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MCB CAMP LEJEUNE
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TECHNICAL MEMORANDUM FOR OPERATION & MAINTENANCE SUMMARY NOVEMBER 2012 MCB CAMP LEJEUNE NC

12/12/2012

RHEA ENHINEERS & CONSULTANTS, INC.

TECHNICAL MEMORANDUM

To: David Cleland, P.G.
NAVFAC Mid-Atlantic

Date: December 12, 2012

From: Benjamin Grosser, P.G.
Rhēa Engineers & Consultants, Inc.

Cc: Charity Rychak
MCIEAST-MCB CAMLEJ EMD

Re: **IR O&M Summary for November 2012**
Rhēa Project No. 581

Rhēa Engineers & Consultants, Inc. (Rhēa) has been retained by Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under Contract No. N40085-09-D-3237, Task Order No. 0013, to conduct operations and maintenance (O&M) at four treatment facilities aboard Marine Corps Installations East – Marine Corps Base Camp Lejeune (MCIEAST-MCB CAMLEJ), Jacksonville, North Carolina.

The four treatment systems include the following:

+ Operable Unit (OU) 2, Site 82 Groundwater Treatment Plant (GWTP);
+ OU1, Site 78 North GWTP;
+ OU1, Site 78 South GWTP; and
+ Site 89 Pond Aerator System.

BACKGROUND

Installation Restoration (IR) Site 82 covers approximately 30 acres and was historically used as a disposal area for materials from Lot 203. The area was reportedly used for storage, disposal, and handling of potentially hazardous waste and materials. A GWTP was constructed on IR Site 82 to address volatile organic compounds (VOCs) and metals in the groundwater. Metals treatment was discontinued in 2009. The IR Site 82 GWTP is supplied by

four deep recovery wells (DRW-1 through DRW-4) and six shallow recovery wells (SRW-1 through SRW-6). In addition, investigative purge water collected from other IR sites is deposited into the sump at the IR Site 82 GWTP.

IR Site 78 covers approximately 590 acres of industrial land in the Hadnot Point Industrial Area (HPIA). The HPIA is comprised of maintenance shops, gas stations, administrative offices, printing shops, warehouses, storage yards, and other similar industrial facilities. Two GWTPs, IR Site 78 North and IR Site 78 South, were constructed to address solvents and fuel-related constituents identified in the groundwater. The IR Site 78 North GWTP is supplied by three active recovery wells (RW-10, RW-11, and RW-12). The IR Site 78 South GWTP is supplied by seven active recovery wells (RW-5, RW-6, RW-8, RW-13, RW-14, RW-15, and IR78-GW58).

IR Site 89 is located on the New River Air Station side of MCIEAST-MCB CAMLEJ. IR Site 89 includes the former Defense Reutilization and Marketing Office (DRMO), a large wooded area to the east and south, a portion of Camp Geiger to the west, and is surrounded by Edwards Creek to the west and south. The DRMO operated until 2000 as a storage yard for items such as scrap and surplus metal, electronic equipment, vehicles, rubber tires, and fuel bladders (mobile storage tanks). Soil at the former DRMO location was treated on site to address chlorinated solvents. Pond aerators were installed in a small pond on Edwards Creek to aid in the degradation of any organic contaminants present in the creek's surface waters.

WATER TREATMENT SYSTEMS

IR Site 82 GWTP

The IR Site 82 GWTP is housed inside an industrial building at Lot 203. The influent groundwater from the recovery wells and the sump is treated in the sequential order listed below:

Shallow Wells and Sump

1. Holding Tank/Reactivation Tank.
2. Clarifier.
3. 145 Tank.
4. 110 Tank.

Deep Wells, Shallow Wells, and Sump

1. 110 Tank.
2. Air Stripper.
3. 220 Tank.
4. Cartridge Filters (in parallel).
5. Carbon Vessels (in parallel).
6. Effluent Holding Tank.
7. Effluent (to Wallace Creek).

The sludge collected in the bottom of the clarifier is passed through filter socks, and the filtered fluid is recirculated through the treatment system via the sump. The used filter socks and cartridge filters are periodically transported to an off-site facility for proper disposal.

IR Site 78 North and South GWTPs

IR Site 78 North and South GWTPs are similar systems housed inside industrial buildings within the HPIA. The influent groundwater from the recovery wells and sumps is treated in the sequential order listed below:

1. Oil/Water Separator.
2. Flocculation Tank.
3. Settling Tank.
4. Sand Filters (in parallel).
5. Air Stripper.
6. Bag Filters (in parallel).
7. Carbon Vessels (in series).
8. Effluent Holding Tank.
9. Effluent (to sanitary sewer).

Flocculent from the settling tank is transferred to a sludge tank. The sludge is periodically passed through filter socks, and the filtered fluid is recirculated through the treatment system via the oil/water separator (OWS). The used filter socks are periodically transported to an off-site facility for proper disposal. Supernatant from the OWS is transferred to the Environmental Management Division Resource Conservation Recovery Section storage lot for proper disposal.

IR Site 89 Pond Aerator

The IR Site 89 Pond Aerator is located in a small impounded pond located on Edwards Creek, at the southwest corner of the site. IR Site 89 consists of two floating aerators that operate in alternating 12-hour timed intervals. The

pond aerator system also includes an adjustable weir at the outflow of the pond to control the water depth and the retention time of the surface waters within the pond.

OPERATIONS AND MAINTENANCE

IR Site 82 GWTP

In November 2012, Rhēa performed daily and weekly inspections at the IR Site 82 GWTP that included the following: recording readings for the well totalizers; recording pressure readings for the process pumps, cartridge filters, and carbon vessels; and observing the condition of the fire extinguishers, eye-wash stations, safety lights, and other plant equipment. Routine maintenance conducted at this GWTP includes field well checks, cartridge filter replacement, sump cleaning, and carbon vessel backwashing.

During the month of November Rhēa completed the following additional maintenance:

+ Cleaned and replaced the flow meter at SRW-3;
+ Replaced the thermal overloads at SRW-3, SRW-5, and SRW-6;
+ Installed a new float tree in the 220 tank;
+ Cleaned the air stripper;
+ Replaced the groundwater level sensors at DRW-1 and DRW-2; and
+ Replaced the carbon filter manifold.

In addition to the above maintenance items, Rhēa personnel completed the second round of acid treatment to clean the air stripper tower. The air stripper cleaning involved cycling an acid solution through the air stripper and then neutralizing the solution. After the acid-washing, the system water was monitored and groundwater in the effluent tank was checked for appropriate pH before any system water was discharged.

Rhēa personnel also assessed and corrected a relay fault within the GWTP control panel. This relay was causing the system to cycle improperly by not activating all recovery wells as described further below.

IR Site 78 North GWTP

In November 2012, Rhēa completed daily and weekly inspections at the IR Site 78 North GWTP that included the following: recording system totalizer readings; recording pressure readings on the sand filters and carbon vessels; and, observing the condition of the fire extinguishers, eye wash station,

safety lights, and other plant equipment. Routine maintenance conducted at this GWTP includes bag filter replacement, air compressor maintenance, air stripper maintenance, OWS and settling tank cleaning, and backwashing of sand filters and carbon vessels.

Additionally, during the month of November well cleanouts were conducted at Site 78 North GWTP recovery wells RW-10 and RW-12. Rhēa personnel also cleaned and vacuumed out the oil-water separator and disassembled and cleaned the air stripper plates.

IR Site 78 South GWTP

In November 2012, Rhēa completed daily and weekly inspections at the IR Site 78 South GWTP that included the following: recording system totalizer readings; recording pressure readings on the sand filters and carbon vessels; and, observing the condition of the fire extinguishers, eye wash station, safety lights, and other plant equipment. Routine maintenance conducted at this GWTP includes bag filter replacement, air compressor maintenance, air stripper maintenance, OWS and settling tank cleaning, and backwashing of sand filters and carbon vessels.

Additional non-routine maintenance completed at the IR Site 78 South GWTP during the month of November included: replacing the sand filters, sand media, and associated plumbing; recovery well gauging; and conducting well cleanouts at RW-6, RW-13, and RW-15. The gauging data for the Site 78 South recovery wells is shown below.

Recovery Well	Depth to Water (ft)	Depth to Bottom (ft)
RW-6	8.50	30.20
RW-13	16.00	32.20
RW-15	16.85	32.00

IR Site 89 Pond Aerator

Rhēa completed daily inspections and periodic maintenance of the Site 89 Pond Aerator. Rhea's inspections and maintenance included periodic cleaning of the pump nozzles and removal of algae and vegetation from the pond. The pond functioned properly throughout the month.

ANALYTICAL RESULTS AND TREATMENT VOLUME

Monthly samples collected from each treatment system were analyzed for contaminants of concern (COCs) and compared to remediation goals identified in the Record of Decision (ROD) for OU1 and OU2. The ROD limits, monthly VOC treatment volume, cumulative VOC treatment volume, and monthly treatment system flows are shown on the attached analytical summary tables.

IR Site 82 GWTP

Rhēa collected monthly treatment system samples, on November 1, 2012, from sample ports installed at the deep well influent (CLJ-IND-R-61), shallow well influent (CLJ-INS-R-61), after the air stripper unit (CLJ-AS-R-61), and from the system effluent (CLJ-EF-R-61). Select samples were analyzed for the following parameters:

+ VOCs using United States Environmental Protection Agency (USEPA Method 8260B;
+ Arsenic, barium, beryllium, calcium, chromium, iron, lead, manganese, mercury, and vanadium using USEPA Methods 6020 and 7470;
+ Total dissolved solids (TDS) using USEPA Method 160.1;
+ Total suspended solids (TSS) using USEPA Method 160.2; and
+ pH using USEPA Method 150.1.

Though not identified in the ROD, 1,1,2,2-tetrachloroethane (PCA) has been identified at elevated concentrations at IR Site 82. The influent PCA concentration was compared to the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Waste Management, Federal Remediation Branch Target Screening Values (NCTSV). The effluent PCA concentration was compared to North Carolina surface water quality (NCSWQ) standards based on the North Carolina "Red Book" dated May 1, 2007.

Analytical results for 1,2-dichloroethane, tetrachloroethene (PCE), and vinyl chloride (VC) have occasionally been reported at levels below their respective practical quantitation limits (PQL). However, the PQL was reported above the ROD remedial goal. These instances may not be indicative of an exceedance. In addition, the PQL values were below effluent discharge limits, except for PCE, at IR Site 82. The effluent samples at IR Site 82 were not diluted. If detected, PCE approaching the effluent discharge limit will be "J" flagged. A "J" flag indicates an approximate analytical result reported between the method detection limit and the PQL.

Analytical results for IR Site 82 GWTP are presented in Table 1 (attached). The SRW and DRW influent samples exhibited ROD remedial goal exceedances for PCE and trichloroethene (TCE). Additionally, the DRW influent sample exhibited ROD remedial goal exceedances for trans-1,2-dichloroethene (tDCE) and VC. PCA was detected above the NCTSV in the SRW influent sample. The effluent levels of the analyzed constituents were all below the ROD remedial goals and discharge limits. The effluent level of PCA was below the NCSWQ limit.

During the month of November 2012, the IR Site 82 GWTP treated approximately 2.3 million gallons of groundwater, with 100 percent efficiency, and removed 38 pounds of VOCs.

Figure 1 (attached) shows the shallow and deep influent flow volumes for the past two years. The decrease in influent flow from the deep wells during the month of November can be attributed to failed groundwater sensors at DRW-1 and DRW-2. Rhēa subsequently replaced the groundwater sensors in DRW-1 and DRW-2. Additionally, the decreased influent volume may also be attributed to a faulty relay in the control panel. This relay was not sending a signal to all wells to reactivate once the system cycled. As such, not all wells would reactivate each time the system completed a pumping cycle in spite of the control panel indicating that the signal was sent properly. Rhēa personnel traced out the electrical issue and replaced the relay to correct the problem.

The influent VOC concentrations associated with the deep and shallow flows are shown in Figure 2 (attached). Figure 3 (attached) shows the total VOCs removed per month and the cumulative amount of VOCs removed during Rhea's operation and maintenance of the IR Site 82 GWTP. Results prior to October 2007 were provided by Shaw.

IR Site 78 North GWTP

Rhēa collected monthly treatment system samples, on November 1, 2012, from sample ports installed in the recovery well influent (CLN-IN-R-61) and from the system effluent (CLN-EF-R-61). Select samples were analyzed for the following parameters:

+ VOCs using USEPA Method 8260B;
+ Oil and grease using USEPA Method 1664A;
+ TDS using USEPA Method 160.1;
+ TSS using USEPA Method 160.2; and
+ pH using USEPA Method 150.1.

Analytical results for the Site 78 North GWTP are presented in Table 2 (attached). The influent samples contained benzene, VC, and TCE at concentrations that exceeded ROD remedial goals. Effluent concentrations of the analyzed constituents were below their ROD remedial goals and discharge limits.

The IR Site 78 North GWTP treated 67,188 gallons of groundwater with 100 percent efficiency, and removed 0.03 pounds of VOCs in November 2012. Figure 4 (attached) shows the influent flow volumes for the past two years. The decreased influent flow in the month of November can be attributed to system downtime associated with cleaning the fouled oil-water separator and air stripper. Additionally, Rhēa personnel noted decreased flows from RW-10 and RW-12. Upon assessing, Rhēa determined that the product recovery lines had become fouled and required replacement. The lines from RW-10 and RW-12 to the treatment system were replaced in late November.

The influent VOC concentrations are shown in Figure 5 (attached). The influent VOC concentration and pounds of VOCs removed for the month of November are relatively consistent with the influent VOC concentration and amount of removed VOCs recorded for the last year.

Figure 6 (attached) shows the total VOCs removed per month and the cumulative amount of VOCs removed during Rhea's operation and maintenance of the IR Site 78 North GWTP. Results prior to October 2007 were provided by Shaw. The March 2011 data point was removed from Figures 5 and 6 for graphing purposes. The abnormally high VOC concentration reported during March 2011 was an anomaly due to elevated chloroform and acetone analytical results. Chloroform and acetone are not COCs and have not been detected before or since March 2011 at the reported levels.

IR Site 78 South GWTP

Rhēa collected monthly treatment system samples, on November 1, 2012, from sample ports installed in the recovery well influent (CLS-IN-R-61) and from the system effluent (CLS-EF-R-61). Select samples were analyzed for the following parameters:

+ VOCs using USEPA method 8260B;
+ Oil and grease using USEPA method 1664A;
+ TDS using USEPA method 160.1;
+ TSS using USEPA method 160.2; and
+ pH using USEPA method 150.1.

Analytical results for the IR Site 78 South GWTP are presented in Table 3 (attached). The influent samples contained benzene and TCE at concentrations that exceeded ROD remedial goals. Effluent levels of the analyzed constituents were below their ROD remedial goals and discharge limits.

The IR Site 78 South GWTP treated 169,672 gallons of groundwater with 100 percent efficiency, and removed 0.15 pounds of VOCs in November 2012. Figure 7 (attached) shows the influent flow volumes for the past two years. The influent flow volume for the month of November is relatively consistent with the monthly influent flows recorded during the last year. The influent VOC concentrations are shown in Figure 8 (attached).

Figure 9 (attached) shows the total VOCs removed per month and the cumulative amount of VOCs removed during Rhea's operation and maintenance of the IR Site 78 South GWTP. Results prior to October 2007 were provided by Shaw. The increase in VOC removal after June 2010 shown in Figure 9 can be attributed to system upgrades and the reactivation of RW-15. RW-15 is located within a source area and was reactivated in May 2010.

RECOMMENDATIONS

Based on Rhēa's review of the data collection for this period, and our operations and maintenance experience, the following recommendations are presented:

+ Abandon the former recovery wells at IR Site 78 North (RW-1, RW-2, RW-3, and RW-4) and IR Site 78 South (RW-7 and RW-9) if there are no plans to use them in future recovery efforts (Technical Memorandum for July 2011).

+ Given the low to asymptotic rates of recovery for IR Site 78 North and South, Rhēa recommends assessing the feasibly of alternate remedial approaches (i.e., air sparge, biosparge, or mobile sparge system) in conjunction with the existing pump and treat systems to remove lingering contaminants of concern outside the sphere of influence of the system.

Rhēa will continue to maintain system components and pumps to preserve system performance. Rhēa will continue to observe treatment system operations and assess potential optimizations.

TABLES

Table 1
IR Site 82
Groundwater Treatment Plant
Monthly Monitoring Results
November 2012

Project #581-01
Completed By: JLE
Checked By: BDG

			INFLUENT (IN)[1]											EFFLUENT (EF)[2]							
Sample Point			CLJ-INS-R-61			CLJ-IND-R-61				CLJ-AS-R-61					CLJ-EF-R-61			CLJ-TB-R-61			
Date Sampled			11/1/12			11/1/12				11/1/12					11/1/12			11/1/12			
Date Analyzed			11/9/12			11/8/12				11/7/12					11/7/12			11/8/12			
Volatiles:	**Method**	**Remedial Goals (µg/L)**	PQL[4]	Results in µg/L		Dilution	PQL[4]	Results in µg/L		Dilution	PQL[4]	Results in µg/L		Dilution	**Daily Effluent Discharge Limit (µg/L)**	PQL[4]	Results in µg/L		Dilution	PQL[4]	Results in µg/L		Dilution
1,2-Dichloroethane	8260B	0.38	1	1	U	1	2	2	U	2	1	1	U	1	113,000	1	1	U	1	1	1	U	1
trans-1,2-Dichloroethene	8260B	70	1	49		1	2	**120**		2	1	1	U	1	100	1	1	U	1	1	1	U	1
Ethylbenzene	8260B	29	1	1	U	1	2	2	U	2	1	1	U	1	430	1	1	U	1	1	1	U	1
Tetrachloroethene	8260B	0.7	1	**140**		1	2	**34**		2	1	1	U	1	0.8	1	1	U	1	1	1	U	1
Trichloroethene	8260B	2.8	10	**320**		10	20	**960**		20	1	1	U	1	92.4	1	1	U	1	1	1	U	1
Vinyl Chloride	8260B	0.015	2	2	U	1	4	**22**		2	2	2	U	1	525	2	2	U	1	2	2	U	1
1,1,2,2-Tetrachloroethane[3]	8260B	0.2	1	**250**		1	2	**2.0**	U	2	1	**16.0**		1	4	1	1	U	1	1	1	U	1
Other VOCs	8260B	N/A	1	193.6		1	Various	888.1		Various	Various	Various	U	1	NS	Various	Various	U	1	Various	Various	U	1
Total VOC Concentration:	8260B		**INS =**	952.6			**IND =**	2,024.1								**EF =**	0.0						
Metals[5]:																							
Arsenic (As)	6010	50	8	8.0	U	1	8	8.0	U	1	8.0	8.0	U	1	50	8	8.0	U	1	N/A	N/A		N/A
Barium (Ba)	6020	1,000	5	12.0		1	5	7.2		1	5	7.1		1	1,000	5	9.3		1	N/A	N/A		N/A
Beryllium (Be)	6020	4	5	5.0	U	1	5	5.0	U	1	5	5.0	U	1	0.117	5	5.0	U	1	N/A	N/A		N/A
Calcium (Ca)	6020	N/A	50	47,000		1	50	59,800		1	50	59,100		1	NS	50	59,400		1	N/A	N/A		N/A
Chromium (Cr)	6020	50	15	10.0	U	1	15	10.0	U	1	15	10.0	U	1	20	15	10.0	U	1	N/A	N/A		N/A
Iron (Fe)	6020	N/A	100	1,240		1	100	598		1	100	428		1	NS	100	1,720		1	N/A	N/A		N/A
Lead (Pb)	6020	15	5	5.0	U	1	5	5.0	U	1	5	5.0	U	1	25	5	5.0	U	1	N/A	N/A		N/A
Manganese (Mn)	6020	50	5	23.5		1	5	11.1		1	5	5.0		1	50	5	58.8		1	N/A	N/A		N/A
Mercury (Hg) (µg/L)	7470	1.1	0.20	0.20	U	1	0.20	0.20	U	1	0.20	0.20	U	1	0.025	0.20	0.20	U	1	N/A	N/A		N/A
Vanadium (V)	6020	80	25	10	U	1	25	10	U	1	25	10	U	1	NS	25	10	U	1	N/A	N/A		N/A
Wet Chemistry:																							
TDS	160.1	N/A	10,000	130,000		1	10,000	180,000		1	10,000	180,000		1	NS	10,000	170,000		1	N/A	N/A		N/A
TSS	160.2	N/A	4,000	4,000	U	1	4,000	4,000		1	4,000	4,000	U	1	NS	4,000	8,800		1	N/A	N/A		N/A
pH	150.1	N/A	N/A	7.1		1	N/A	7.5		1	N/A	8.1		1	NS	N/A	7.9		1	N/A	N/A		N/A

Initial Gallons Deep Wells:	322,102,840	Gallons Treated Deep Wells:	324,270,194	Total Gallons Treated Deep Wells:	2,167,354
Initial Gallons Shallow Wells:	14,188,279	Gallons Treated Shallow Wells:	14,334,219	Total Gallons Treated Shallow Wells:	145,940
				Total Flow:	2,313,294

Notes: N/A - Not applicable.
NS - No standard established.
J - The associated value is an estimated quantity between the Method Detection Limit and the PQL.
U - Not detected above the PQL.
Exceedances of the remedial goals are bolded and highlighted in gray.
PQL - Practical Quantitation Limit.
[ ] - Result not above PQL; however, PQL was above remedial goal.
INS - Influent shallow.
IND - Influent deep.

*Total VOCs treated prior to date = 207,292 lbs
Total VOCs treated this month = 38 lbs
Total VOCs treated to date = 207,330 lbs

*Results prior to October 2007 were provided by Shaw.

[1]Influent exceedances are based on the Remedial Goal in the ROD (Sites 6, 9, and 82), Baker, 1993.
[2]Effluent exceedances are based on numerous water quality criteria (Final ROD, Table II, Sept 1993).
[3]1,1,2,2-Tetrachloroethane is not a COC in the ROD but is being tracked for optimization purposes. Its identified remedial goal is assumed to be the Interim Concentration, which is found in the NC 2L Groundwater Classifications and Standards Guidelines. Its effluent discharge limit is assumed to be the NC Stream Water Discharge Limit of 4 µg/L, which is a Human Health Standard and is based on the consumption of fish.
[4]Dilution is performed when chemical concentrations are too high to maintain QA/QC protocols. As sample dilutions increase, PQL increases as well.
[5] Metal results not detected above the PQL were reported with their Method Detection Limit value.

Monthly Treatment Rate
(IN - EF) 2,977 µg/L

Weighted Treatment Efficiency
$[(C_{IS} / 1000 \times Q_{IS}) + (C_{ID} / 1000 \times Q_{ID}) - (C_{EF} / 1000 \times Q_{EF})] \times (8.33 / 10^6)$ 38 lbs/month

Total Removal Efficiency
(INS + IND) - EF / (INS + IND) x 100 100.00 %

1 liter = 0.26417 gal
I mg = 2.2×10^{-6} lbs

$(mg / L) \times (2.2 \times 10^{-6}$ lbs / 1 mg) x (1 L / 0.26417 gal)

$(2.2$ lbs / 0.26417 gal) x $(1 / 10^6)$ = $\mathbf{8.33 / 10^6}$

C_{IS} = Total Influent Shallow VOC Concentration
C_{ID} = Total Influent Deep VOC Concentration
C_{EF} = Total Effluent VOC Concentration
Q_{IS} = Total Influent Shallow Flow
Q_{ID} = Total Influent Deep Flow
Q_{EF} = Total Flow

Comments: Constituents were screened as defined by the goals of the ROD using the Standard 8260B Method. Note that the Standard 8260B Method can only achieve a method detection limit for vinyl chloride of 0.20 µg/L (remediation goal of 0.015 µg/L), and 0.26 µg/L for 1,1,2,2 - tetrachloroethane.

Table 2
IR Site 78 North
Groundwater Treatment Plant
Monthly Monitoring Results
November 2012

Project #581-02A
Created By: JLE
Checked By: BDG

			INFLUENT (IN)[1]				EFFLUENT (EF)[2]				
Sample Point			CLN-IN-R-61					CLN-EF-R-61			
Date Sampled		Remedial Goal	11/1/12				Daily Effluent Discharge Limit (µg/L)	11/1/12			
Date Analyzed			11/7/12					11/7/12			
Volatiles:	**Method**		PQL[3]	Results in µg/L		Dilution		PQL[3]	Results in µg/L		Dilution
Benzene	8260B	1	1	**2.5**		1	100	1	1	U	1
Dichloroethene (total)	8260B	70	2	36.5		1	100	2	2	U	1
Ethylbenzene	8260B	29	1	1	U	1	100	1	1	U	1
Tetrachloroethene	8260B	0.7	1	1	U	1	100	1	1	U	1
Toluene	8260B	1,000	1	1	U	1	100	1	1	U	1
Trichloroethene	8260B	2.8	1	**10**		1	100	1	1	U	1
Vinyl Chloride	8260B	0.015	2	**3.9**		1	100	2	2	U	1
Xylenes (total)	8260B	400	3	3	U	1	100	3	3	U	1
Other VOCs	8260B	N/A	Various	Various	U	1	N/A	Various	Various	U	1
Total VOCs Treated:	8260B		**IN =**	52.9				**EF =**	0.0		
Metals:											
Arsenic (As)	6020	50	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Barium (Ba)	6020	1,000	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Beryllium (Be)	6020	4	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Calcium (Ca)	6020	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Chromium (Cr)	6020	50	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Iron (Fe)	6020	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Manganese (Mn)	6020	50	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Vanadium (V)	6020	110	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Wet Chemistry Method:											
TDS	160.1	N/A	10,000	150,000		1	N/A	10,000	210,000		1
TSS	160.2	N/A	4,000	190,000		1	45,000	4,000	4,000	U	1
pH	150.1	N/A	N/A	6.4		1	6.8 - 8.5	N/A	7.8		1
Oil & Grease	1664A	N/A	5,000	5,000	U	1	60,000	5,000	5,000	U	1

Initial Gallons on the First Day of the Month:	28,828,270	Gallons Treated at Last Day of the Month:	28,895,458
		Monthly Total of Gallons Treated:	67,188

Notes: N/A - Not applicable.
NS - No standard established.
J - The associated value is an estimated quantity between the Method Detection Limit and the PQL.
U - Not detected above the PQL.
PQL - Practical Quantitation Limit.
[ ] - Result not above PQL; however, PQL was above remedial goal.
Exceedances of the remedial goals are highlighted in gray.

*Total VOCs treated prior to date =	130.85 lbs
Total VOCs treated this month =	0.03 lbs
Total VOCs treated to date =	130.88 lbs

[1]Influent exceedances are based on the Remedial Goal in the ROD (Sites 21, 24, and 78). Baker, 2004.
[2]Effluent exceedances are based on the listed Effluent Limitations and Monitoring Requirements and Part III, Subsection C.a.(1) in the NPDES Permit NC0063029, dated 9/10/07, for the wastewater treatment plant at Camp Lejeune; no pre-treatment requirements.
[3]Dilution is performed when chemical concentrations are too high to maintain QA/QC protocols. As sample dilutions increase, PQL increases as well.

Monthly Treatment Rate
(IN - EF) 52.9 µg/L

Weighted Treatment Efficiency
$[(C_{IN} / 1000 \times Q_{IN}) - (C_{EF} / 1000 \times Q_{EF})] \times (8.33 / 10^6)$ 0.03 lbs / month

Total Removal Efficiency
(IN - EF) / IN x 100 100.00 %

1 liter = 0.26417 gal
I mg = 2.2×10^{-6} lbs
(1 mg / L) x (2.2×10^{-6} lbs / 1 mg) x (1 L / 0.26417 gal) = 8.33×10^{6} lbs/gal
(2.2 lbs / 0.26417 gal) x ($1 / 10^6$) = $8.33 / 10^6$

C_{IN} = Total Influent VOC Concentration
C_{EF} = Total Effluent VOC Concentration
Q_{EF} = Total Flow

Comments: Constituents were screened as defined by the goals of the ROD using the Standard 8260B Method. Note that the Standard 8260B Method can only achieve a method detection limit for vinyl chloride of 0.20 µg/L (remediation goal of 0.015 µg/L).

Table 3
IR Site 78 South
Groundwater Treatment Plant
Monthly Monitoring Results
November 2012

Project #581-02B
Created By: JLE
Checked By: BDG

			INFLUENT (IN)[1]					EFFLUENT (EF)[2]			
Sample Point			CLS-IN-R-61					CLS-EF-R-61			
Date Sampled		Remedial Goal (µg/L)	11/1/12				Daily Effluent Discharge Limit (µg/L)	11/1/12			
Date Analyzed			11/7/12					11/7/12			
Volatiles:	**Method**		PQL[3]	Results in µg/L		Dilution		PQL[3]	Results in µg/L		Dilution
Benzene	8260B	1	1	**9.2**		1	100	1	1	U	1
Dichloroethene (total)	8260B	70	2	28		1	100	2	2	U	1
Ethylbenzene	8260B	29	1	8.3	U	1	100	1	1	U	1
Tetrachloroethene	8260B	0.7	1	1	U	1	100	1	1	U	1
Toluene	8260B	1,000	2	57		2	100	1	1	U	1
Trichloroethene	8260B	2.8	1	**11**		1	100	1	1	U	1
Vinyl Chloride	8260B	0.015	2	2	U	1	100	2	2	U	1
Xylenes (total)	8260B	400	3	75		1	100	3	3	U	1
Other VOCs	8260B	N/A	1	Various		1	N/A	Various	Various	U	1
Total VOCs Treated:	8260B		**IN =**	105.2				**EF =**	0		
Metals:											
Arsenic (As)	6020	50	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Barium (Ba)	6020	1,000	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Beryllium (Be)	6020	4	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Calcium (Ca)	6020	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Chromium (Cr)	6020	50	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Iron (Fe)	6020	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Manganese (Mn)	6020	50	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Vanadium (V)	6020	110	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Wet Chemistry Method:											
TDS	160.1	N/A	10,000	190,000		1	N/A	10,000	210,000		1
TSS	160.2	N/A	4,000	28,000		1	45,000	4,000	4,000	U	1
pH	150.1	N/A	N/A	7.4		1	6.8 - 8.5	N/A	7.9		1
Oil & Grease	1664A	N/A	5,000	5,000	U	1	60,000	5,000	5,000	U	1

Initial Gallons on the First Day of the Month:	25,815,163	Gallons Treated at Last Day of the Month:	25,984,835
		Monthly Total of Gallons Treated:	169,672

Notes: N/A - Not applicable.
NS - No standard established.
J - The associated value is an estimated quantity between the Method Detection Limit and the PQL.
U - Not detected above the PQL.
PQL - Practical Quantitation Limit.
[ ] - Result not above PQL; however, PQL was above remedial goal.
Exceedances of the remedial goals are highlighted in gray.

*Total lbs treated prior to date =	115.82 lbs
Total lbs treated this month =	0.15 lbs
Total lbs treated to date =	115.97 lbs

[1]Influent exceedances are based on the Remedial Goal in the ROD (Sites 21, 24, and 78). Baker, 2004.

[2]Effluent exceedances are based on the listed Effluent Limitations and Monitoring Requirements and Part III, Subsection C.a.(1) in the NPDES Permit NC0063029, dated 9/10/07, for the wastewater treatment plant at Camp Lejeune; no pre-treatment requirements.
[3]Dilution is performed when chemical concentrations are too high to maintain QA/QC protocols. As sample dilutions increase, PQL increases as well.

Monthly Treatment Rate
(IN - EF) 105.2 µg/L

Weighted Treatment Efficiency
$[(C_{IN} / 1000 \times Q_{IN}) - (C_{EF} / 1000 \times Q_{EF})] \times (8.33 / 10^6)$ 0.15 lbs/month

Removal Efficiency
(IN - EF) / IN x 100 100 %

1 liter = 0.26417 gal
I mg = 2.2×10^{-6} lbs
$(1 \text{ mg / L}) \times (2.2 \times 10^{-6} \text{ lbs / 1 mg}) \times (1 \text{ L / 0.26417 gal}) = 8.33 \times 10^{6}$ lbs/gal
$(2.2 \text{ lbs / 0.26417 gal}) \times (1 / 10^{6}) = 8.33 / 10^{6}$

Comments: Constituents were screened as defined by the goals of the ROD using the Standard 8260B Method. Note that the Standard 8260B Method can only achieve a method detection limit for vinyl chloride of 0.20 µg/L (remediation goal of 0.015 µg/L).

FIGURES

Figure 1
IR Site 82 GWTP - Influent Flow

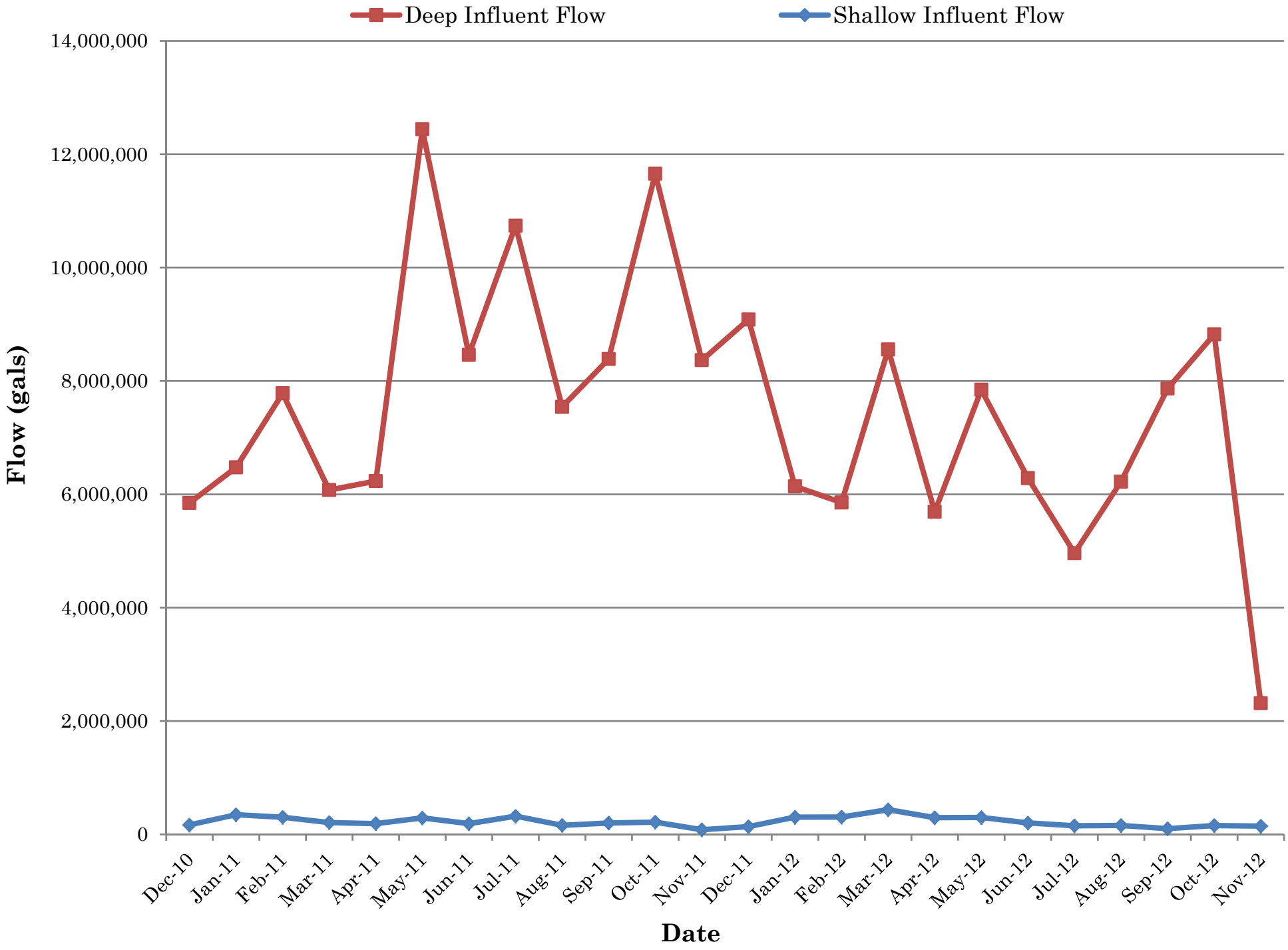


Figure 2
IR Site 82 GWTP - Influent VOC Concentration

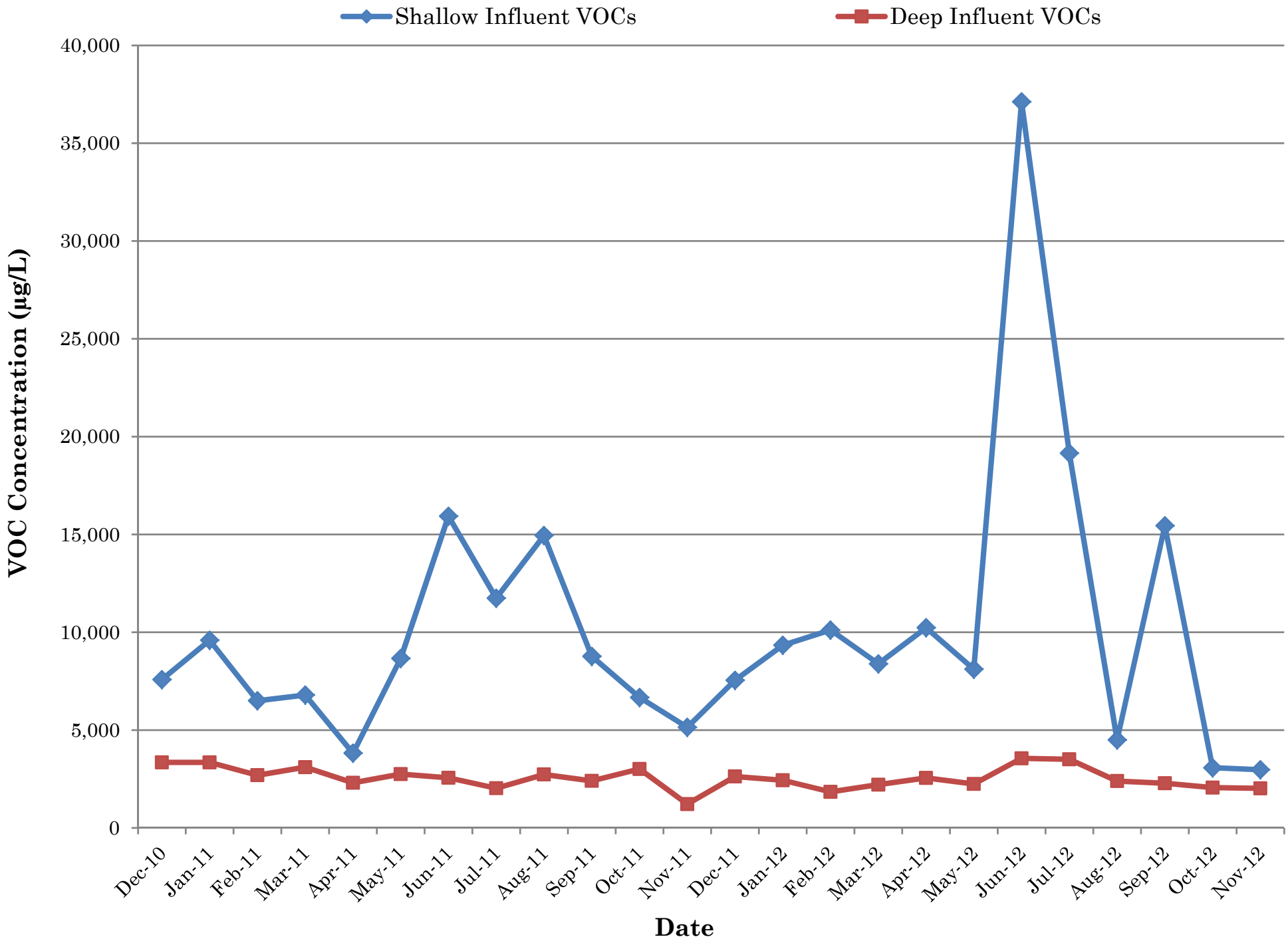


Figure 3
IR Site 82 GWTP - Total VOCs Removed

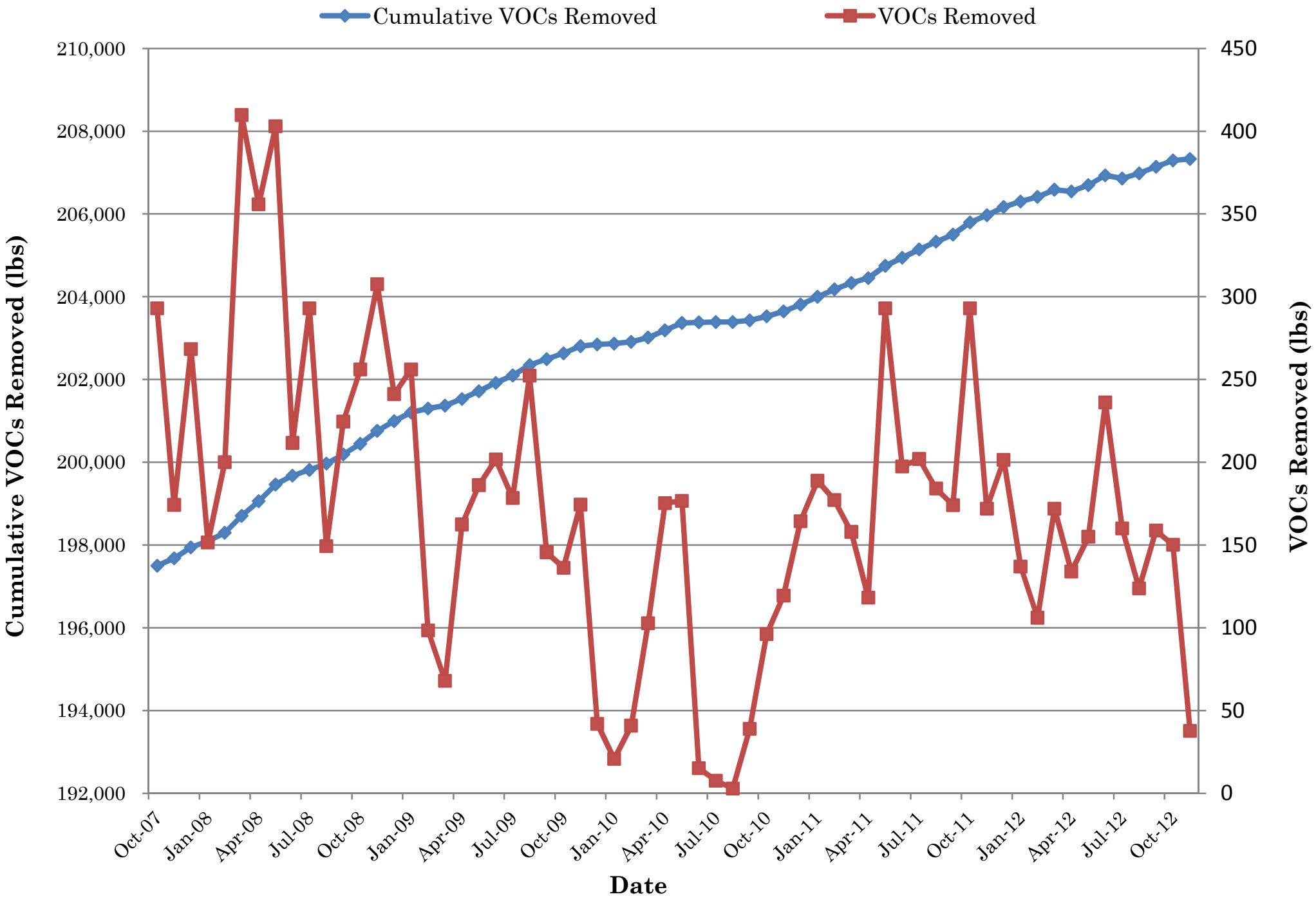


Figure 4
IR Site 78 North GWTP - Influent Flow

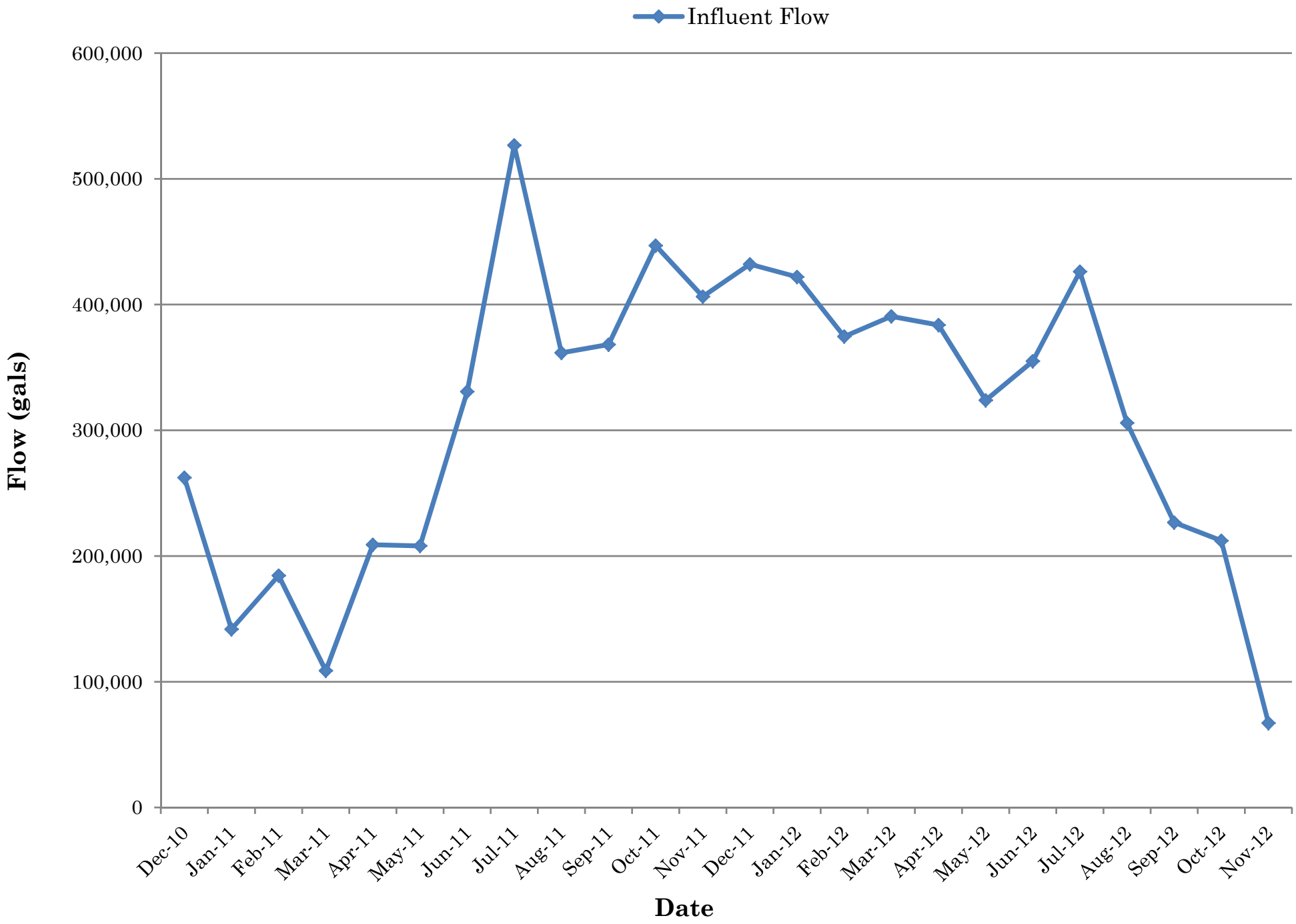
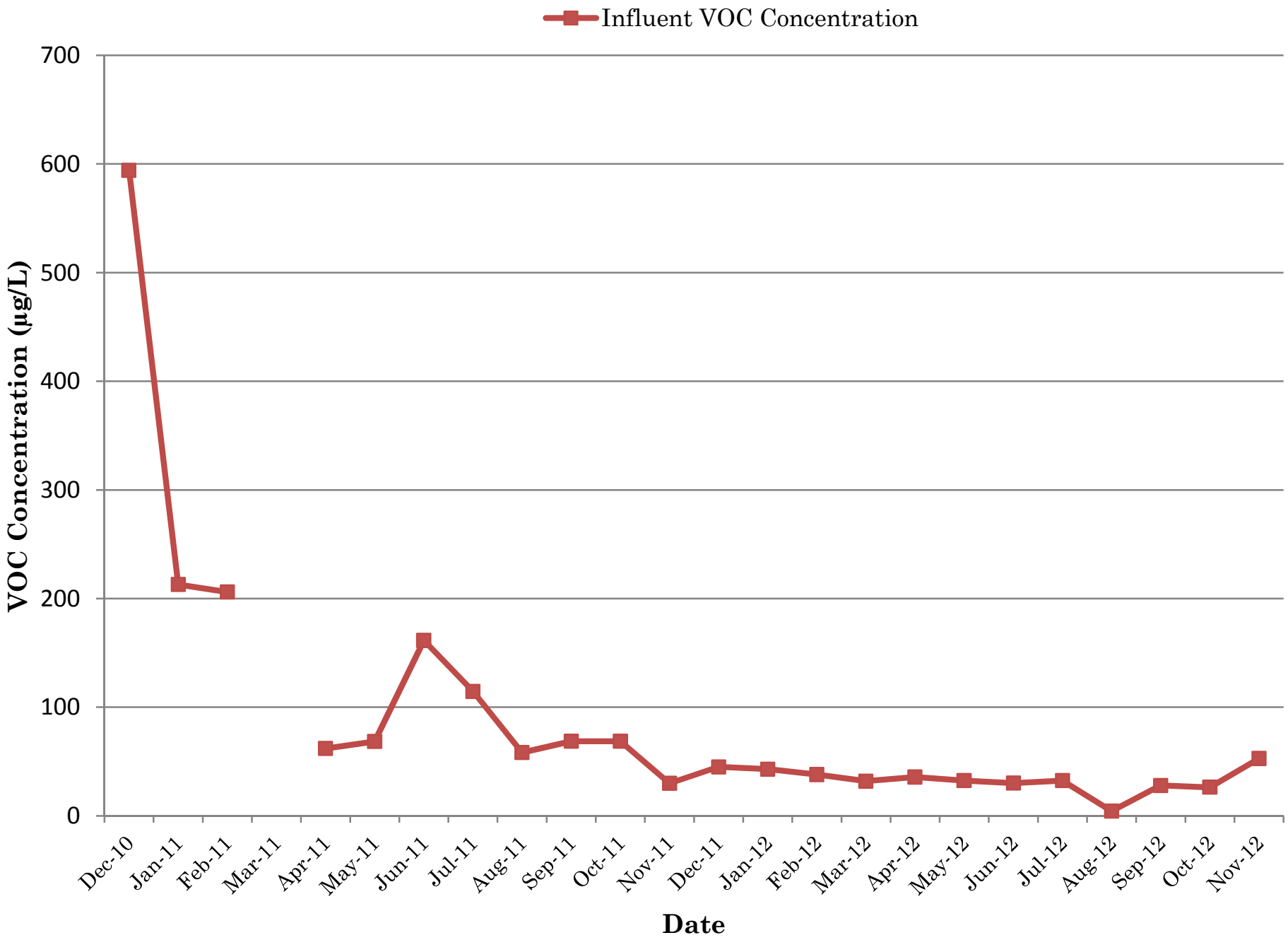
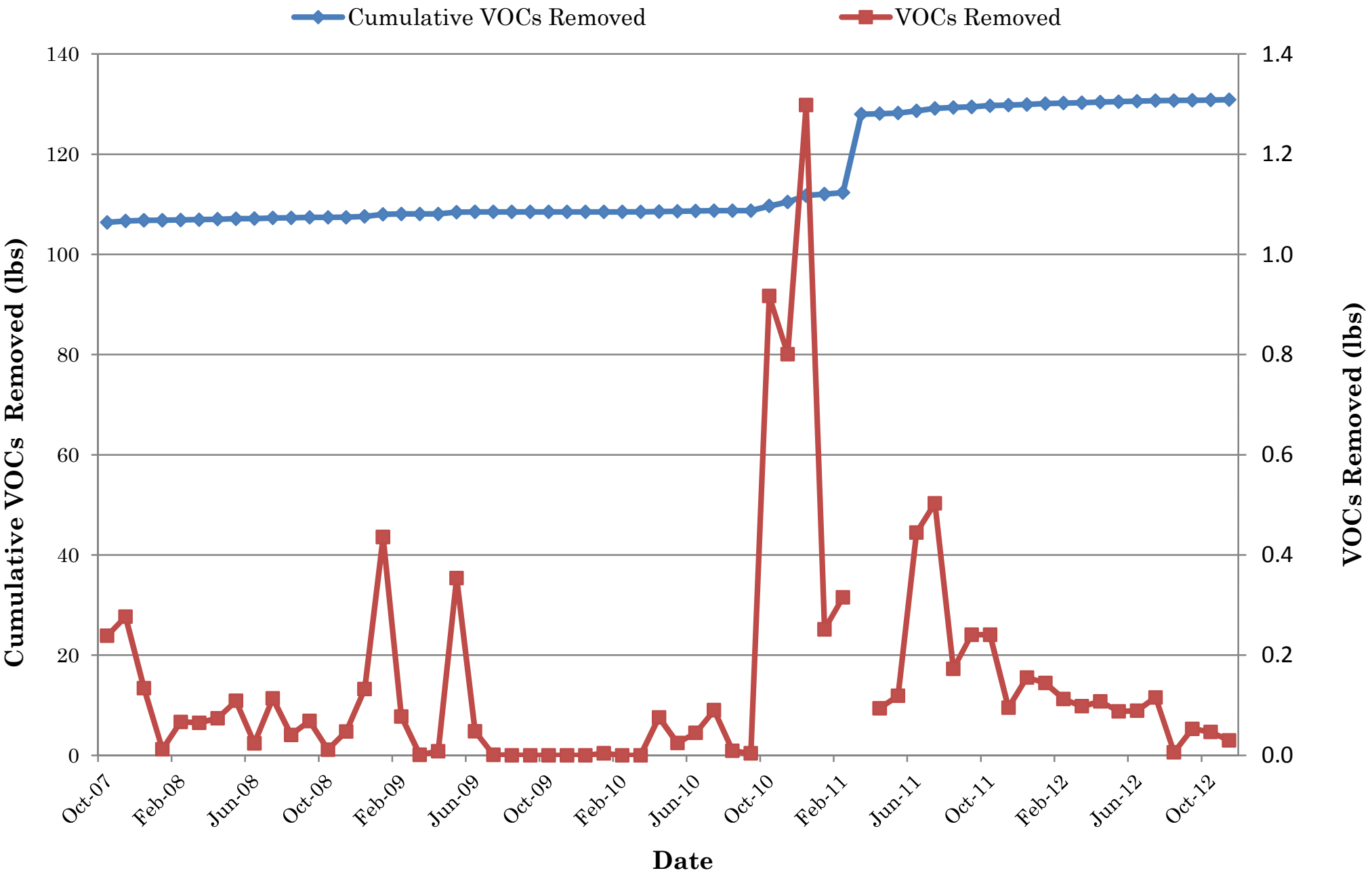


Figure 5
IR Site 78 North GWTP - Influent VOC Concentration



*March 2011 data point, 17,297 µg/L, was omitted for graphing purposes.

Figure 6
IR Site 78 North GWTP - Total VOCs Removed



*March 2011 VOCs Removed data point, 15.67 lbs, was ommited for graphing purposes.

Figure 7
IR Site 78 South GWTP - Influent Flow

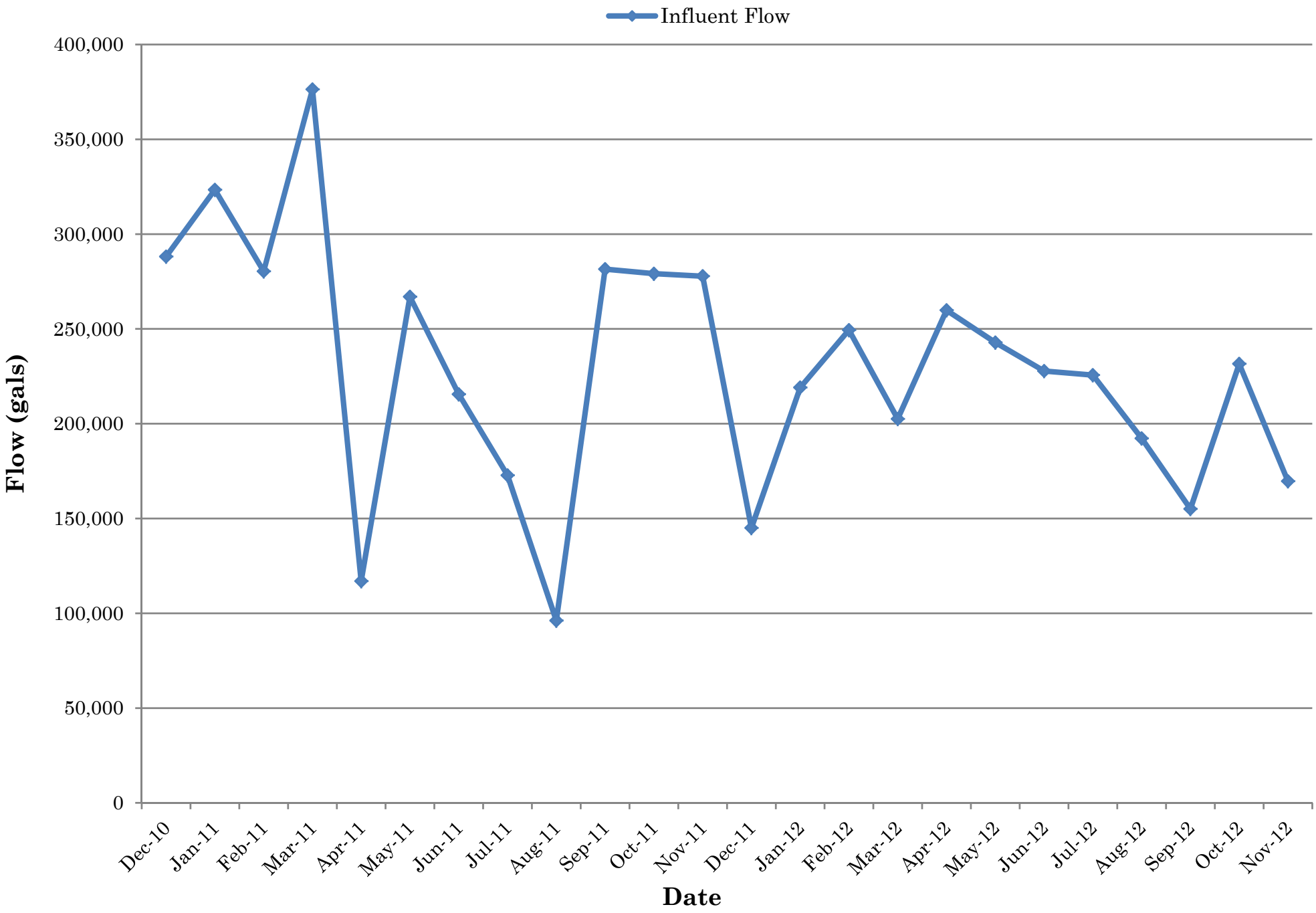


Figure 8
IR Site 78 South GWTP - Influent VOC Concentration

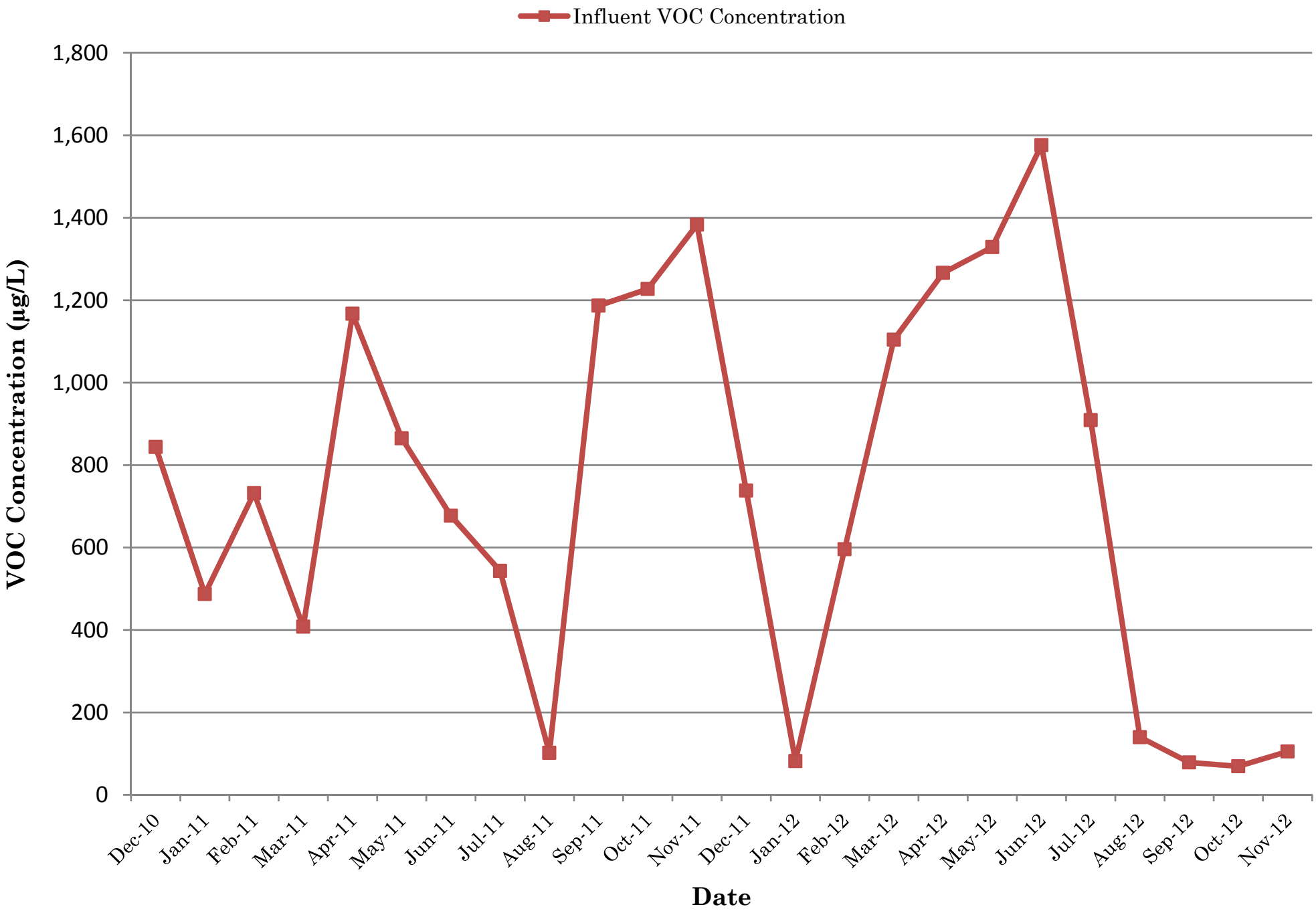
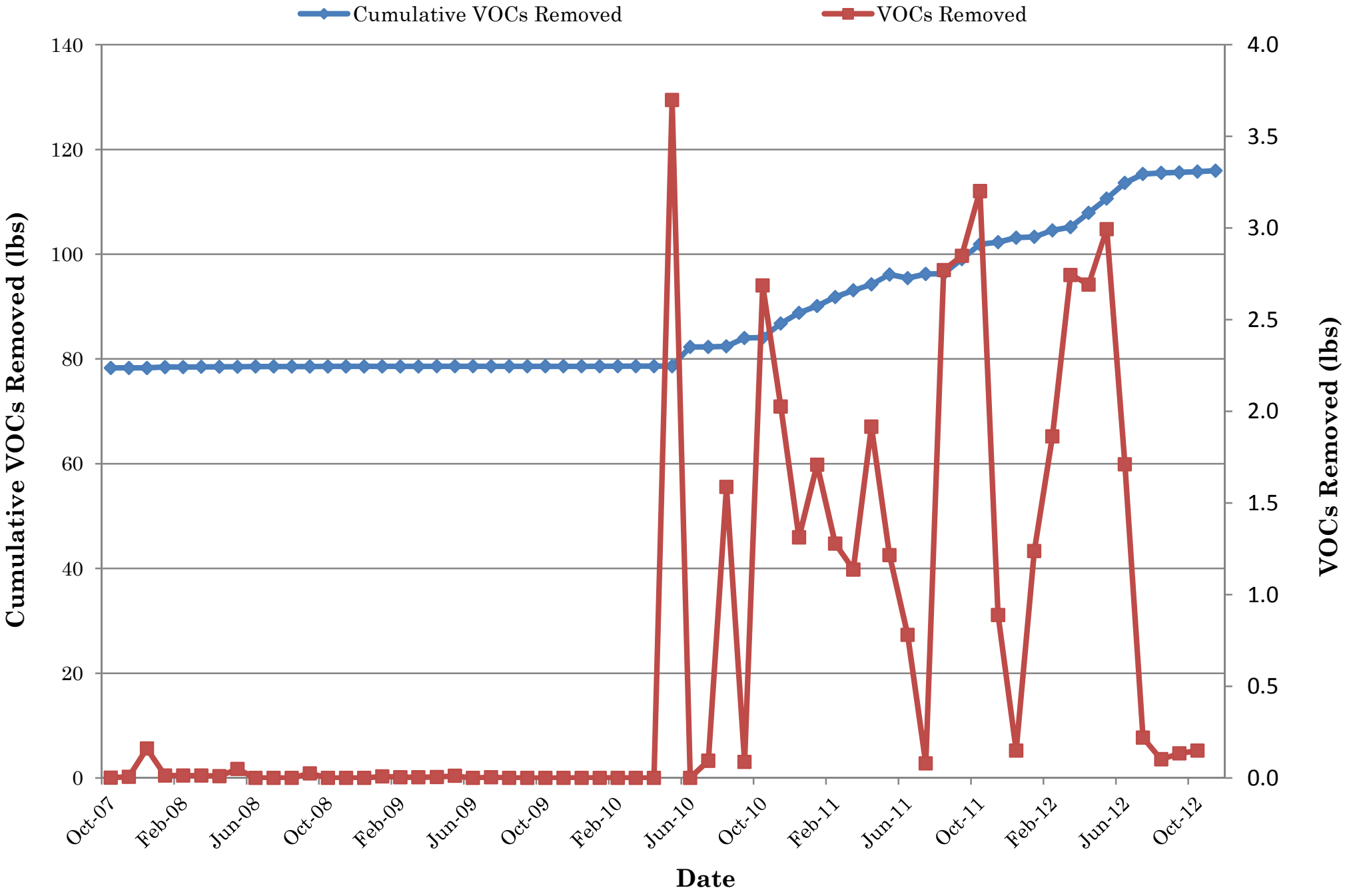


Figure 9
IR Site 78 South GWTP - Total VOCs Removed



ANALYTICAL

Katahdin ANALYTICAL SERVICES

nelac Cert. No. E87604

November 14, 2012

Mr. Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Suite 14
Gibsonia,PA 15044

RE: Katahdin Lab Number: SF7679
Project ID: Monthly O&M, Camp Lejeune, NC
Project Manager: Ms. Jennifer Obrin
Sample Receipt Date(s): November 02, 2012

Dear Mr. Grosser:

Please find enclosed the following information:

* Report of Analysis (Analytical and/or Field)
* Quality Control Data Summary
* Chain of Custody (COC)
* Login Report

A copy of the Chain of Custody is included in the paginated report. The original COC is attached as an addendum to this report.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. The results contained in this report relate only to the submitted samples. This cover letter is an integral part of the ROA.

We certify that the test results provided in this report meet all the requirements of the NELAC standards unless otherwise noted in an attached technical narrative or in the Report of Analysis.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Please go to http://www.katahdinlab.com/cert.html for copies of Katahdin Analytical Services Inc. current certificates and analyte lists.

Sincerely,
KATAHDIN ANALYTICAL SERVICES

Deborah J Nadeau
Authorized Signature

11/14/2012
Date

TECHNICAL NARRATIVE

Organics Analysis

The samples of Work Order SF7679 were analyzed in accordance with "Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods." SW-846, 2nd edition, 1982 (revised 1984), 3rd edition, 1986, and Updates I, II, IIA, III, IIIA, and IIIB 1996, 1998 & 2004, Office of Solid Waste and Emergency Response, U.S. EPA, and/or for the specific methods listed below or on the Report of Analysis.

8260B Analysis

The reported percent recovery acceptance limits for the Laboratory Control Samples (LCSs) are statistically derived for the full list of spiked compounds. The recoveries of the spiked analytes in the LCS, Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are compared to these acceptance limits. Katahdin standard operating procedure is to take corrective action only if the number of spiked analytes in the LCS that are outside of the QC limits is greater than ten percent of the client compound list. If the associated MS/MSD has greater than the allowable number of exceedances, no corrective action is taken, as long the LCS is acceptable.

There were no other protocol deviations or observations noted by the organics laboratory staff.

Oil & Grease Analysis

The samples of work order SF7679 were analyzed for Oil & Grease in accordance with EPA method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil and Grease) by Extraction and Gravimetry.

All analyses were performed within analytical hold time. All quality control criteria were met with the following exceptions:

The Laboratory Control Sample (LCS) WG116135-2 had a low recovery for Oil & Grease that was outside of the method acceptance limits. Since the Laboratory Control Sample Duplicate (LCSD) was acceptable, the associated samples were not reanalyzed.

There were no other protocol deviations or observations noted by the organics laboratory staff.

KATAHDIN ANALYTICAL SERVICES - ORGANIC DATA QUALIFIERS

The sampled date indicated on the attached Report(s) of Analysis (ROA) is the date for which a grab sample was collected or the date for which a composite sample was completed. Beginning and start times for composite samples can be found on the Chain-of-Custody.

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Limit of Quantitation (LOQ)(previously called Practical Quantitation Level (PQL)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL/LOQ or "U" LOD, where the rate of false negatives is <1%.

* Compound recovery outside of quality control limits.

D Indicates the result was obtained from analysis of a diluted sample. Surrogate recoveries may not be calculable.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Limit of Quantitation (LOQ)(previously called Practical Quantitation Limit (PQL)), but above the Method Detection Limit (MDL).

or

J Used for Pesticides, PCBs, Herbicides, Formaldehyde, Explosives and Method 504.1 analytes when there is a greater than 40% difference for detected concentrations between the two GC columns.

B Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.

C Indicates that the flagged compound did not meet DoD criteria in the corresponding daily calibration verification (CV).

L Indicates that the flagged compound did not meet DoD criteria in the corresponding Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD) prepared and/or analyzed concurrently with the sample.

M Indicates that the flagged compound did not meet DoD criteria in the Matrix Spike and/or Matrix Spike Duplicate prepared and/or analyzed concurrently with the native sample.

N Presumptive evidence of a compound based on a mass spectral library search.

A Indicates that a tentatively identified compound is a suspected aldol-condensation product.

P Used for Pesticide/Aroclor analyte when there is a greater than 25% difference for detected concentrations between the two GC columns. (for CLP methods only).

KATAHDIN ANALYTICAL SERVICES – INORGANIC DATA QUALIFIERS
(Refer to BOD Qualifiers Page for BOD footnotes)

The sampled date indicated on the attached Report(s) of Analysis (ROA) is the date for which a grab sample was collected or the date for which a composite sample was completed. Beginning and start times for composite samples can be found on the Chain-of-Custody.

U Indicates the compound was analyzed for but not detected above the specified level. This level may be the Limit of Quantitation (LOQ)(previously called Practical Quantitation Level (PQL)), the Limit of Detection (LOD) or Method Detection Limit (MDL) as required by the client.

Note: All results reported as "U" MDL have a 50% rate for false negatives compared to those results reported as "U" PQL/LOQ or "U" LOD, where the rate of false negatives is <1%.

E Estimated value. This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis.

J Estimated value. The analyte was detected in the sample at a concentration less than the laboratory Limit of Quantitation (LOQ)(previously called Practical Quantitation Limit (PQL)), but above the Method Detection Limit (MDL).

I-7 The laboratory's Practical Quantitation Level could not be achieved for this parameter due to sample composition, matrix effects, sample volume, or quantity used for analysis.

A-4 Please refer to cover letter or narrative for further information.

MCL Maximum Contaminant Level

NL No limit

NFL No Free Liquid Present

FLP Free Liquid Present

NOD No Odor Detected

TON Threshold Odor Number

H_ Please note that the regulatory holding time for _____ is "analyze immediately". Ideally, this analysis must be performed in the field at the time of sample collection. _____ for this sample was not performed at the time of sample collection. The analysis was performed as soon as possible after receipt by the laboratory.

H1 pH
H2 DO
H3 sulfite
H4 residual chlorine

T1 The client did not provide the full volume of at least one liter for analysis of TSS. Therefore, the PQL of 2.5 mg/L could not be achieved.

T2 The client provided the required volume of at least one liter for analysis of TSS, but the laboratory could not filter the full one liter volume due to the sample matrix. Therefore, the PQL of 2.5 mg/L could not be achieved.

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-1
Client ID: CLJ-INS-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7848.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 09-NOV-12
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene		49.	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene		190	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	E	250	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene		140	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane		3.6	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
Tel:(207) 874-2400 Fax:(207) 775-4029

http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-1
Client ID: CLJ-INS-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7848.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 09-NOV-12
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	E	220	ug/L	1	1	1.0
P-Bromofluorobenzene		79.7	%			
Toluene-d8		83.0	%			
1,2-Dichloroethane-d4		86.7	%			
Dibromofluoromethane		85.4	%			

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
Tel:(207) 874-2400 Fax:(207) 775-4029

http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-1DL
Client ID: CLJ-INS-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7849.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 09-NOV-12
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	4.0	ug/L	2	2	4.0
Vinyl Chloride	U	4.0	ug/L	2	2	4.0
Bromomethane	U	4.0	ug/L	2	2	4.0
Chloroethane	U	4.0	ug/L	2	2	4.0
1,1-Dichloroethene	U	2.0	ug/L	2	1	2.0
Carbon Disulfide	U	2.0	ug/L	2	1	2.0
Methylene Chloride	U	10.	ug/L	2	5	10.
Acetone	U	10.	ug/L	2	5	10.
trans-1,2-Dichloroethene		59.	ug/L	2	1	2.0
1,1-Dichloroethane	U	2.0	ug/L	2	1	2.0
cis-1,2-Dichloroethene		190	ug/L	2	1	2.0
Chloroform	U	2.0	ug/L	2	1	2.0
Carbon Tetrachloride	U	2.0	ug/L	2	1	2.0
1,1,1-Trichloroethane	U	2.0	ug/L	2	1	2.0
2-Butanone	U	10.	ug/L	2	5	10.
Benzene	U	2.0	ug/L	2	1	2.0
1,2-Dichloroethane	U	2.0	ug/L	2	1	2.0
Trichloroethene		320	ug/L	2	1	2.0
1,2-Dichloropropane	U	2.0	ug/L	2	1	2.0
Bromodichloromethane	U	2.0	ug/L	2	1	2.0
cis-1,3-Dichloropropene	U	2.0	ug/L	2	1	2.0
Toluene	U	2.0	ug/L	2	1	2.0
4-Methyl-2-Pentanone	U	10.	ug/L	2	5	10.
Tetrachloroethene		170	ug/L	2	1	2.0
trans-1,3-Dichloropropene	U	2.0	ug/L	2	1	2.0
1,1,2-Trichloroethane		3.4	ug/L	2	1	2.0
Dibromochloromethane	U	2.0	ug/L	2	1	2.0
2-Hexanone	U	10.	ug/L	2	5	10.
Chlorobenzene	U	2.0	ug/L	2	1	2.0
Ethylbenzene	U	2.0	ug/L	2	1	2.0
Xylenes (Total)	U	6.0	ug/L	2	3	6.0
m+p-Xylenes	U	4.0	ug/L	2	2	4.0
o-Xylene	U	2.0	ug/L	2	1	2.0
Styrene	U	2.0	ug/L	2	1	2.0
Bromoform	U	2.0	ug/L	2	1	2.0

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-1DL
Client ID: CLJ-INS-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7849.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 09-NOV-12
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane		250	ug/L	2	1	2.0
P-Bromofluorobenzene		89.1	%			
Toluene-d8		93.8	%			
1,2-Dichloroethane-d4		95.3	%			
Dibromofluoromethane		94.3	%			

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Katahdin ANALYTICAL SERVICES

REPORT OF ANALYTICAL RESULTS

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Suite 14
Gibsonia, PA 15044

Lab Sample ID: SF7679-001
Report Date: 11/12/2012
PO No.: 581
Project: Monthly O&M, Camp Lejeune, NC

Sample Description	Matrix	Filtered	Date Sampled	Date Received
CLJ-INS-R-61	AQ	No(Total)	11/01/2012	11/02/2012

Parameter	Result	Units	Adjusted PQL	Dilution Factor	PQL	Analytical Method	Analysis Date	By	Prep Method	Prepped Date	By	QC	Notes
ARSENIC	U 0.008	mg/L	0.008	1	0.008	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BARIUM	0.0120	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BERYLLIUM	U 0.00500	mg/L	0.00500	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CALCIUM	47.0	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CHROMIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
IRON	1.24	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
LEAD	U 0.005	mg/L	0.005	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MANGANESE	0.0235	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MERCURY	U 0.20	ug/L	0.20	1	0.2	SW846 7470	11/7/12	NAT	SW846 7470	11/7/12	NAT	FK07HGW1	
VANADIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-1
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLJ-INS-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	130 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:12:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	U4.0 mg/L	4.0	1.22	EPA 160.2	WG115865	05-NOV-12 15:01:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	7.1 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:25:00	N/A	N/A	KP	H1

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-2DL
Client ID: CLJ-IND-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7822.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	40.	ug/L	20	2	40.
Vinyl Chloride	U	40.	ug/L	20	2	40.
Bromomethane	U	40.	ug/L	20	2	40.
Chloroethane	U	40.	ug/L	20	2	40.
1,1-Dichloroethene	U	20.	ug/L	20	1	20.
Carbon Disulfide	U	20.	ug/L	20	1	20.
Methylene Chloride	U	100	ug/L	20	5	100
Acetone	U	100	ug/L	20	5	100
trans-1,2-Dichloroethene		120	ug/L	20	1	20.
1,1-Dichloroethane	U	20.	ug/L	20	1	20.
cis-1,2-Dichloroethene		870	ug/L	20	1	20.
Chloroform	U	20.	ug/L	20	1	20.
Carbon Tetrachloride	U	20.	ug/L	20	1	20.
1,1,1-Trichloroethane	U	20.	ug/L	20	1	20.
2-Butanone	U	100	ug/L	20	5	100
Benzene	U	20.	ug/L	20	1	20.
1,2-Dichloroethane	U	20.	ug/L	20	1	20.
Trichloroethene		960	ug/L	20	1	20.
1,2-Dichloropropane	U	20.	ug/L	20	1	20.
Bromodichloromethane	U	20.	ug/L	20	1	20.
cis-1,3-Dichloropropene	U	20.	ug/L	20	1	20.
Toluene	U	20.	ug/L	20	1	20.
4-Methyl-2-Pentanone	U	100	ug/L	20	5	100
Tetrachloroethene		33.	ug/L	20	1	20.
trans-1,3-Dichloropropene	U	20.	ug/L	20	1	20.
1,1,2-Trichloroethane	U	20.	ug/L	20	1	20.
Dibromochloromethane	U	20.	ug/L	20	1	20.
2-Hexanone	U	100	ug/L	20	5	100
Chlorobenzene	U	20.	ug/L	20	1	20.
Ethylbenzene	U	20.	ug/L	20	1	20.
Xylenes (Total)	U	60.	ug/L	20	3	60.
m+p-Xylenes	U	40.	ug/L	20	2	40.
o-Xylene	U	20.	ug/L	20	1	20.
Styrene	U	20.	ug/L	20	1	20.
Bromoform	U	20.	ug/L	20	1	20.

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-2DL
Client ID: CLJ-IND-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7822.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	20.	ug/L	20	1	20.
P-Bromofluorobenzene		92.0	%			
Toluene-d8		102.	%			
1,2-Dichloroethane-d4		101.	%			
Dibromofluoromethane		100.	%			

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-2DL2
Client ID: CLJ-IND-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7830.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	4.0	ug/L	2	2	4.0
Vinyl Chloride		22.	ug/L	2	2	4.0
Bromomethane	U	4.0	ug/L	2	2	4.0
Chloroethane	U	4.0	ug/L	2	2	4.0
1,1-Dichloroethene		16.	ug/L	2	1	2.0
Carbon Disulfide	U	2.0	ug/L	2	1	2.0
Methylene Chloride	U	10.	ug/L	2	5	10.
Acetone	U	10.	ug/L	2	5	10.
trans-1,2-Dichloroethene		120	ug/L	2	1	2.0
1,1-Dichloroethane		2.1	ug/L	2	1	2.0
cis-1,2-Dichloroethene	E	830	ug/L	2	1	2.0
Chloroform	U	2.0	ug/L	2	1	2.0
Carbon Tetrachloride	U	2.0	ug/L	2	1	2.0
1,1,1-Trichloroethane	U	2.0	ug/L	2	1	2.0
2-Butanone	U	10.	ug/L	2	5	10.
Benzene	U	2.0	ug/L	2	1	2.0
1,2-Dichloroethane	U	2.0	ug/L	2	1	2.0
Trichloroethene	E	710	ug/L	2	1	2.0
1,2-Dichloropropane	U	2.0	ug/L	2	1	2.0
Bromodichloromethane	U	2.0	ug/L	2	1	2.0
cis-1,3-Dichloropropene	U	2.0	ug/L	2	1	2.0
Toluene	U	2.0	ug/L	2	1	2.0
4-Methyl-2-Pentanone	U	10.	ug/L	2	5	10.
Tetrachloroethene		34.	ug/L	2	1	2.0
trans-1,3-Dichloropropene	U	2.0	ug/L	2	1	2.0
1,1,2-Trichloroethane	U	2.0	ug/L	2	1	2.0
Dibromochloromethane	U	2.0	ug/L	2	1	2.0
2-Hexanone	U	10.	ug/L	2	5	10.
Chlorobenzene	U	2.0	ug/L	2	1	2.0
Ethylbenzene	U	2.0	ug/L	2	1	2.0
Xylenes (Total)	U	6.0	ug/L	2	3	6.0
m+p-Xylenes	U	4.0	ug/L	2	2	4.0
o-Xylene	U	2.0	ug/L	2	1	2.0
Styrene	U	2.0	ug/L	2	1	2.0
Bromoform	U	2.0	ug/L	2	1	2.0

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-2DL2
Client ID: CLJ-IND-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7830.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	2.0	ug/L	2	1	2.0
P-Bromofluorobenzene		87.5	%			
Toluene-d8		107.	%			
1,2-Dichloroethane-d4		96.2	%			
Dibromofluoromethane		94.2	%			

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Katahdin ANALYTICAL SERVICES

REPORT OF ANALYTICAL RESULTS

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Suite 14
Gibsonia, PA 15044

Lab Sample ID: SF7679-002
Report Date: 11/12/2012
PO No.: 581
Project: Monthly O&M, Camp Lejeune, NC

Sample Description	Matrix	Filtered	Date Sampled	Date Received
CLJ-IND-R-61	AQ	No(Total)	11/01/2012	11/02/2012

Parameter	Result	Units	Adjusted PQL	Dilution Factor	PQL	Analytical Method	Analysis Date	By	Prep Method	Prepped Date	By	QC	Notes
ARSENIC	U 0.008	mg/L	0.008	1	0.008	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BARIUM	0.0072	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BERYLLIUM	U 0.00500	mg/L	0.00500	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CALCIUM	59.8	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CHROMIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
IRON	0.598	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
LEAD	U 0.005	mg/L	0.005	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MANGANESE	0.0111	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MERCURY	U 0.20	ug/L	0.20	1	0.2	SW846 7470	11/7/12	NAT	SW846 7470	11/7/12	NAT	FK07HGW1	
VANADIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-2
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLJ-IND-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	180 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:13:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	U4.0 mg/L	4.0	1.22	EPA 160.2	WG115865	05-NOV-12 15:01:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	7.5 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:27:00	N/A	N/A	KP	H1

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-3
Client ID: CLJ-AS-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7782.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-3
Client ID: CLJ-AS-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7782.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane		16.	ug/L	1	1	1.0
P-Bromofluorobenzene		86.7	%			
Toluene-d8		102.	%			
1,2-Dichloroethane-d4		99.6	%			
Dibromofluoromethane		100.	%			

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Katahdin ANALYTICAL SERVICES

REPORT OF ANALYTICAL RESULTS

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Suite 14
Gibsonia, PA 15044

Lab Sample ID: SF7679-003
Report Date: 11/12/2012
PO No.: 581
Project: Monthly O&M, Camp Lejeune, NC

Sample Description	Matrix	Filtered	Date Sampled	Date Received
CLJ-AS-R-61	AQ	No(Total)	11/01/2012	11/02/2012

Parameter	Result	Units	Adjusted PQL	Dilution Factor	PQL	Analytical Method	Analysis Date	By	Prep Method	Prepped Date	By	QC	Notes
ARSENIC	U 0.008	mg/L	0.008	1	0.008	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BARIUM	0.0071	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BERYLLIUM	U 0.00500	mg/L	0.00500	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CALCIUM	59.1	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CHROMIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
IRON	0.428	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
LEAD	U 0.005	mg/L	0.005	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MANGANESE	0.0050	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MERCURY	U 0.20	ug/L	0.20	1	0.2	SW846 7470	11/7/12	NAT	SW846 7470	11/7/12	NAT	FK07HGW1	
VANADIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-3
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLJ-AS-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	180 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:14:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	U4.0 mg/L	4.0	1.22	EPA 160.2	WG115865	05-NOV-12 15:02:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	8.1 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:29:00	N/A	N/A	KP	H1

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-4
Client ID: CLJ-EF-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7783.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

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Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-4
Client ID: CLJ-EF-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7783.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		88.6	%			
Toluene-d8		98.2	%			
1,2-Dichloroethane-d4		102.	%			
Dibromofluoromethane		100.	%			

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Katahdin ANALYTICAL SERVICES

REPORT OF ANALYTICAL RESULTS

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Suite 14
Gibsonia, PA 15044

Lab Sample ID: SF7679-004
Report Date: 11/12/2012
PO No.: 581
Project: Monthly O&M, Camp Lejeune, NC

Sample Description	Matrix	Filtered	Date Sampled	Date Received
CLJ-EF-R-61	AQ	No(Total)	11/01/2012	11/02/2012

Parameter	Result	Units	Adjusted PQL	Dilution Factor	PQL	Analytical Method	Analysis Date	By	Prep Method	Prepped Date	By	QC	Notes
ARSENIC	U 0.008	mg/L	0.008	1	0.008	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BARIUM	0.0093	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
BERYLLIUM	U 0.00500	mg/L	0.00500	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CALCIUM	59.4	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
CHROMIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
IRON	1.72	mg/L	0.100	1	0.1	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
LEAD	U 0.005	mg/L	0.005	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MANGANESE	0.0588	mg/L	0.0050	1	0.005	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	
MERCURY	U 0.20	ug/L	0.20	1	0.2	SW846 7470	11/7/12	NAT	SW846 7470	11/7/12	NAT	FK07HGW1	
VANADIUM	U 0.0100	mg/L	0.0100	1	0.01	SW846 6010	11/9/12	EAM	SW846 3010	11/8/12	NAT	FK08ICW1	

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ANALYTICAL SERVICES

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-4
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLJ-EF-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	170 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:16:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	8.8 mg/L	4.0	1.22	EPA 160.2	WG115865	05-NOV-12 15:03:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	7.9 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:31:00	N/A	N/A	KP	HI

Katahdin Analytical Services SF7679 page 0000024 of 0000072

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-5
Client ID: CLN-IN-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7784.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride		3.9	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene		1.5	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene		35.	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene		2.5	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene		10.	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene		1.4	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-5
Client ID: CLN-IN-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7784.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		87.0	%			
Toluene-d8		97.1	%			
1,2-Dichloroethane-d4		97.3	%			
Dibromofluoromethane		99.7	%			

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-5
Report Date: 09-nov-2012 08:52
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLN-IN-R-61	AQ	01-nov-2012 07:30	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Oil and Grease	U5.0 mg/L	5		EPA 1664A	WG116135	08-NOV-12 18:24:00	EPA 1664A	08-NOV-12	JH	

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Report of Analytical Results

Client: Benjamin Grosser
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4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-5
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLN-IN-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	150 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:17:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	190 mg/L	10.	3.0	EPA 160.2	WG115865	05-NOV-12 15:03:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	6.4 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:33:00	N/A	N/A	KP	HI

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-6
Client ID: CLN-EF-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7785.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-6
Client ID: CLN-EF-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7785.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		87.2	%			
Toluene-d8		100.	%			
1,2-Dichloroethane-d4		100.	%			
Dibromofluoromethane		101.	%			

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-6
Report Date: 09-nov-2012 08:52
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLN-EF-R-61	AQ	01-nov-2012 07:35	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Oil and Grease	U5.0 mg/L	5		EPA 1664A	WG116135	08-NOV-12 18:24:00	EPA 1664A	08-NOV-12	JH	

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Report of Analytical Results

Client: Benjamin Grosser
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Gibsonia,PA 15044

Lab Sample ID: SF7679-6
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLN-EF-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	210 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:18:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	U4.0 mg/L	4.0	1.22	EPA 160.2	WG115865	05-NOV-12 15:04:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	7.8 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:35:00	N/A	N/A	KP	H1

Katahdin Analytical Services SF7679 page 0000032 of 0000072

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-7
Client ID: CLS-IN-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7786.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene		28.	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene		9.2	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene		11.	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene		57.	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene		8.3	ug/L	1	1	1.0
Xylenes (Total)		75.	ug/L	1	3	3.0
m+p-Xylenes		44.	ug/L	1	2	2.0
o-Xylene		32.	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

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ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-7
Client ID: CLS-IN-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7786.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		87.6	%			
Toluene-d8		98.9	%			
1,2-Dichloroethane-d4		97.0	%			
Dibromofluoromethane		97.5	%			

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Cert No E87604

Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-7
Report Date: 09-nov-2012 08:52
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLS-IN-R-61	AQ	01-nov-2012 08:00	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Oil and Grease	U5.2 mg/L	5.2		EPA 1664A	WG116135	08-NOV-12 18:24:00	EPA 1664A	08-NOV-12	JH	

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-7
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLS-IN-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	190 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:19:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	28. mg/L	4.0	1.22	EPA 160.2	WG115865	05-NOV-12 15:04:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	7.4 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:37:00	N/A	N/A	KP	HI

Katahdin Analytical Services SF7679 page 0000036 of 0000072

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-8
Client ID: CLS-EF-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7787.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-8
Client ID: CLS-EF-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7787.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		86.4	%			
Toluene-d8		103.	%			
1,2-Dichloroethane-d4		100.	%			
Dibromofluoromethane		105.	%			

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-8
Report Date: 09-nov-2012 08:52
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLS-EF-R-61	AQ	01-nov-2012 08:05	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Oil and Grease	U5.0 mg/L	5		EPA 1664A	WG116135	08-NOV-12 18:24:00	EPA 1664A	08-NOV-12	JH	

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Report of Analytical Results

Client: Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Gibsonia,PA 15044

Lab Sample ID: SF7679-8
Report Date: 13-NOV-12
Client PO: 581
Project: Monthly O&M, Camp Lejeune, NC
SDG: SF7679

Sample Description	Matrix	Date Sampled	Date Received
CLS-EF-R-61	AQ	01-NOV-12	02-NOV-12

Parameter	Result	Adj PQL	Adj MDL	Anal. Method	QC Batch	Analysis Date	Prep. Method	Prep. Date	Analyst	Footnotes
Solids-Filterable Residue	210 mg/L	10.	5.02	EPA 160.1	WG115843	05-NOV-12 17:20:00	EPA 160.1	02-NOV-12	KF	
Solids-Nonfilterable Residue	U4.0 mg/L	4.0	1.22	EPA 160.2	WG115865	05-NOV-12 15:05:00	EPA 160.2	02-NOV-12	KF	
pH(Laboratory)	7.9 pH	0.10	0.10	EPA 150.1	WG115855	02-NOV-12 11:39:00	N/A	N/A	KP	H1

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Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-9RA
Client ID: CLJ-TB-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7819.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0
Bromoform	U	1.0	ug/L	1	1	1.0

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Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Rhea Engineers and Consultar
Lab ID: SF7679-9RA
Client ID: CLJ-TB-R-61
Project: Monthly O&M, Camp Lejeun
SDG: SF7679
Lab File ID: F7819.D

Sample Date: 01-NOV-12
Received Date: 02-NOV-12
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		89.2	%			
Toluene-d8		95.9	%			
1,2-Dichloroethane-d4		93.1	%			
Dibromofluoromethane		91.0	%			

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Form 4
Method Blank Summary

Lab Name : Katahdin Analytical Services
Project : Monthly O&M, Camp Lejeune, NC
Lab File ID : F7780.D
Instrument ID : GCMS-F
Heated Purge : No

SDG : SF7679
Lab Sample ID : WG116098-2
Date Analyzed : 07-NOV-12
Time Analyzed : 14:04

This Method Blank applies to the following samples, LCS, MS and MSD:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG116098-1	F7777.D	11/07/12	11:55
CLJ-AS-R-61	SF7679-3	F7782.D	11/07/12	15:09
CLJ-EF-R-61	SF7679-4	F7783.D	11/07/12	15:42
CLN-IN-R-61	SF7679-5	F7784.D	11/07/12	16:15
CLN-EF-R-61	SF7679-6	F7785.D	11/07/12	16:47
CLS-IN-R-61	SF7679-7	F7786.D	11/07/12	17:20
CLS-EF-R-61	SF7679-8	F7787.D	11/07/12	17:53

Katahdin
ANALYTICAL SERVICES

Cert No E87604

LCS Recovery Report

Client:
Lab ID: WG116098-1
Client ID: LCS
Project:
SDG: SF7679
LCS File ID: F7777.D

Sample Date:
Received Date: 07-NOV-12
Extract Date:
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Recovery (%)	Conc Added	Conc Recovered	Conc Units	Limits
Chloromethane	101.	50.0	50.7	ug/L	59-123
Vinyl Chloride	107.	50.0	53.3	ug/L	64-131
Bromomethane	99.4	50.0	49.7	ug/L	57-135
Chloroethane	114.	50.0	57.2	ug/L	53-157
1,1-Dichloroethene	114.	50.0	57.0	ug/L	88-127
Carbon Disulfide	119.	50.0	59.5	ug/L	71-129
Methylene Chloride	105.	50.0	52.3	ug/L	72-129
Acetone	145.	50.0	72.5	ug/L	62-172
trans-1,2-Dichloroethene	102.	50.0	50.9	ug/L	78-125
1,1-Dichloroethane	108.	50.0	54.1	ug/L	76-130
cis-1,2-Dichloroethene	101.	50.0	50.7	ug/L	85-123
Chloroform	103.	50.0	51.6	ug/L	78-128
Carbon Tetrachloride	102.	50.0	51.1	ug/L	87-126
1,1,1-Trichloroethane	104.	50.0	52.1	ug/L	77-129
2-Butanone	115.	50.0	57.4	ug/L	71-132
Benzene	108.	50.0	53.8	ug/L	86-116
1,2-Dichloroethane	99.4	50.0	49.7	ug/L	81-125
Trichloroethene	102.	50.0	51.0	ug/L	79-121
1,2-Dichloropropane	105.	50.0	52.6	ug/L	84-118
Bromodichloromethane	111.	50.0	55.5	ug/L	85-122
cis-1,3-Dichloropropene	106.	50.0	52.8	ug/L	83-119
Toluene	102.	50.0	51.2	ug/L	84-118
4-Methyl-2-Pentanone	* 122.	50.0	60.9	ug/L	83-122
Tetrachloroethene	95.2	50.0	47.6	ug/L	47-155
trans-1,3-Dichloropropene	118.	50.0	59.0	ug/L	85-135
1,1,2-Trichloroethane	100.	50.0	50.2	ug/L	84-115
Dibromochloromethane	99.4	50.0	49.7	ug/L	85-119
2-Hexanone	* 125.	50.0	62.5	ug/L	80-124
Chlorobenzene	* 114.	50.0	56.9	ug/L	89-113
Ethylbenzene	111.	50.0	55.4	ug/L	88-113
Xylenes (Total)	111.	150.	166.	ug/L	89-116
m+p-Xylenes	108.	100.	108.	ug/L	88-116
o-Xylene	* 117.	50.0	58.4	ug/L	90-116
Styrene	107.	50.0	53.5	ug/L	88-117
Bromoform	91.4	50.0	45.7	ug/L	86-117

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Katahdin
ANALYTICAL SERVICES

Cert No E87604

LCS Recovery Report

Client:
Lab ID: WG116098-1
Client ID: LCS
Project:
SDG: SF7679
LCS File ID: F7777.D

Sample Date:
Received Date: 07-NOV-12
Extract Date:
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Recovery (%)	Conc Added	Conc Recovered	Conc Units	Limits
1,1,2,2-Tetrachloroethane	98.8	50.0	49.4	ug/L	79-121
P-Bromofluorobenzene	92.1				56-133
Toluene-d8	101.				65-128
1,2-Dichloroethane-d4	97.1				67-135
Dibromofluoromethane	101.				68-128

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Cert No E87604

Report of Analytical Results

Client:
Lab ID: WG116098-2
Client ID: Method Blank Sample
Project:
SDG: SF7679
Lab File ID: F7780.D

Sample Date:
Received Date:
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0

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Report of Analytical Results

Client:
Lab ID: WG116098-2
Client ID: Method Blank Sample
Project:
SDG: SF7679
Lab File ID: F7780.D

Sample Date:
Received Date:
Extract Date: 07-NOV-12
Extracted By: JSS
Extraction Method: SW846 5030
Lab Prep Batch: WG116098

Analysis Date: 07-NOV-12
Analyst: JSS
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Bromoform	U	1.0	ug/L	1	1	1.0
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		89.3	%			
Toluene-d8		98.6	%			
1,2-Dichloroethane-d4		97.5	%			
Dibromofluoromethane		97.8	%			

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Form 4
Method Blank Summary

Lab Name : Katahdin Analytical Services
Project : Monthly O&M, Camp Lejeune, NC
Lab File ID : F7817.D
Instrument ID : GCMS-F
Heated Purge : No

SDG : SF7679
Lab Sample ID : WG116176-2
Date Analyzed : 08-NOV-12
Time Analyzed : 14:37

This Method Blank applies to the following samples, LCS, MS and MSD:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG116176-1	F7814.D	11/08/12	12:43
CLJ-TB-R-61	SF7679-9RA	F7819.D	11/08/12	15:43
CLJ-IND-R-61	SF7679-2DL	F7822.D	11/08/12	17:21
CLJ-IND-R-61	SF7679-2DL2	F7830.D	11/08/12	21:44

Katahdin
ANALYTICAL SERVICES

Cert No E87604

LCS Recovery Report

Client:
Lab ID: WG116176-1
Client ID: LCS
Project:
SDG: SF7679
LCS File ID: F7814.D

Sample Date:
Received Date: 08-NOV-12
Extract Date:
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Recovery (%)	Conc Added	Conc Recovered	Conc Units	Limits
Chloromethane	95.0	50.0	47.5	ug/L	59-123
Vinyl Chloride	104.	50.0	52.1	ug/L	64-131
Bromomethane	101.	50.0	50.6	ug/L	57-135
Chloroethane	130.	50.0	65.2	ug/L	53-157
1,1-Dichloroethene	111.	50.0	55.4	ug/L	88-127
Carbon Disulfide	110.	50.0	54.9	ug/L	71-129
Methylene Chloride	103.	50.0	51.3	ug/L	72-129
Acetone	* 187.	50.0	93.6	ug/L	62-172
trans-1,2-Dichloroethene	99.8	50.0	49.9	ug/L	78-125
1,1-Dichloroethane	102.	50.0	51.2	ug/L	76-130
cis-1,2-Dichloroethene	98.8	50.0	49.4	ug/L	85-123
Chloroform	103.	50.0	51.6	ug/L	78-128
Carbon Tetrachloride	90.0	50.0	45.0	ug/L	87-126
1,1,1-Trichloroethane	95.8	50.0	47.9	ug/L	77-129
2-Butanone	* 132.	50.0	65.9	ug/L	71-132
Benzene	100.	50.0	50.2	ug/L	86-116
1,2-Dichloroethane	97.6	50.0	48.8	ug/L	81-125
Trichloroethene	97.2	50.0	48.6	ug/L	79-121
1,2-Dichloropropane	97.2	50.0	48.6	ug/L	84-118
Bromodichloromethane	103.	50.0	51.6	ug/L	85-122
cis-1,3-Dichloropropene	100.	50.0	50.1	ug/L	83-119
Toluene	99.2	50.0	49.6	ug/L	84-118
4-Methyl-2-Pentanone	112.	50.0	56.1	ug/L	83-122
Tetrachloroethene	82.6	50.0	41.3	ug/L	47-155
trans-1,3-Dichloropropene	109.	50.0	54.4	ug/L	85-135
1,1,2-Trichloroethane	96.6	50.0	48.3	ug/L	84-115
Dibromochloromethane	91.2	50.0	45.6	ug/L	85-119
2-Hexanone	* 128.	50.0	63.9	ug/L	80-124
Chlorobenzene	105.	50.0	52.5	ug/L	89-113
Ethylbenzene	97.6	50.0	48.8	ug/L	88-113
Xylenes (Total)	99.3	150.	149.	ug/L	89-116
m+p-Xylenes	99.0	100.	99.0	ug/L	88-116
o-Xylene	100.	50.0	50.0	ug/L	90-116
Styrene	102.	50.0	50.9	ug/L	88-117
Bromoform	* 83.4	50.0	41.7	ug/L	86-117

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Cert No E87604

LCS Recovery Report

Client:
Lab ID: WG116176-1
Client ID: LCS
Project:
SDG: SF7679
LCS File ID: F7814.D

Sample Date:
Received Date: 08-NOV-12
Extract Date:
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Recovery (%)	Conc Added	Conc Recovered	Conc Units	Limits
1,1,2,2-Tetrachloroethane	99.2	50.0	49.6	ug/L	79-121
P-Bromofluorobenzene	93.0				56-133
Toluene-d8	97.2				65-128
1,2-Dichloroethane-d4	92.7				67-135
Dibromofluoromethane	98.8				68-128

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Cert No E87604

Report of Analytical Results

Client:
Lab ID: WG116176-2
Client ID: Method Blank Sample
Project:
SDG: SF7679
Lab File ID: F7817.D

Sample Date:
Received Date:
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0

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Report of Analytical Results

Client:
Lab ID: WG116176-2
Client ID: Method Blank Sample
Project:
SDG: SF7679
Lab File ID: F7817.D

Sample Date:
Received Date:
Extract Date: 08-NOV-12
Extracted By: REC
Extraction Method: SW846 5030
Lab Prep Batch: WG116176

Analysis Date: 08-NOV-12
Analyst: REC
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Bromoform	U	1.0	ug/L	1	1	1.0
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		98.7	%			
Toluene-d8		103.	%			
1,2-Dichloroethane-d4		101.	%			
Dibromofluoromethane		102.	%			

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Form 4
Method Blank Summary

Lab Name : Katahdin Analytical Services
Project : Monthly O&M, Camp Lejeune, NC
Lab File ID : F7844.D
Instrument ID : GCMS-F
Heated Purge : No

SDG : SF7679
Lab Sample ID : WG116244-9
Date Analyzed : 09-NOV-12
Time Analyzed : 17:00

This Method Blank applies to the following samples, LCS, MS and MSD:

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Laboratory Control S	WG116244-7	F7841.D	11/09/12	15:22
CLJ-INS-R-61	SF7679-1	F7848.D	11/09/12	19:11
CLJ-INS-R-61	SF7679-1DL	F7849.D	11/09/12	19:44

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ANALYTICAL SERVICES

Cert No E87604

LCS Recovery Report

Client:
Lab ID: WG116244-7
Client ID: LCS
Project:
SDG: SF7679
LCS File ID: F7841.D

Sample Date:
Received Date: 10-NOV-12
Extract Date:
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Recovery (%)	Conc Added	Conc Recovered	Conc Units	Limits
Chloromethane	93.8	50.0	46.9	ug/L	59-123
Vinyl Chloride	104.	50.0	51.8	ug/L	64-131
Bromomethane	123.	50.0	61.5	ug/L	57-135
Chloroethane	123.	50.0	61.5	ug/L	53-157
1,1-Dichloroethene	98.6	50.0	49.3	ug/L	88-127
Carbon Disulfide	91.6	50.0	45.8	ug/L	71-129
Methylene Chloride	89.2	50.0	44.6	ug/L	72-129
Acetone	129.	50.0	64.4	ug/L	62-172
trans-1,2-Dichloroethene	92.4	50.0	46.2	ug/L	78-125
1,1-Dichloroethane	98.0	50.0	49.0	ug/L	76-130
cis-1,2-Dichloroethene	96.2	50.0	48.1	ug/L	85-123
Chloroform	95.8	50.0	47.9	ug/L	78-128
Carbon Tetrachloride	93.6	50.0	46.8	ug/L	87-126
1,1,1-Trichloroethane	95.6	50.0	47.8	ug/L	77-129
2-Butanone	103.	50.0	51.7	ug/L	71-132
Benzene	98.4	50.0	49.2	ug/L	86-116
1,2-Dichloroethane	94.0	50.0	47.0	ug/L	81-125
Trichloroethene	94.8	50.0	47.4	ug/L	79-121
1,2-Dichloropropane	98.6	50.0	49.3	ug/L	84-118
Bromodichloromethane	106.	50.0	52.9	ug/L	85-122
cis-1,3-Dichloropropene	102.	50.0	50.8	ug/L	83-119
Toluene	96.2	50.0	48.1	ug/L	84-118
4-Methyl-2-Pentanone	108.	50.0	53.8	ug/L	83-122
Tetrachloroethene	98.4	50.0	49.2	ug/L	47-155
trans-1,3-Dichloropropene	110.	50.0	55.0	ug/L	85-135
1,1,2-Trichloroethane	103.	50.0	51.4	ug/L	84-115
Dibromochloromethane	105.	50.0	52.4	ug/L	85-119
2-Hexanone	106.	50.0	52.8	ug/L	80-124
Chlorobenzene	105.	50.0	52.6	ug/L	89-113
Ethylbenzene	95.4	50.0	47.7	ug/L	88-113
Xylenes (Total)	103.	150.	155.	ug/L	89-116
m+p-Xylenes	101.	100.	101.	ug/L	88-116
o-Xylene	109.	50.0	54.5	ug/L	90-116
Styrene	106.	50.0	53.2	ug/L	88-117
Bromoform	96.8	50.0	48.4	ug/L	86-117

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LCS Recovery Report

Client:
Lab ID: WG116244-7
Client ID: LCS
Project:
SDG: SF7679
LCS File ID: F7841.D

Sample Date:
Received Date: 10-NOV-12
Extract Date:
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Recovery (%)	Conc Added	Conc Recovered	Conc Units	Limits
1,1,2,2-Tetrachloroethane	93.2	50.0	46.6	ug/L	79-121
P-Bromofluorobenzene	108.				56-133
Toluene-d8	102.				65-128
1,2-Dichloroethane-d4	91.5				67-135
Dibromofluoromethane	99.2				68-128

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Report of Analytical Results

Client:
Lab ID: WG116244-9
Client ID: Method Blank Sample
Project:
SDG: SF7679
Lab File ID: F7844.D

Sample Date:
Received Date:
Extract Date: 09-NOV-12
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Chloromethane	U	2.0	ug/L	1	2	2.0
Vinyl Chloride	U	2.0	ug/L	1	2	2.0
Bromomethane	U	2.0	ug/L	1	2	2.0
Chloroethane	U	2.0	ug/L	1	2	2.0
1,1-Dichloroethene	U	1.0	ug/L	1	1	1.0
Carbon Disulfide	U	1.0	ug/L	1	1	1.0
Methylene Chloride	U	5.0	ug/L	1	5	5.0
Acetone	U	5.0	ug/L	1	5	5.0
trans-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
1,1-Dichloroethane	U	1.0	ug/L	1	1	1.0
cis-1,2-Dichloroethene	U	1.0	ug/L	1	1	1.0
Chloroform	U	1.0	ug/L	1	1	1.0
Carbon Tetrachloride	U	1.0	ug/L	1	1	1.0
1,1,1-Trichloroethane	U	1.0	ug/L	1	1	1.0
2-Butanone	U	5.0	ug/L	1	5	5.0
Benzene	U	1.0	ug/L	1	1	1.0
1,2-Dichloroethane	U	1.0	ug/L	1	1	1.0
Trichloroethene	U	1.0	ug/L	1	1	1.0
1,2-Dichloropropane	U	1.0	ug/L	1	1	1.0
Bromodichloromethane	U	1.0	ug/L	1	1	1.0
cis-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
Toluene	U	1.0	ug/L	1	1	1.0
4-Methyl-2-Pentanone	U	5.0	ug/L	1	5	5.0
Tetrachloroethene	U	1.0	ug/L	1	1	1.0
trans-1,3-Dichloropropene	U	1.0	ug/L	1	1	1.0
1,1,2-Trichloroethane	U	1.0	ug/L	1	1	1.0
Dibromochloromethane	U	1.0	ug/L	1	1	1.0
2-Hexanone	U	5.0	ug/L	1	5	5.0
Chlorobenzene	U	1.0	ug/L	1	1	1.0
Ethylbenzene	U	1.0	ug/L	1	1	1.0
Xylenes (Total)	U	3.0	ug/L	1	3	3.0
m+p-Xylenes	U	2.0	ug/L	1	2	2.0
o-Xylene	U	1.0	ug/L	1	1	1.0
Styrene	U	1.0	ug/L	1	1	1.0

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Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client:
Lab ID: WG116244-9
Client ID: Method Blank Sample
Project:
SDG: SF7679
Lab File ID: F7844.D

Sample Date:
Received Date:
Extract Date: 09-NOV-12
Extracted By: DJP
Extraction Method: SW846 5030
Lab Prep Batch: WG116244

Analysis Date: 09-NOV-12
Analyst: DJP
Analysis Method: SW846 8260B
Matrix: AQ
% Solids: NA
Report Date: 10-NOV-12

Compound	Qualifier	Result	Units	Dilution	PQL	ADJ PQL
Bromoform	U	1.0	ug/L	1	1	1.0
1,1,2,2-Tetrachloroethane	U	1.0	ug/L	1	1	1.0
P-Bromofluorobenzene		105.	%			
Toluene-d8		99.7	%			
1,2-Dichloroethane-d4		95.7	%			
Dibromofluoromethane		98.9	%			

600 Technology Way
P.O. Box 540, Scarborough, ME 04070
Tel:(207) 874-2400 Fax:(207) 775-4029

http://www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Quality Control Report

Blank Sample Summary Report

Oil and Grease

Samp Type	QC Batch	Anal. Method	Anal. Date	Prep. Date	Result	PQL
MBLANK	WG116135	EPA 1664A	08-NOV-12	08-NOV-12	U 5.0 mg/L	5 mg/L

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Quality Control Report

Laboratory Control Sample Summary Report

Oil and Grease

Lab Sample Id	Samp Type	QC Batch	Analysis Date	Prep Date	Units	Spike Amt.	Result	Recovery	Acceptance Range	RPD
WG116135-2	LCS	WG116135	08-NOV-12	08-NOV-12	mg/L	40	25.	*62	78-114	
WG116135-3	LCSD	WG116135	08-NOV-12	08-NOV-12	mg/L	40	37.	92	78-114	39*

Katahdin ANALYTICAL SERVICES

PREPARATION BLANK REPORT

Sample ID: PBWFK08ICW1 **Batch ID:** FK08ICW1

Element Name	Result	Units	Flag	PQL	File
ALUMINUM	0.02	mg/L	U	0.30	IFK09B
ANTIMONY	0.002	mg/L	U	0.008	IFK09B
ARSENIC	0.002	mg/L	U	0.008	IFK09B
BARIUM	0.0003	mg/L	U	0.0050	IFK09B
BERYLLIUM	0.00009	mg/L	U	0.00500	IFK09B
BORON	0.0011	mg/L	J	0.0500	IFK09B
CADMIUM	0.00007	mg/L	U	0.00500	IFK09B
CALCIUM	0.009	mg/L	U	0.100	IFK09B
CHROMIUM	0.0004	mg/L	U	0.0100	IFK09B
COBALT	0.0003	mg/L	U	0.0100	IFK09B
COPPER	0.0008	mg/L	U	0.0250	IFK09B
IRON	0.009	mg/L	J	0.100	IFK09B
LEAD	0.001	mg/L	U	0.005	IFK09B
LITHIUM	0.003	mg/L	U	0.100	IFK09B
MAGNESIUM	0.008	mg/L	U	0.100	IFK09B
MANGANESE	0.0006	mg/L	U	0.0050	IFK09B
MOLYBDENUM	0.0005	mg/L	U	0.0100	IFK09B
NICKEL	0.0006	mg/L	U	0.0100	IFK09B
POTASSIUM	0.08	mg/L	J	1.00	IFK09B
SELENIUM	0.003	mg/L	U	0.010	IFK09B
SILICON	0.02	mg/L	J	0.20	IFK09B
SILVER	0.0005	mg/L	U	0.0100	IFK09B
SODIUM	0.03	mg/L	U	1.00	IFK09B
STRONTIUM	0.0003	mg/L	U	0.100	IFK09B
THALLIUM	0.001	mg/L	U	0.015	IFK09B
TIN	0.001	mg/L	U	0.100	IFK09B
TITANIUM	0.0003	mg/L	U	0.0150	IFK09B
VANADIUM	0.0004	mg/L	U	0.0100	IFK09B
ZINC	0.0011	mg/L	J	0.0200	IFK09B

U The analyte was not detected in the sample at a level greater than the instrument detection limit.

J The analyte was detected in the sample at a concentration greater than the instrument detection limit, but less than the laboratory's Practical Quantitation Level.

H The analyte was detected in the sample at a concentration greater than the laboratory's acceptance limit.

Katahdin ANALYTICAL SERVICES

LABORATORY CONTROL SAMPLE REPORT

Sample ID: LCSWFK08ICW1 **Batch ID:** FK08ICW1

Element Name	True Value	Result	Units	Recovery(%)	Flag	Limits (%)		File
ALUMINUM	2.00	2.07	mg/L	103.5%		80.	120.	IFK09B
ANTIMONY	0.100	0.103	mg/L	103.0%		80.	120.	IFK09B
ARSENIC	0.100	0.103	mg/L	103.0%		80.	120.	IFK09B
BARIUM	2.00	2.07	mg/L	103.5%		80.	120.	IFK09B
BERYLLIUM	0.0500	0.0523	mg/L	104.6%		80.	120.	IFK09B
BORON	0.500	0.514	mg/L	102.8%		80.	120.	IFK09B
CADMIUM	0.250	0.258	mg/L	103.2%		80.	120.	IFK09B
CALCIUM	2.50	2.58	mg/L	103.2%		80.	120.	IFK09B
CHROMIUM	0.200	0.209	mg/L	104.5%		80.	120.	IFK09B
COBALT	0.500	0.528	mg/L	105.6%		80.	120.	IFK09B
COPPER	0.250	0.262	mg/L	104.8%		80.	120.	IFK09B
IRON	1.00	1.03	mg/L	103.0%		80.	120.	IFK09B
LEAD	0.100	0.108	mg/L	108.0%		80.	120.	IFK09B
LITHIUM	0.500	0.519	mg/L	103.8%		80.	120.	IFK09B
MAGNESIUM	5.00	5.22	mg/L	104.4%		80.	120.	IFK09B
MANGANESE	0.500	0.490	mg/L	98.0%		80.	120.	IFK09B
MOLYBDENUM	0.300	0.319	mg/L	106.3%		80.	120.	IFK09B
NICKEL	0.500	0.515	mg/L	103.0%		80.	120.	IFK09B
POTASSIUM	10.0	10.6	mg/L	106.0%		80.	120.	IFK09B
SELENIUM	0.100	0.106	mg/L	106.0%		80.	120.	IFK09B
SILICON	5.00	4.91	mg/L	98.2%		80.	120.	IFK09B
SILVER	0.0500	0.0496	mg/L	99.2%		80.	120.	IFK09B
SODIUM	7.50	7.90	mg/L	105.3%		80.	120.	IFK09B
STRONTIUM	0.500	0.517	mg/L	103.4%		80.	120.	IFK09B
THALLIUM	0.100	0.109	mg/L	109.0%		80.	120.	IFK09B
TIN	0.500	0.517	mg/L	103.4%		80.	120.	IFK09B
TITANIUM	0.500	0.513	mg/L	102.6%		80.	120.	IFK09B
VANADIUM	0.500	0.514	mg/L	102.8%		80.	120.	IFK09B
ZINC	0.500	0.528	mg/L	105.6%		80.	120.	IFK09B

H Laboratory control sample recovery is greater than the laboratory's acceptance limit.

L Laboratory control sample recovery is less than the laboratory's acceptance limit.

Katahdin
ANALYTICAL SERVICES

PREPARATION BLANK REPORT

Sample ID: PBWFK07HGW1 **Batch ID:** FK07HGW1

Element Name	Result	Units	Flag	PQL	File
MERCURY	0.05	ug/L	U	0.20	HFK07B

U The analyte was not detected in the sample at a level greater than the instrument detection limit.

J The analyte was detected in the sample at a concentration greater than the instrument detection limit, but less than the laboratory's Practical Quantitation Level.

H The analyte was detected in the sample at a concentration greater than the laboratory's acceptance limit.

Katahdin ANALYTICAL SERVICES

LABORATORY CONTROL SAMPLE REPORT

Sample ID: LCSWFK07HGW1 **Batch ID:** FK07HGW1

Element Name	True Value	Result	Units	Recovery(%)	Flag	Limits (%)		File
MERCURY	5.00	4.60	ug/L	92.0%		80.	120.	HFK07B

H Laboratory control sample recovery is greater than the laboratory's acceptance limit.

L Laboratory control sample recovery is less than the laboratory's acceptance limit.

Quality Control Report

Blank Sample Summary Report

Solids-Filterable Residue

Samp Type	QC Batch	Anal. Method	Anal. Date	Prep. Date	Result	PQL
MBLANK	WG115843	EPA 160.1	05-NOV-12	02-NOV-12	U 8.0 mg/L	10. mg/L

Solids-Nonfilterable Residue

Samp Type	QC Batch	Anal. Method	Anal. Date	Prep. Date	Result	PQL
MBLANK	WG115865	EPA 160.2	05-NOV-12	02-NOV-12	U 3 mg/L	4 mg/L

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Quality Control Report

Laboratory Control Sample Summary Report

Solids-Filterable Residue

Lab Sample Id	Samp Type	QC Batch	Analysis Date	Prep Date	Units	Spike Amt.	Result	Recovery	Acceptance Range	RPD
WG115843-2	LCS	WG115843	05-NOV-12	02-NOV-12	mg/L	750	730	97	80-120	

Solids-Nonfilterable Residue

Lab Sample Id	Samp Type	QC Batch	Analysis Date	Prep Date	Units	Spike Amt.	Result	Recovery	Acceptance Range	RPD
WG115865-2	LCS	WG115865	05-NOV-12	02-NOV-12	mg/L	1000	940	94	60-140	

pH(Laboratory)

Lab Sample Id	Samp Type	QC Batch	Analysis Date	Prep Date	Units	Spike Amt.	Result	Recovery	Acceptance Range	RPD
WG115855-1	LCS	WG115855	02-NOV-12	N/A	pH	7	7.0	100	99-101	

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sales@katahdinlab.com

Katahdin Analytical Services, Inc. — Sample Receipt Condition Report

Client: Rhea	KAS PM: JO	Sampled By: Client
Project:	KIMS Entry By: GN	Delivered By: Fed-Ex
KAS Work Order#: SF7679	KIMS Review By:	Received By: GN
SDG #:	Cooler: 1 of 2	Date/Time Rec.: 11-2-12 09:00

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?	✓				
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?	✓				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.	✓				Temp (°C): 3.5
Samples received at <6 °C w/o freezing?	✓				Note: Not required for metals analysis.
Ice packs or ice present?	✓				The lack of ice or ice packs (i.e. no attempt to begin cooling process) may not meet certain regulatory requirements and may invalidate certain data.
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals analysis.
6. Volatiles free of headspace: **Aqueous:** No bubble larger than a pea	✓				
Soil/Sediment: Received in airtight container?	✓				
Received in methanol?				✓	
Methanol covering soil?				✓	
7. Trip Blank present in cooler?	✓				
8. Proper sample containers and volume?	✓				
9. Samples within hold time upon receipt?	✓				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2	✓			X	GN
Sulfide - >9				✓	
Cyanide – pH >12				✓	

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments

Katahdin Analytical Services, Inc. — Sample Receipt Condition Report

Client: Rhea	KAS PM: JO	Sampled By: Client
Project:	KIMS Entry By: GN	Delivered By: FedEx
KAS Work Order#: SF7679	KIMS Review By: JO	Received By: GN
SDG #:	Cooler: 2 of 2	Date/Time Rec.: 11-2-12 / 0900

Receipt Criteria	Y	N	EX*	NA	Comments and/or Resolution
1. Custody seals present / intact?	✓				
2. Chain of Custody present in cooler?	✓				
3. Chain of Custody signed by client?	✓				
4. Chain of Custody matches samples?	✓				
5. Temperature Blanks present? If not, take temperature of any sample w/ IR gun.	✓				Temp (°C): 4.4
Samples received at <6 °C w/o freezing?	✓				Note: Not required for metals analysis.
Ice packs or ice present?	✓				The lack of ice or ice packs (i.e. no attempt to begin cooling process) may not meet certain regulatory requirements and may invalidate certain data.
If temp. out, has the cooling process begun (i.e. ice or packs present) and sample collection times <6hrs., but samples are not yet cool?				✓	Note: No cooling process required for metals analysis.
6. Volatiles free of headspace: **Aqueous:** No bubble larger than a pea				✓	
Soil/Sediment: Received in airtight container?				✓	
Received in methanol?				✓	
Methanol covering soil?				✓	
7. Trip Blank present in cooler?				✓	
8. Proper sample containers and volume?	✓				
9. Samples within hold time upon receipt?	✓				
10. Aqueous samples properly preserved? Metals, COD, NH3, TKN, O/G, phenol, TPO4, N+N, TOC, DRO, TPH – pH <2	✓				
Sulfide - >9				✓	
Cyanide – pH >12				✓	

* Log-In Notes to Exceptions: document any problems with samples or discrepancies or pH adjustments

600 Technology Way
P.O. Box 540
Scarborough, ME 04070
Tel: (207) 874-2400
Fax: (207) 775-4029

Chain of Custody

Client:	Contract:	Phone #:	Fax #:
Rhea Engineers		(724) 443-4111	( )
Address: 4975 Wm Flynn Hy Ste 14	City: Gibsonia	State: PA	Zip Code:15044
Purchase Order #: 581	Proj. Name/No.: Camp Lejeune		Katahdin Quote #:
Bill (if different than above):		Address:	
Sampler (Print/Sign):			Copies To:

LAB USE ONLY — Work Order #: SF7679 (Katahdin Project Number)

Remarks:

Shipping Info: FEDEX UPS CLIENT
Airbill No:
Temp C Temp Blank Intact Not Intact

Analysis and Container Type Preservatives

*	Sample Description	Date/Time Collected	Matrix	No. of Containers	VOC 8260B (Filt. Y/N)	Metals 6010/7470 (Filt. Y/N)	O & G 1664A (Filt. Y/N)	TSS 160.2 (Filt. Y/N)	TDS 160.1 (Filt. Y/N)	pH 150.1 (Filt. Y/N)	(Filt. Y/N)	(Filt. Y/N)	(Filt. Y/N)	(Filt. Y/N)
	CLJ-INS-R-61	11/1/12/ 700	GW	5	X	X		X	X	X				
	CLJ-IND-R-61	11/1/12 / 705	GW	5	X	X		X	X	X				
	CLJ-AS-R-61	11/1/12/ 710	GW	5	X	X		X	X	X				
	CLJ-EF-R-61	11/1/12/ 715	GW	5	X	X		X	X	X				
	CLN-IN-R-61	11/1/12/ 730	GW	6	X		X	X	X	X				
	CLN-EF-R-61	11/1/12/ 735	GW	6	X		X	X	X	X				
	CLS-IN-R-61	11/1/12/ 800	GW	6	X		X	X	X	X				
	CLS-EF-R-61	11/1/12 / 805	GW	6	X		X	X	X	X				
	CLJ-TB-R-61			3	X									

COMMENTS: See attached sheet for specific metals and additional instructions
Email results to: ben@rhea.us, tim@rhea.us, jamie.eberl@rhea.us

Relinquished By:	Date/Time	Received By:	Relinquished By:	Date/Time	Received By:
[signature]	11/1/12 1300	[signature]			
Relinquished By:	Date/Time	Received By:	Relinquished By:	Date/Time	Received By:

O & M Camp Lejeune
MCB Camp Lejeune, North Carolina

Operating System Testing
Chain of Custody Attachment, Sample Analysis Desired

HOLD SD's

Electronic Report Only

Sampling Event

Updated BDG 05-13-10

Site	Sample ID Number	Sample Description	Analysis Desired						Metals to be Reported
			VOC 8260B	Metals 6010/7470	O & G 1664A	TSS 160.2	TDS 160.1	pH 150.1	
Lot 203	CLJ-INS-R-##	Shallow Wells	X	X		X	X	X	Arsenic (As), Barium (Ba), Beryllium (Be), Calcium (Ca), Chromium (Cr), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Mg), and Vanadium (V)
Lot 203	CLJ-IND-R-##	Deep Wells	X	X		X	X	X	Arsenic (As), Barium (Ba), Beryllium (Be), Calcium (Ca), Chromium (Cr), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Mg), and Vanadium (V)
Lot 203	CLJ-AS-R-##	Air Stripper	X	X		X	X	X	Arsenic (As), Barium (Ba), Beryllium (Be), Calcium (Ca), Chromium (Cr), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Mg), and Vanadium (V)
Lot 203	CLJ-EF-R-##	Effluent	X	X		X	X	X	Arsenic (As), Barium (Ba), Beryllium (Be), Calcium (Ca), Chromium (Cr), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Mg), and Vanadium (V)
Total Tests			5	5	0	5	5	5	
North Plant	CLN-IN-R-##	Influent	X		X	X	X	X	
North Plant	CLN-EF-R-##	Effluent	X		X	X	X	X	
Total Tests			3	0	3	3	3	2	
South Plant	CLS-IN-R-##	Influent	X		X	X	X	X	
South Plant	CLS-EF-R-##	Effluent	X		X	X	X	X	
Total Tests			3	0	3	3	3	2	
QA / QC Samples									
Trip Blank	CLJ-TB-R-##	1 per VOC Cooler	X						Report as part of the CLJ Group
Temperature Blank		1 per Cooler							
Total Tests			3	0	0	0	0	0	
Total # of Tests			14	5	6	11	11	9	

C:\Users\Jamie\Desktop\Monthly Tech Memo\COCs\Copy of IR COC attachment -reduced list
Updated: TJG Date: 8-12-09

Katahdin
ANALYTICAL SERVICES

Katahdin Analytical Services

Login Chain of Custody Report (Ino1)

Nov. 02, 2012
12:45 PM

Login Number: SF7679

Account: RHEA001 Web
Rhea Engineers and Consultants, Inc.

Project: RHEATP001

Primary Report Address:
Benjamin Grosser
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Suite 14
Gibsonia,PA 15044
scott@rhea.us

Primary Invoice Address:
Accounts Payable
Rhea Engineers and Consultants, Inc.
4975 William Flynn Hwy
Suite 14
Gibsonia,PA 15044

Report CC Addresses:
Invoice CC Addresses:

Quote/Incoming: RHLEJOM

Login Information:

ANALYSIS INSTRUCTIONS	:	Firm 14 day TAT.
CHECK NO.	:	
CLIENT PO#	:	581
CLIENT PROJECT MANAGE	:	
CONTRACT	:	
COOLER TEMPERATURE	:	3.5, 4.4
DELIVERY SERVICES	:	Fedex
EDD FORMAT	:	WEST-XLS
LOGIN INITIALS	:	GN
PM	:	JO
PROJECT NAME	:	Monthly O&M, Camp Lejeune, NC
QC LEVEL	:	II
REGULATORY LIST	:	
REPORT INSTRUCTIONS	:	Send rpt pdf and EDD via email to ben@rhea.us and cc tim@rhea.us and jamie.eberl@rhea.us. No hc.
SDG ID	:	
SDG STATUS	:	

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Verbal Date	Due Date	Mailed
SF7679-1	CLJ-INS-R-61	01-NOV-12 07:00	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	SW3010-PREP	30-APR-13	250mL Plastic+HNO3	1	
Aqueous	S	SW6010-ARSENIC	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BARIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BERYLLIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CALCIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CHROMIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-IRON	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-LEAD	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-MANGANESE	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-VANADIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW7470-MERCURY	29-NOV-12	250mL Plastic+HNO3		
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

SF7679-2	CLJ-IND-R-61	01-NOV-12 07:05	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	SW3010-PREP	30-APR-13	250mL Plastic+HNO3	1	
Aqueous	S	SW6010-ARSENIC	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BARIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BERYLLIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CALCIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CHROMIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-IRON	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-LEAD	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-MANGANESE	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-VANADIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW7470-MERCURY	29-NOV-12	250mL Plastic+HNO3		
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

11.02.12

Katahdin ANALYTICAL SERVICES

Katahdin Analytical Services

Login Chain of Custody Report (lno1)

Nov. 02, 2012
12:45 PM

Login Number: SF7679

Quote/Incoming: RHLEJOM

Account: RHEA001 Web
Rhea Engineers and Consultants, Inc.

Project: RHEATP001

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Verbal Date	Due Date	Mailed
SF7679-3	CLJ-AS-R-61	01-NOV-12 07:10	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	SW3010-PREP	30-APR-13	250mL Plastic+HNO3	1	
Aqueous	S	SW6010-ARSENIC	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BARIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BERYLLIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CALCIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CHROMIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-IRON	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-LEAD	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-MANGANESE	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-VANADIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW7470-MERCURY	29-NOV-12	250mL Plastic+HNO3		
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

SF7679-4	CLJ-EF-R-61	01-NOV-12 07:15	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	SW3010-PREP	30-APR-13	250mL Plastic+HNO3	1	
Aqueous	S	SW6010-ARSENIC	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BARIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-BERYLLIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CALCIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-CHROMIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-IRON	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-LEAD	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-MANGANESE	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW6010-VANADIUM	30-APR-13	250mL Plastic+HNO3		
Aqueous	S	SW7470-MERCURY	29-NOV-12	250mL Plastic+HNO3		
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

SF7679-5	CLN-IN-R-61	01-NOV-12 07:30	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	E1664-O/G	29-NOV-12	1L N-AmberG+H2SO4	2	
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

SF7679-6	CLN-EF-R-61	01-NOV-12 07:35	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	E1664-O/G	29-NOV-12	1L N-AmberG+H2SO4	2	
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

SF7679-7	CLS-IN-R-61	01-NOV-12 08:00	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	E1664-O/G	29-NOV-12	1L N-AmberG+H2SO4	2	
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

11.02.12

Katahdin
ANALYTICAL SERVICES

Katahdin Analytical Services

Login Chain of Custody Report (Ino1)

Nov. 02, 2012
12:45 PM

Login Number: SF7679

Quote/Incoming: RHLEJOM

Account: RHEA001 Web
Rhea Engineers and Consultants, Inc.

Project: RHEATP001

Laboratory Sample ID	Client Sample Number	Collect Date/Time	Receive Date	PR	Verbal Date	Due Date	Mailed
SF7679-8	CLS-EF-R-61	01-NOV-12 08:05	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	E150.1-PH	02-NOV-12	500mL Plastic	1	
Aqueous	S	E160.1-TDS	08-NOV-12	500mL Plastic		
Aqueous	S	E160.2-TSS	08-NOV-12	500mL Plastic		
Aqueous	S	E1664-O/G	29-NOV-12	1L N-AmberG+H2SO4	2	
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

SF7679-9	CLJ-TB-R-61	01-NOV-12 00:00	02-NOV-12			15-NOV-12	

Matrix		Product	Hold Date (shortest)	Bottle Type	Bottle Count	Comments
Aqueous	S	SW8260-S	15-NOV-12	40mL Vial+HCl	3	

Total Samples: *9* ***Total Analyses:*** *81*

OP
11.02.12