031914
SAMPLE

Lab Sample ID: YD53L
LIMS ID: 14-4874
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/21/14	6010C	03/25/14	**7440-70-2**	**Calcium**	0.05	**70.1**	
6010C	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**24.6**	
6010C	03/21/14	6010C	03/25/14	**7439-95-4**	**Magnesium**	0.05	**29.4**	
6010C	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**1.45**	
6010C	03/21/14	6010C	03/25/14	**7440-09-7**	**Potassium**	0.5	**12.6**	
6010C	03/21/14	6010C	03/25/14	**7440-23-5**	**Sodium**	0.5	**60.8**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: SPL-GW-MW08-031914
SAMPLE

Lab Sample ID: YD53M
LIMS ID: 14-4875
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/21/14	6010C	03/25/14	**7440-70-2**	**Calcium**	0.05	**42.6**	
6010C	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**16.4**	
6010C	03/21/14	6010C	03/25/14	**7439-95-4**	**Magnesium**	0.05	**47.2**	
6010C	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**1.13**	
6010C	03/21/14	6010C	03/25/14	**7440-09-7**	**Potassium**	0.5	**16.7**	
6010C	03/21/14	6010C	03/25/14	**7440-23-5**	**Sodium**	0.5	**154**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: SPL-GW-MW27-031914
SAMPLE

Lab Sample ID: YD53N
LIMS ID: 14-4876
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/21/14	6010C	03/25/14	**7440-70-2**	**Calcium**	0.05	**24.7**	
6010C	03/21/14	6010C	03/25/14	**7439-89-6**	**Iron**	0.05	**1.69**	
6010C	03/21/14	6010C	03/25/14	**7439-95-4**	**Magnesium**	0.05	**5.84**	
6010C	03/21/14	6010C	03/25/14	**7439-96-5**	**Manganese**	0.001	**0.167**	
6010C	03/21/14	6010C	03/25/14	**7440-09-7**	**Potassium**	0.5	**3.2**	
6010C	03/21/14	6010C	03/25/14	**7440-23-5**	**Sodium**	0.5	**18.2**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: YD53MB
LIMS ID: 14-4864
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	03/21/14	6010C	03/25/14	7439-89-6	Iron	0.05	0.05	U
3010A	03/21/14	6010C	03/25/14	7439-96-5	Manganese	0.001	0.001	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Sample ID: LAB CONTROL

Lab Sample ID: YD53LCS
LIMS ID: 14-4864
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	6010C	2.06	2.00	103%	
Manganese	6010C	0.492	0.500	98.4%	

Reported in mg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS **Sample ID: METHOD BLANK**

Lab Sample ID: YD53MB
LIMS ID: 14-4872
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
6010C	03/21/14	6010C	03/25/14	7440-70-2	Calcium	0.05	0.05	U
6010C	03/21/14	6010C	03/25/14	7439-89-6	Iron	0.05	0.05	U
6010C	03/21/14	6010C	03/25/14	7439-95-4	Magnesium	0.05	0.05	U
6010C	03/21/14	6010C	03/25/14	7439-96-5	Manganese	0.001	0.001	U
6010C	03/21/14	6010C	03/25/14	7440-09-7	Potassium	0.5	0.5	U
6010C	03/21/14	6010C	03/25/14	7440-23-5	Sodium	0.5	0.5	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: LAB CONTROL

Lab Sample ID: YD53LCS
LIMS ID: 14-4872
Matrix: Water
Data Release Authorized:
Reported: 03/26/14

QC Report No: YD53-Aspect Consulting
Project: South Park Landfill
100116
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Calcium	6010C	9.97	10.0	99.7%	
Iron	6010C	2.12	2.00	106%	
Magnesium	6010C	10.3	10.0	103%	
Manganese	6010C	0.507	0.500	101%	
Potassium	6010C	10.1	10.0	101%	
Sodium	6010C	10.4	10.0	104%	

Reported in mg/L

N-Control limit not met
Control Limits: 80-120%

SAMPLE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Client ID: SPL-GW-MW31-031914
ARI ID: 14-4863 YD53A

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	95.2
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	95.2
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/20/14 032014#1	EPA 300.0	mg/L	0.5	20.1
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/25/14 032514#1	EPA 350.1M	mg-N/L	0.020	1.58
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	0.1	0.4
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Client ID: SPL-GW-MW30-031914
ARI ID: 14-4864 YD53B

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	190
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	190
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/20/14 032014#1	EPA 300.0	mg/L	0.5	24.8
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.2
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/25/14 032514#1	EPA 350.1M	mg-N/L	0.010	0.396
Sulfate	03/20/14 032014#1	EPA 300.0	mg/L	0.5	20.6
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Client ID: SPL-GW-MW26-031914
ARI ID: 14-4865 YD53C

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	52.3
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	52.3
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/21/14 032114#1	EPA 300.0	mg/L	0.5	9.2
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/25/14 032514#1	EPA 350.1M	mg-N/L	0.010	0.084
Sulfate	03/20/14 032014#1	EPA 300.0	mg/L	0.2	8.9
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Client ID: SPL-GW-MW24-031914
ARI ID: 14-4866 YD53D

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	405
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	405
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/20/14 032014#1	EPA 300.0	mg/L	1.0	42.3
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/25/14 032514#1	EPA 350.1M	mg-N/L	0.050	3.80
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	0.1	0.5
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Client ID: SPL-GW-MW08-031914
ARI ID: 14-4867 YD53E

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	378
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	378
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/20/14 032014#1	EPA 300.0	mg/L	10.0	194
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.1
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/25/14 032514#1	EPA 350.1M	mg-N/L	0.050	2.90
Sulfate	03/19/14 031914#1	EPA 300.0	mg/L	0.1	2.6
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Client ID: SPL-GW-MW27-031914
ARI ID: 14-4868 YD53F

Analyte	Date Batch	Method	Units	RL	Sample
Alkalinity	03/25/14 032514#1	SM 2320	mg/L CaCO3	1.0	99.2
Carbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Bicarbonate	03/25/14	SM 2320	mg/L CaCO3	1.0	99.2
Hydroxide	03/25/14	SM 2320	mg/L CaCO3	1.0	< 1.0 U
Chloride	03/20/14 032014#1	EPA 300.0	mg/L	0.5	15.9
N-Nitrate	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	0.2
N-Nitrite	03/19/14 031914#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
N-Ammonia	03/25/14 032514#1	EPA 350.1M	mg-N/L	0.010	0.471
Sulfate	03/20/14 032014#1	EPA 300.0	mg/L	0.2	6.9
Sulfide	03/20/14 032014#1	EPA 376.2	mg/L	0.050	< 0.050 U

RL Analytical reporting limit
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
Chloride	EPA 300.0	03/20/14	mg/L	< 0.1 U	
		03/21/14		< 0.1 U	
N-Nitrate	EPA 300.0	03/19/14	mg-N/L	< 0.1 U	
N-Nitrite	EPA 300.0	03/19/14	mg-N/L	< 0.1 U	
N-Ammonia	EPA 350.1M	03/25/14	mg-N/L	< 0.010 U	FB
Sulfate	EPA 300.0	03/19/14	mg/L	< 0.1 U	
		03/20/14		< 0.1 U	
Sulfide	EPA 376.2	03/20/14	mg/L	< 0.050 U	

FB Filtration Blank

LAB CONTROL RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide EPA 376.2	ICVL	03/20/14	mg/L	0.504	0.501	100.6%

STANDARD REFERENCE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Alkalinity	SM 2320	03/25/14	mg/L CaCO3	58.7	59.8	98.2%
ERA #P114506		03/25/14		56.0	59.8	93.6%
Chloride	EPA 300.0	03/20/14	mg/L	2.9	3.0	96.7%
ERA 210312		03/21/14		2.9	3.0	96.7%
N-Nitrate	EPA 300.0	03/19/14	mg-N/L	2.9	3.0	96.7%
ERA #220912						
N-Nitrite	EPA 300.0	03/19/14	mg-N/L	2.8	3.0	93.3%
ERA 490412						
N-Ammonia	EPA 350.1M	03/25/14	mg-N/L	0.490	0.500	98.0%
ERA #040912						
Sulfate	EPA 300.0	03/19/14	mg/L	2.9	3.0	96.7%
ERA 240312		03/20/14		2.9	3.0	96.7%

REPLICATE RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: YD53A Client ID: SPL-GW-MW31-031914						
Alkalinity	SM 2320	03/25/14	mg/L CaCO3	95.2	94.7	0.5%
Carbonate	SM 2320	03/25/14	mg/L CaCO3	< 1.0	< 1.0	NA
Bicarbonate	SM 2320	03/25/14	mg/L CaCO3	95.2	94.7	0.5%
Hydroxide	SM 2320	03/25/14	mg/L CaCO3	< 1.0	< 1.0	NA
N-Ammonia	EPA 350.1M	03/25/14	mg-N/L	1.58	1.57	0.6%

MS/MSD RESULTS-CONVENTIONALS
YD53-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 03/31/14

Project: South Park Landfill
Event: 100116
Date Sampled: 03/19/14
Date Received: 03/19/14

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: YD53A Client ID: SPL-GW-MW31-031914							
N-Ammonia	EPA 350.1M	03/25/14	mg-N/L	1.58	4.11	2.50	101.2%

South Park Landfill

March 2014 Interim Site-Wide Groundwater Monitoring Results

Appendix C
Data Validation Report

March 2014 Groundwater Sampling Event
South Park Landfill

Data Validation Report

Prepared for
Seattle Public Utilities

Prepared by
Floyd|Snider
601 Union Street
Suite 600
Seattle, Washington 98101

April 2014

DRAFT

Table of Contents

List of Attachments

List of Abbreviations and Acronyms

Abbreviation/ Acronym	Definition
ARI	Analytical Resources, Inc. Laboratory
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
RPD	Relative percent difference
QC	Quality control
SDG	Sample Delivery Group
USEPA	U. S. Environmental Protection Agency
VOC	Volatile organic compound

1.0 Project Narrative

1.1 OVERVIEW OF DATA VALIDATION

This report summarizes the results of the Compliance Screening (Level I) performed on the groundwater and field quality control (QC) sample data for the South Park Landfill March 2014 Groundwater Monitoring Event. A complete list of samples is provided below.

Project Sample Index

SDG (Batch)	Sample ID	Lab ID	8260C	8260C-SIM	6010B
YD18	SPL-GW-KMW08-031714	YD18A 14-4581/YD18H 14-4588	X	X	X
YD18	SPL-GW-MW61-031714	YD18B 14-4582/YD18I 14-4589	X	X	X
YD18	SPL-GW-KMW03A-031714	YD18C 14-4583/YD18J 14-4590	X	X	X
YD18	SPL-GW-KMW05-031714	YD18D 14-4584/YD18K 14-4590	X	X	X
YD18	SPL-GW-MW25-031714	YD18E 14-4585/YD18L 14-4592	X	X	X
YD18	SPL-GW-MW60-031714	YD18F 14-4586/YD18M 14-4593	X	X	X
YD18	SPL-GW-MW10-031714	YD18G 14-4587/YD18N 14-4594	X	X	X
YD18	Trip Blanks	YD18O 14-4595	X	X	
YD33	SPL-GW-MW32-031814	YD33A 14-4787/YD33G 14-4793	X	X	X
YD33	SPL-GW-MW-33-031814	YD33B 14-4788/YD33H 14-4794	X	X	X
YD33	SPL-GW-MW18-031814	YD33C 14-4789/YD33I 14-4795	X	X	X
YD33	SPL-GW-MW14-031814	YD33D 14-4790/YD33J 14-4796	X	X	X
YD33	SPL-GW-MW29-031814	YD33E 14-4791/YD33K 14-4797	X	X	X
YD33	SPL-GW-MW12-031814	YD33F 14-4792/YD33L 14-4798	X	X	X
YD33	Trip Blanks	YD33M 14-4799	X	X	
YD53	SPL-GW-MW31-031914	YD53A 14-4863/YD53I 14-4871	X	X	X
YD53	SPL-GW-MW320-031914	YD53B 14-4864/YD53J 14-4872	X	X	X
YD53	SPL-GW-MW26-031914	YD53C 14-4865/YD53K 14-4873	X	X	X
YD53	SPL-GW-MW24-031914	YD53D 14-4866/YD53L 14-4874	X	X	X
YD53	SPL-GW-MW08-031914	YD53E 14-4867/YD53M 14-4875	X	X	X
YD53	SPL-GW-MW27-031914	YD53F 14-4868/YD53N 14-4876	X	X	X
YD53	SPL-GW-MW80-031914	YD53G 14-4869	X	X	
YD53	Trip Blanks	YD53H 14-4870	X	X	

The chemical analyses were performed by Analytical Resources, Inc. (ARI), located in Tukwila, Washington. Groundwater samples were collected between March 17 and 19, 2014, and were submitted to ARI for chemical analyses. The analytical methods include the following:

- Select volatile organic compounds (VOCs)—U.S. Environmental Protection Agency (USEPA) Method 8260C
- Vinyl chloride—USEPA Method 8260C-SIM
- Select metals—USEPA Method 6010B

The data were reviewed using guidance and QC criteria documented in the analytical methods, *National Functional Guidelines for Inorganic Data Review* (USEPA 1994 and 2004), *National Functional Guidelines for Organic Data Review* (USEPA 1999 and 2008), and the *Sampling and Analysis Plan, Appendix D of the Remedial Investigation/Feasibility Study Work Plan for South Park Landfill Site* (Farallon Consulting, LLC 2010).

Conventional parameters such as alkalinity, nitrate, nitrite, chloride, sulfate, and sulfide were also analyzed; however, they do not have data quality compliance requirements, and, therefore, the results were not included in this data validation report.

Floyd|Snider's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes, but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. When compounds are analyzed at multiple dilutions, select results will be assigned a Do Not Report (DNR) qualification as a more appropriate result is reported from another dilution. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reasons, and validation criteria are included as Attachment 1. The Qualified Data Summary Table is included in Attachment 2. Data validation worksheets (excel worksheets) will be kept on file at Floyd|Snider.

2.0 Data Validation Report
Select VOCs by USEPA Method 8260C

This report documents the review of analytical data from the analyses of groundwater and field QC samples and the associated laboratory QC samples. Samples were analyzed by ARI. Compliance Screening (Level I) was performed on all analytical results by Chell Black as the primary data reviewer, and secondary review was performed by Jessi Massingale.

2.1 DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

2.2 TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

QC Requirements

Cooler temperature and preservation	Surrogate recoveries
Extraction and analysis holding times	Analyte response
Blank contamination	Reporting limits and reported results
Laboratory control sample (LCS) and LCS duplicate (LCSD)	Target analyte list

All QC requirements were met without exception, and did not require further evaluation.

2.3 OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by surrogate, LCS, and LCSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD relative percent difference (RPD).

All data, as reported by the laboratory, are acceptable for use.

3.0 Data Validation Report
Vinyl Chloride by USEPA Method 8260C-SIM

This report documents the review of analytical data from the analyses of groundwater and field QC samples and the associated laboratory QC samples. Samples were analyzed by ARI. Compliance Screening (Level I) was performed on all analytical results by Chell Black as the primary data reviewer, and secondary review was performed by Jessi Massingale.

3.1 DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

3.2 TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

QC Requirements

Cooler temperature and preservation	Surrogate recoveries
Extraction and analysis holding times	[1] Analyte response
Blank contamination	Reporting limits and reported results
LCS and LCSD	Target analyte list

Note:
1 Quality control outliers that impact the reported data were noted. Data qualifiers were issued, as discussed below.

Attachment 1 presents data validation criteria tables for organic compound analysis. QC requirements that were met without exception are not discussed below. QC requirements that required further evaluation and had exceptions to the validation criteria are discussed below.

3.2.1 Analyte Response

For SDG YD53, the vinyl chloride result for SPL-GW-MW31-031914 was flagged by the laboratory as exceeding the valid instrument calibration range. It has been flagged “DNR” as a more appropriate result is available from the SW8260C analysis.

3.3 OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the sample surrogate, LCS, and LCSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD RPD.

All data are acceptable for use as qualified; refer to Attachment 2 for details.

4.0 Data Validation Report
Select Metals by USEPA Method 6010B

This report documents the review of analytical data from the analyses of groundwater and field QC samples and the associated laboratory QC samples. Samples were analyzed by ARI. Compliance Screening (Level I) was performed on all analytical results by Chell Black as the primary data reviewer, and secondary review was performed by Jessi Massingale.

4.1 DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and any anomalies were discussed in the case narrative.

4.2 Technical Data Validation

The QC requirements that were reviewed are listed below.

QC Requirements

Cooler temperature and preservation	LCS
Extraction and analysis holding times	Sample and sample duplicate RPD
Blank contamination	Reporting limits and reported results
Matrix spike (MS)	Target analyte list

All QC requirements were met without exception, and did not require further evaluation.

4.3 OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by MS and LCS percent recovery values. Precision was acceptable, as demonstrated by the sample/sample duplicate RPD.

All data, as reported by the laboratory, are acceptable for use.

5.0 References

Farallon Consulting, LLC. 2010. *Sampling and Analysis Plan, Appendix D of the Remedial Investigation/Feasibility Study Work Plan for South Park Landfill Site*.

U.S. Environmental Protection Agency (USEPA). 1994. *National Functional Guidelines for Inorganic Data Review*.

———. 1999. *National Functional Guidelines for Organic Data Review*.

———. 2004. *National Functional Guidelines for Inorganic Data Review*.

———. 2008. *National Functional Guidelines for Organic Data Review*.

March 2014 Groundwater Sampling Event
South Park Landfill

Data Validation Report

Attachment 1
Data Qualifier Definitions and Criteria Tables

DRAFT

DATA VALIDATION QUALIFIER CODES
National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is a Floyd|Snider qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

Floyd|Snider Validation Guidelines for Volatile Analysis by GC/MS (Based on Organic NFG 1999)

Validation QC Element	Acceptance Criteria	Action
Cooler Temperature	4°C±2°C Water: HCl to pH < 2	J/UJ if greater than 6 deg. C (Floyd|Snider PJ)
Hold Time	Waters: 14 days preserved 7 Days: unpreserved (for aromatics) Solids: 14 Days	J/UJ if hold times exceeded If exceeded by > 3X HT: J/R (Floyd|Snider PJ)
Tuning	BFB Beginning of each 12 hour period Method acceptance criteria	R all analytes in all samples associated with the tune
Initial Calibration (Minimum 5 stds.)	RRF > 0.05	(Floyd|Snider PJ) If MDL= reporting limit: J/R if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05
	%RSD < 30%	(Floyd|Snider PJ) J if %RSD > 30%
Continuing Calibration (Prior to each 12 hr. shift)	RRF > 0.05	(Floyd|Snider PJ) If MDL= reporting limit: J/R if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05
	%D <25%	(Floyd|Snider PJ) If > +/-90%: J/RIf -90% to -26%: J (high bias) If 26% to 90%: J/UJ (low bias)
Method Blank	One per matrix per batch No results > CRQL	U if sample result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL)
		U if sample result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value)
	No TICs present	R TICs using 10X rule
Storage Blank	One per SDG <CRQL	U the specific analyte(s) results in all assoc. samples using the 5x or 10x rule

Validation QC Element	**Acceptance Criteria**	**Action**
Trip Blank	Frequency as per project QAPP	Same as method blank for positive results remaining in trip blank after method blank qualifiers are assigned
Field Blanks (if required in QAPP)	No results > CRQL	Apply 5X/10X rule; U < action level
MS/MSD (recovery)	One per matrix per batch Use method acceptance criteria	Qualify parent only unless other QC indicates systematic problems: J if both %R > UCL J/UJ if both %R < LCL J/R if both %R < 10% PJ if only one %R outlier
MS/MSD (RPD)	One per matrix per batch Use method acceptance criteria	J in parent sample if RPD > CL
LCS *low conc. H2O VOA*	One per lab batch Within method control limits	J assoc. cmpd if > UCL J/R assoc. cmpd if < LCL J/R all cmpds if half are < LCL
LCS *regular VOA (H2O & solid)*	One per lab batch Lab or method control limits	J if %R > UCL J/UJ if %R <LCL J/R if %R < 10% (Floyd|Snider PJ)
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J/UJ assoc. cmpd. in all samples
Surrogates	Added to all samples Within method control limits	J if %R >UCL J/UJ if %R <LCL but >10% J/R if <10%
Internal Standard (IS)	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	J if > 200% J/UJ if < 50% J/R if < 25% RT>30 seconds, narrate and Notify PM
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (Floyd|Snider PJ)
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NJ the TIC unless: R common laboratory contaminants See Technical Director for ID issues

Validation QC Element	Acceptance Criteria	Action
Quantitation/ Identification	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	See Technical Director if outliers

Notes:

PJ[1] No action if there are 4+ surrogates and only 1 outlier

Floyd|Snider Validation Guidelines for Metals Analysis by ICP-MS (Based on Inorganic NFG 1994 & 2004)

Validation QC Element	Acceptance Criteria	Action
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration	Floyd|Snider Professional Judgment—no qualification based on cooler temperature outliers J/UJ if pH preservation requirements are not met
Holding Time	180 days from date sampled Frozen tissues—HT extended to 2 years	J/UJ if holding time exceeded
Tune	Prior to ICAL monitoring compounds analyzed 5 times wih Std Dev. < 5% mass calibration <0.1 amu from True Value Resolution < 0.9 AMU @ 10% peak height or <0.75 amu @ 5% peak height	Use Professional Judgment to evaluate tune J/UJ if tune criteria not met
Initial Calibration	Blank + minimum 1 standard If more than 1 standard, r>0.995	J/UJ if r<0.995 (for multi point cal)
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±10% of true value	J/UJ if %R 75–89% J if %R = 111-125% R if %R > 125% R if %R < 75%
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run ±10% of true value	J/UJ if %R = 75–89% J if %R 111-125% R if %R > 125% R if %R < 75%

Initial and Continuing Calibration Blanks (ICB/CCB)	After each ICV and CCV
	every ten samples and end of run
	| blank | < IDL (MDL)
		Action level is 5x absolute value of blank conc.
		For (+)blanks, U results < action level
		For (-) blanks, J/UJ results < action level

Validation QC Element	Acceptance Criteria	Action
Reporting Limit Standard (CRI)	2x RL analyzed beginning of run Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Co,Mn, Zn)	R, < 2x RL if %R < 50% (< 30% Co,Mn, Zn) J < 2x RL, UJ if %R 50-69% (30%-49% Co,Mn, Zn) J < 2x RL if %R 130%-180% (150%-200% Co,Mn, Zn) R < 2x RL if %R > 180% (200% Co, Mn, Zn)
Interference Check Samples (ICSA/ICSAB)	Required by SW 6020, but not 200.8 ICSAB %R 80% - 120% for all spiked elements | ICSA | < IDL (MDL) for all unspiked elements	For samples with Al, Ca, Fe, or Mg > ICS levels R if %R < 50% J if %R >120% J/UJ if %R = 50% to 79% Use Professional Judgment for ICSA to determine if bias is present
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U results < action level
Laboratory Control Sample (LCS)	One per matrix per batch Blank Spike: %R within 80%-120%	R if %R < 50% J/UJ if %R = 50-79% J if %R >120%
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J/UJ if < LCL, J if > UCL
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	One per matrix per batch 75-125% for samples where results do not exceed 4x spike level	J if %R>125% J/UJ if %R <75% J/R if %R<30% or J/UJ if Post Spike %R 75%-125% Qualify all samples in batch
Post-digestion Spike	If Matrix Spike is outside 75-125%, Spike parent sample at 2x the sample conc.	No qualifiers assigned based on this element
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples > RL and < 5 x RL (Diff < 2x RL for solids)	J/UJ if RPD > 20% or diff > RL All samples in batch
Serial Dilution	5x dilution one per matrix %D < 10% for original sample values > 50x MDL	J/UJ if %D >10% All samples in batch

Validation QC Element	Acceptance Criteria	Action
Internal Standards	Every sample SW6020: 60%-125% of cal blank IS 200.8: 30%-120% of cal blank IS	J /UJ all analytes associated with IS outlier
Field Blank	Blank < MDL	Action level is 5x blank conc. U sample values < AL in associated field samples only
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff < RL Solid: Diff < 2x RL	J/UJ in parent samples only
Linear Range	Sample concentrations must fall within range	J values over range

March 2014 Groundwater Sampling Event
South Park Landfill

Data Validation Report

Attachment 2
Qualified Data Summary Table

DRAFT

Table 2.1
Qualified Data Summary Table
March 2014 Groundwater Sampling Event

SDG	Sample ID	Lab ID	Method	Analyte	Result	Units	Lab Qualifier	DV Qualifiers
YD53	SPL-GW-MW31-031914	YD53A 14-4863	SW8260C-SIM	Vinyl Chloride	5.7	µg/L	E	DNR

Qualifiers:

DNR Do not report. A more appropriate result from another analysis or dilution is available.

E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.