Progress Report
April — September 2012
Boomsnub/Airco Superfund Site
Hazel Dell, Washington

Prepared for

Linde LLC
575 Mountain Avenue
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Prepared by

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November 2012
Revision: 0
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LIST OF ACRONYMS

Church	First Church of God
City	City of Vancouver
EA	EA Engineering, Science, and Technology, Inc.
EPA	United States Environmental Protection Agency
IWS	In-Well Stripping
IX	Ion Exchange
lb	Pound(s)
Linde	Linde LLC
O&M	Operation and Maintenance
OU	Operable Unit
QASP	Quality Assurance and Sampling Plan
Site	Boomsnub/Airco Superfund Site
TCE	Trichloroethene
VOC	Volatile Organic Compounds

PROGRESS REPORT

Site Name: Boomsnub/Airco Superfund Site, Hazel Dell, Washington (Site)
Prepared By: EA Engineering, Science, and Technology, Inc. (EA)
Date: 20 November 2012
Reporting Period: April through September 2012.

A. PROGRESS MADE THIS PERIOD

A discussion of Daily Operation and Maintenance (O&M) activities for the reporting period including system availability, system modifications, sampling activities, and meetings follows.

For reference, a site map which identifies Operable Unit (OU)-2 and OU-3 is presented on Figure 1, and the well locations are identified on Figure 2.

A.1 SYSTEM OPERATIONS AND AVAILABILITY

A.1.1 OU-2 Volatile Organic Compound (VOC) Source Area System

General O&M activities continued throughout the reporting period as specified in the O&M Manual, with modifications approved by the United States Environmental Protection Agency (EPA). Copies of the monthly operating field forms for the OU-2 system are provided in Appendix B.

The OU-2 in-well stripping (IWS) system availability over this reporting period was as follows:

Total hours available from 1 April to 30 September 2012: 4392
Total hours of IWS system downtime: 8
Total operating hours: 4,384
System availability: over 99 percent

A.1.2 OU-3 Sitewide Groundwater Extraction and Treatment System

Copies of the completed Boomsnub Bi-weekly System Monitoring Checklists are provided in Appendix C.1. System operation tables are provided in Appendix C.2 and include the following:

- Tables 1A through 1F summarize the groundwater flow information for April 2012 through September 2012.
- Tables 2A through 2F present the pumping rates for each of the extraction wells during this period.
- Table 3 presents monthly system sampling analytical results.

Groundwater pumped through the extraction system was treated via ion exchange and air stripping. The treated groundwater was discharged to the infiltration gallery on Linde LLC (Linde) property. There were no discharges made to the sanitary sewer during the reporting period.

From 1 April 2012 to 30 September 2012, 41,504,164 gallons of groundwater were treated, removing 5.8 pounds (lb) of trichloroethene (TCE) and 17 lb of total chromium from the groundwater. Appendix C.3 provides mass removal tables and charts.

Included in Appendix C.4 is a copy of the Semiannual Self Monitoring Report delivered to the City of Vancouver (City) for January through June 2012. Monthly influent and effluent sampling data is submitted to the City with the Semiannual Self Monitoring Report. The reporting periods are different for the Semiannual Self Monitoring Report and this Progress Report, therefore, three months of data (January through March 2012) submitted with the Semiannual Self Monitoring Report is included in the previous Progress Report. Monthly influent and effluent sampling data for the Progress Report reporting period, 1 April 2012 through 30 September 2012, are included in Appendix C.4

Synopsis of OU-3 System Downtime

Unscheduled system shut-downs and system maintenance shut-offs are listed on the table below. The OU-3 treatment system operated for 4,383 hours, more than 99 percent of the reporting period, exceeding the requirements of the Consent Decree. System downtime details are discussed in the Daily Operation and Maintenance Summary in Appendix A.

Synopsis of OU-3 System Downtime

Date	System Down Time	Type	Reason
April 2012			
21 April	4 hours	Unscheduled	Power Outage
30 April	14 minutes	Maintenance	Pumped water out of vaults.
Total April Downtime: Unscheduled; 4 hours, Maintenance; 14 minutes.			
May 2012			
3 May	3 hours, 40 minutes	Unscheduled	Flooding issues.
8 May	2 minutes	Maintenance	Testing floats
24 May	25 minutes	Maintenance	Pumped water out of vaults.
Total May Downtime: Unscheduled; 3 hours 40 minutes, Maintenance; 27 minutes.			
June 2012			
26 June	16 minutes	Maintenance	Pumped water out of vaults.
Total June Downtime: Maintenance; 16 minutes.			
July 2012			
5 July	13 minutes	Unscheduled	The electric lines were damaged by construction on the church property.

Date	System Down Time	Type	Reason
6 July	11 minutes	Maintenance	Pumped water out of vaults.
Total July Downtime: Unscheduled; 13 minutes, Maintenance; 11 minutes.			
August 2012			
Total August Downtime: No system downtime in the month of August.			
September 2012			
Total September Downtime: No system downtime in the month of September.			

A.2 SYSTEM MODIFICATIONS

OU-2

There were no modifications to the IWS system during this reporting period.

OU-3

The First Church of God (Church) has been constructing sports fields on their property, both east and north of the Church and school area. To allow for this development, modifications to the extraction system pipeline and to several monitoring and extraction wells were required.

The following modifications were made during this reporting period:

- Decommissioned monitoring wells AMW-14 and AMW-15.
- Decommissioned the pipeline between extraction wells MW-21D and MW-27D by grouting in place.
- Converted MW-27D from an extraction well to a monitoring well.
- Abandoned the pipeline between control vaults CV-12 and CV-13 and replaced it with a pipeline at a higher elevation to follow the revised land contour, and connected directly to MW-21D.
- Abandoned control vault CV-13.
- Replaced electrical lines between control vault CV-12 and well MW-21D, and moved electrical lines between control vault CV-12 and well CPU-13.
- Raised the well and vault at extraction well MW-21D.

All modifications were made with prior approval by EPA.

A.3 OU-3 SAMPLING

Monthly influent and effluent sampling of the OU-3 groundwater treatment system was completed in accordance with the Site-specific Quality Assurance and Sampling Plan (QASP) (EA 2004). VOC analyses were conducted using EPA Method 8260C, total chromium analyses using EPA Method 200.7, and pH analyses using Standard Method 4500-H+B. VOC method 8360C is the most recent version of the method listed in the QASP (8260B). Samples were sent to Columbia Analytical Services/ALS Group, in Kelso, Washington for these analyses.

Effluent samples were collected by EA on 4 April, 3 May, 8 June, 5 July, 2 August and 5 September 2012. Based on the analytical results for these samples, effluent water quality met both the City discharge permit limits and the Site-specific discharge limits during the reporting period. Table 3 in Appendix C.2 provides a summary of influent and effluent analytical data from the reporting period. It also presents the discharge permit limits and the infiltration gallery discharge limits.

A.4 MEETINGS

- **4 April 2012 –** Attendees: Claire Hong and Bernie Zavala (EPA); Cathy Böhlke and Jil Frain (EA). Purpose: to discuss the plans for athletic field development and modifications to the Site infrastructure needed to accommodate the development.

- **13 September 2012 –** Attendees: Claire Hong and Bernie Zavala (EPA); Cathy Böhlke and Jil Frain (EA). Purpose: to discuss recent recommendations for Site activities, the status of document reviews, and concerns regarding Parcel No. 144718-000 brought up by the representative for that property.

A.5 MISCELLANEOUS

EA continues to pursue easement agreements and restrictive covenants with neighboring property owners. EPA assistance has been requested with the remaining property owners.

B. ANTICIPATED PROBLEM AREAS AND RECOMMENDED SOLUTIONS

To address concerns regarding Parcel No. 144718-000, modifications to infrastructure on that property may be required.

C. PROBLEMS RESOLVED

Replaced the failed pump in extraction well MW-14E.

D. DELIVERABLES

D.1 DELIVERABLES SUBMITTED

- **6 April 2012 –** Spring 2012 sampling notification letters sent to property owners.
- **9 April 2012 –** Letter regarding proposed System Modifications on the Church property submitted to EPA.
- **10 April 2012 –** Results of Quarterly Northern Plume Monitoring Well Sampling – Winter 2012 submitted to EPA.
- **18 May 2012 –** Progress Report, October 2011 through March 2012, Revision 0 submitted to EPA.
- **2 July 2012 –** Semi-Annual Self-Monitoring Report – 30 June 2012, submitted to the City of Vancouver.
- **5 July 2012 –** Quarterly groundwater sampling notification letters submitted to property owners.
- **16 July 2012 –** Groundwater Modeling Tech Memo #5 **–** Assessment of Proposed Pumping Rates and Extraction System Capture at the Leading Edge of the Plume submitted to EPA.
- **13 August 2012 –** Spring 2012 Semiannual Groundwater Sampling Report submitted to EPA.
- **15 August 2012 –** QASP Addendum for the Fall 2012 Semiannual Sampling Event, Revision 0, submitted to EPA.
- **21 August 2012 –** Groundwater Data Statistical Analysis for Well MW-31 and Closure Status of the Toe-of-Plume Area submitted to EPA.
- **20 September 2012 –** QASP Addendum for the Fall 2012 Semiannual Sampling Event, Revision 1, submitted to EPA.
- **25 September 2012 –** Progress Report, October 2011 through March 2012, Revision 1, submitted to EPA.
- **26 September 2012 –** Summer quarterly groundwater sampling results submitted to EPA.

D.2 ANTICIPATED SUBMITTAL DATES

- **5 October 2012 –** Fall 2012 sampling notification letters to be sent to the property owners.
- **10 January 2013 –** Semi-Annual Self-Monitoring Report – 31 December 2012, to be submitted to the City of Vancouver
- **21 February 2013 –** Fall 2012 Semiannual Groundwater Sampling Report to be submitted to EPA.
- **1 March 2013 –** Annual Dangerous Waste Report to be submitted to Ecology.
- **To be determined –** Winter Quarterly Sampling Report to be submitted to EPA.

E. EVENTS

E.1 FIELD EVENTS COMPLETED

- **Monthly –** O&M influent and effluent sampling.
- **23 through 26 April –** Spring 2012 semiannual groundwater sampling event.
- **25 July –** Summer 2012 quarterly groundwater sampling event.

E.2 UPCOMING EVENTS

- **Monthly –** O&M influent and effluent sampling.
- **15 through 25 October –** Fall 2012 semiannual groundwater sampling event.
- **To be determined –** Winter 2013 quarterly groundwater sampling event.

F. DATA QUALITY

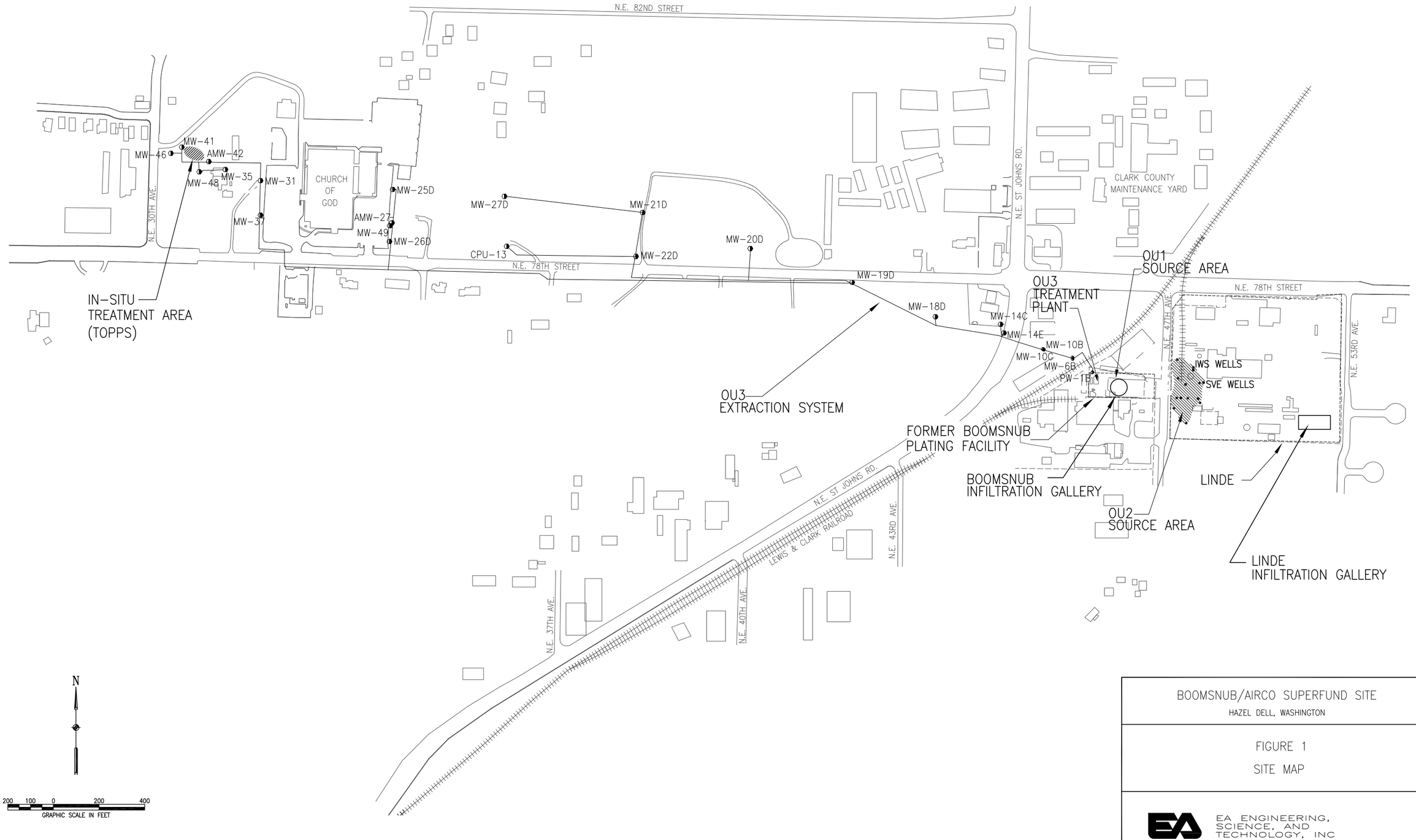
The monthly OU-3 influent/effluent data for the reporting period were reviewed in accordance with the standards established in the 2004 QASP.

The sample coolers and the samples contained within were received intact at the laboratory with the proper chemical preservative. The samples were received at less than 6 degrees Celsius with the exception of the July, August and September 2012 samples. The cooler and/or temperature blank for the samples collected in these months were too warm. This was most likely due to the

short travel time to the lab which may not allow for enough time to cool the cooler and/or temperature blank to the proper temperature. The cooler temperature for the samples collected in May was too cold at 0.2 degrees Celsius. This may have been due to too much ice used as an over-compensation for previous blanks being too warm. No qualification of sample data is necessary on the basis of sample receipt or chain of custody.

Methylene chloride was detected in the trip and/or method blanks for April through September 2012 data. Hexachlorobutadiene was detected in the May 2012 method blank. These chemicals are common lab contaminants and were not detected in the field samples; therefore, do not affect the data.

Figures



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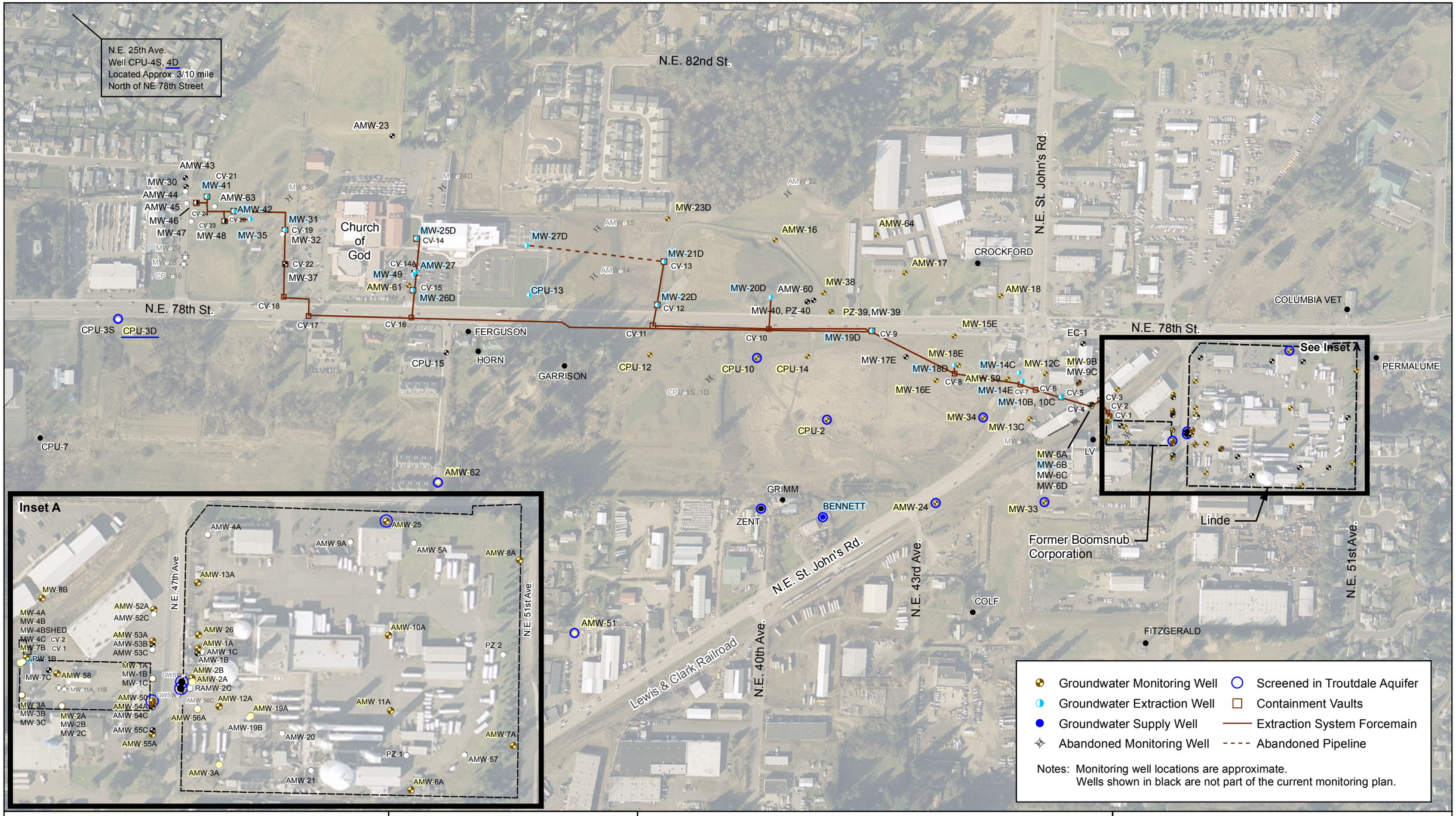
BOOMSNUB/AIRCO SUPERFUND SITE

HAZEL DELL, WASHINGTON

FIGURE 1

SITE MAP

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC



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BOOMSNUB / AIRCO SUPERFUND SITE
HAZEL DELL, WASHINGTON

EA Project No. 14495.05
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FIGURE 2
MONITORING AND EXTRACTION WELL NETWORK

Appendix A

Daily Operation and Maintenance Summary

APPENDIX A
DAILY OPERATION AND MAINTENANCE SUMMARY

The Site System Operator performs routine tasks on the OU-2 VOC source area systems and OU-3 site-wide groundwater treatment system. Routine and other site activities are recorded in this section.

Synopsis of the Activities:

April 2012

April 2. Downloaded and tabulated data.

April 4. Collected the monthly treatment system influent and effluent samples. Conducted the bi-weekly system inspection.

April 16. Conducted the bi-weekly system inspection.

April 18. Conducted routine maintenance and the OU-2 system inspection.

April 15. Downloaded and tabulated run-time data.

April 21. The system shut down due to a power outage and was restarted when power resumed. The system was down for 4 hours.

April 30. Recorded and tabulated monthly extraction well flow rates. The system was shut off to pump out the vaults. The system was off for 14 minutes.

May 2012

May 1. Downloaded and tabulated data.

May 3. Collected the monthly treatment system influent and effluent samples. The system shut down due to flooding. Several vaults filled with water from a heavy thunderstorm and overwhelmed the influent tank capacity. An ion exchange (IX) tank high level fault shut the system off but no water was released from the IX building. Water was pumped into a temporary holding tank to stabilize the levels in the system tanks and remedy faults. The water in the temporary holding tank was pumped back through the treatment system once normal levels were achieved. The system was down for 3 hours and 40 minutes.

May 4. Conducted the bi-weekly system inspection.

May 5. Replaced the pump in MW-14E.

May 8. The system was shut off to test floats. The system was down for 2 minutes

May 15. Downloaded and tabulated data.

May 16. Conducted the bi-weekly system inspection.

May 17. Conducted routine maintenance and the OU-2 system inspection.

May 24. The system was shut off to pump out the vaults. The system was off for 25 minutes.

May 30. Recorded and tabulated monthly extraction well flow rates.

June 2012

June 1. Downloaded and tabulated data.

June 7. Conducted the bi-weekly system inspection.

June 8. Collected the monthly treatment system influent and effluent samples.

June 14. Conducted routine maintenance and the OU-2 system inspection.

June 15. Downloaded and tabulated run-time data.

June 20. Removed the sump pump from containment vault CV-13. Glued cap in CV-13 to isolate MW-21D so line from MW-27D to CV-13 can be grouted in place.

June 22. Conducted the bi-weekly system inspection.

June 26. Recorded and tabulated monthly extraction well flow rates. The system was shut off to pump out the vaults. The system was off for 16 minutes.

July 2012

July 2. Downloaded and tabulated run-time data.

July 5. Collected the monthly treatment system influent and effluent samples. Troubleshooting electrical lines at the Church sports fields. The system shut down due to damage to the electric lines between the control shed and CV-13 during construction activities on the Church property. The system was off for 13 minutes.

July 6. Oversight of electrical line replacement and reconnecting power to MW-21D. The power to MW-21D was off from 1:12 pm July 5 until 10:00 am on July 6.

Additionally, the system was shut off to pump out the vaults. The system was off for 11 minutes.

July 9. Grouted the pipeline between MW-27D and containment vault CV-13 to abandon line in-place. Filled containment vault CV-13 with cement.

July 10. Conducted the bi-weekly system inspection.

July 12. Conducted routine maintenance and the OU-2 system inspection.

July 17. Downloaded and tabulated run-time data. Turned off power to CPU-13 while conduit was being re-buried deeper.

July 18. Added additional pipe to extend MW-27D to the top of the vault.

July 24. Conducted the bi-weekly system inspection.

July 25. Conducted Northern Plume investigation groundwater sampling.

July 26. Replaced a valve in containment vault CV-12 that was not seating. Wells CPU-13, MW-22D and MW-21D were all turned off while valve was replaced.

July 31. Recorded and tabulated monthly extraction well flow rates.

August 2012

August 1. Downloaded and tabulated data.

August 2. Collected the monthly treatment system influent and effluent samples.

August 3. Oversight of trenching to new vault at MW-21D.

August 9. Pulled the pump out of well MW-21D and raised the casing. Drained the old pipeline between containment vault CV-13 and where the pipe was cut 40 feet north of containment vault CV-12. The water was contained and put into treatment system. Grouted the abandoned section of the pipeline. Provided oversight during installation, welding and pressure testing of the new section of high density polyethylene pipeline. Began installation of a new conduit to the new vault at well MW-21D.

August 10. Conducted the bi-weekly inspection.

August 12. Conducted routine maintenance and the monthly OU-2 system inspection.

August 13. Sealed the new raised casing sections in wells MW-21D and MW-27D. Placed a larger diameter outer casing around couplings in the well casings and filled the void between casings with bentonite chips.

August 14. Backfilled containment vaults at wells MW-21D and MW-27D with pea gravel.

August 15. Poured a concrete floor in the new containment vault at well MW-21D. Downloaded and tabulated run-time data.

August 20. Finished installing the new conduit from the control shed to well MW-21D.

August 21. Installed a new pump and plumbed the containment vault at well MW-21D.

August 22. Finished plumbing and restarted well MW-21D. Had the electric panel on Parcel No.144718-000 inspected by the Washington State Labor & Industries Bureau.

August 23. Conducted the bi-weekly system inspection.

August 30. Recorded and tabulated monthly extraction well flow rates.

September 2012

September 4. Downloaded and tabulated data.

September 5. Collected the monthly treatment system influent and effluent samples.

September 17. Conducted the bi-weekly inspection.

September 18. Conducted routine maintenance and the monthly OU-2 system inspection.

September 21. Evaluated options for moving the electrical panel on Parcel No.144718-000.

September 26. Pulled the pump from well AMW-59.

September 27. Installed passive diffusion bags for the Fall 2012 sampling event.

September 28. Recorded and tabulated monthly extraction well flow rates. Installed passive diffusion bags for the Fall sampling event. Conducted the bi-weekly inspection.

Appendix B

OU-2 Monthly Operating Field Forms

Name: Richard Read **Date:** 4/18/2012

In Well Stripping System						
Operating Parameters				**Individual Well Measurements**		
		System 1 (South Side)	**System 2** (North Side)		**Flow** (scfm)	**Depth to Water** (ft btc)
Total System Flow	scfm	off	200	**IWS-1**	off	
Vacuum Blower Inlet Vacuum	in H_20	off	-30	**IWS-2**	off	
Vacuum Blower Outlet Pressure	in H_20	off	26	**IWS-3**	38	
Pressure Blower Outlet Temperature	deg F	off	152	**IWS-4**	38	
Operating Hz	%	off	100	**IWS-5**	off	
Secondary GAC Outlet Temperature	deg F	off	NA	**IWS-6**	38	
				IWS-7	off	
Comments on IWS System				**IWS-8**	off	
				IWS-9	off	

Name: Richard Read **Date:** 5/17/2012

In Well Stripping System						
Operating Parameters				**Individual Well Measurements**		
		System 1 (South Side)	**System 2** (North Side)		**Flow** (scfm)	**Depth to Water** (ft btc)
Total System Flow	scfm	off	200	**IWS-1**	off	
Vacuum Blower Inlet Vacuum	in H_20	off	-30	**IWS-2**	off	
Vacuum Blower Outlet Pressure	in H_20	off	26	**IWS-3**	38	
Pressure Blower Outlet Temperature	deg F	off	152	**IWS-4**	38	
Operating Hz	%	off	100	**IWS-5**	off	
Secondary GAC Outlet Temperature	deg F	off	NA	**IWS-6**	38	
				IWS-7	off	
Comments on IWS System				**IWS-8**	off	
				IWS-9	off	

Name: Richard Read **Date:** 6/14/2012

In Well Stripping System						
Operating Parameters				**Individual Well Measurements**		
		System 1 (South Side)	**System 2** (North Side)		**Flow** (scfm)	**Depth to Water** (ft btc)
Total System Flow	scfm	off	200	**IWS-1**	off	
Vacuum Blower Inlet Vacuum	in H_20	off	-30	**IWS-2**	off	
Vacuum Blower Outlet Pressure	in H_20	off	26	**IWS-3**	38	
Pressure Blower Outlet Temperature	deg F	off	152	**IWS-4**	38	
Operating Hz	%	off	100	**IWS-5**	off	
Secondary GAC Outlet Temperature	deg F	off	NA	**IWS-6**	38	
				IWS-7	off	
Comments on IWS System				**IWS-8**	off	
				IWS-9	off	

Name: Richard Read **Date:** 7/12/2012

In Well Stripping System						
Operating Parameters				**Individual Well Measurements**		
		System 1 (South Side)	**System 2** (North Side)		**Flow** (scfm)	**Depth to Water** (ft btc)
Total System Flow	scfm	off	200	**IWS-1**	off	
Vacuum Blower Inlet Vacuum	in H_20	off	-30	**IWS-2**	off	
Vacuum Blower Outlet Pressure	in H_20	off	26	**IWS-3**	38	
Pressure Blower Outlet Temperature	deg F	off	156	**IWS-4**	38	
Operating Hz	%	off	100	**IWS-5**	off	
Secondary GAC Outlet Temperature	deg F	off	NA	**IWS-6**	38	
				IWS-7	off	
Comments on IWS System				**IWS-8**	off	
				IWS-9	off	

Name: Richard Read **Date:** 8/12/2012

In Well Stripping System						
Operating Parameters				**Individual Well Measurements**		
		System 1 (South Side)	**System 2** (North Side)		**Flow** (scfm)	**Depth to Water** (ft btc)
Total System Flow	scfm	off	200	**IWS-1**	off	
Vacuum Blower Inlet Vacuum	in H_20	off	-30	**IWS-2**	off	
Vacuum Blower Outlet Pressure	in H_20	off	26	**IWS-3**	38	
Pressure Blower Outlet Temperature	deg F	off	159	**IWS-4**	38	
Operating Hz	%	off	100	**IWS-5**	off	
Secondary GAC Outlet Temperature	deg F	off	NA	**IWS-6**	38	
				IWS-7	off	
Comments on IWS System				**IWS-8**	off	
				IWS-9	off	

Name: Richard Read **Date:** 9/18/2012

In Well Stripping System						
Operating Parameters				**Individual Well Measurements**		
		System 1 (South Side)	**System 2** (North Side)		**Flow** (scfm)	**Depth to Water** (ft btc)
Total System Flow	scfm	off	200	**IWS-1**	off	
Vacuum Blower Inlet Vacuum	in H_20	off	-30	**IWS-2**	off	
Vacuum Blower Outlet Pressure	in H_20	off	26	**IWS-3**	38	
Pressure Blower Outlet Temperature	deg F	off	159	**IWS-4**	38	
Operating Hz	%	off	100	**IWS-5**	off	
Secondary GAC Outlet Temperature	deg F	off	NA	**IWS-6**	38	
				IWS-7	off	
Comments on IWS System				**IWS-8**	off	
				IWS-9	off	

Appendix C

OU-3 Sitewide Groundwater Extraction System

Appendix C.1

OU-3 Bi-weekly System Monitoring Checklists

Name: Rick Read **Date:** 04/04/12

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.030	3	55%
Secondary	ND	1	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 6.99, 4.00 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	5.87
Pre-IX	6.01
IX Effluent	6.05
Final Discharge	7.89

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	150		
Well Field Influent	152	73753482	8:15
IX Influent Flow Meter	152	91178769	8:18
AS Influent Flow Meter	152	69638523	8:19
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	50
Pre-Carbon Air Temperature (F^o)	70

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☐	☒	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☐	☒	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	1
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	6
Canister Filters	
10 Micron 29.25 inch	6
10 Micron 30 inch	6
20 Micron 29.25 inch	20
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes
INF-040412	CAS	3/6/12	8260b, T.Cr, pH
EFF-040412	CAS	3/6/12	8260b, T.Cr, pH
EFFD-040412	CAS	3/6/12	8260b, T.Cr, pH
TB-040412	CAS	3/6/12	8260b

Comments:

Name: Rick Read **Date:** 04/16/12

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.035	3	64%
Secondary	ND	1	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 6.98, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	5.86
Pre-IX	6.01
IX Effluent	6.04
Final Discharge	7.88

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	154		
Well Field Influent	154	76155820	17:05
IX Influent Flow Meter	154	91421781	17:03
AS Influent Flow Meter	154	70144961	17:02
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	54
Pre-Carbon Air Temperature (F^o)	72

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☒	☐	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☒	☐	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	1
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	6
Canister Filters	
10 Micron 29.25 inch	6
10 Micron 30 inch	2
20 Micron 29.25 inch	20
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes

Comments:

Name: Rick Read **Date:** 05/08/12

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 6.99, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	5.87
Pre-IX	6.00
IX Effluent	6.03
Final Discharge	7.86

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	156		
Well Field Influent	156	80949040	15:23
IX Influent Flow Meter	156	91905893	15:21
AS Influent Flow Meter	156	70144961	15:22
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	62
Pre-Carbon Air Temperature (F^o)	82

Maintenance:

Replace Bag Filter?	Yes	☒	No	☐
Drain Compressor?	Yes	☒	No	☐
Replace Canister Filters?	Yes	☒	No	☐
Lube Pump Motors?	Yes	☒	No	☐
Inspect Infiltration Galleries?	Yes	☒	No	☐

Leaks/Notes? Changed IX vessels on 5/3/12.

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	6
10 Micron 30 inch	2
20 Micron 29.25 inch	20
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes
INF-050312	CAS	5/3/12	8260b, T.Cr, pH
EFF-050312	CAS	5/3/12	8260b, T.Cr, pH
EFFD-050312	CAS	5/3/12	8260b, T.Cr, pH
TB-050312	CAS	5/3/12	8260b

Comments:

Name: Rick Read **Date:** 05/23/12

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.00, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	5.87
Pre-IX	6.00
IX Effluent	6.04
Final Discharge	7.87

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	156		
Well Field Influent	156	84295830	16:43
IX Influent Flow Meter	156	92246598	16:40
AS Influent Flow Meter	156	71595384	16:41
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	56
Pre-Carbon Air Temperature (F^o)	76

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☐	☒	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☐	☒	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	6
10 Micron 30 inch	2
20 Micron 29.25 inch	20
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes

Comments:

Name: Rick Read **Date:** 06/07/12

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.00, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	5.86
Pre-IX	6.00
IX Effluent	6.04
Final Discharge	7.86

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	156		
Well Field Influent	156	87584770	14:32
IX Influent Flow Meter	155	92582787	14:18
AS Influent Flow Meter	156	72232096	14:19
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	55
Pre-Carbon Air Temperature (F^o)	75

Maintenance:

Replace Bag Filter?	Yes	☒	No	☐
Drain Compressor?	Yes	☒	No	☐
Replace Canister Filters?	Yes	☐	No	☒
Lube Pump Motors?	Yes	☐	No	☒
Inspect Infiltration Galleries?	Yes	☒	No	☐

Leaks/Notes?

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	2
10 Micron 30 inch	2
20 Micron 29.25 inch	6
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes

Comments:

Name: Rick Read **Date:** 06/22/12

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.00, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	5.86
Pre-IX	6.01
IX Effluent	6.05
Final Discharge	7.88

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	156		
Well Field Influent	156	90873710	11:20
IX Influent Flow Meter	155	92918975	11:15
AS Influent Flow Meter	157	72868808	11:16
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	55
Pre-Carbon Air Temperature (F^o)	75

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☒	☐	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☐	☒	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	2
10 Micron 30 inch	2
20 Micron 29.25 inch	6
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes
INF-060812	ALS	6/8/12	8260b,T.Cr, pH
EFF-060812	ALS	6/8/12	8260b,T.Cr, pH
EFFD-060812	ALS	6/8/12	8260b,T.Cr, pH
TB-060812	ALS	6/8/12	8260b

Comments:

Name: Rick Read **Date:** 7/10/2012

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.00, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	6.26
Pre-IX	6.58
IX Effluent	6.60
Final Discharge	7.86

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	156		
Well Field Influent	156	94933550	15:58
IX Influent Flow Meter	155	93336482	15:55
AS Influent Flow Meter	156	73635710	15:56
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	65
Pre-Carbon Air Temperature (F^o)	85

Maintenance:

	Yes	No
Replace Bag Filter?	☐	☒
Drain Compressor?	☒	☐
Replace Canister Filters?	☐	☒
Lube Pump Motors?	☐	☒
Inspect Infiltration Galleries?	☒	☐

Leaks/Notes?

MW-21D was down for a day 7/5/12 to 7/6/12 due to danaged power line.

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	2
10 Micron 30 inch	2
20 Micron 29.25 inch	6
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes
INF-070512	ALS	7/5/12	8260b, T.Cr, pH
EFF-070512	ALS	7/5/12	8260b, T.Cr, pH
EFFD-070512	ALS	7/5/12	8260b, T.Cr, pH
TB-070512	ALS	7/5/12	8260b

Comments:

Name: Rick Read **Date:** 7/24/2012

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.01, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	6.26
Pre-IX	6.55
IX Effluent	6.58
Final Discharge	7.86

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	156		
Well Field Influent	156	98079351	17:10
IX Influent Flow Meter	155	93658220	17:06
AS Influent Flow Meter	156	74235370	17:07
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	65
Pre-Carbon Air Temperature (F^o)	85

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☐	☒	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☐	☒	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	2
10 Micron 30 inch	2
20 Micron 29.25 inch	6
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes

Comments:

Name: Rick Read **Date:** 8/10/2012

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.01, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	6.27
Pre-IX	6.55
IX Effluent	6.59
Final Discharge	7.86

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	153		
Well Field Influent	155	1877479	16:26
IX Influent Flow Meter	154	94047177	16:28
AS Influent Flow Meter	154	74880715	16:29
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	68
Pre-Carbon Air Temperature (F^o)	85

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☐	☒	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☐	☒	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	2
10 Micron 30 inch	2
20 Micron 29.25 inch	6
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes
INF-080212	ALS	8/2/12	8260b, T.Cr, pH
EFF-080212	ALS	8/2/12	8260b, T.Cr, pH
EFFD-080212	ALS	8/2/12	8260b, T.Cr, pH
TB-080212	ALS	8/2/12	8260b

Comments:

MW-21D was turned off on 8/9/12 to accommodate pulling pump to raise the well casing.

Name: Rick Read **Date:** 8/23/2012

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.01, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	6.26
Pre-IX	6.55
IX Effluent	6.58
Final Discharge	7.87

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	158		
Well Field Influent	158	4735406	18:10
IX Influent Flow Meter	158	94339110	18:12
AS Influent Flow Meter	158	75335400	18:13
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	70
Pre-Carbon Air Temperature (F^o)	88

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☐	☒	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☐	☒	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	2
10 Micron 30 inch	2
20 Micron 29.25 inch	6
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes

Comments:

MW-21D was turned back on on 8/22/12 following raising the well casing and reconnecting power and plumbing in new vault.

Name: Rick Read **Date:** 9/17/2012

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.01, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	6.26
Pre-IX	6.55
IX Effluent	6.58
Final Discharge	7.87

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	156		
Well Field Influent	157	10245510	8:51
IX Influent Flow Meter	157	94402430	8:57
AS Influent Flow Meter	158	76361234	8:56
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	60
Pre-Carbon Air Temperature (F^o)	80

Maintenance:

			Leaks/Notes?
Replace Bag Filter?	Yes ☐	No ☒	
Drain Compressor?	Yes ☒	No ☐	
Replace Canister Filters?	Yes ☐	No ☒	
Lube Pump Motors?	Yes ☐	No ☒	
Inspect Infiltration Galleries?	Yes ☒	No ☐	

Inventory:

		Quantity
Gloves		10
Drums	Empty 55-gal	9
Super sacks Spent Resin		0
Bag Filters		5
Canister Filters		
10 Micron	29.25 inch	2
10 Micron	30 inch	2
20 Micron	29.25 inch	6
30 Micron	30 inch	
75 Micron	30 inch	16

Sampling:

Location	Lab	Date	Analytes
INF-090512	ALS	9/5/12	8260b, T. Cr, pH
EFF-090512	ALS	9/5/12	8260b, T. Cr, pH
EFFD-090512	ALS	9/5/12	8260b, T. Cr, pH
TB-090512	ALS	9/5/12	8260b

Comments:

Name: Rick Read **Date:** 9/28/2012

Groundwater Treatment:

Ion Exchange System Chromium Testing:

Kit Used: DR 100 Colorimeter

Test Location:	Chromium (ppm)	ID#	%
Well Field Influent	0.055		
Primary	0.000	1	0%
Secondary	ND	2	
Final Discharge	ND		

System pH Measurements:

Initial Calibration 7.01, 4.01 **Final Calibration** 7.0, 4.0

Location:	pH
Well Field	6.26
Pre-IX	6.55
IX Effluent	6.58
Final Discharge	7.87

System Flow Rates:

Location:	GPM	Totalizer	Time
Total Flow from Wells	158		
Well Field Influent	158	12771148	16:04
IX Influent Flow Meter	159	95159327	16:11
AS Influent Flow Meter	159	76808073	16:12
COV Sewer Flow Meter			
Boomsnub Inf. Gal. Flow Meter			
Calculated Flow to BOC Inf. Gal.			

Air Stripper Monitoring:

Pressure Readings:

Location:	(In. H2O)
Blower	31
Air Stripper	28

TCE Concentrations:

Location:	TCE (ppm)	
Air Stripper Effluent	1	
Post Primary	ND	
Final Discharge	ND	< 5?

Capsulhelic Gauge (In. H_2O)	1
Pre-Heater Air Temperature (F^o)	62
Pre-Carbon Air Temperature (F^o)	82

Maintenance:

	Yes	No	Leaks/Notes?
Replace Bag Filter?	☐	☒	
Drain Compressor?	☒	☐	
Replace Canister Filters?	☐	☒	
Lube Pump Motors?	☐	☒	
Inspect Infiltration Galleries?	☒	☐	

Inventory:

	Quantity
Gloves	10
Drums Empty 55-gal	9
Super sacks Spent Resin	0
Bag Filters	5
Canister Filters	
10 Micron 29.25 inch	2
10 Micron 30 inch	2
20 Micron 29.25 inch	6
30 Micron 30 inch	
75 Micron 30 inch	16

Sampling:

Location	Lab	Date	Analytes

Comments:

Appendix C.2

OU-3 System Operation Tables

APPENDIX C.2 - TABLE 1A
OU-3 APRIL 2012 GROUNDWATER EXTRACTION SUMMARY
BOOMSNUB/AIRCO SUPERFUND SITE

Date	Total Flow gpd[1]	System Operating Hours[2]	System Operating Percentage
04/01/11	213,930	24.00	100.00%
04/02/11	213,840	24.00	100.00%
04/03/11	213,858	24.00	100.00%
04/04/11	213,956	24.00	100.00%
04/05/11	214,598	24.00	100.00%
04/06/11	220,114	24.00	100.00%
04/07/11	225,267	24.00	100.00%
04/08/11	225,018	24.00	100.00%
04/09/11	225,045	24.00	100.00%
04/10/11	225,057	24.00	100.00%
04/11/11	225,171	24.00	100.00%
04/12/11	225,219	24.00	100.00%
04/13/11	225,151	24.00	100.00%
04/14/11	225,142	24.00	100.00%
04/15/11	225,018	24.00	100.00%
04/16/11	225,072	24.00	100.00%
04/17/11	225,356	24.00	100.00%
04/18/11	225,555	24.00	100.00%
04/19/11	225,287	24.00	100.00%
04/20/11	225,056	24.00	100.00%
04/21/11	187,594	20.00	83.33%
04/22/11	224,444	24.00	100.00%
04/23/11	224,881	24.00	100.00%
04/24/11	225,500	24.00	100.00%
04/25/11	225,398	24.00	100.00%
04/26/11	225,562	24.00	100.00%
04/27/11	225,662	24.00	100.00%
04/28/11	225,613	24.00	100.00%
04/29/11	225,512	24.00	100.00%
04/30/11	224,037	23.77	99.03%
Subtotals	**6,656,913**	**715.77**	**99.41%**

Scheduled Downtime/Maintenance[3]	0.23	
Total Hours/Month	720	
Total Operating Hours/Availability %	**716.00**	**99.44%**
Daily Breakdown	**April 2012**	**Vancouver Permit Limits[4]**
Average Daily Flow (gallons)	221,897	230,400
Maximum Daily Flow (gallons)	225,662	230,400
Hundreds of Cubic Feet Breakdown		
Total Flow (hundreds of cubic feet)	8900	
Average Daily Flow (hundreds of cubic feet)	297	

Notes:

[1] gpd = gallons per day to the infiltration gallery.

[2] Based on minutes of operation as reported by data logger.

[3] Planned shutdown periods for routine maintenance or monitoring activities - see monthly notes for details.

[4] Only applies if water is being discharged to the City of Vancouver sewer.

APPENDIX C.2 - TABLE 1B
OU-3 MAY 2012 GROUNDWATER EXTRACTION SUMMARY
BOOMSNUB/AIRCO SUPERFUND SITE

Date	Total Flow gpd[1]	System Operating Hours[2]	System Operating Percentage
05/01/11	225,929	24.00	100.00%
05/02/11	225,869	24.00	100.00%
05/03/11	198,831	20.33	84.72%
05/04/11	227,761	24.00	100.00%
05/05/11	227,731	24.00	100.00%
05/06/11	227,716	24.00	100.00%
05/07/11	227,458	24.00	100.00%
05/08/11	227,092	23.97	99.86%
05/09/11	227,411	24.00	100.00%
05/10/11	227,494	24.00	100.00%
05/11/11	227,373	24.00	100.00%
05/12/11	227,231	24.00	100.00%
05/13/11	227,074	24.00	100.00%
05/14/11	226,963	24.00	100.00%
05/15/11	227,017	24.00	100.00%
05/16/11	227,066	24.00	100.00%
05/17/11	227,197	24.00	100.00%
05/18/11	227,141	24.00	100.00%
05/19/11	227,066	24.00	100.00%
05/20/11	227,088	24.00	100.00%
05/21/11	227,203	24.00	100.00%
05/22/11	227,209	24.00	100.00%
05/23/11	227,142	24.00	100.00%
05/24/11	224,355	23.58	98.26%
05/25/11	227,196	24.00	100.00%
05/26/11	227,534	24.00	100.00%
05/27/11	227,176	24.00	100.00%
05/28/11	227,141	24.00	100.00%
05/29/11	227,139	24.00	100.00%
05/30/11	227,005	24.00	100.00%
05/31/11	227,003	24.00	100.00%
Subtotals	**7,010,609**	**739.88**	**99.45%**
Scheduled Downtime/Maintenance[3]		0.45	
Total Hours/Month		744	
Total Operating Hours/Availability %		**740.33**	**99.51%**
Daily Breakdown		**May 2012**	**Vancouver Permit Limits[4]**
Average Daily Flow (gallons)		226,120	230,400
Maximum Daily Flow (gallons)		227,761	230,400
Hundreds of Cubic Feet Breakdown			
Total Flow (hundreds of cubic feet)		9372	
Average Daily Flow (hundreds of cubic feet)		302	

Notes:

[1] gpd = gallons per day to the infiltration gallery.

[2] Based on minutes of operation as reported by data logger.

[3] Planned shutdown periods for routine maintenance or monitoring activities - see monthly notes for details.

[4] Only applies if water is being discharged to the City of Vancouver sewer.

[5] Data reflects daylight savings time on November 6.

APPENDIX C.2 - TABLE 1C
OU-3 JUNE 2012 GROUNDWATER EXTRACTION SUMMARY
BOOMSNUB/AIRCO SUPERFUND SITE

Date	Total Flow gpd[1]	System Operating Hours[2]	System Operating Percentage
06/01/11	226,995	24.00	100.00%
06/02/11	227,083	24.00	100.00%
06/03/11	227,124	24.00	100.00%
06/04/11	227,223	24.00	100.00%
06/05/11	227,179	24.00	100.00%
06/06/11	227,203	24.00	100.00%
06/07/11	227,329	24.00	100.00%
06/08/11	227,557	24.00	100.00%
06/09/11	227,588	24.00	100.00%
06/10/11	227,429	24.00	100.00%
06/11/11	227,251	24.00	100.00%
06/12/11	227,321	24.00	100.00%
06/13/11	226,416	24.00	100.00%
06/14/11	227,359	24.00	100.00%
06/15/11	227,161	24.00	100.00%
06/16/11	226,919	24.00	100.00%
06/17/11	226,964	24.00	100.00%
06/18/11	227,128	24.00	100.00%
06/19/11	227,182	24.00	100.00%
06/20/11	227,052	24.00	100.00%
06/21/11	226,835	24.00	100.00%
06/22/11	228,872	24.00	100.00%
06/23/11	230,892	24.00	100.00%
06/24/11	230,904	24.00	100.00%
06/25/11	230,945	24.00	100.00%
06/26/11	228,569	23.73	98.89%
06/27/11	230,806	24.00	100.00%
06/28/11	230,719	24.00	100.00%
06/29/11	230,635	24.00	100.00%
06/30/11	230,635	24.00	100.00%
Subtotals	**6,843,276**	**719.73**	**99.96%**

Scheduled Downtime/Maintenance[3]	0.27	
Total Hours/Month	720	
Total Operating Hours/Availability %	**720.00**	**100.00%**
Daily Breakdown	**June 2012**	**Vancouver Permit Limits[4]**
Average Daily Flow (gallons)	228,109	230,400
Maximum Daily Flow (gallons)	230,945	230,400
Hundreds of Cubic Feet Breakdown		
Total Flow (hundreds of cubic feet)	9149	
Average Daily Flow (hundreds of cubic feet)	305	

Notes:

[1] gpd = gallons per day to the infiltration gallery.

[2] Based on minutes of operation as reported by data logger.

[3] Planned shutdown periods for routine maintenance or monitoring activities - see monthly notes for details.

[4] Only applies if water is being discharged to the City of Vancouver sewer.

APPENDIX C.2 - TABLE 1D
OU-3 JULY 2012 GROUNDWATER EXTRACTION SUMMARY
BOOMSNUB/AIRCO SUPERFUND SITE

Date	Total Flow gpd[1]	System Operating Hours[2]	System Operating Percentage
07/01/12	230,760	24.00	100.00%
07/02/12	230,648	24.00	100.00%
07/03/12	230,698	24.00	100.00%
07/04/12	230,626	24.00	100.00%
07/05/12	217,173	23.78	99.10%
07/06/12	220,550	23.82	99.24%
07/07/12	230,268	24.00	100.00%
07/08/12	230,164	24.00	100.00%
07/09/12	230,210	24.00	100.00%
07/10/12	230,281	24.00	100.00%
07/11/12	230,250	24.00	100.00%
07/12/12	230,203	24.00	100.00%
07/13/12	230,260	24.00	100.00%
07/14/12	230,143	24.00	100.00%
07/15/12	230,298	24.00	100.00%
07/16/12	230,231	24.00	100.00%
07/17/12	225,607	24.00	100.00%
07/18/12	225,715	24.00	100.00%
07/19/12	229,925	24.00	100.00%
07/20/12	230,004	24.00	100.00%
07/21/12	229,856	24.00	100.00%
07/22/12	229,976	24.00	100.00%
07/23/12	229,918	24.00	100.00%
07/24/12	229,824	24.00	100.00%
07/25/12	229,641	24.00	100.00%
07/26/12	222,066	24.00	100.00%
07/27/12	230,511	24.00	100.00%
07/28/12	230,387	24.00	100.00%
07/29/12	230,368	24.00	100.00%
07/30/12	230,398	24.00	100.00%
07/31/12	230,323	24.00	100.00%
Subtotals	**7,097,279**	**743.60**	**99.95%**

Scheduled Downtime/Maintenance[3]	0.18	
Total Hours/Month	744	
Total Operating Hours/Availability %	**743.78**	**99.97%**
Daily Breakdown	**July 2012**	**Vancouver Permit Limits[4]**
Average Daily Flow (gallons)	228,899	230,400
Maximum Daily Flow (gallons)	230,760	230,400
Hundreds of Cubic Feet Breakdown		
Total Flow (hundreds of cubic feet)	9488	
Average Daily Flow (hundreds of cubic feet)	306	

Notes:

[1] gpd = gallons per day to the infiltration gallery.

[2] Based on minutes of operation as reported by data logger.

[3] Planned shutdown periods for routine maintenance or monitoring activities - see monthly notes for details.

[4] Only applies if water is being discharged to the City of Vancouver sewer.

APPENDIX C.2 - TABLE 1E
OU-3 AUGUST 2012 GROUNDWATER EXTRACTION SUMMARY
BOOMSNUB/AIRCO SUPERFUND SITE

Date	Total Flow gpd[1]	System Operating Hours[2]	System Operating Percentage
08/01/12	230,295	24.00	100.00%
08/02/12	230,250	24.00	100.00%
08/03/12	230,046	24.00	100.00%
08/04/12	229,854	24.00	100.00%
08/05/12	229,712	24.00	100.00%
08/06/12	229,653	24.00	100.00%
08/07/12	229,822	24.00	100.00%
08/08/12	229,910	24.00	100.00%
08/09/12	225,825	24.00	100.00%
08/10/12	223,834	24.00	100.00%
08/11/12	223,704	24.00	100.00%
08/12/12	223,567	24.00	100.00%
08/13/12	223,485	24.00	100.00%
08/14/12	223,540	24.00	100.00%
08/15/12	223,452	24.00	100.00%
08/16/12	223,280	24.00	100.00%
08/17/12	223,274	24.00	100.00%
08/18/12	223,556	24.00	100.00%
08/19/12	223,574	24.00	100.00%
08/20/12	221,015	24.00	100.00%
08/21/12	223,542	24.00	100.00%
08/22/12	225,567	24.00	100.00%
08/23/12	229,721	24.00	100.00%
08/24/12	229,709	24.00	100.00%
08/25/12	229,618	24.00	100.00%
08/26/12	229,557	24.00	100.00%
08/27/12	229,442	24.00	100.00%
08/28/12	229,403	24.00	100.00%
08/29/12	229,422	24.00	100.00%
08/30/12	229,328	24.00	100.00%
08/31/12	229,319	24.00	100.00%
Subtotals	**7,036,276**	**744.00**	**100.00%**
Scheduled Downtime/Maintenance[3]		0.00	
Total Hours/Month		744	
Total Operating Hours/Availability %		**744.00**	**100.00%**
Daily Breakdown		**August 2012**	**Vancouver Permit Limits[4]**
Average Daily Flow (gallons)		226,899	230,400
Maximum Daily Flow (gallons)		230,295	230,400
Hundreds of Cubic Feet Breakdown			
Total Flow (hundreds of cubic feet)		9407	
Average Daily Flow (hundreds of cubic feet)		303	

Notes:

[1] gpd = gallons per day to the infiltration gallery.

[2] Based on minutes of operation as reported by data logger.

[3] Planned shutdown periods for routine maintenance or monitoring activities - see monthly notes for details.

[4] Only applies if water is being discharged to the City of Vancouver sewer.

APPENDIX C.2 - TABLE 1F
OU-3 SEPTEMBER 2012 GROUNDWATER EXTRACTION SUMMARY
BOOMSNUB/AIRCO SUPERFUND SITE

Date	Total Flow gpd[1]	System Operating Hours[2]	System Operating Percentage
09/01/12	229,333	24.00	100.00%
09/02/12	229,285	24.00	100.00%
09/03/12	229,192	24.00	100.00%
09/04/12	229,011	24.00	100.00%
09/05/12	228,969	24.00	100.00%
09/06/12	228,876	24.00	100.00%
09/07/12	228,822	24.00	100.00%
09/08/12	228,796	24.00	100.00%
09/09/12	228,926	24.00	100.00%
09/10/12	228,899	24.00	100.00%
09/11/12	228,987	24.00	100.00%
09/12/12	228,862	24.00	100.00%
09/13/12	228,754	24.00	100.00%
09/14/12	228,678	24.00	100.00%
09/15/12	228,604	24.00	100.00%
09/16/12	228,615	24.00	100.00%
09/17/12	228,467	24.00	100.00%
09/18/12	228,482	24.00	100.00%
09/19/12	228,531	24.00	100.00%
09/20/12	228,610	24.00	100.00%
09/21/12	228,599	24.00	100.00%
09/22/12	228,443	24.00	100.00%
09/23/12	228,444	24.00	100.00%
09/24/12	228,421	24.00	100.00%
09/25/12	228,368	24.00	100.00%
09/26/12	228,350	24.00	100.00%
09/27/12	228,262	24.00	100.00%
09/28/12	228,080	24.00	100.00%
09/29/12	228,035	24.00	100.00%
09/30/12	228,110	24.00	100.00%
Subtotals	**6,859,810**	**720.00**	**100.00%**

Scheduled Downtime/Maintenance[3]	0.00	
Total Hours/Month	720	
Total Operating Hours/Availability %	**720.00**	**100.00%**
Daily Breakdown	**September 2012**	**Vancouver Permit Limits[4]**
Average Daily Flow (gallons)	228,660	230,400
Maximum Daily Flow (gallons)	229,333	230,400
Hundreds of Cubic Feet Breakdown		
Total Flow (hundreds of cubic feet)	9171	
Average Daily Flow (hundreds of cubic feet)	306	

Notes:

[1] gpd = gallons per day to the infiltration gallery.

[2] Based on minutes of operation as reported by data logger.

[3] Planned shutdown periods for routine maintenance or monitoring activities - see monthly notes for details.

[4] Only applies if water is being discharged to the City of Vancouver sewer.

APPENDIX C.2 - TABLE 2A

OU-3 EXTRACTION WELL PUMPING RATES FOR APRIL 30, 2012
BOOMSNUB/AIRCO SUPERFUND SITE

Well ID	Flow Rate (GPM)	Totalizer Reading	Time
PW-1B	9.8	958140	15:46
MW-6B	7.8	2898960	16:49
MW-10B	9.0	3792850	16:46
MW-10C	10.0	2602320	16:45
CPU-13	12.3	507055	16:13
MW-14C	12.0	6525870	16:41
MW-14E	5.3	7053110	16:42
MW-18D	11.4	3276080	16:37
MW-19D	10.0	2822600	16:33
MW-20D	15.0	332984	15:57
MW-21D	11.4	118918	16:03
MW-22D	13.3	663820	16:06
MW-25D	9.0	853730	16:22
MW-26D	9.0	9282760	16:16
MW-27D	off	off	
AMW-27	1.0	5764380	16:27
MW-31	off	off	
MW-37	off	off	
AMW-42	off	off	
MW-48	off	off	
MW-49	13.0	7702200	16:19
Total	159.3		

Notes:
Pumps in MW-27D, 31, 37, 48 and AMW-42
were off during the reporting period.

APPENDIX C.2 - TABLE 2B

OU-3 EXTRACTION WELL PUMPING RATES FOR MAY 30, 2012
BOOMSNUB/AIRCO SUPERFUND SITE

Well ID	Flow Rate (GPM)	Totalizer Reading	Time
PW-1B	10.0	1375340	15:46
MW-6B	7.8	3226170	16:49
MW-10B	8.6	4164690	16:46
MW-10C	10.0	3020380	16:45
CPU-13	12.2	576673	16:13
MW-14C	12.0	7065640	16:41
MW-14E	5.0	7251510	16:42
MW-18D	11.2	3749870	16:37
MW-19D	10.1	3255630	16:33
MW-20D	15.0	417354	15:57
MW-21D	10.5	182955	16:03
MW-22D	13.5	739361	16:06
MW-25D	9.0	1133630	16:22
MW-26D	9.0	9658920	16:16
MW-27D	off	off	
AMW-27	1.0	5764190	16:27
MW-31	off	off	
MW-37	off	off	
AMW-42	off	off	
MW-48	off	off	
MW-49	13.0	8247910	16:19
Total	157.9		

Notes:
Pumps in MW- 27D, 31, 37, 48 and AMW-42
were off during the reporting period.

APPENDIX C.2 - TABLE 2C

OU-3 EXTRACTION WELL PUMPING RATES FOR JUNE 26, 2012
BOOMSNUB/AIRCO SUPERFUND SITE

Well ID	Flow Rate (GPM)	Totalizer Reading	Time
PW-1B	9.9	1753910	15:46
MW-6B	7.8	3521580	16:49
MW-10B	8.6	4501300	16:46
MW-10C	10.0	3399580	16:45
CPU-13	12.8	639578	16:13
MW-14C	12.0	7596930	16:41
MW-14E	8.5	7453120	16:42
MW-18D	11.5	4179820	16:37
MW-19D	10.0	3645100	16:33
MW-20D	15.0	496831	15:57
MW-21D	11.4	290250	16:03
MW-22D	13.5	808084	16:06
MW-25D	9.0	1387810	16:22
MW-26D	9.0	42280	16:16
MW-27D	off	off	
AMW-27	1.0	5783970	16:27
MW-31	off	off	
MW-37	off	off	
AMW-42	off	off	
MW-48	off	off	
MW-49	13.0	8744030	16:19
Total	163.0		

Notes:
Pumps in MW-27, 31, 37, 48 and AMW-42
were off during the reporting period.
Turned up flow in MW-14E on 6/22/12.

APPENDIX C.2 - TABLE 2D

OU-3 EXTRACTION WELL PUMPING RATES FOR JULY 31, 2012
BOOMSNUB/AIRCO SUPERFUND SITE

Well ID	Flow Rate (GPM)	Totalizer Reading	Time
PW-1B	9.8	2237740	15:36
MW-6B	7.7	3892490	15:29
MW-10B	8.9	4930300	15;17
MW-10C	10.0	3885120	15:16
CPU-13	12.3	717016	14:43
MW-14C	12.6	8186880	15:11
MW-14E	8.3	7862790	15:12
MW-18D	11.2	4731050	15:07
MW-19D	10.0	4144470	15:03
MW-20D	15.0	592103	14:27
MW-21D	10.6	NA	14:32
MW-22D	14.2	896490	14:34
MW-25D	6.3	1711530	14:58
MW-26D	8.6	440720	14:47
AMW-27	1.0	5799264	14:55
MW-31	off	off	
MW-37	off	off	
AMW-42	off	off	
MW-48	off	off	
MW-49	12.5	9380100	14:53
Total	159.0		

Notes:
Pumps in MW-31, 37, 48 and AMW-42
were off during the reporting period.
Meter too far down to read numbers for MW-21D.

APPENDIX C.2 - TABLE 2E

OU-3 EXTRACTION WELL PUMPING RATES FOR AUGUST 30, 2012
BOOMSNUB/AIRCO SUPERFUND SITE

Well ID	Flow Rate (GPM)	Totalizer Reading	Time
PW-1B	9.6	2648880	14:51
MW-6B	7.5	4219690	14:54
MW-10B	8.5	5299390	15:51
MW-10C	10.0	4302590	15:49
CPU-13	12.1	787229	15:16
MW-14C	11.6	8729660	15:46
MW-14E	8.1	8213490	15:45
MW-18D	11.2	5206990	15:42
MW-19D	10.0	471310	15:36
MW-20D	15.0	676926	14:58
MW-21D	11.2	347442	15:03
MW-22D	14.2	983746	15:08
MW-25D	6.3	1996550	15:29
MW-26D	8.6	831400	15:19
AMW-27	1.0	5799270	15:26
MW-31	off	off	
MW-37	off	off	
AMW-42	off	off	
MW-48	off	off	
MW-49	12.5	9935570	15:23
Total	157.4		

Notes:
Pumps in MW-31, 37, 48 and AMW-42
were off during the reporting period.

APPENDIX C.2 - TABLE 2F

OU-3 EXTRACTION WELL PUMPING RATES FOR SEPTEMBER 28, 2012
BOOMSNUB/AIRCO SUPERFUND SITE

Well ID	Flow Rate (GPM)	Totalizer Reading	Time
PW-1B	9.6	3044710	14:30
MW-6B	7.5	4531840	14:43
MW-10B	8.5	5650610	14:40
MW-10C	10.0	4701940	14:41
CPU-13	12.4	854147	13:55
MW-14C	13.2	9249810	14:37
MW-14E	8.0	8541380	14:38
MW-18D	11.0	5660770	14:32
MW-19D	10.0	4975490	14:39
MW-20D	15.0	757378	13:36
MW-21D	11.3	409802	13:42
MW-22D	14.4	62650	13:47
MW-25D	6.2	2254650	14:09
MW-26D	9.0	1190480	14:05
AMW-27	1.0	NR	14:08
MW-31	off	off	
MW-37	off	off	
AMW-42	off	off	
MW-48	off	off	
MW-49	12.4	9935570	14:07
Total	159.5		

Notes:
Pumps in MW-31, 37, 48 and AMW-42
were off during the reporting period.
AMW-27D was blocked by a vehicle.

APPENDIX C.2 - TABLE 3
APRIL THROUGH SEPTEMBER 2012

OU-3 MONTHLY SYSTEM SAMPLING ANALYTICAL RESULTS
BOOMSNUB/AIRCO SUPERFUND SITE

Location	Sample Number	Sampling Date	TCE (µg/L)	PCE (µg/L)	Total Chromium (µg/L)	pH
Permit #20009-07 Mod 1 Discharge Limits			**330**		**7,220**	**5.5 to 10**
Infiltration Gallery Discharge Limits			**1.9**		**19**	
April 2012						
Influent	INF-040412	4/4/2012	16	1	47.9	6.83
Effluent	EFF-040412	4/4/2012	0.38 J	0.5 U	2 U	8.07
Effluent Duplicate	EFFD-040412	4/4/2012	0.38 J	0.5 U	2 U	7.9
Trip Blank	TB-040412	4/4/2012	0.5 U	0.5 U	NA	NA
May 2012						
Influent	INF-050312	5/3/2012	16	1.1	50.7	7.33
Effluent	EFF-050312	5/3/2012	0.48 J	0.5 U	0.7 J	8.12
Effluent Duplicate	EFFD-050312	5/3/2012	0.43 J	0.5 U	0.6 J	8.16
Trip Blank	TB-050312	5/3/2012	0.5 U	0.5 U	NA	NA
June 2012						
Influent	INF-060812	6/8/2012	16	0.92	51.9	6.74
Effluent	EFF-060812	6/8/2012	0.41 J	0.5 U	0.6 U	8.15
Effluent Duplicate	EFFD-060812	6/8/2012	0.37 J	0.5 U	0.6 U	8.14
Trip Blank	TB-060812	6/8/2012	0.5 U	0.5 U	NA	NA
July 2012						
Influent	INF-070512	7/5/2012	18	1.3	52.4	6.78
Effluent	EFF-070512	7/5/2012	0.45 J	0.5 U	1.6 J	7.95
Effluent Duplicate	EFFD-070512	7/5/2012	0.43 J	0.5 U	0.6 U	7.94
Trip Blank	TB-070512	7/5/2012	0.5 U	0.5 U	NA	NA
August 2012						
Influent	INF-080212	8/2/2012	18	1.2	45.9	7.00
Effluent	EFF-080212	8/2/2012	0.4 J	0.5 U	0.6 U	8.22
Effluent Duplicate	EFFD-080212	8/2/2012	0.39 J	0.5 U	0.6 U	8.23
Trip Blank	TB-080212	8/2/2012	0.5 U	0.5 U	NA	NA
September 2012						
Influent	INF-090512	9/5/2012	17	1.1	44.7	7.16
Effluent	EFF-090512	9/5/2012	0.51	0.5 U	0.6 U	8.1
Effluent Duplicate	EFFD-090512	9/5/2012	0.41 J	0.5 U	0.6 U	8.22
Trip Blank	TB-090512	9/5/2012	0.5 U	0.5 U	NA	NA

Notes:
J - result is an estimated concentration that is less then the Method Reporting Limit but is greater than or equal to the Method Detection Limit.
µg/L - micrograms per liter
NA - not analyzed
PCE - tetrachloroethene
TCE - trichloroethene
U - analyte not detected above specified reporting limit

Appendix C.3

OU-3 Mass Removal Tables and Charts

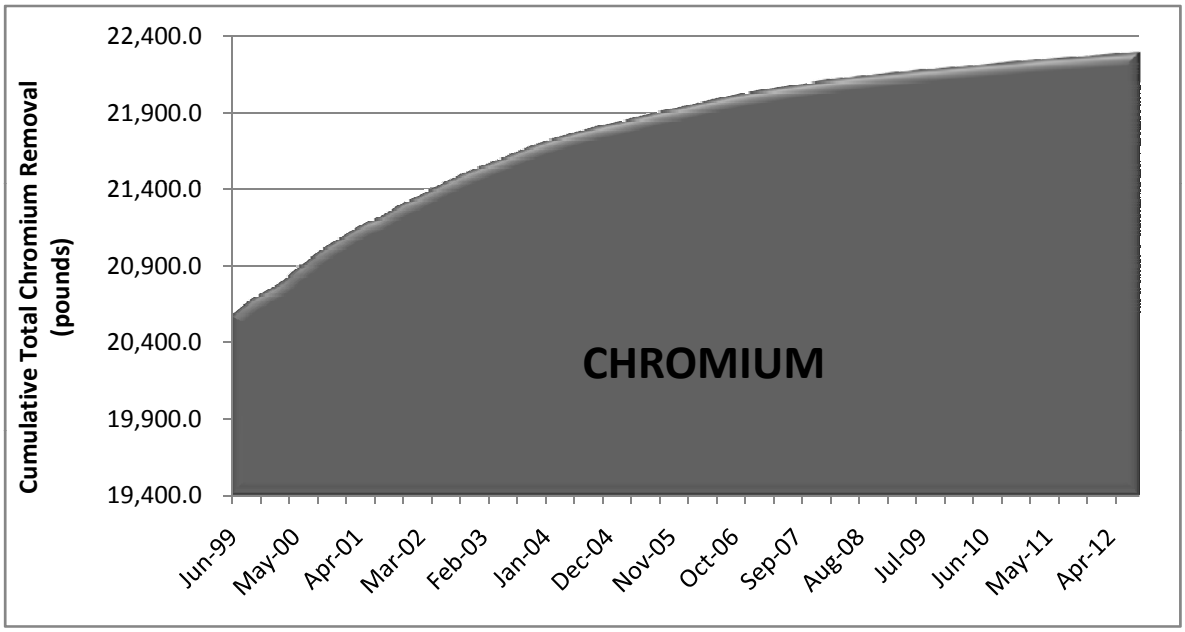
APPENDIX C.3 - TABLE 1
OU-3 CHROMIUM AND TCE MASS REMOVAL ESTIMATION
BOOMSNUB/AIRCO SUPERFUND SITE

Date	Monthly Flow (Gallons)	Influent Chromium (ug/L)	Influent TCE (ug/L)	Monthly Chromium Removal (lbs)	Monthly TCE Removal (lbs)	Cumulative Chromium Removed (lbs)	Cumulative TCE Removed (lbs)
1990 to 1995[1]						13,751.0	
1995 to May 1999[1]						20,538.0	
1990 to 1999[1]							1,645.7
Ave. Jun-Dec 1999	5,303,734	634.4	160.7	27.9	7.2	20,733.6	1,696.3
Ave. for 2000	5,429,513	593.4	197.5	27.0	8.9	21,057.0	1,803.6
Ave. for 2001	5,482,077	450.6	139.2	20.7	6.4	21,305.7	1,879.9
Ave. for 2002	5,587,227	379.0	102.1	17.7	4.8	21,518.0	1,937.3
Ave. for 2003	6,279,889	281.8	74.7	14.7	3.9	21,694.7	1,984.1
Ave. for 2004	6,463,796	194.1	59.8	10.5	3.2	21,820.2	2,022.8
Ave. for 2005	6,213,535	165.5	54.8	8.6	2.8	21,923.2	2,056.8
Ave. for 2006	6,409,175	153.8	55.8	8.2	3.0	22,022.0	2,092.2
Ave. for 2007	6,366,615	108.7	40.1	5.7	2.1	22,090.9	2,117.3
Ave. for 2008	6,547,878	84.2	26.3	4.6	1.4	22,146.3	2,134.6
Ave. for 2009	6,628,721	64.6	22.3	3.6	1.2	22,189.7	2,149.4
Ave. for 2010	6,835,587	60.5	20.8	3.5	1.2	22,230.8	2,163.6
Jan-11	7,119,637	64.9	21.0	3.9	1.2	22,234.7	2,164.8
Feb-11	6,415,188	57.9	20.0	3.1	1.1	22,237.8	2,165.9
Mar-11	6,941,436	61.7	20.0	3.6	1.2	22,241.3	2,167.1
Apr-11	6,743,201	57.3	20.0	3.2	1.1	22,244.6	2,168.2
May-11	6,591,577	54.8	17.0	3.0	0.9	22,247.6	2,169.1
Jun-11	6,276,833	51.0	17.0	2.7	0.9	22,250.3	2,170.0
Jul-11	5,510,495	48.1	14.0	2.2	0.6	22,252.5	2,170.7
Aug-11	6,391,648	49.3	14.0	2.6	0.7	22,255.1	2,171.4
Sep-11	6,575,576	47.2	14.0	2.6	0.8	22,257.7	2,172.2
Oct-11	6,932,254	53.2	20.0	3.1	1.2	22,260.8	2,173.3
Nov-11	6,587,484	49.9	17.0	2.7	0.9	22,263.5	2,174.3
Dec-11	6,942,775	52.1	16.0	3.0	0.9	22,266.5	2,175.2
Jan-12	6,951,522	53.3	17.0	3.1	1.0	22,269.6	2,176.2
Feb-12	6,499,220	54.3	16.0	2.9	0.9	22,272.6	2,177.1
Mar-12	6,611,808	50.8	15.0	2.8	0.8	22,275.4	2,175.1
Apr-12	6,656,913	47.9	16.0	2.7	0.9	22,278.0	2,176.0
May-12	7,010,609	50.7	16.0	3.0	0.9	22,281.0	2,176.9
Jun-12	6,843,276	51.9	16.0	3.0	0.9	22,284.0	2,177.9
Jul-12	7,097,279	52.4	18.0	3.1	1.1	22,287.1	2,178.9
Aug-12	7,036,276	45.9	18.0	2.7	1.1	22,289.8	2,180.0
Sep-12	6,859,810	44.7	17.0	2.6	1.0	22,292.3	2,181.0

Notes:
June 1999 through March 2002 data provided by URS

[1] - Provided by ICF Kaiser

FIGURE C.3.1. OU-3 CUMULATIVE TOTAL REMOVAL OVER TIME



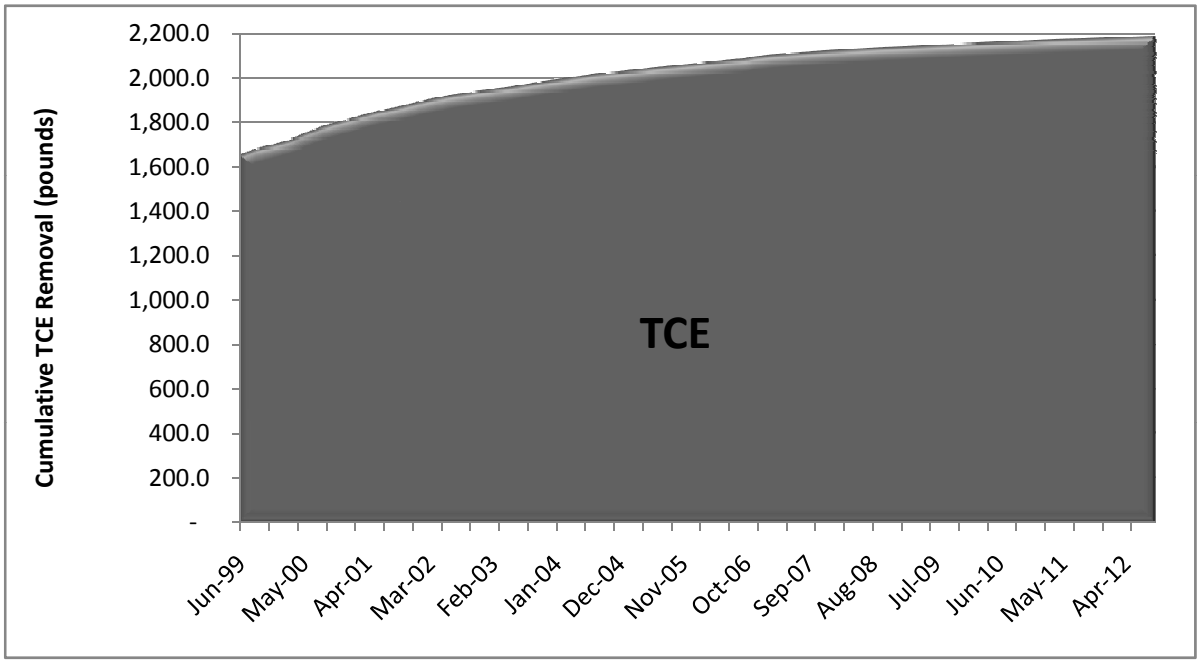
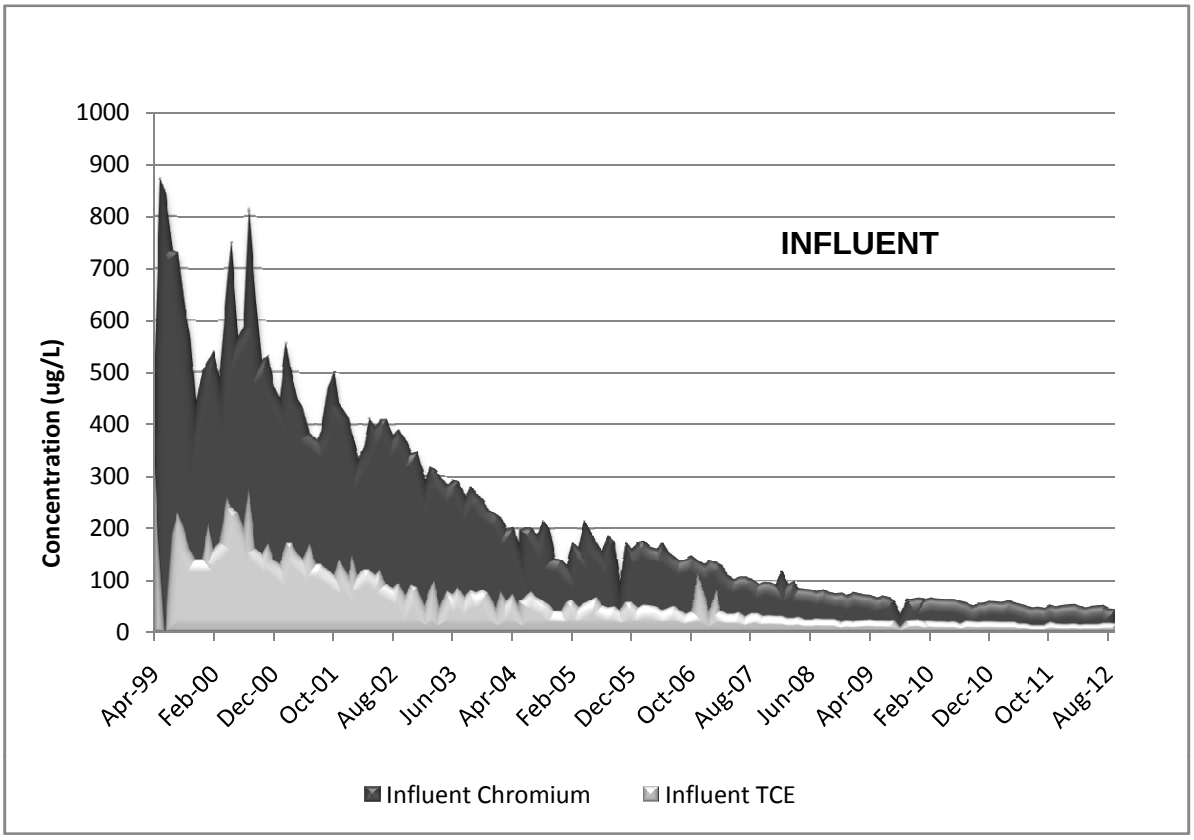


FIGURE C.3.2. OU-3 INFLUENT AND EFFLUENT CONCENTRATIONS VERSUS TIME



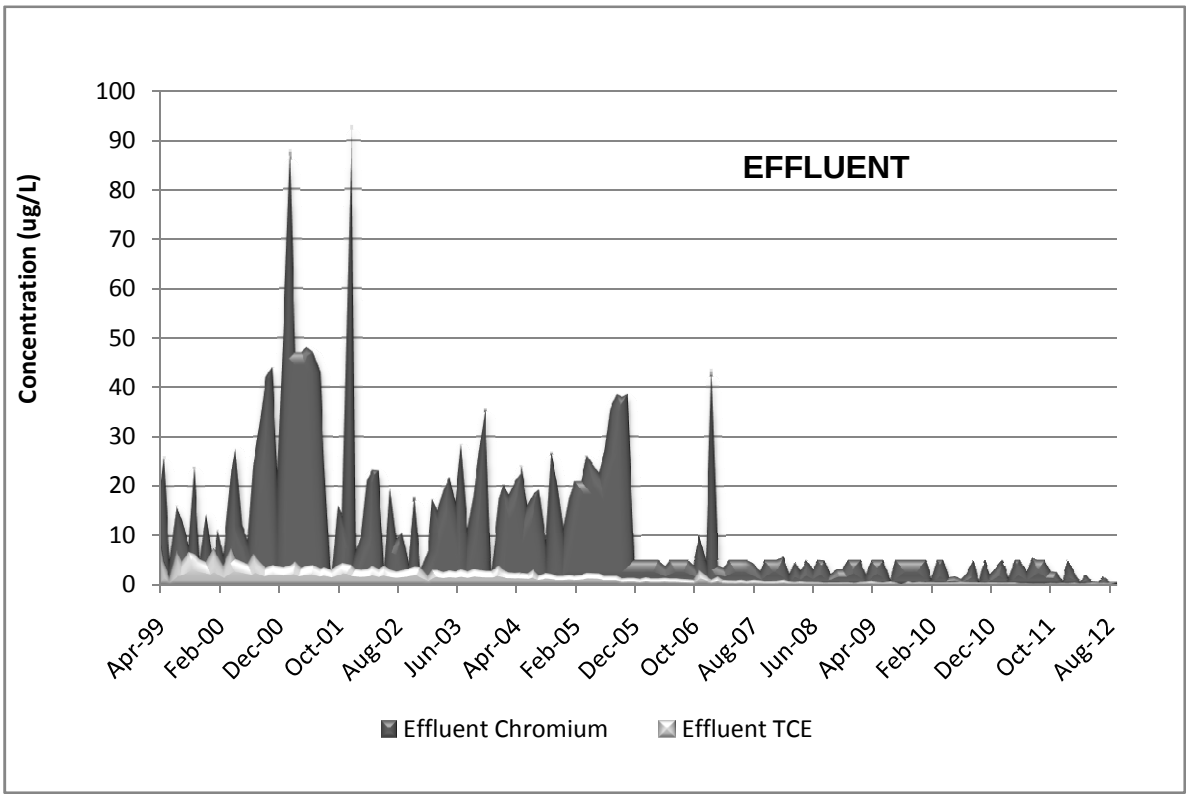
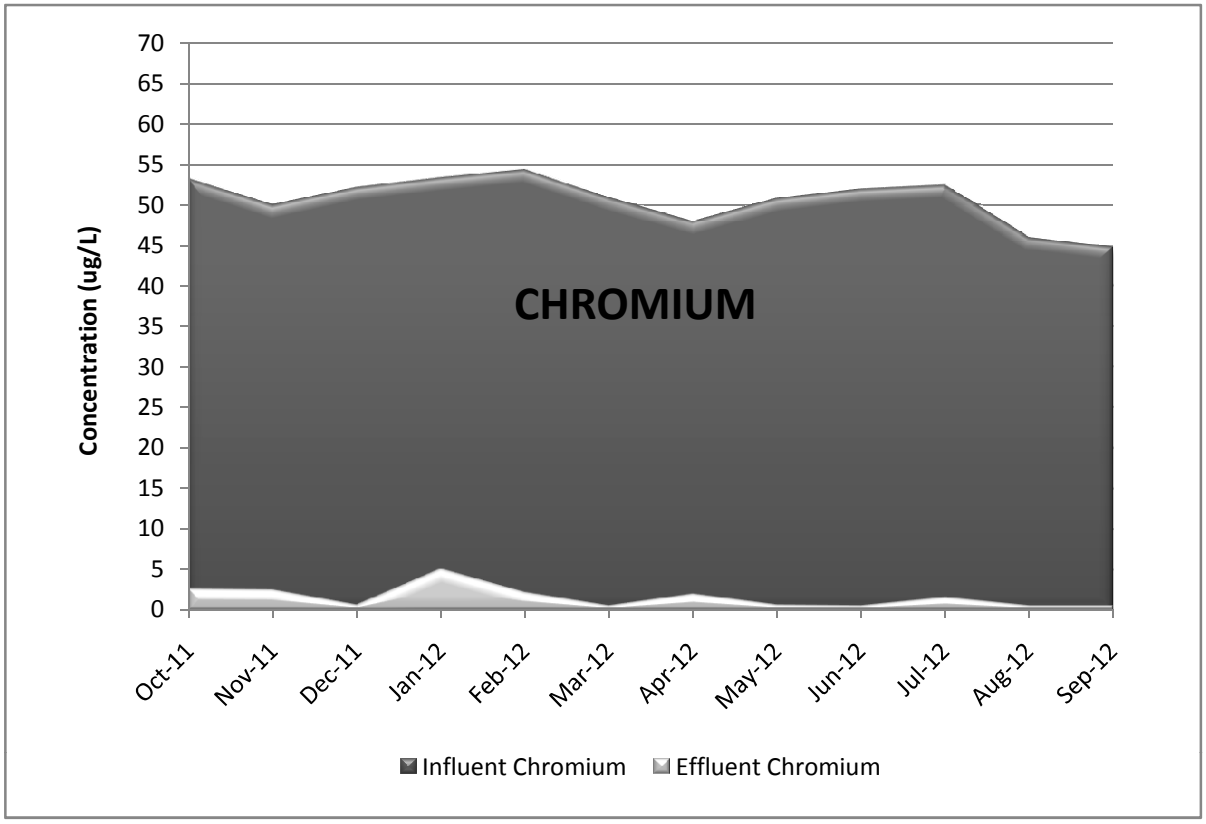


FIGURE C.3-3. OU-3 INFLUENT AND EFFLUENT CONCENTRATIONS OVER 1 YEAR



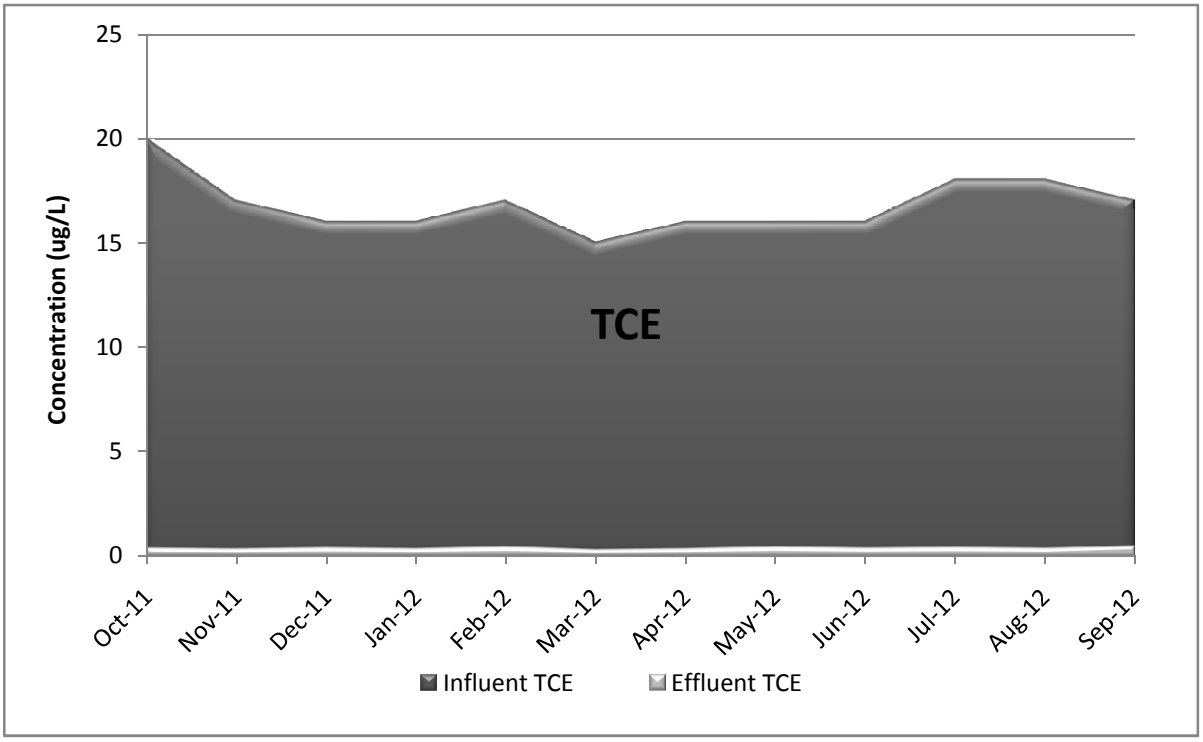
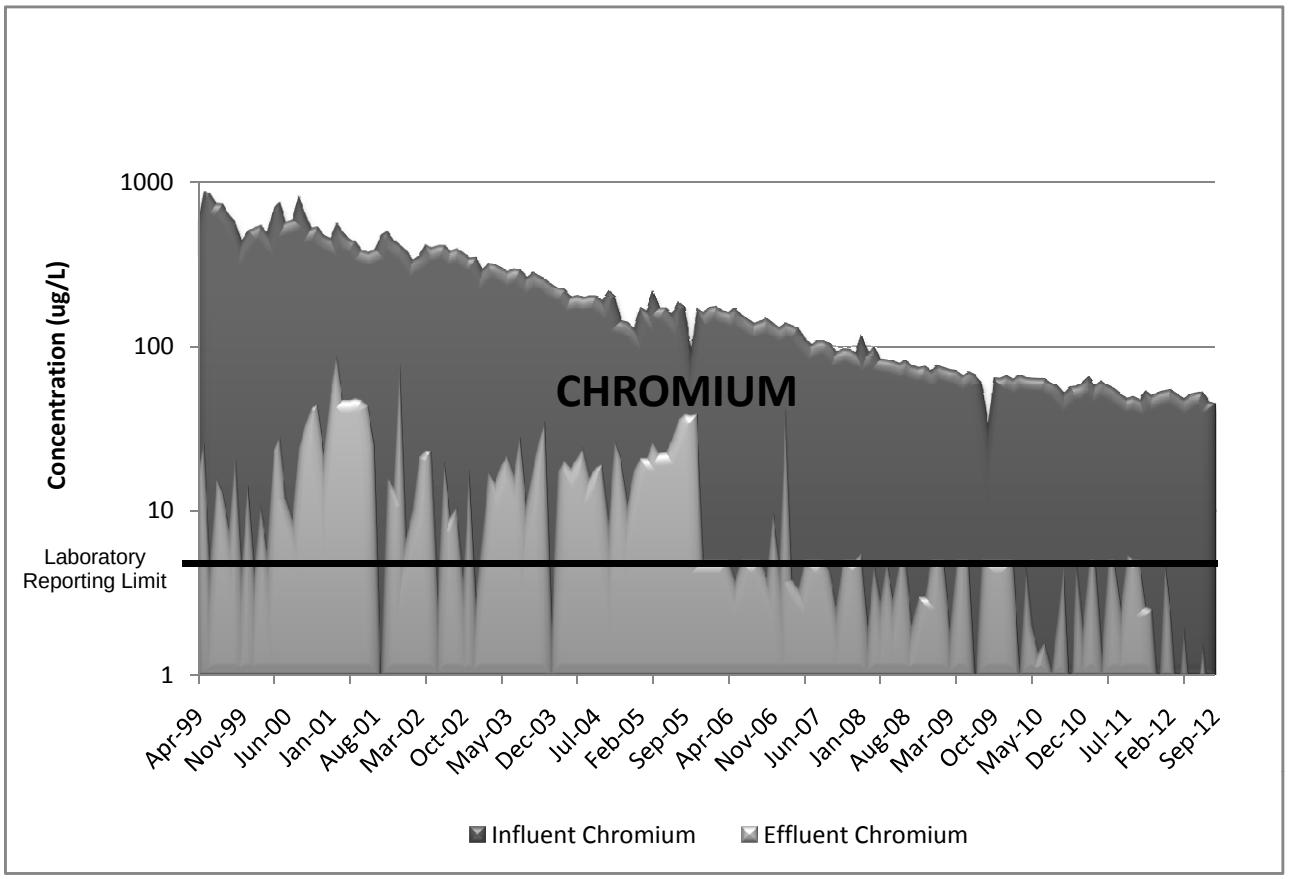
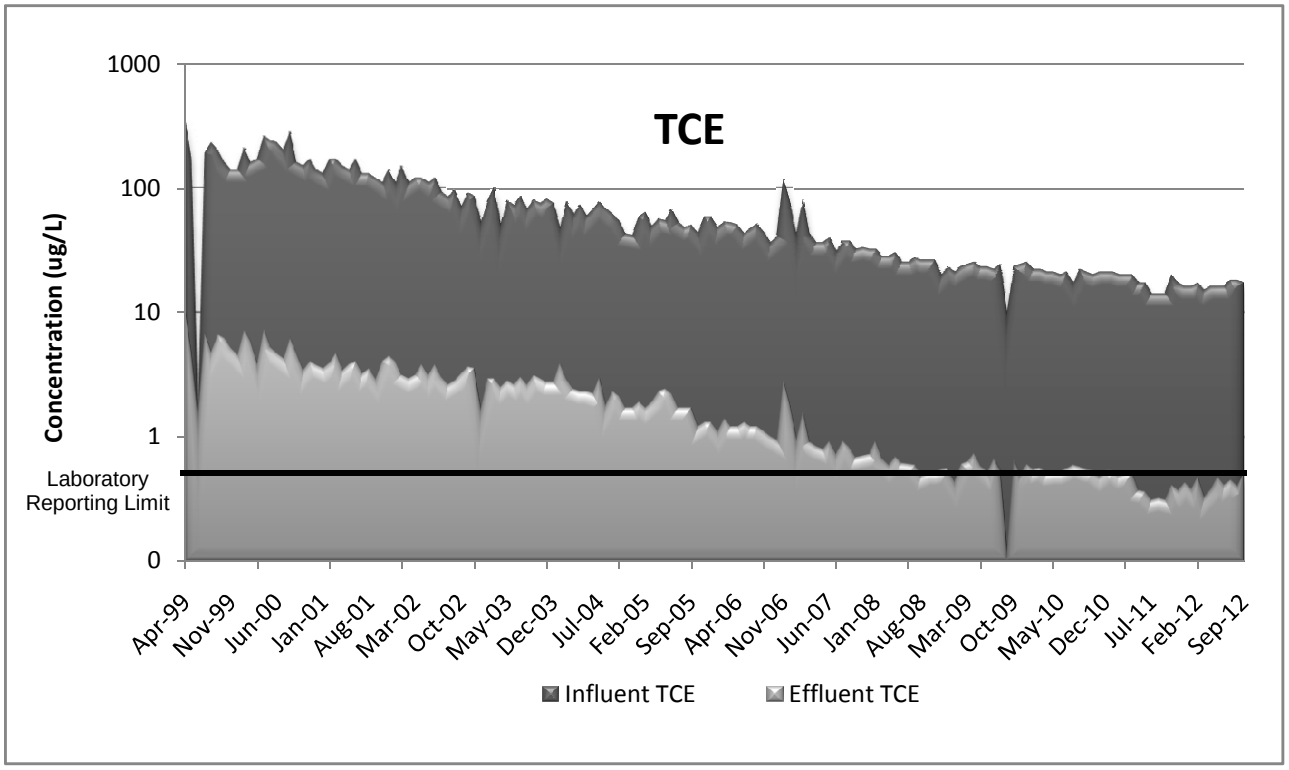


FIGURE C.3-4. OU-3 INFLUENT AND EFFLUENT CONCENTRATIONS VERSUS TIME - LOGARITHMIC SCALE





Appendix C.4

OU-3 Reports to the City of Vancouver
and
Supporting Flow Data

EA Engineering, Science, and Technology, Inc.

720 Sixth Street South, Suite 100
Kirkland, WA 98033
Telephone: 425-451-7400
Fax: 425-451-7800
www.eaest.com

2 July 2012
14495.05 LN1275

Mr. Johnny Leuthold
Industrial Pretreatment Coordinator
City of Vancouver
Marine Park Engineering Office
P.O. Box 1995
Vancouver, Washington 98668-1995

Subject: Semi-Annual Self-Monitoring Report – 30 June 2012
Boomsnub/Airco Superfund Site
Hazel Dell, Washington

Dear Mr. Leuthold:

Attached is the Semi-Annual Self-Monitoring Report for the Boomsnub/Airco Superfund Site prepared in accordance with the City of Vancouver Industrial Wastewater Discharge Permit 2009-07 Mod1. The time period covered includes January through June 2012. Flow data is being reported from the flow meter on the air stripper. During the reporting period all discharges were made to the infiltration gallery on Linde LLC property.

Effluent samples were collected by EA Engineering, Science, and Technology, Inc. on January 4, February 8, March 6, April 4, May 3, and June 8, 2012. Columbia Analytical Services/ALS, located in Kelso, Washington is our analytical laboratory. The analytical data for each monthly sampling event are included, along with the sample Chain-of-Custody forms, data qualifiers and the case narrative.

Please let me know if you have any questions regarding the enclosed information.

Sincerely,

Catherine Bohlke
Project Coordinator

cc: Dave Grupp

Enclosures: City of Vancouver Quarterly Self-Monitoring Report
Laboratory Analytical Results, Chain of Custody, Data Qualifiers and Case Narrative

Boomsnub Airco Superfund Site **(Permit No. 2009-07 Mod1)**

Semi-Annual Self-Monitoring Report

Report Due Date (circle one): *June 30*, December 31

Lab Contracted for Analysis: Columbia Analytical Services, Inc.

Attach: Chain of Custody, Laboratory Results, Lab Report Narrative

Parameter**	Result	Permit Limit	Sample Type*	Sample Date/Collected by:
Month 1 – January				
Peak Flow – gpd	0	230,400 gpd	NA	NA
Peak Chrome – mg/L	0.002 U	7.22 mg/L	G	January 4, 2012/EA
Trichloroethene – mg/L	0.00039 J	0.33 mg/L	G	January 4, 2012/EA
pH (high/low) – SU	8.03/7.93	10.0/5.5 SU	G	January 4, 2012/EA
Month 2 – February				
Peak Flow – gpd	0	230,400 gpd	NA	NA
Peak Chrome – mg/L	0.0022 J	7.22 mg/L	G	February 8, 2012/EA
Trichloroethene – mg/L	0.00048 J	0.33 mg/L	G	February 8, 2012/EA
pH (high/low) – SU	8.07/8.06	10.0/5.5 SU	G	February 8, 2012/EA
Month 3 – March				
Peak Flow – gpd	0	230,400 gpd	NA	NA
Peak Chrome – mg/L	0.0006 J	7.22 mg/L	G	March 6, 2012/EA
Trichloroethene – mg/L	0.00033 J	0.33 mg/L	G	March 6, 2012/EA
pH (high/low) - SU	8.16/8.15	10.0/5.5 SU	G	March 6, 2012/EA
Month 4 – April				
Peak Flow – gpd	0	230,400 gpd	NA	NA
Peak Chrome – mg/L	0.002 U	7.22 mg/L	G	April 4, 2012/EA
Trichloroethene – mg/L	0.00038 J	0.33 mg/L	G	April 4, 2012/EA
pH (high/low) - SU	8.07/7.90	10.0/5.5 SU	G	April 4, 2012/EA
Month 5 – May				
Peak Flow – gpd	0	230,400 gpd	NA	NA
Peak Chrome – mg/L	0.0007 J	7.22 mg/L	G	May 3, 2012/EA
Trichloroethene – mg/L	0.00048 J	0.33 mg/L	G	May 3, 2012/EA
pH (high/low) - SU	8.16/8.12	10.0/5.5 SU	G	May 3, 2012/EA
Month 6 – June				
Peak Flow – gpd	0	230,400 gpd	NA	NA
Peak Chrome – mg/L	0.0006 U	7.22 mg/L	G	June 8, 2012/EA
Trichloroethene – mg/L	0.00041 J	0.33 mg/L	G	June 8, 2012/EA
pH (high/low) - SU	8.15/8.14	10.0/5.5 SU	G	June 8, 2012/EA

Parameter	Value – mg/L	Limit	No. Samples
Semi Annual Average - Chrome	0.0013	0.572 mg/L	12

* Sample Type: *Cont*-Continuous; *G* – Grab; *Comp* - Composite

** If more than one sample analyzed, report the highest concentration for the month.

General Certification Statement: "*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*"

Signature | Head of Site Operations *Title* | 7/2/12 *Date*

April 4, 2012
OU-3 Laboratory Analytical Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	EA Engineering, Science and Technology	**Service Request No.:**	K1203066
Project:	Boomsnub	**Date Received:**	04/04/12
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Water samples were received for analysis at Columbia Analytical Services on 04/04/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

No anomalies associated with the analysis of these samples were observed.

Approved by _____ **Date** 04/25/12

CHAIN OF CUSTODY

Columbia Analytical Services

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800 695 7222 | 360 636 1068 (fax)

SR#: K12-04-06

PAGE 1 OF 1 COC #

PROJECT NAME: Boomsnub
PROJECT NUMBER: 14495.07.2012.0040-03
PROJECT MANAGER: J. I Frain
COMPANY ADDRESS: EA Engineering
720 Sixth Street South Suite 100
CITY STATE ZIP: Kirkland, WA 98033
E-MAIL ADDRESS: jfrain@eaest.com
PHONE #: (425) 451-7400 FAX #: (425) 451-7800
SAMPLER'S SIGNATURE: Richard R. Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC MS 625 8270	Volatile Organics 624 8260 8270LL	Hydrocarbons (*see below) Gas Diesel Oil BTEX 8021	Fuel Fingerprint (FIQ) NW HCID Screen	Oil & Grease/TRPH 1664 HEM 1664 SGT	PCB's Aroclors Congeners	Pesticides/Herbicides 608 8081A 8141A 8151A	Chlorophenolics - 8151M Tri Tetra PCP	PAHS 8310 SIM	Metals Total or Dissolved (See list below)	Cyanide	Hex-Chrom OR Cond, Cl, SO4, PO4, F, NO2 NO3, BOD, TSS, TDS (circle)	NH3-N, COD, Total-P, TKN, TOC DOC (circle) NO2+NO3	TOX 9020 AOX 1650 506	REMARKS
INF-040412	4/4/12	8:00		H_2O	5		X							X		X				
EFF-040412	4/4/12	8:05			5		X							X		X				
EFFD-040412	4/4/12	8:10			5		X							X		X				
TB-040412	4/4/12	NA	47299	V	2		X													

REPORT REQUIREMENTS

- ___ I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- X III. Data Validation Report (includes all raw data)
- ___ IV. CLP Deliverable Report
- X V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co (Cr) Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

VOCs - 8260b
Total Metals - Cr
pH

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Richard Read	Signature: [signature]	Signature:	Signature:
Date/Time: 4/4/12 8:20	Date/Time: 4/4/12 1430	Date/Time:	Date/Time:
Printed Name: RICK READ	Printed Name: JUELL	Printed Name:	Printed Name:
Firm: EA	Firm: EAS	Firm:	Firm:

RCOC #1 03/10

Analytical Report

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1203066
Project:	Boomsnub/14495.07.2012.0040-03	**Date Collected:**	04/4/12
Sample Matrix:	Water	**Date Received:**	04/4/12
Analysis Method:	SM 4500-H+ B	**Units:**	pH Units
		Basis:	NA

pH

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
INF-040412	K1203066-001	6.83	-	-	1	04/04/12 17:39	H
EFF-040412	K1203066-002	8.07	-	-	1	04/04/12 17:44	H
EFFD-040412	K1203066-003	7.90	-	-	1	04/04/12 19:06	H

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1203066
Project No.:	14495.07.2012.0040-03	**Date Collected:**	04/04/12
Project Name:	Boomsnub	**Date Received:**	04/04/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: INF-040412 **Lab Code:** K1203066-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	2.0	1.0	04/09/12	04/18/12	47.9		

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	Service Request:	K1203066
Project No.:	14495.07.2012.0040-03	Date Collected:	04/04/12
Project Name:	Boomsnub	Date Received:	04/04/12
Matrix:	WATER	Units:	ug/L
		Basis:	NA

Sample Name: EFF-040412 Lab Code: K1203066-002

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	2.0	1.0	04/09/12	04/18/12	2.0	U	

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1203066
Project No.:	14495.07.2012.0040-03	**Date Collected:**	04/04/12
Project Name:	Boomsnub	**Date Received:**	04/04/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFFD-040412 **Lab Code:** K1203066-003

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	2.0	1.0	04/09/12	04/18/12	2.0	U	

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.07.2012.0040-03
Sample Matrix: Water

Service Request: K1203066
Date Collected: 04/04/2012
Date Received: 04/04/2012

Volatile Organic Compounds

Sample Name: INF-040412
Lab Code: K1203066-001

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Trichlorofluoromethane	**0.36**	J	0.50	0.12	1	04/12/12	04/12/12	KWG1203762	
1,1-Dichloroethene	**0.76**		0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Methylene Chloride	ND	U	2.0	0.10	1	04/12/12	04/12/12	KWG1203762	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	04/12/12	04/12/12	KWG1203762	
cis-1,2-Dichloroethene	**0.31**	J	0.50	0.067	1	04/12/12	04/12/12	KWG1203762	
1,1,1-Trichloroethane (TCA)	**0.10**	J	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Carbon Tetrachloride	ND	U	0.50	0.096	1	04/12/12	04/12/12	KWG1203762	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Trichloroethene (TCE)	**16**		0.50	0.10	1	04/12/12	04/12/12	KWG1203762	
Bromodichloromethane	ND	U	0.50	0.091	1	04/12/12	04/12/12	KWG1203762	
Tetrachloroethene (PCE)	**1.0**		0.50	0.099	1	04/12/12	04/12/12	KWG1203762	
Dibromochloromethane	ND	U	0.50	0.14	1	04/12/12	04/12/12	KWG1203762	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	04/12/12	04/12/12	KWG1203762	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	04/12/12	04/12/12	KWG1203762	
Hexachlorobutadiene	ND	U	2.0	0.11	1	04/12/12	04/12/12	KWG1203762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	101	73-122	04/12/12	Acceptable
Toluene-d8	111	65-144	04/12/12	Acceptable
4-Bromofluorobenzene	100	68-117	04/12/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.07.2012.0040-03
Sample Matrix: Water

Service Request: K1203066
Date Collected: 04/04/2012
Date Received: 04/04/2012

Volatile Organic Compounds

Sample Name: EFF-040412
Lab Code: K1203066-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Trichlorofluoromethane	ND	U	0.50	0.12	1	04/12/12	04/12/12	KWG1203762	
1,1-Dichloroethene	ND	U	0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Methylene Chloride	ND	U	2.0	0.10	1	04/12/12	04/12/12	KWG1203762	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	04/12/12	04/12/12	KWG1203762	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	04/12/12	04/12/12	KWG1203762	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Carbon Tetrachloride	ND	U	0.50	0.096	1	04/12/12	04/12/12	KWG1203762	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Trichloroethene (TCE)	**0.38**	J	0.50	0.10	1	04/12/12	04/12/12	KWG1203762	
Bromodichloromethane	ND	U	0.50	0.091	1	04/12/12	04/12/12	KWG1203762	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	04/12/12	04/12/12	KWG1203762	
Dibromochloromethane	ND	U	0.50	0.14	1	04/12/12	04/12/12	KWG1203762	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	04/12/12	04/12/12	KWG1203762	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	04/12/12	04/12/12	KWG1203762	
Hexachlorobutadiene	ND	U	2.0	0.11	1	04/12/12	04/12/12	KWG1203762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	73-122	04/12/12	Acceptable
Toluene-d8	110	65-144	04/12/12	Acceptable
4-Bromofluorobenzene	98	68-117	04/12/12	Acceptable

Comments:

Client: EA Engineering. Science, and Technology
Project: Boomsnub/14495.07.2012.0040-03
Sample Matrix: Water

Service Request: K1203066
Date Collected: 04/04/2012
Date Received: 04/04/2012

Volatile Organic Compounds

Sample Name: EFFD-040412
Lab Code: K1203066-003

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Trichlorofluoromethane	ND	U	0.50	0.12	1	04/12/12	04/12/12	KWG1203762	
1,1-Dichloroethene	ND	U	0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Methylene Chloride	ND	U	2.0	0.10	1	04/12/12	04/12/12	KWG1203762	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	04/12/12	04/12/12	KWG1203762	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	04/12/12	04/12/12	KWG1203762	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Carbon Tetrachloride	ND	U	0.50	0.096	1	04/12/12	04/12/12	KWG1203762	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Trichloroethene (TCE)	**0.38**	J	0.50	0.10	1	04/12/12	04/12/12	KWG1203762	
Bromodichloromethane	ND	U	0.50	0.091	1	04/12/12	04/12/12	KWG1203762	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	04/12/12	04/12/12	KWG1203762	
Dibromochloromethane	ND	U	0.50	0.14	1	04/12/12	04/12/12	KWG1203762	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	04/12/12	04/12/12	KWG1203762	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	04/12/12	04/12/12	KWG1203762	
Hexachlorobutadiene	ND	U	2.0	0.11	1	04/12/12	04/12/12	KWG1203762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	100	73-122	04/12/12	Acceptable
Toluene-d8	109	65-144	04/12/12	Acceptable
4-Bromofluorobenzene	98	68-117	04/12/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.07.2012.0040-03
Sample Matrix: Water

Service Request: K1203066
Date Collected: 04/04/2012
Date Received: 04/04/2012

Volatile Organic Compounds

Sample Name: TB-040412
Lab Code: K1203066-004

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Trichlorofluoromethane	ND	U	0.50	0.12	1	04/12/12	04/12/12	KWG1203762	
1,1-Dichloroethene	ND	U	0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Methylene Chloride	**0.21**	J	2.0	0.10	1	04/12/12	04/12/12	KWG1203762	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	04/12/12	04/12/12	KWG1203762	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	04/12/12	04/12/12	KWG1203762	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	04/12/12	04/12/12	KWG1203762	
Carbon Tetrachloride	ND	U	0.50	0.096	1	04/12/12	04/12/12	KWG1203762	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	04/12/12	04/12/12	KWG1203762	
Trichloroethene (TCE)	ND	U	0.50	0.10	1	04/12/12	04/12/12	KWG1203762	
Bromodichloromethane	ND	U	0.50	0.091	1	04/12/12	04/12/12	KWG1203762	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	04/12/12	04/12/12	KWG1203762	
Dibromochloromethane	ND	U	0.50	0.14	1	04/12/12	04/12/12	KWG1203762	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	04/12/12	04/12/12	KWG1203762	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	04/12/12	04/12/12	KWG1203762	
Hexachlorobutadiene	ND	U	2.0	0.11	1	04/12/12	04/12/12	KWG1203762	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	98	73-122	04/12/12	Acceptable
Toluene-d8	109	65-144	04/12/12	Acceptable
4-Bromofluorobenzene	97	68-117	04/12/12	Acceptable

Comments:

May 3, 2012
OU-3 Laboratory Analytical Results

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	EA Engineering, Science and Technology	**Service Request No.:**	K1204203
Project:	Boomsnub	**Date Received:**	05/03/12
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Three water samples and one trip blank were received for analysis at Columbia Analytical Services on 05/03/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

Calibration Verification Exceptions:
The following analyte was flagged as outside the upper control criterion for Continuing Calibration Verification (CCV) J:\MS18\0514F005.D: Hexachlorobutadiene. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The CAS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____ **Date** 05/21/12

CHAIN OF CUSTODY

SR#: K1204203

Columbia Analytical Services
1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

PAGE 1 OF 1 COC #

PROJECT NAME: Boomsnub
PROJECT NUMBER: 14495.2012.0040-03
PROJECT MANAGER: J. Frain
COMPANY ADDRESS: EA Engineering
720 Sixth Street South, Suite 100
CITY/STATE/ZIP: Kirkland, WA. 98033
E MAIL ADDRESS: jfrain@eaest.com
PHONE #: (425) 451-7400
FAX #: (425) 451-7500
SAMPLER'S SIGNATURE: Rick R. Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 X 8021 ☐ BTEX ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐ Oil & Grease Screen	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	Metals (Total or Dissolved) (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐	REMARKS
INF-050312	5/3/12	8:10		H2O	5		X							X		X			
EFF-050312	↓	8:15		↓	5		X							X		X			
EFFD-050312	↓	8:20		↓	5		X							X		X			
TB-050312	↓	NA	47444	↓	2		X												

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REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
X III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
X V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results
5/21/12 Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co (Cr) Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
VOCs - 8260b
Total Metals - Cr
pH

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Rick Read	Signature:	Signature:	Signature:
Date/Time: 5/3/12 8:45	Date/Time: 5/3/12 1320	Date/Time:	Date/Time:
Printed Name: RICK READ	Printed Name: Les Kennedy	Printed Name:	Printed Name:
Firm: EA	Firm: ALS	Firm:	Firm:

Analytical Report

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1204203
Project:	Boomsnub/14495.2012.0400-03	**Date Collected:**	05/3/12
Sample Matrix:	Water	**Date Received:**	05/3/12
Analysis Method:	SM 4500-H+ B	**Units:**	pH Units
		Basis:	NA

pH

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
INF-050312	K1204203-001	**7.33**	-	-	1	05/03/12 15:32	H
EFF-050312	K1204203-002	**8.12**	-	-	1	05/03/12 15:34	H
EFFD-050312	K1204203-003	**8.16**	-	-	1	05/03/12 15:36	H

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1204203
Project No.:	14495.2012.0400-03	**Date Collected:**	5/3/2012
Project Name:	Boomsnub	**Date Received:**	5/3/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: INF-050312 **Lab Code:** K1204203-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	05/08/12	05/16/12	50.7		

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1204203
Project No.:	14495.2012.0400-03	**Date Collected:**	5/3/2012
Project Name:	Boomsnub	**Date Received:**	5/3/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFF-050312 **Lab Code:** K1204203-002

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	05/08/12	05/16/12	0.7	J	

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1204203
Project No.:	14495.2012.0400-03	**Date Collected:**	5/3/2012
Project Name:	Boomsnub	**Date Received:**	5/3/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFFD-050312 **Lab Code:** K1204203-003

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	05/08/12	05/16/12	0.6	J	

Comments:

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1204203
Project:	Boomsnub/14495.2012.0400-03	**Date Collected:**	05/03/2012
Sample Matrix:	Water	**Date Received:**	05/03/2012

Volatile Organic Compounds

Sample Name:	INF-050312	**Units:**	ug/L
Lab Code:	K1204203-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Trichlorofluoromethane	**0.46**	J	0.50	0.12	1	05/14/12	05/14/12	KWG1204969	
1,1-Dichloroethene	**0.73**		0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Methylene Chloride	ND	U	2.0	0.10	1	05/14/12	05/14/12	KWG1204969	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	05/14/12	05/14/12	KWG1204969	
cis-1,2-Dichloroethene	**0.29**	J	0.50	0.067	1	05/14/12	05/14/12	KWG1204969	
1,1,1-Trichloroethane (TCA)	**0.11**	J	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Carbon Tetrachloride	ND	U	0.50	0.096	1	05/14/12	05/14/12	KWG1204969	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Trichloroethene (TCE)	**16**		0.50	0.10	1	05/14/12	05/14/12	KWG1204969	
Bromodichloromethane	ND	U	0.50	0.091	1	05/14/12	05/14/12	KWG1204969	
Tetrachloroethene (PCE)	**1.1**		0.50	0.099	1	05/14/12	05/14/12	KWG1204969	
Dibromochloromethane	ND	U	0.50	0.14	1	05/14/12	05/14/12	KWG1204969	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	05/14/12	05/14/12	KWG1204969	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	05/14/12	05/14/12	KWG1204969	
Hexachlorobutadiene	ND	U	2.0	0.11	1	05/14/12	05/14/12	KWG1204969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	95	73-122	05/14/12	Acceptable
Toluene-d8	95	65-144	05/14/12	Acceptable
4-Bromofluorobenzene	75	68-117	05/14/12	Acceptable

Comments:

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1204203
Project:	Boomsnub/14495.2012.0400-03	**Date Collected:**	05/03/2012
Sample Matrix:	Water	**Date Received:**	05/03/2012

Volatile Organic Compounds

Sample Name:	EFF-050312	**Units:**	ug/L
Lab Code:	K1204203-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Trichlorofluoromethane	ND	U	0.50	0.12	1	05/14/12	05/14/12	KWG1204969	
1,1-Dichloroethene	ND	U	0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Methylene Chloride	ND	U	2.0	0.10	1	05/14/12	05/14/12	KWG1204969	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	05/14/12	05/14/12	KWG1204969	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	05/14/12	05/14/12	KWG1204969	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Carbon Tetrachloride	ND	U	0.50	0.096	1	05/14/12	05/14/12	KWG1204969	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Trichloroethene (TCE)	**0.48**	J	0.50	0.10	1	05/14/12	05/14/12	KWG1204969	
Bromodichloromethane	ND	U	0.50	0.091	1	05/14/12	05/14/12	KWG1204969	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	05/14/12	05/14/12	KWG1204969	
Dibromochloromethane	ND	U	0.50	0.14	1	05/14/12	05/14/12	KWG1204969	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	05/14/12	05/14/12	KWG1204969	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	05/14/12	05/14/12	KWG1204969	
Hexachlorobutadiene	ND	U	2.0	0.11	1	05/14/12	05/14/12	KWG1204969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	73-122	05/14/12	Acceptable
Toluene-d8	91	65-144	05/14/12	Acceptable
4-Bromofluorobenzene	73	68-117	05/14/12	Acceptable

Comments:

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1204203
Project:	Boomsnub/14495.2012.0400-03	**Date Collected:**	05/03/2012
Sample Matrix:	Water	**Date Received:**	05/03/2012

Volatile Organic Compounds

Sample Name:	EFFD-050312	**Units:**	ug/L
Lab Code:	K1204203-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Trichlorofluoromethane	ND	U	0.50	0.12	1	05/14/12	05/14/12	KWG1204969	
1,1-Dichloroethene	ND	U	0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Methylene Chloride	ND	U	2.0	0.10	1	05/14/12	05/14/12	KWG1204969	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	05/14/12	05/14/12	KWG1204969	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	05/14/12	05/14/12	KWG1204969	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Carbon Tetrachloride	ND	U	0.50	0.096	1	05/14/12	05/14/12	KWG1204969	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Trichloroethene (TCE)	**0.43**	J	0.50	0.10	1	05/14/12	05/14/12	KWG1204969	
Bromodichloromethane	ND	U	0.50	0.091	1	05/14/12	05/14/12	KWG1204969	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	05/14/12	05/14/12	KWG1204969	
Dibromochloromethane	ND	U	0.50	0.14	1	05/14/12	05/14/12	KWG1204969	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	05/14/12	05/14/12	KWG1204969	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	05/14/12	05/14/12	KWG1204969	
Hexachlorobutadiene	ND	U	2.0	0.11	1	05/14/12	05/14/12	KWG1204969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	93	73-122	05/14/12	Acceptable
Toluene-d8	92	65-144	05/14/12	Acceptable
4-Bromofluorobenzene	73	68-117	05/14/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.2012.0400-03
Sample Matrix: Water

Service Request: K1204203
Date Collected: 05/03/2012
Date Received: 05/03/2012

Volatile Organic Compounds

Sample Name: TB-050312
Lab Code: K1204203-004

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Trichlorofluoromethane	ND	U	0.50	0.12	1	05/14/12	05/14/12	KWG1204969	
1,1-Dichloroethene	ND	U	0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Methylene Chloride	**0.11**	J	2.0	0.10	1	05/14/12	05/14/12	KWG1204969	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	05/14/12	05/14/12	KWG1204969	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	05/14/12	05/14/12	KWG1204969	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	05/14/12	05/14/12	KWG1204969	
Carbon Tetrachloride	ND	U	0.50	0.096	1	05/14/12	05/14/12	KWG1204969	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	05/14/12	05/14/12	KWG1204969	
Trichloroethene (TCE)	ND	U	0.50	0.10	1	05/14/12	05/14/12	KWG1204969	
Bromodichloromethane	ND	U	0.50	0.091	1	05/14/12	05/14/12	KWG1204969	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	05/14/12	05/14/12	KWG1204969	
Dibromochloromethane	ND	U	0.50	0.14	1	05/14/12	05/14/12	KWG1204969	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	05/14/12	05/14/12	KWG1204969	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	05/14/12	05/14/12	KWG1204969	
Hexachlorobutadiene	ND	U	2.0	0.11	1	05/14/12	05/14/12	KWG1204969	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	91	73-122	05/14/12	Acceptable
Toluene-d8	94	65-144	05/14/12	Acceptable
4-Bromofluorobenzene	73	68-117	05/14/12	Acceptable

Comments:

June 8, 2012
OU-3 Laboratory Analytical Results

ALS ENVIRONMENTAL

Client:	EA Engineering Science and Technology	**Service Request No.:**	K1205559
Project:	Boomsnub/14495.05.2012.0040-03	**Date Received:**	06/08/12
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Three water samples and a trip blank sample were received for analysis at ALS Environmental on 06/08/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

Calibration Verification Exceptions:
The following analytes were flagged as outside the upper control criterion for Continuing Calibration Verification (CCV) J:\MS27\0622F005.D: Vinyl Chloride. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The CAS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

Matrix Spike Recovery Exceptions:
The matrix spike recovery of Vinyl Chloride and 1,1,2,2-Tetrachloroethane for sample Batch QC was outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. No further corrective action was appropriate.

No other anomalies associated with the analysis of these samples were observed.

Approved by Date 6/27/12

CHAIN OF CUSTODY

SR#: K1205559

Columbia Analytical Services™
1317 South 13th Ave. Kelso, WA 98626 | 360.577.7222 | 800.695 7222 | 360.636 1068 (fax)

PAGE 1 OF 1 COC #

PROJECT NAME: Boomsnub
PROJECT NUMBER: 14495.05.2012.0040-03
PROJECT MANAGER: J. Frain
COMPANY ADDRESS: EA Engineering
720 Sixth Street South
CITY STATE ZIP: Kirkland, WA 98033
E MAIL ADDRESS: jfrain@eaest.com
PHONE #: (425) 451-7400 FAX #: (425) 451-7800
SAMPLER'S SIGNATURE: Richard R. Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐	Volatile Organics 624 ☐ 8260 ☐ 8270LL ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ 8021 ☐ BTEX ☐	Fuel Fingerprint (FIO) ☐ NW-HCID Screen ☐ Oil	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	Metals (Total or Dissolved) (See list below)	Cyanide ☐	Hex-Chrom ☐	RH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐	AOX 1650 ☐ 506 ☐					REMARKS
INF-060812	6/8/12	8:15		H_2O	5		X								X		X								
EFF-060812	↓	8:20		↓	5		X								X		X								
EFFD-060812	↓	8:25		↓	5		X								X		X								
TB-060812	↓	NA	47529	↓	2		X																		

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
X III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
X V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results
6/25/12 Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co (Cr) Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
VOCs - 8260b
Total Metals - Cr
pH

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Richard Read	Signature:	Signature:	Signature: Dwight Bellingham
Date/Time: 6/8/12 8:40	Date/Time:	Date/Time:	Date/Time: 6/8/12 1500
Printed Name: RICK READ	Printed Name:	Printed Name:	Printed Name:
Firm: EA	Firm:	Firm:	Firm: ALS

8

Analytical Report

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1205559
Project:	Boomsnub/14495.05.2012.0040-03	**Date Collected:**	06/8/12
Sample Matrix:	Water	**Date Received:**	06/8/12
Analysis Method:	SM 4500-H+ B	**Units:**	pH Units
		Basis:	NA

pH

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
INF-060812	K1205559-001	**6.74**	-	-	1	06/08/12 19:12	H
EFF-060812	K1205559-002	**8.15**	-	-	1	06/08/12 19:37	H
EFFD-060812	K1205559-003	**8.14**	-	-	1	06/08/12 19:41	H

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1205559
Project No.:	14495.05.2012.0040-03	**Date Collected:**	6/8/2012
Project Name:	Boomsnub	**Date Received:**	6/8/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: INF-060812 **Lab Code:** K1205559-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	06/12/12	06/20/12	51.9		

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1205559
Project No.:	14495.05.2012.0040-03	**Date Collected:**	6/8/2012
Project Name:	Boomsnub	**Date Received:**	6/8/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFF-060812 **Lab Code:** K1205559-002

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	06/12/12	06/20/12	0.6	U	

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1205559
Project No.:	14495.05.2012.0040-03	**Date Collected:**	6/8/2012
Project Name:	Boomsnub	**Date Received:**	6/8/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFFD-060812 **Lab Code:** K1205559-003

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	06/12/12	06/20/12	0.6	U	

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1205559
Date Collected: 06/08/2012
Date Received: 06/08/2012

Volatile Organic Compounds

Sample Name: INF-060812
Lab Code: K1205559-001

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Trichlorofluoromethane	**0.33**	J	0.50	0.12	1	06/22/12	06/22/12	KWG1206857	
1,1-Dichloroethene	**0.71**		0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Methylene Chloride	ND	U	2.0	0.10	1	06/22/12	06/22/12	KWG1206857	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	06/22/12	06/22/12	KWG1206857	
cis-1,2-Dichloroethene	**0.32**	J	0.50	0.067	1	06/22/12	06/22/12	KWG1206857	
1,1,1-Trichloroethane (TCA)	**0.13**	J	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Carbon Tetrachloride	ND	U	0.50	0.096	1	06/22/12	06/22/12	KWG1206857	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Trichloroethene (TCE)	**16**		0.50	0.10	1	06/22/12	06/22/12	KWG1206857	
Bromodichloromethane	ND	U	0.50	0.091	1	06/22/12	06/22/12	KWG1206857	
Tetrachloroethene (PCE)	**0.92**		0.50	0.099	1	06/22/12	06/22/12	KWG1206857	
Dibromochloromethane	ND	U	0.50	0.14	1	06/22/12	06/22/12	KWG1206857	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	06/22/12	06/22/12	KWG1206857	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	06/22/12	06/22/12	KWG1206857	
Hexachlorobutadiene	ND	U	2.0	0.11	1	06/22/12	06/22/12	KWG1206857	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	73-122	06/22/12	Acceptable
Toluene-d8	101	65-144	06/22/12	Acceptable
4-Bromofluorobenzene	89	68-117	06/22/12	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.
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Analytical Results

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1205559
Date Collected: 06/08/2012
Date Received: 06/08/2012

Volatile Organic Compounds

Sample Name: EFF-060812
Lab Code: K1205559-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Trichlorofluoromethane	ND	U	0.50	0.12	1	06/22/12	06/22/12	KWG1206857	
1,1-Dichloroethene	ND	U	0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Methylene Chloride	ND	U	2.0	0.10	1	06/22/12	06/22/12	KWG1206857	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	06/22/12	06/22/12	KWG1206857	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	06/22/12	06/22/12	KWG1206857	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Carbon Tetrachloride	ND	U	0.50	0.096	1	06/22/12	06/22/12	KWG1206857	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Trichloroethene (TCE)	**0.41**	J	0.50	0.10	1	06/22/12	06/22/12	KWG1206857	
Bromodichloromethane	ND	U	0.50	0.091	1	06/22/12	06/22/12	KWG1206857	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	06/22/12	06/22/12	KWG1206857	
Dibromochloromethane	ND	U	0.50	0.14	1	06/22/12	06/22/12	KWG1206857	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	06/22/12	06/22/12	KWG1206857	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	06/22/12	06/22/12	KWG1206857	
Hexachlorobutadiene	ND	U	2.0	0.11	1	06/22/12	06/22/12	KWG1206857	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	98	73-122	06/22/12	Acceptable
Toluene-d8	100	65-144	06/22/12	Acceptable
4-Bromofluorobenzene	91	68-117	06/22/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1205559
Date Collected: 06/08/2012
Date Received: 06/08/2012

Volatile Organic Compounds

Sample Name: EFFD-060812
Lab Code: K1205559-003

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Trichlorofluoromethane	ND	U	0.50	0.12	1	06/22/12	06/22/12	KWG1206857	
1,1-Dichloroethene	ND	U	0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Methylene Chloride	ND	U	2.0	0.10	1	06/22/12	06/22/12	KWG1206857	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	06/22/12	06/22/12	KWG1206857	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	06/22/12	06/22/12	KWG1206857	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Carbon Tetrachloride	ND	U	0.50	0.096	1	06/22/12	06/22/12	KWG1206857	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Trichloroethene (TCE)	0.37	J	0.50	0.10	1	06/22/12	06/22/12	KWG1206857	
Bromodichloromethane	ND	U	0.50	0.091	1	06/22/12	06/22/12	KWG1206857	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	06/22/12	06/22/12	KWG1206857	
Dibromochloromethane	ND	U	0.50	0.14	1	06/22/12	06/22/12	KWG1206857	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	06/22/12	06/22/12	KWG1206857	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	06/22/12	06/22/12	KWG1206857	
Hexachlorobutadiene	ND	U	2.0	0.11	1	06/22/12	06/22/12	KWG1206857	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	100	73-122	06/22/12	Acceptable
Toluene-d8	100	65-144	06/22/12	Acceptable
4-Bromofluorobenzene	88	68-117	06/22/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1205559
Date Collected: 06/08/2012
Date Received: 06/08/2012

Volatile Organic Compounds

Sample Name: TB-060812
Lab Code: K1205559-004

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Trichlorofluoromethane	ND	U	0.50	0.12	1	06/22/12	06/22/12	KWG1206857	
1,1-Dichloroethene	ND	U	0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Methylene Chloride	0.29	J	2.0	0.10	1	06/22/12	06/22/12	KWG1206857	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	06/22/12	06/22/12	KWG1206857	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	06/22/12	06/22/12	KWG1206857	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	06/22/12	06/22/12	KWG1206857	
Carbon Tetrachloride	ND	U	0.50	0.096	1	06/22/12	06/22/12	KWG1206857	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	06/22/12	06/22/12	KWG1206857	
Trichloroethene (TCE)	ND	U	0.50	0.10	1	06/22/12	06/22/12	KWG1206857	
Bromodichloromethane	ND	U	0.50	0.091	1	06/22/12	06/22/12	KWG1206857	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	06/22/12	06/22/12	KWG1206857	
Dibromochloromethane	ND	U	0.50	0.14	1	06/22/12	06/22/12	KWG1206857	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	06/22/12	06/22/12	KWG1206857	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	06/22/12	06/22/12	KWG1206857	
Hexachlorobutadiene	ND	U	2.0	0.11	1	06/22/12	06/22/12	KWG1206857	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	100	73-122	06/22/12	Acceptable
Toluene-d8	101	65-144	06/22/12	Acceptable
4-Bromofluorobenzene	89	68-117	06/22/12	Acceptable

Comments:

July 5, 2012, 2012
OU-3 Laboratory Analytical Results

ALS ENVIRONMENTAL

Client:	EA Engineering, Science and Technology	**Service Request No.:**	K1206458
Project:	Boomsnub	**Date Received:**	07/05/12
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Three water samples and a trip blank sample were received for analysis at ALS Environmental on 07/05/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

Continuing Calibration Verification Exceptions:
The following analyte was flagged as outside the lower control criterion for Continuing Calibration Verification (CCV) J:\MS18\0706F003.D: 1,2-Dibromo-3-chloropropane. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The CAS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

The following analyte was flagged as outside the higher control criterion for Continuing Calibration Verification (CCV) J:\MS18\0706F003.D: Trichlorofluoromethane. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The CAS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____ **Date** 7/26/12

Columbia Analytical Services

CHAIN OF CUSTODY

SR#: K1206458

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800 695 7222 | 360.636.1068 (fax)

PAGE _____ OF _____ COC #_____

PROJECT NAME: Boomsnub
PROJECT NUMBER: 14445.05.2012.0040-03
PROJECT MANAGER: Jil Frain
COMPANY/ADDRESS: EA Engineering
720 Sixth Street South Suite 100
CITY/STATE/ZIP: Kirkland, WA 98033
E MAIL ADDRESS: jfrain@eaest
PHONE #: (425) 451-7400 FAX #: 425 451-7800
SAMPLER'S SIGNATURE: Richard R. Read

SAMPLE I.D	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐	Volatile Organics 624 ☐ 8260 ☒ 8270LL ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐	Fuel Fingerprint (FIO) ☐ NW HCID Screen ☐	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB s Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics Tri ☐ Tetra ☐ 8151M PCP ☐	PAHS 8310 ☐ SIM ☐	Metals Total or Dissolved (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS (circle)	NH3-N, COD, Total-P, TKN, TOC, DOC (circle) NO2+NO3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐	REMARKS
INF-070512	7/5/12	10:10		H2O			X							X		X				
EFF-070512		10:15					X							X		X				
EFFD-070512		10:20					X							X		X				
TB-070512		NA	47726				X													

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
X III. Data Validation Report (includes all raw data)
~~X~~ IV. CLP Deliverable Report
X V. EDD

INVOICE INFORMATION

P.O. # _____
Bill To: _____

TURNAROUND REQUIREMENTS

____ 24 hr. ____ 48 hr.
____ 5 Day
X Standard (10-15 working days)
____ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co (Cr) Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

VOCs - 8260b
Total Metals - Cr.
pH

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Richard Read	Signature: [illegible]	Signature:	Signature:
Date/Time: 7/5/12 10:30	Date/Time: 7/6/12 1450	Date/Time:	Date/Time:
Printed Name: RICK READ	Printed Name: [illegible]	Printed Name:	Printed Name:
Firm: EA	Firm: ALS	Firm:	Firm:

8

Analytical Report

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1206458
Project:	Boomsnub/14495.05.2012.0040-03	**Date Collected:**	07/5/12
Sample Matrix:	Water	**Date Received:**	07/5/12
Analysis Method:	SM 4500-H+ B	**Units:**	pH Units
		Basis:	NA

pH

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
INF-070512	K1206458-001	6.78	-	-	1	07/05/12 17:05	H
EFF-070512	K1206458-002	7.95	-	-	1	07/05/12 17:09	H
EFFD-070512	K1206458-003	7.94	-	-	1	07/05/12 17:10	H

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1206458
Project No.:	14495.05.2012.0040-03	**Date Collected:**	07/05/12
Project Name:	Boomsnub	**Date Received:**	07/05/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: INF-070512 **Lab Code:** K1206458-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	07/06/12	07/19/12	52.4		

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1206458
Project No.:	14495.05.2012.0040-03	**Date Collected:**	07/05/12
Project Name:	Boomsnub	**Date Received:**	07/05/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFF-070512 **Lab Code:** K1206458-002

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	07/06/12	07/19/12	1.6	J	

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1206458
Project No.:	14495.05.2012.0040-03	**Date Collected:**	07/05/12
Project Name:	Boomsnub	**Date Received:**	07/05/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFFD-070512 **Lab Code:** K1206458-003

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	07/06/12	07/19/12	0.6	U	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.
Now part of the ALS Group
Analytical Results

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1206458
Project:	Boomsnub/14495.05.2012.0040-03	**Date Collected:**	07/05/2012
Sample Matrix:	Water	**Date Received:**	07/05/2012

Volatile Organic Compounds

Sample Name:	INF-070512	**Units:**	ug/L
Lab Code:	K1206458-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Trichlorofluoromethane	**0.41**	J	0.50	0.12	1	07/06/12	07/06/12	KWG1207493	*
1,1-Dichloroethene	**0.88**		0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Methylene Chloride	ND	U	2.0	0.10	1	07/06/12	07/06/12	KWG1207493	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	07/06/12	07/06/12	KWG1207493	
cis-1,2-Dichloroethene	**0.34**	J	0.50	0.067	1	07/06/12	07/06/12	KWG1207493	
1,1,1-Trichloroethane (TCA)	**0.10**	J	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Carbon Tetrachloride	ND	U	0.50	0.096	1	07/06/12	07/06/12	KWG1207493	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Trichloroethene (TCE)	**18**		0.50	0.10	1	07/06/12	07/06/12	KWG1207493	
Bromodichloromethane	ND	U	0.50	0.091	1	07/06/12	07/06/12	KWG1207493	
Tetrachloroethene (PCE)	**1.3**		0.50	0.099	1	07/06/12	07/06/12	KWG1207493	
Dibromochloromethane	ND	U	0.50	0.14	1	07/06/12	07/06/12	KWG1207493	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	07/06/12	07/06/12	KWG1207493	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	07/06/12	07/06/12	KWG1207493	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	07/06/12	07/06/12	KWG1207493	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	87	73-122	07/06/12	Acceptable
Toluene-d8	91	65-144	07/06/12	Acceptable
4-Bromofluorobenzene	78	68-117	07/06/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1206458
Date Collected: 07/05/2012
Date Received: 07/05/2012

Volatile Organic Compounds

Sample Name: EFF-070512
Lab Code: K1206458-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Trichlorofluoromethane	ND	U	0.50	0.12	1	07/06/12	07/06/12	KWG1207493	
1,1-Dichloroethene	ND	U	0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Methylene Chloride	ND	U	2.0	0.10	1	07/06/12	07/06/12	KWG1207493	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	07/06/12	07/06/12	KWG1207493	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	07/06/12	07/06/12	KWG1207493	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Carbon Tetrachloride	ND	U	0.50	0.096	1	07/06/12	07/06/12	KWG1207493	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Trichloroethene (TCE)	**0.45**	J	0.50	0.10	1	07/06/12	07/06/12	KWG1207493	
Bromodichloromethane	ND	U	0.50	0.091	1	07/06/12	07/06/12	KWG1207493	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	07/06/12	07/06/12	KWG1207493	
Dibromochloromethane	ND	U	0.50	0.14	1	07/06/12	07/06/12	KWG1207493	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	07/06/12	07/06/12	KWG1207493	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	07/06/12	07/06/12	KWG1207493	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	07/06/12	07/06/12	KWG1207493	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	87	73-122	07/06/12	Acceptable
Toluene-d8	91	65-144	07/06/12	Acceptable
4-Bromofluorobenzene	80	68-117	07/06/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1206458
Date Collected: 07/05/2012
Date Received: 07/05/2012

Volatile Organic Compounds

Sample Name: EFFD-070512
Lab Code: K1206458-003

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Trichlorofluoromethane	ND	U	0.50	0.12	1	07/06/12	07/06/12	KWG1207493	
1,1-Dichloroethene	ND	U	0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Methylene Chloride	ND	U	2.0	0.10	1	07/06/12	07/06/12	KWG1207493	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	07/06/12	07/06/12	KWG1207493	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	07/06/12	07/06/12	KWG1207493	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Carbon Tetrachloride	ND	U	0.50	0.096	1	07/06/12	07/06/12	KWG1207493	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Trichloroethene (TCE)	**0.43**	J	0.50	0.10	1	07/06/12	07/06/12	KWG1207493	
Bromodichloromethane	ND	U	0.50	0.091	1	07/06/12	07/06/12	KWG1207493	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	07/06/12	07/06/12	KWG1207493	
Dibromochloromethane	ND	U	0.50	0.14	1	07/06/12	07/06/12	KWG1207493	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	07/06/12	07/06/12	KWG1207493	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	07/06/12	07/06/12	KWG1207493	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	07/06/12	07/06/12	KWG1207493	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	86	73-122	07/06/12	Acceptable
Toluene-d8	90	65-144	07/06/12	Acceptable
4-Bromofluorobenzene	78	68-117	07/06/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1206458
Date Collected: 07/05/2012
Date Received: 07/05/2012

Volatile Organic Compounds

Sample Name: TB-070512
Lab Code: K1206458-004

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Trichlorofluoromethane	ND	U	0.50	0.12	1	07/06/12	07/06/12	KWG1207493	
1,1-Dichloroethene	ND	U	0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Methylene Chloride	0.31	J	2.0	0.10	1	07/06/12	07/06/12	KWG1207493	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	07/06/12	07/06/12	KWG1207493	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	07/06/12	07/06/12	KWG1207493	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	07/06/12	07/06/12	KWG1207493	
Carbon Tetrachloride	ND	U	0.50	0.096	1	07/06/12	07/06/12	KWG1207493	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	07/06/12	07/06/12	KWG1207493	
Trichloroethene (TCE)	ND	U	0.50	0.10	1	07/06/12	07/06/12	KWG1207493	
Bromodichloromethane	ND	U	0.50	0.091	1	07/06/12	07/06/12	KWG1207493	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	07/06/12	07/06/12	KWG1207493	
Dibromochloromethane	ND	U	0.50	0.14	1	07/06/12	07/06/12	KWG1207493	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	07/06/12	07/06/12	KWG1207493	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	07/06/12	07/06/12	KWG1207493	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	07/06/12	07/06/12	KWG1207493	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	88	73-122	07/06/12	Acceptable
Toluene-d8	90	65-144	07/06/12	Acceptable
4-Bromofluorobenzene	79	68-117	07/06/12	Acceptable

Comments:

August 2, 2012
OU-3 Laboratory Analytical Results

ALS ENVIRONMENTAL

Client:	EA Engineering, Science and Technology	**Service Request No.:**	K1207530
Project:	Boomsnub	**Date Received:**	08/02/12
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Three water samples and a trip blank sample samples were received for analysis at ALS Environmental on 08/02/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

Calibration Verification Exceptions:
The following analyte was flagged as outside the upper control criterion for Continuing Calibration Verification (CCV) J:\MS13\0809F003.D: Hexachlorobutadiene. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The CAS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

Elevated Detection Limits:
The detection limit was elevated for Methylene Chloride in sample Batch. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the normal limit. The results were "i" flagged to indicate the matrix interference.

Sample Batch QC required dilution due to the presence of elevated levels of non-target analyte. The reporting limits were adjusted to reflect the dilution.

No other anomalies associated with the analysis of these samples were observed.

Approved by _____

CHAIN OF CUSTODY

Columbia Analytical Services™

1317 South 13th Ave, Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

SR#: 1207530

PAGE 1 OF 1 COC #

PROJECT NAME: Boomsnub
PROJECT NUMBER: 14495.05.2012.0040-03
PROJECT MANAGER: J. I Frain
COMPANY/ADDRESS: EA Engineering
720 Sixth Street South Suite 100
CITY STATE ZIP: Kirkland, WA 98033
E-MAIL ADDRESS: jfrain@eaest.com
PHONE #: (425) 451-7400 FAX #: (425) 451-7800
SAMPLER'S SIGNATURE: Richard R. Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐	Volatile Organics 624 ☐ 8260 ☒	Hydrocarbons (*see below) Gas ☐ Diesel ☐ 8021 ☐ BTEX ☐	☐ Fuel Fingerprint (FIQ) ☐ NW-HCID ☐ Oil ☐	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHs 8310 ☐ SIM ☐	Metals (Total or Dissolved) (See list below)	Cyanide ☐	Hex-Chrom ☐ pH Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐	REMARKS
INF-080212	8/2/12	10:40		H_2O	5		X								X		X			
EFF-080212	↓	10:45		↓	5		X								X		X			
EFFD-080212	↓	10:50		↓	5		X								X		X			
TB-080212	↓	NA	47988	↓	2		X													

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
X III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
X V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co (Cr) Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

VOCs - 8260b
Total Metals - Cr
pH

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Richard Read	Signature:	Signature:	Signature:
Date/Time: 8/2/12 10:55	Date/Time: 8/2/12 1430	Date/Time:	Date/Time:
Printed Name: RICK READ	Printed Name:	Printed Name:	Printed Name:
Firm: EA	Firm: AS	Firm:	Firm:

RCOC #1 03/10

8

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1207530
Project:	Boomsnub/14495.05.2012.0040-03	**Date Collected:**	08/2/12
Sample Matrix:	Water	**Date Received:**	08/2/12
Analysis Method:	SM 4500-H+ B	**Units:**	pH Units
		Basis:	NA

pH

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
INF-080212	K1207530-001	**7.00**	-	-	1	08/02/12 15:58	H
EFF-080212	K1207530-002	**8.22**	-	-	1	08/02/12 16:00	H
EFFD-080212	K1207530-003	**8.23**	-	-	1	08/02/12 16:03	H

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1207530
Project No.:	14495.05.2012.0040-03	**Date Collected:**	08/02/12
Project Name:	Boomsnub	**Date Received:**	08/02/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: INF-080212 **Lab Code:** K1207530-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	08/06/12	08/09/12	45.9		

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1207530
Project No.:	14495.05.2012.0040-03	**Date Collected:**	08/02/12
Project Name:	Boomsnub	**Date Received:**	08/02/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFF-080212 **Lab Code:** K1207530-002

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	08/06/12	08/09/12	0.6	U	

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1207530
Project No.:	14495.05.2012.0040-03	**Date Collected:**	08/02/12
Project Name:	Boomsnub	**Date Received:**	08/02/12
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFFD-080212 **Lab Code:** K1207530-003

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	08/06/12	08/09/12	0.6	U	

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1207530
Date Collected: 08/02/2012
Date Received: 08/02/2012

Volatile Organic Compounds

Sample Name: INF-080212
Lab Code: K1207530-001

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Trichlorofluoromethane	**0.38**	J	0.50	0.12	1	08/09/12	08/09/12	KWG1208956	
1,1-Dichloroethene	**0.88**		0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Methylene Chloride	ND	U	2.0	0.10	1	08/09/12	08/09/12	KWG1208956	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	08/09/12	08/09/12	KWG1208956	
cis-1,2-Dichloroethene	**0.41**	J	0.50	0.067	1	08/09/12	08/09/12	KWG1208956	
1,1,1-Trichloroethane (TCA)	**0.14**	J	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Carbon Tetrachloride	ND	U	0.50	0.096	1	08/09/12	08/09/12	KWG1208956	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Trichloroethene (TCE)	**18**		0.50	0.10	1	08/09/12	08/09/12	KWG1208956	
Bromodichloromethane	ND	U	0.50	0.091	1	08/09/12	08/09/12	KWG1208956	
Tetrachloroethene (PCE)	**1.2**		0.50	0.099	1	08/09/12	08/09/12	KWG1208956	
Dibromochloromethane	ND	U	0.50	0.14	1	08/09/12	08/09/12	KWG1208956	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	08/09/12	08/09/12	KWG1208956	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	08/09/12	08/09/12	KWG1208956	
Hexachlorobutadiene	ND	U	2.0	0.11	1	08/09/12	08/09/12	KWG1208956	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	102	73-122	08/09/12	Acceptable
Toluene-d8	105	65-144	08/09/12	Acceptable
4-Bromofluorobenzene	99	68-117	08/09/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1207530
Date Collected: 08/02/2012
Date Received: 08/02/2012

Volatile Organic Compounds

Sample Name: EFF-080212
Lab Code: K1207530-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Trichlorofluoromethane	ND	U	0.50	0.12	1	08/09/12	08/09/12	KWG1208956	
1,1-Dichloroethene	ND	U	0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Methylene Chloride	ND	U	2.0	0.10	1	08/09/12	08/09/12	KWG1208956	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	08/09/12	08/09/12	KWG1208956	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	08/09/12	08/09/12	KWG1208956	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Carbon Tetrachloride	ND	U	0.50	0.096	1	08/09/12	08/09/12	KWG1208956	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Trichloroethene (TCE)	0.40	J	0.50	0.10	1	08/09/12	08/09/12	KWG1208956	
Bromodichloromethane	ND	U	0.50	0.091	1	08/09/12	08/09/12	KWG1208956	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	08/09/12	08/09/12	KWG1208956	
Dibromochloromethane	ND	U	0.50	0.14	1	08/09/12	08/09/12	KWG1208956	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	08/09/12	08/09/12	KWG1208956	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	08/09/12	08/09/12	KWG1208956	
Hexachlorobutadiene	ND	U	2.0	0.11	1	08/09/12	08/09/12	KWG1208956	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	98	73-122	08/09/12	Acceptable
Toluene-d8	103	65-144	08/09/12	Acceptable
4-Bromofluorobenzene	97	68-117	08/09/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1207530
Date Collected: 08/02/2012
Date Received: 08/02/2012

Volatile Organic Compounds

Sample Name: EFFD-080212
Lab Code: K1207530-003

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Trichlorofluoromethane	ND	U	0.50	0.12	1	08/09/12	08/09/12	KWG1208956	
1,1-Dichloroethene	ND	U	0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Methylene Chloride	ND	U	2.0	0.10	1	08/09/12	08/09/12	KWG1208956	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	08/09/12	08/09/12	KWG1208956	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	08/09/12	08/09/12	KWG1208956	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Carbon Tetrachloride	ND	U	0.50	0.096	1	08/09/12	08/09/12	KWG1208956	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Trichloroethene (TCE)	0.39	J	0.50	0.10	1	08/09/12	08/09/12	KWG1208956	
Bromodichloromethane	ND	U	0.50	0.091	1	08/09/12	08/09/12	KWG1208956	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	08/09/12	08/09/12	KWG1208956	
Dibromochloromethane	ND	U	0.50	0.14	1	08/09/12	08/09/12	KWG1208956	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	08/09/12	08/09/12	KWG1208956	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	08/09/12	08/09/12	KWG1208956	
Hexachlorobutadiene	ND	U	2.0	0.11	1	08/09/12	08/09/12	KWG1208956	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	73-122	08/09/12	Acceptable
Toluene-d8	105	65-144	08/09/12	Acceptable
4-Bromofluorobenzene	98	68-117	08/09/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1207530
Date Collected: 08/02/2012
Date Received: 08/02/2012

Volatile Organic Compounds

Sample Name: TB-080212
Lab Code: K1207530-004

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Trichlorofluoromethane	ND	U	0.50	0.12	1	08/09/12	08/09/12	KWG1208956	
1,1-Dichloroethene	ND	U	0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Methylene Chloride	0.24	J	2.0	0.10	1	08/09/12	08/09/12	KWG1208956	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	08/09/12	08/09/12	KWG1208956	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	08/09/12	08/09/12	KWG1208956	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	08/09/12	08/09/12	KWG1208956	
Carbon Tetrachloride	ND	U	0.50	0.096	1	08/09/12	08/09/12	KWG1208956	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	08/09/12	08/09/12	KWG1208956	
Trichloroethene (TCE)	ND	U	0.50	0.10	1	08/09/12	08/09/12	KWG1208956	
Bromodichloromethane	ND	U	0.50	0.091	1	08/09/12	08/09/12	KWG1208956	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	08/09/12	08/09/12	KWG1208956	
Dibromochloromethane	ND	U	0.50	0.14	1	08/09/12	08/09/12	KWG1208956	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	08/09/12	08/09/12	KWG1208956	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	08/09/12	08/09/12	KWG1208956	
Hexachlorobutadiene	ND	U	2.0	0.11	1	08/09/12	08/09/12	KWG1208956	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	98	73-122	08/09/12	Acceptable
Toluene-d8	101	65-144	08/09/12	Acceptable
4-Bromofluorobenzene	98	68-117	08/09/12	Acceptable

Comments:

September 5, 2012
OU-3 Laboratory Analytical Results

ALS ENVIRONMENTAL

Client:	EA Engineering, Science, and Technology	**Service Request No.:**	K1208813
Project:	Boomsnub	**Date Received:**	09/05/12
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Three water samples and a trip blank sample was received for analysis at ALS Environmental on 09/05/12. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

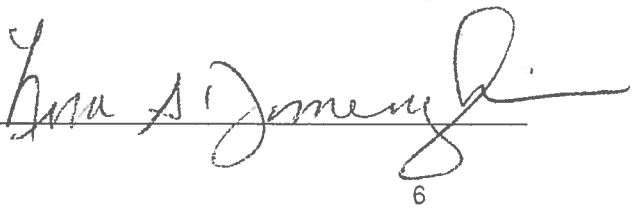
Total Metals

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

Calibration Verification Exceptions:
The following analyte was flagged as outside the control criterion for Continuing Calibration Verification (CCV) J:\MS18\0917F003.D: 1,2-Dichloroethane and 1,2-Dibromo-3-chloropropane. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The CAS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

No other anomalies associated with the analysis of these samples were observed.

Approved by 

CHAIN OF CUSTODY

ALS Environmental

1317 South 13th Ave Kelso, WA 98626 | 360.577.7222 | 800.695.7222 | 360.636.1068 (fax)

SR# 16120 8813

PAGE 1 OF 1 COC#

PROJECT NAME: Boomsnub
PROJECT NUMBER: 14495.05.2012.0040-03
PROJECT MANAGER: J. I Frain
COMPANY NAME: EA Engineering
ADDRESS: 720 Sixth Street South, Suite 100
CITY/STATE/ZIP: Kirkland, WA 98033
E-MAIL: jfrain@eaest.com
PHONE #: (425) 451-7400 FAX #: (425) 451-7800
SAMPLER'S SIGNATURE: Rick R. Read

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐ SIM PAH☐	Volatile Organics 8240☐ 8260☒	Hydrocarbons Gas☐ Diesel☐ (*see below) Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	Metals (Total or Dissolved) (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS, Turb.	(circle) NH_3-N, COD, TKN, TOC, DOC, NO_2+NO_3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity ☐ CO_3☐ HCO_3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases CO_2☐ RSK 175☐ Methane☐ Ethane☐ Ethene☐	REMARKS
INF-090512	9/5/12	8:05		H_2O	5		X						X		X						
EFF-090512	↓	8:10		↓	5		X						X		X						
EFFD-090512	↓	8:15		↓	5		X						X		X						
TB-090512	↓	NA	48631	↓	2		X														

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
X IV. Data Validation Report
X V. EDD

INVOICE INFORMATION

P.O. # _____
Bill To: _____

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 day
X Standard (15 working days)
___ Provide FAX Results
9/24/12
Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co (Cr) Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

VOCs - 8260b
Total Metals - Cr
pH

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Rick R. Read	Signature: [illegible]	Signature:	Signature:
Date/Time: 9/5/12	Date/Time: 9/5/12 1510	Date/Time:	Date/Time:
Printed Name: RICK READ	Printed Name: [illegible]	Printed Name:	Printed Name:
Firm: EA	Firm: ALS	Firm:	Firm:
Date/Time: 8:25			

Analytical Report

Client:	EA Engineering, Science, and Technology	**Service Request:**	K1208813
Project:	Boomsnub/14495.05.2012.0040-03	**Date Collected:**	09/5/12
Sample Matrix:	Water	**Date Received:**	09/5/12
Analysis Method:	SM 4500-H+ B	**Units:**	pH Units
		Basis:	NA

pH

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
INF-090512	K1208813-001	7.16	-	-	1	09/05/12 16:48	H
EFF-090512	K1208813-002	8.10	-	-	1	09/05/12 16:49	H
EFFD-090512	K1208813-003	8.22	-	-	1	09/05/12 16:51	H

Metals

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INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1208813
Project No.:	14495.05.2012.0040-03	**Date Collected:**	9/5/2012
Project Name:	Boomsnub	**Date Received:**	9/5/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: INF-090512 **Lab Code:** K1208813-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	09/12/12	09/14/12	44.7		

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1208813
Project No.:	14495.05.2012.0040-03	**Date Collected:**	9/5/2012
Project Name:	Boomsnub	**Date Received:**	9/5/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFF-090512 **Lab Code:** K1208813-002

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	09/12/12	09/14/12	0.6	U	

Comments:

Metals

- 1 -

INORGANIC ANALYSIS DATA PACKAGE

Client:	EA Engineering, Science, and Tec	**Service Request:**	K1208813
Project No.:	14495.05.2012.0040-03	**Date Collected:**	9/5/2012
Project Name:	Boomsnub	**Date Received:**	9/5/2012
Matrix:	WATER	**Units:**	ug/L
		Basis:	NA

Sample Name: EFFD-090512 **Lab Code:** K1208813-003

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Chromium	200.7	5.0	0.6	1.0	09/12/12	09/14/12	0.6	U	

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1208813
Date Collected: 09/05/2012
Date Received: 09/05/2012

Volatile Organic Compounds

Sample Name: INF-090512
Lab Code: K1208813-001

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Trichlorofluoromethane	**0.46**	J	0.50	0.12	1	09/17/12	09/17/12	KWG1210831	
1,1-Dichloroethene	**0.77**		0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Methylene Chloride	ND	U	2.0	0.10	1	09/17/12	09/17/12	KWG1210831	
trans-1,2-Dichloroethene	**0.10**	J	0.50	0.072	1	09/17/12	09/17/12	KWG1210831	
cis-1,2-Dichloroethene	**0.42**	J	0.50	0.067	1	09/17/12	09/17/12	KWG1210831	
1,1,1-Trichloroethane (TCA)	**0.090**	J	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Carbon Tetrachloride	ND	U	0.50	0.096	1	09/17/12	09/17/12	KWG1210831	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Trichloroethene (TCE)	**17**		0.50	0.10	1	09/17/12	09/17/12	KWG1210831	
Bromodichloromethane	ND	U	0.50	0.091	1	09/17/12	09/17/12	KWG1210831	
Tetrachloroethene (PCE)	**1.1**		0.50	0.099	1	09/17/12	09/17/12	KWG1210831	
Dibromochloromethane	ND	U	0.50	0.14	1	09/17/12	09/17/12	KWG1210831	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	09/17/12	09/17/12	KWG1210831	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	09/17/12	09/17/12	KWG1210831	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	09/17/12	09/17/12	KWG1210831	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	84	73-122	09/17/12	Acceptable
Toluene-d8	92	65-144	09/17/12	Acceptable
4-Bromofluorobenzene	79	68-117	09/17/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1208813
Date Collected: 09/05/2012
Date Received: 09/05/2012

Volatile Organic Compounds

Sample Name: EFF-090512
Lab Code: K1208813-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Trichlorofluoromethane	ND	U	0.50	0.12	1	09/17/12	09/17/12	KWG1210831	
1,1-Dichloroethene	ND	U	0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Methylene Chloride	ND	U	2.0	0.10	1	09/17/12	09/17/12	KWG1210831	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	09/17/12	09/17/12	KWG1210831	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	09/17/12	09/17/12	KWG1210831	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Carbon Tetrachloride	ND	U	0.50	0.096	1	09/17/12	09/17/12	KWG1210831	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Trichloroethene (TCE)	0.51		0.50	0.10	1	09/17/12	09/17/12	KWG1210831	
Bromodichloromethane	ND	U	0.50	0.091	1	09/17/12	09/17/12	KWG1210831	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	09/17/12	09/17/12	KWG1210831	
Dibromochloromethane	ND	U	0.50	0.14	1	09/17/12	09/17/12	KWG1210831	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	09/17/12	09/17/12	KWG1210831	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	09/17/12	09/17/12	KWG1210831	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	09/17/12	09/17/12	KWG1210831	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	85	73-122	09/17/12	Acceptable
Toluene-d8	90	65-144	09/17/12	Acceptable
4-Bromofluorobenzene	79	68-117	09/17/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1208813
Date Collected: 09/05/2012
Date Received: 09/05/2012

Volatile Organic Compounds

Sample Name: EFFD-090512
Lab Code: K1208813-003

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Trichlorofluoromethane	ND	U	0.50	0.12	1	09/17/12	09/17/12	KWG1210831	
1,1-Dichloroethene	ND	U	0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Methylene Chloride	ND	U	2.0	0.10	1	09/17/12	09/17/12	KWG1210831	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	09/17/12	09/17/12	KWG1210831	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	09/17/12	09/17/12	KWG1210831	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Carbon Tetrachloride	ND	U	0.50	0.096	1	09/17/12	09/17/12	KWG1210831	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Trichloroethene (TCE)	**0.41**	J	0.50	0.10	1	09/17/12	09/17/12	KWG1210831	
Bromodichloromethane	ND	U	0.50	0.091	1	09/17/12	09/17/12	KWG1210831	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	09/17/12	09/17/12	KWG1210831	
Dibromochloromethane	ND	U	0.50	0.14	1	09/17/12	09/17/12	KWG1210831	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	09/17/12	09/17/12	KWG1210831	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	09/17/12	09/17/12	KWG1210831	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	09/17/12	09/17/12	KWG1210831	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	85	73-122	09/17/12	Acceptable
Toluene-d8	91	65-144	09/17/12	Acceptable
4-Bromofluorobenzene	79	68-117	09/17/12	Acceptable

Comments:

Client: EA Engineering, Science, and Technology
Project: Boomsnub/14495.05.2012.0040-03
Sample Matrix: Water

Service Request: K1208813
Date Collected: 09/05/2012
Date Received: 09/05/2012

Volatile Organic Compounds

Sample Name: TB-090512
Lab Code: K1208813-004

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Vinyl Chloride	ND	U	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Trichlorofluoromethane	ND	U	0.50	0.12	1	09/17/12	09/17/12	KWG1210831	
1,1-Dichloroethene	ND	U	0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Methylene Chloride	ND	U	2.0	0.10	1	09/17/12	09/17/12	KWG1210831	
trans-1,2-Dichloroethene	ND	U	0.50	0.072	1	09/17/12	09/17/12	KWG1210831	
cis-1,2-Dichloroethene	ND	U	0.50	0.067	1	09/17/12	09/17/12	KWG1210831	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	0.075	1	09/17/12	09/17/12	KWG1210831	
Carbon Tetrachloride	ND	U	0.50	0.096	1	09/17/12	09/17/12	KWG1210831	
1,2-Dichloroethane (EDC)	ND	U	0.50	0.080	1	09/17/12	09/17/12	KWG1210831	
Trichloroethene (TCE)	ND	U	0.50	0.10	1	09/17/12	09/17/12	KWG1210831	
Bromodichloromethane	ND	U	0.50	0.091	1	09/17/12	09/17/12	KWG1210831	
Tetrachloroethene (PCE)	ND	U	0.50	0.099	1	09/17/12	09/17/12	KWG1210831	
Dibromochloromethane	ND	U	0.50	0.14	1	09/17/12	09/17/12	KWG1210831	
1,1,2,2-Tetrachloroethane	ND	U	0.50	0.16	1	09/17/12	09/17/12	KWG1210831	
1,2-Dibromo-3-chloropropane	ND	U	2.0	0.20	1	09/17/12	09/17/12	KWG1210831	*
Hexachlorobutadiene	ND	U	2.0	0.11	1	09/17/12	09/17/12	KWG1210831	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	83	73-122	09/17/12	Acceptable
Toluene-d8	92	65-144	09/17/12	Acceptable
4-Bromofluorobenzene	78	68-117	09/17/12	Acceptable

Comments: