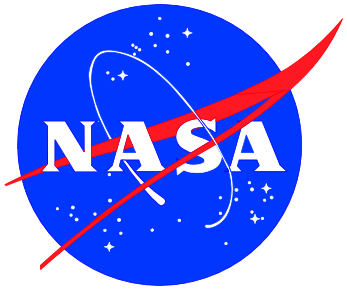
LAUNCH COMPLEX 39B (SWMU 009)
2014 ANNUAL GROUNDWATER MONITORING REPORT: SUMMARY OF PERFORMANCE MONITORING, MONITORED NATURAL ATTENUATION, AND OPERATION AND MAINTENANCE ACTIVITIES
KENNEDY SPACE CENTER, FLORIDA

Prepared for:



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CERTIFICATION AND APPROVAL

I hereby certify that in my professional judgment this document entitled: *Launch Complex 39B, SWMU 009, 2014 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities* satisfies the requirements set forth in Chapter 471, Florida Statues. I have completed and/or been in responsible charge of work completed by qualified professionals working directly under my supervision.

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ABBREVIATIONS AND ACRONYMS

Accutest	Accutest Laboratories
cDCE	*cis*-1,2-dichloroethene
CMD	Corrective Measures Design
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CVOC	chlorinated volatile organic compound
Dhc	*Dehalococcoides*
DO	dissolved oxygen
ECS	Engineering Control Structures
EPA	Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
Geosyntec	Geosyntec Consultants
GCTL	Groundwater Cleanup Target Level
KSCRT	KSC Remediation Team
KSC	Kennedy Space Center
LC39B	Launch Complex 39B
LOX	liquid oxygen
µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
MNA	monitored natural attenuation
NASA	National Aeronautics and Space Administration
O&M	Operation and Maintenance
ORP	oxidation reduction potential
PQL	practical quantitation limit
RCRA	Resource Conservation and Recovery Act
RIS	Remediation Information System
SU	standard unit
SOP	standard operating procedure
SWCTL	Surface Water Cleanup Target Level
SWMU	Solid Waste Management Unit
TCE	trichloroethene
tDCE	*trans*-1,2-dichloroethene
TDS	total dissolved solids
TOC	total organic carbon
USGS	United States Geological Survey
VC	vinyl chloride
%	percent

SECTION I

INTRODUCTION

1.1 OVERVIEW

This document presents a summary of the 2014 performance monitoring, the 2014 monitored natural attenuation (MNA) sampling, and the 2014 operation and maintenance (O&M) activities completed at Launch Complex 39B (LC39B), located at the John F. Kennedy Space Center (KSC), Florida. LC39B has been designated Solid Waste Management Unit Number 009 (SWMU 009) under KSC's Resource Conservation and Recovery Act (RCRA) Corrective Action program. This report was prepared by Geosyntec Consultants (Geosyntec) for the National Aeronautics and Space Administration (NASA) under contract number NNK09CA02B/NNK10CA31D, project control number PCN ENV1644.

This report provides information regarding ongoing Corrective Measures Implementation (CMI) activities as proposed in the *2013 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities (Revision 0)* [NASA 2014a], which received Florida Department of Environmental Protection (FDEP) approval via correspondence dated 10 April 2014.

1.2 FACILITY LOCATION

LC39B is a National Historic Site located within KSC on the east-central Atlantic Coast of Florida in Brevard County. The site is a NASA operated facility that encompasses approximately 170 acres, and is the northernmost of the two former space shuttle launch sites situated along the eastern boundary of KSC (Figure 1-1). Figure 1-2 presents the United States Geological Survey (USGS) 7.5-minute Wilson OE East, Wilson, and False Cape topographic Quadrangle Map that shows LC39B is located within Section 28 and Section 33 of Township 21S, Range 37E.

1.3 SITE HISTORY AND BACKGROUND

During the RCRA Facility Investigation [NASA 2000; NASA 2003a; NASA 2003b] and additional field investigations, trichloroethene (TCE), *cis*-1,2-dichloroethene (cDCE), and vinyl chloride (VC) were identified as the principal contaminants present in groundwater downgradient of the liquid oxygen (LOX) tank discharge pipes, which extend from the LC39B launch pad. In the Corrective Measures Study (CMS) [NASA 2004] the chlorinated volatile organic compound (CVOC) groundwater impacts were separated into a high concentration plume (TCE concentrations greater than 300 micrograms per liter [µg/L]) and a low concentration plume (TCE concentrations less than 300 µg/L and CVOC concentrations greater than their FDEP Groundwater Cleanup Target Levels

[GCTLs]) as shown in Figure 1-3. The cleanup strategy selected in the CMS was enhanced bioremediation using biostimulation and bioaugmentation with aquifer buffering and downgradient recirculation for the high concentration plume, coupled with MNA for the low concentration plume.

As detailed in the FDEP-approved Corrective Measures Design (CMD) [NASA 2005], the enhanced bioremediation approach relied on the injection of sodium bicarbonate, potassium lactate, and a microbial culture (KB-1®) into a network of 107 injection wells to provide aquifer buffering, electron donor, and dechlorinating organisms for the *in situ* treatment of CVOCs. The CMD also provided details for a solar powered recirculation system including two extraction and two injection wells for the recirculation of site groundwater to mitigate the potential discharge of impacted groundwater into the adjacent surface water body and to encourage mixing in the subsurface. The site layout with the 107 injection wells, LOX area monitoring wells, and the extraction and injection wells for the recirculation system is shown on Figure 1-4. The site-specific cleanup goals detailed in the CMD are presented in Table 1-1.

CMI activities were implemented by Jacobs Engineering from December 2005 to September 2007. Geosyntec assumed CMI activities in October 2007, and performed a comprehensive treatment zone "snap shot" groundwater sampling event that included sampling all site injection and monitoring wells. In addition to performing groundwater sampling after assuming CMI activities, Geosyntec also changed the electron donor and aquifer neutralization agent to EOS® and EOS® AquaBupH™, respectively, to eliminate the need for multiple injections of sodium bicarbonate and lactate. Details of the comprehensive groundwater sampling event and modification to the electron donor and aquifer neutralization agent were provided in the *Current Site Assessment and Injection Modification Plan (Revision 0)* [NASA 2008]. EOS® and EOS® AquaBupH™ injections were performed in June and July 2008, with a total of 17, 55-gallon drums of EOS® AquaBupH™ and 54, 55-gallon drums of EOS® diluted with potable water injected (total injection volume of 28,760 gallons). From implementation (2006) to December 2008, performance monitoring results indicated that approximately 52 percent (%) of the total CVOC mass was removed. Injection activities and performance monitoring results from 2008 are documented in the *2008 Annual Groundwater Monitoring Report: Summary of Injection Activities, Performance Monitoring and Monitored Natural Attenuation (Revision 0)* [NASA 2009].

In July 2009, two injection wells (INJ0110 and INJ0111) for the recirculation system were installed to increase the recirculation of groundwater in the vicinity of monitoring well TA0002S, with the objective of increasing the rate of reductive dechlorination in that area (Figure 1-4). After the injection well installation, performance monitoring results indicated that the increased recirculation in the vicinity of monitoring well TA0002S increased mass removal. In addition, an evaluation of the pH in site soil and groundwater was performed and results suggested that the EOS® AquaBupH™ was not providing the buffering capacity required to maintain the pH of the aquifer above the optimal level for reductive dechlorination of 6.5 standard units (SU). Even with a lower

site pH, approximately 75% of the total CVOC mass was removed from implementation (2006) to December 2009. Details from the 2009 CMI activities are documented in the *2009 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities (Revision 0)* [NASA 2010].

Performance monitoring continued in 2010 and results suggested that the installation of the new injection wells for the recirculation system increased the concentration of VC, ethene and total organic carbon (TOC) in the area around the monitoring wells influenced by the recirculation system (LOX-TA0002S, LOX-TA0003S and LOX-IW0009S). The average site pH measured during all sampling events in 2010 was approximately 5.9 SU (consistent with pH in 2009), which appears to be limiting the dechlorination rate of VC to ethene. Though the rate of dechlorination appears to be limited, ethene production is occurring (25% of site mass in December 2010) and an approximate 80% CVOC mass reduction was observed from implementation (2006) to December 2010. During 2010, a surface water sample was collected in the area near injection well INJ0029 and results for CVOCs were non-detect (less than 0.26 µg/L TCE and cDCE and less than 0.22 µg/L VC). Details from the 2010 CMI activities are documented in the *2010 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities (Revision 0)* [NASA 2011a].

Performance monitoring continued in 2011 through 2013, and the results suggested the following: (i) VC was the only constituent with concentrations above the site-specific cleanup criteria, with the exception of the results from samples collected from the LOX-IW0013 monitoring well cluster (cluster with practical quantitation limit [PQL] as cleanup criteria); (ii) that VC to ethene dechlorination is still rate limited due to pH (average pH of 6.0 (2011), 5.9 (2012), and 5.7 (2013) SU); and (iii) EOS® was still viable based on TOC concentrations which ranged from 22 to 94 milligrams per liter (mg/L) in 2011 and 14 to 61 mg/L in 2012 (TOC sampling was eliminated from the sampling and analysis plan following 2012). It was estimated that an 88%, 87%, and 86% CVOC mass reduction was observed from implementation (2006) to September 2011, September 2012, and October 2013 respectively. Details from the 2011 CMI activities are documented in the *2011 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities (Revision 0)* [NASA 2012], the details from the 2012 CMI activities are documented in the *2012 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities (Revision 0)* [NASA 2013], and the details from the 2013 CMI activities are documented in the *2013 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities* [NASA 2014a].

In addition to CMI activities, supplemental assessment activities were occurring inside the LC39B perimeter fence in the area around the former Engineering Control Structure (ECS) Area and outside

the perimeter fence in the area around the LOX discharge pipes. A preliminary evaluation of the results from the assessment is presented on Figure 1-5. TCE has been identified inside the pad fence line adjacent to the LOX area and this mass is likely influencing the treatment zone via dissolved flux entering the LOX area. Results from the supplemental assessment activities will be reported after the assessment is complete in a Step 1 Engineering Evaluation and a CMI Progress Report.

1.4 PURPOSE

The purpose of this report is to: (i) present the results of the 2014 performance monitoring, (ii) present the results of the 2014 MNA sampling, and (iii) provide a summary of the 2014 O&M activities.

1.5 REPORT ORGANIZATION

The remainder of this report is organized as follows:

Section II: *Field Activities* – This section provides a summary of the field activities that occurred during 2014.

Section III: *Results* – This section provides a summary of the 2014 performance monitoring sampling results, MNA sampling results, and O&M activities.

Section IV: *Conclusions and Recommendations*- This section provides the conclusions from the results presented in Section III and recommendations for the path forward for the site.

Section V: *References* - This section provides a listing of the documents used in developing this report.

Table 1-1. Site-Specific Cleanup Criteria from the Corrective Measures Design Report Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Analyte	FDEP SWCTL (µg/L)	GIII (non-potable) (µg/L)	Upper Range of KSC Background Value (µg/L)	Site-Specific Cleanup Level (µg/L)
Trichloroethene	80.7	30	-	80.7/< PQL
cis-1,2-Dichloroethene	NA	700	-	700/< PQL
trans-1,2-Dichloroethene	11,000	1,000	-	11,000/< PQL
Dichloroethene (total)	7,000	700	-	7,000/< PQL
Vinyl Chloride	2.4	100	-	2.4/< PQL
Aluminum	13	-	280	280
Iron	1,000	-	10,000	10,000

Notes:

1. FDEP indicates Florida Department of Environmental Protection.
2. SWCTL indicates Surface Water Cleanup Target Level.
3. µg/L indicates micrograms per liter.
4. PQL indicates practical quantitation limit.
5. The site-specific cleanup goal is to ultimately have contaminant concentrations below their FDEP SWCTL for monitoring wells inside the plume and below their PQLs in monitoring wells adjacent to surface water body (IW0013S and IW0013I).

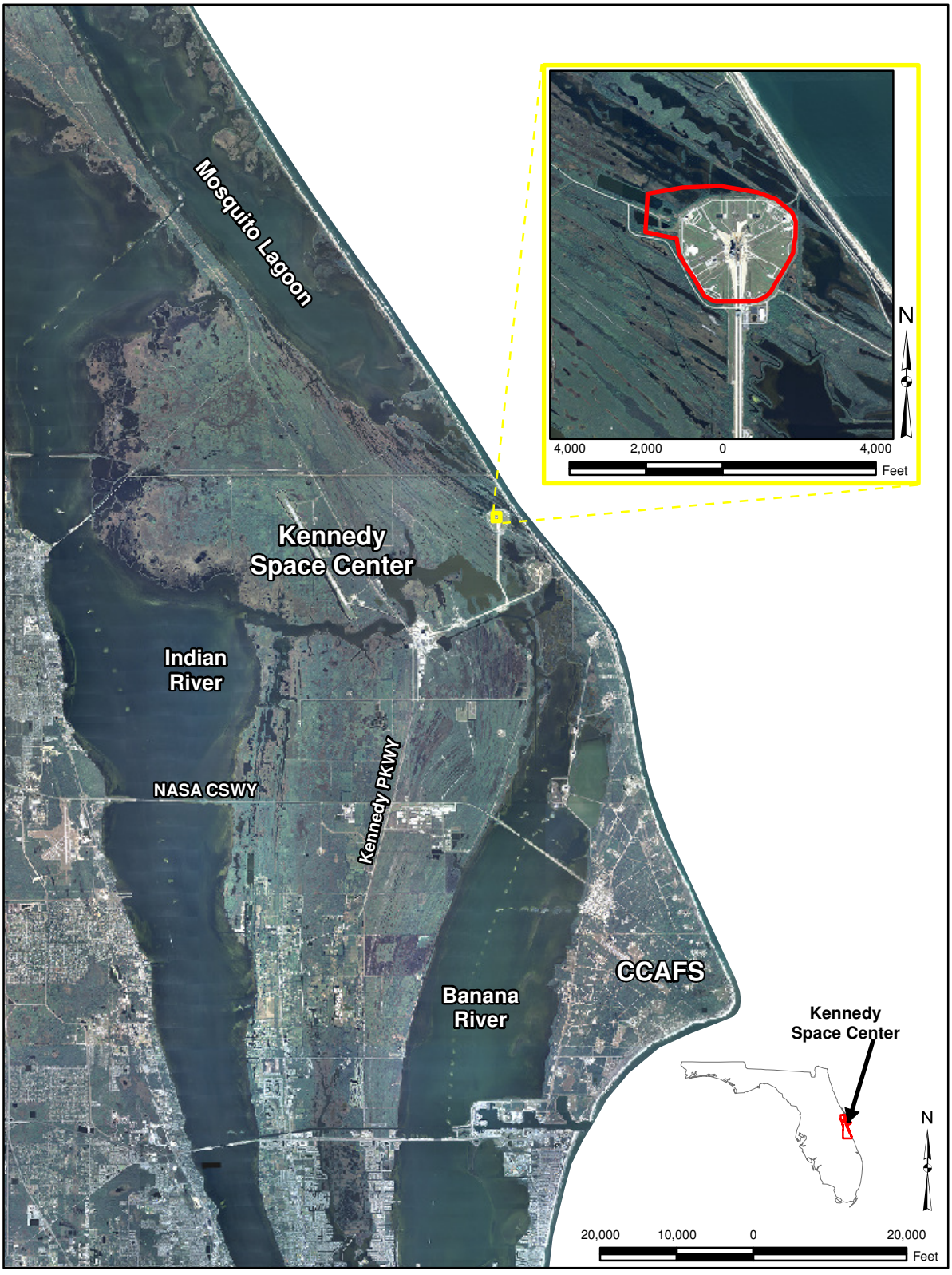

Figure 1-1
LC39B Site Location Map

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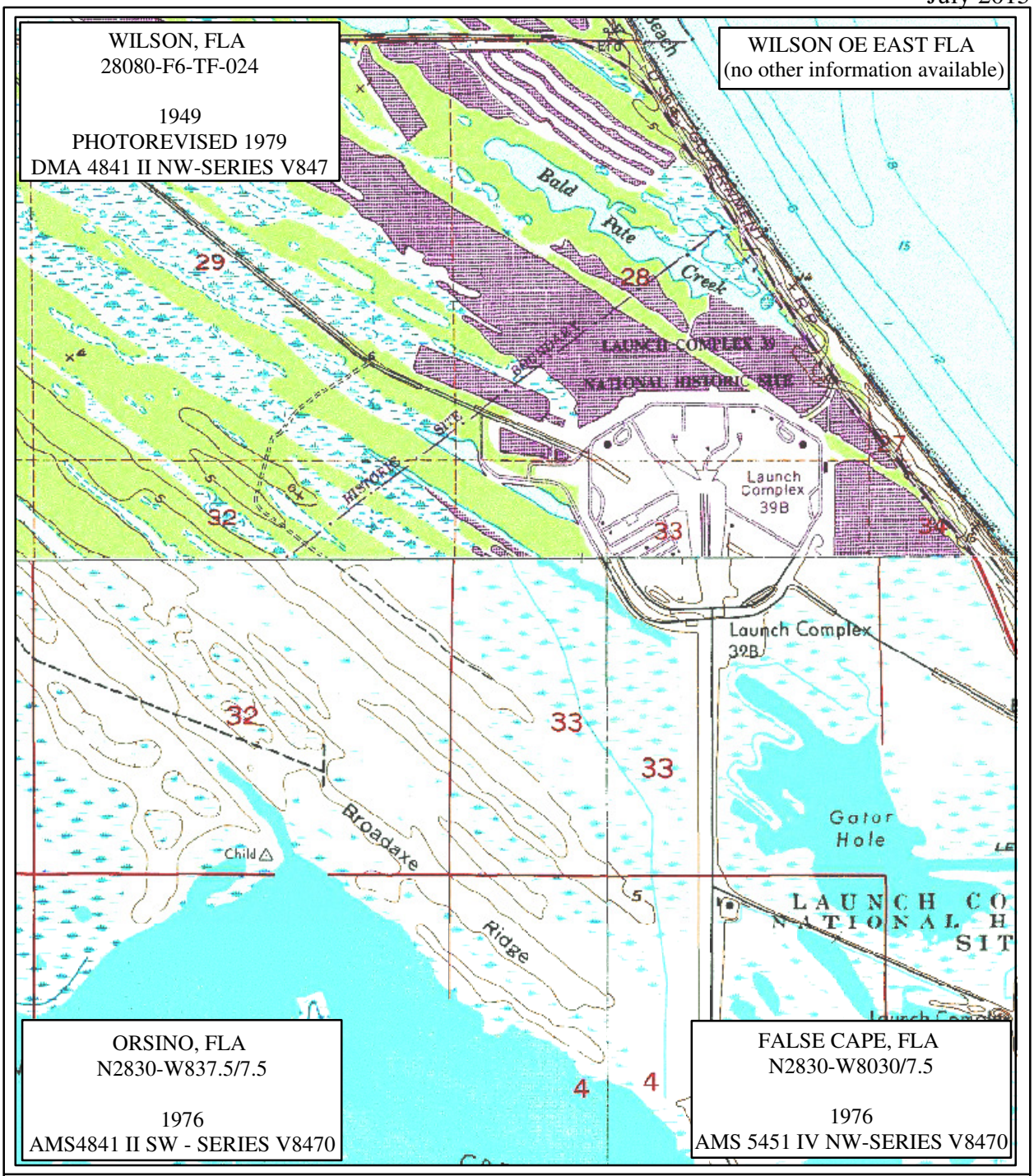

Figure 1-2
USGS Topographic Map

Legend

- Topographic Contour
- Section Line
- Section Line
- Road, paved
- Unimproved Road
- Unimproved Road
- Bathymetric Contour
- Marsh or Swamp
- Water
- Ocean
- Land Feature
- Land Feature

Revisions in shown in purple compiled from aerial photographs taken in 1977 and other source data. This information is not field checked. Map edited in 1979.

N

2,000 1,000 0 2,000 Feet

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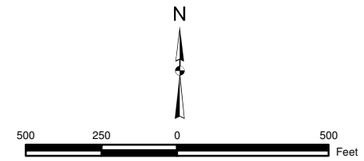

LEGEND

High concentration plume
(TCE greater than 300 µg/L)

Low concentration plume
(TCE less than 300 µg/L and CVOC concentrations greater than their GCTL)

Notes:
1. TCE indicates trichloroethene.
2. CVOC indicates chlorinated volatile organic compound.
3. GCTL indicates Groundwater Cleanup Target Level.
4. CMS indicates Corrective Measures Study.

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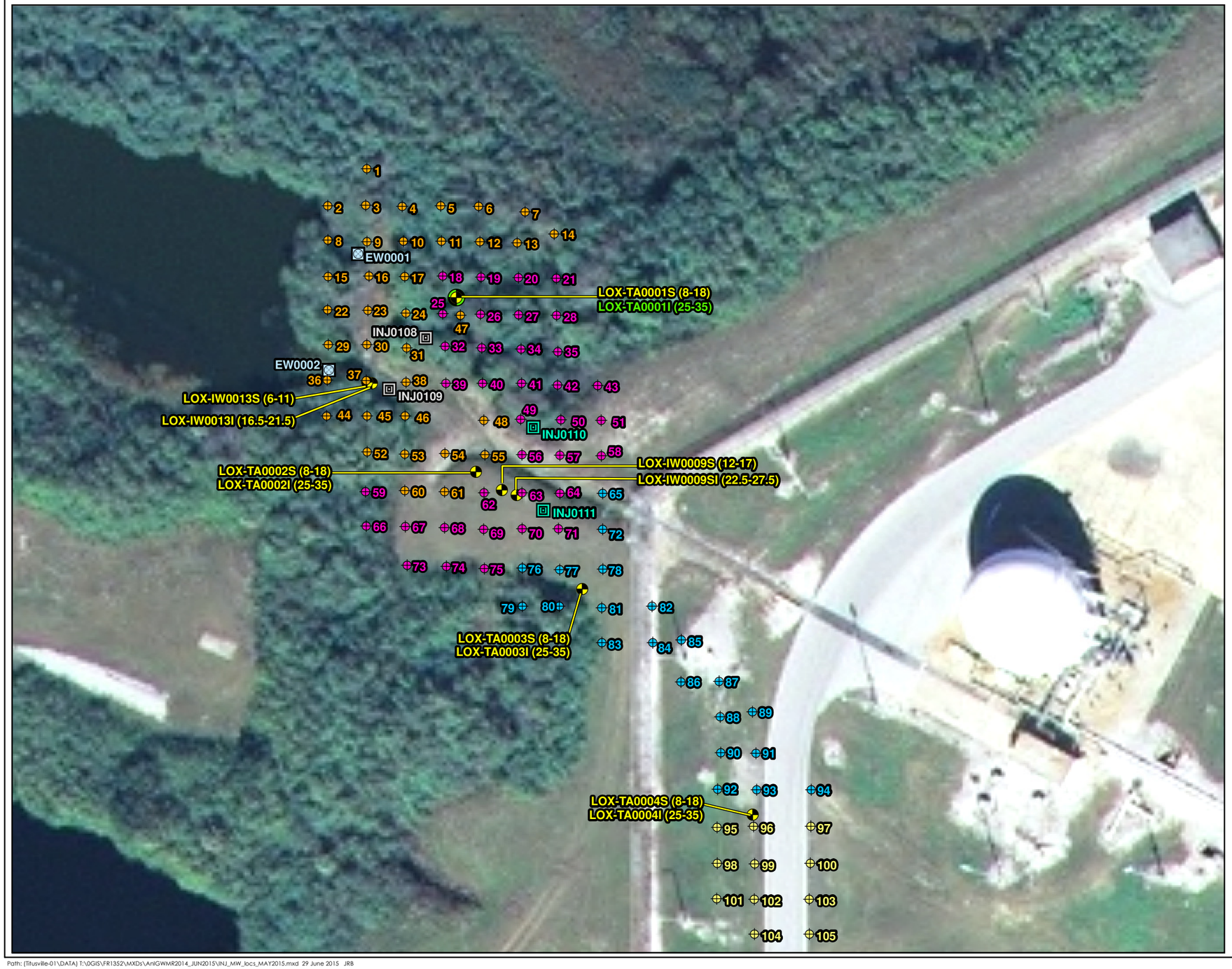
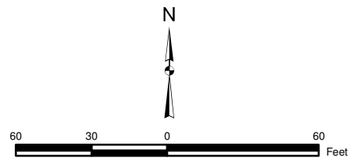
Figure 1-3
High and Low Concentration Plumes from CMS
1-11/1-12





Legend

- Injection Well Location (5-15 ft BLS)
- Injection Well Location (10-20 ft BLS)
- Injection Well Location (15-20 ft BLS)
- Injection Well Location (15-25 ft BLS)
- Performance Monitoring Well Location showing screen interval (ft BLS)
- Monitoring Well Location - Not Part of Sampling Plan showing screen interval (ft BLS)

Recirculation System

- Non-operational Injection Well Location (operational from 2005 to 2009)
- Operational Injection Well Location (installed in 2009)
- Extraction Well Location

Note:
ft BLS indicates feet below land surface.

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Figure 1-4
Injection Well and Performance Monitoring Well Locations

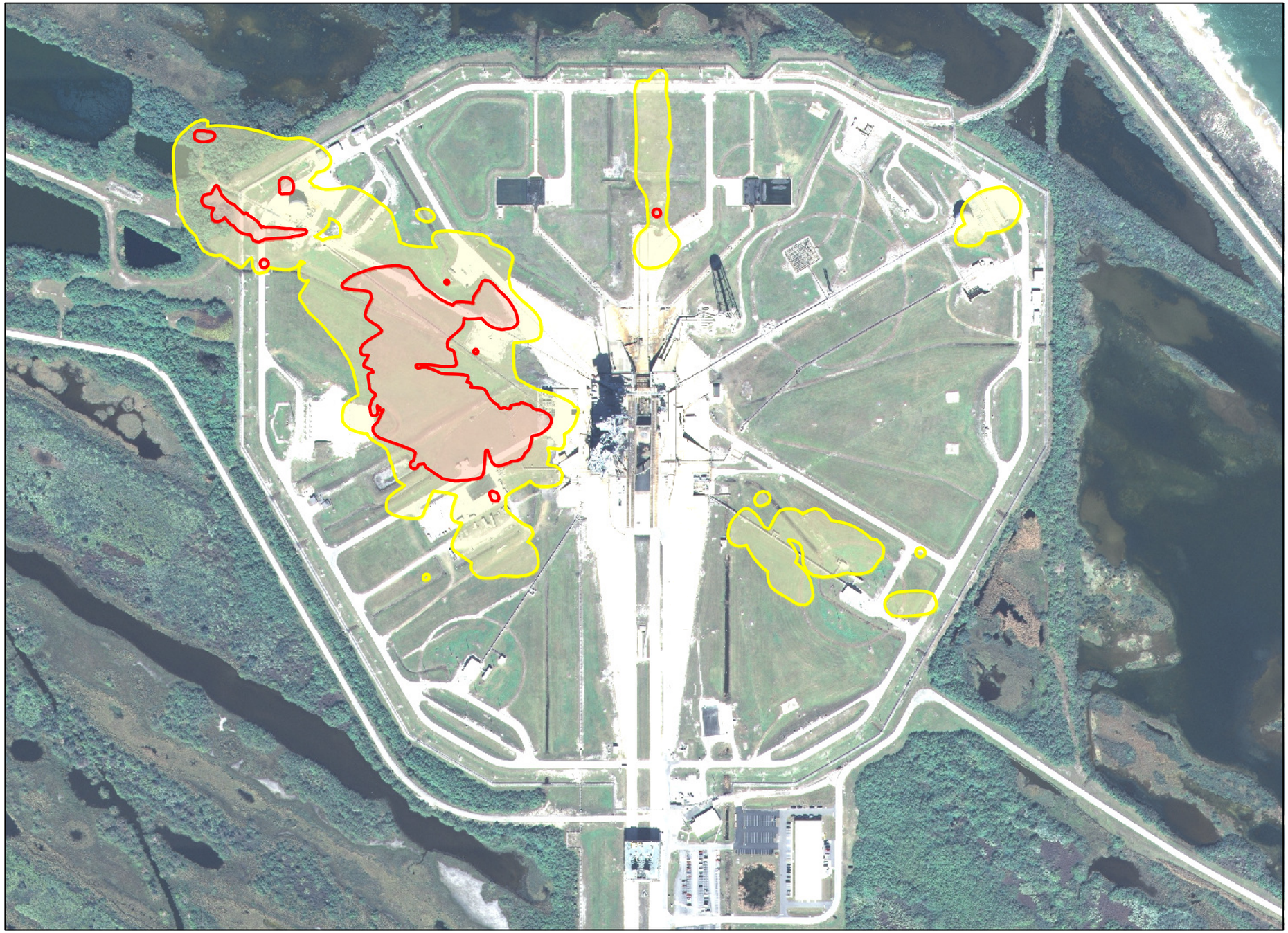

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Figure 1-5
CVOC Groundwater Impacts at LC39B
1-15/1-16

SECTION II

FIELD ACTIVITIES

2.1 OVERVIEW

The 2014 field activities included performance monitoring, MNA sampling, and O&M activities. The performance monitoring and MNA sampling plans followed were presented in the *2013 Annual Groundwater Monitoring Report: Summary of Performance Monitoring, Monitored Natural Attenuation, and Operation and Maintenance Activities (Revision 0)* [NASA 2014a].

Monitoring well purging and sampling activities were conducted in general accordance with FDEP Standard Operating Procedures (SOPs) [FDEP 2014] and the KSC Sampling and Analysis Plan [NASA 2011b]. During monitoring well purging, Geosyntec recorded the following geochemical parameters at regular intervals: pH, temperature, dissolved oxygen (DO), conductivity, oxidation reduction potential (ORP), salinity, total dissolved solids (TDS), and turbidity. Field forms are included in Appendix A, laboratory analytical data is included in Appendix B, and the Remediation Information System (RIS) Completion Tickets are included in Appendix C. Groundwater samples were submitted to Accutest Laboratories (Accutest) for analysis under chain-of-custody protocol. Accutest is certified under the National Environmental Laboratory Accreditation Conference.

2.2 PERFORMANCE MONITORING

The annual performance monitoring event occurred on 22 and 23 October 2014. The event included the collection of groundwater samples from 11 monitoring wells (Figure 1-4). Groundwater samples were analyzed for CVOCs using Environmental Protection Agency (EPA) Method 8260B/SW846. In addition to the sampling, the concrete pad for monitoring well TA0003I was replaced after damage was noted during the October 2014 sampling event.

2.3 MONITORED NATURAL ATTENUATION

MNA was selected as the presumptive remedy in the CMD for the low concentration dissolved CVOC plume located in the ECS Area (within the LC39B perimeter fence) and for monitoring metals present in site groundwater with concentrations above the Upper Range of KSC Background Values. After supplemental assessment activities began, the MNA plan was modified to include only the wells outside the supplemental assessment area. MNA sampling occurs annually and included the collection of groundwater samples from two monitoring wells (Figure 2-1). The 2014 annual MNA sampling event occurred on 22 October 2014. Groundwater samples were analyzed for CVOCs using EPA Method 8260B/SW846 (two groundwater samples) and filtered and unfiltered aluminum (one groundwater sample) using EPA Method 6020A/SW846.

2.4 OPERATION AND MAINTENANCE

O&M at LC39B includes activities associated with maintaining and optimizing the solar powered groundwater recirculation system. O&M activities were performed biweekly (25 visits total during 2014) and included the following activities:

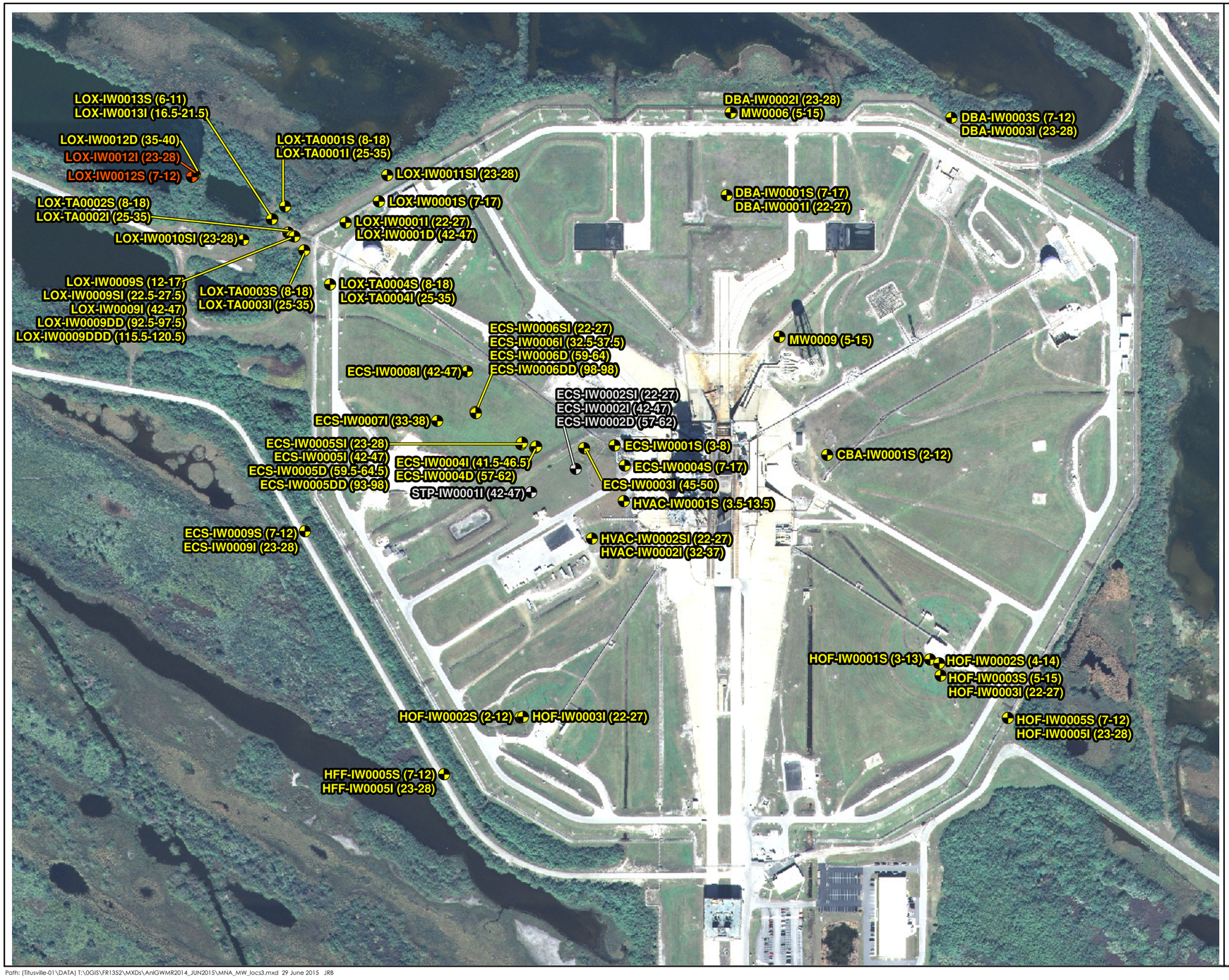
- measuring the flow rate from each extraction well;
- recording the hour meter reading;
- measuring the battery charge;
- inspecting system wiring and connections (monthly);
- inspecting the piping and connections for leaks (monthly);
- cleaning pump impellers (bi-weekly);
- cleaning the solar panels (as needed);
- cleaning flow meters (as needed);
- clearing vegetation around the trailer, piping, and wells (as needed); and
- cleaning injection and extraction well screens (monthly).

O&M forms documenting regular O&M activities are provided in Appendix D.

In addition to activities associated with the recirculation system, O&M also includes the monthly inspection of sediment blocks placed in the drainage swales to prevent the potential discharge of zinc impacted sediment from within the pad area.

2.4.1 INJECTION WELL STATUS. During a routine mowing event in September 2009, numerous injection wells in the treatment zone were damaged during mowing activities performed by NASA personnel. The mowing equipment ran over injections wells that had either been marked with tape or covered with traffic cones. The damaged wells were not repaired following the incident, and were left in place to be abandoned or repaired at a later date.

In November 2014, clearing activities performed by NASA personnel associated with both the supplemental assessment activities and regularly scheduled site maintenance occurred in the treatment area. The clearing activities included the use of a gyro-track to clear wooded areas around the treatment area. The gyro-trac destroyed a majority of the injection wells in the treatment area and left a significant layer of mulch debris (up to 2 feet thick) across the treatment area Since the injection wells are damaged and buried beneath mulch debris, it is not practical (or potentially possible) to located destroyed injection wells at the site. In addition, the injection wells will not be utilized in the future.



Legend

- MNA Monitoring Well Location showing screen interval (ft BLS)
- Monitoring Well not included in MNA showing screen interval (ft BLS)
- Abandoned Monitoring Well showing screen interval (ft BLS)

Notes:
1. ft BLS indicates feet below land surface.
2. MNA indicates monitored natural attenuation.

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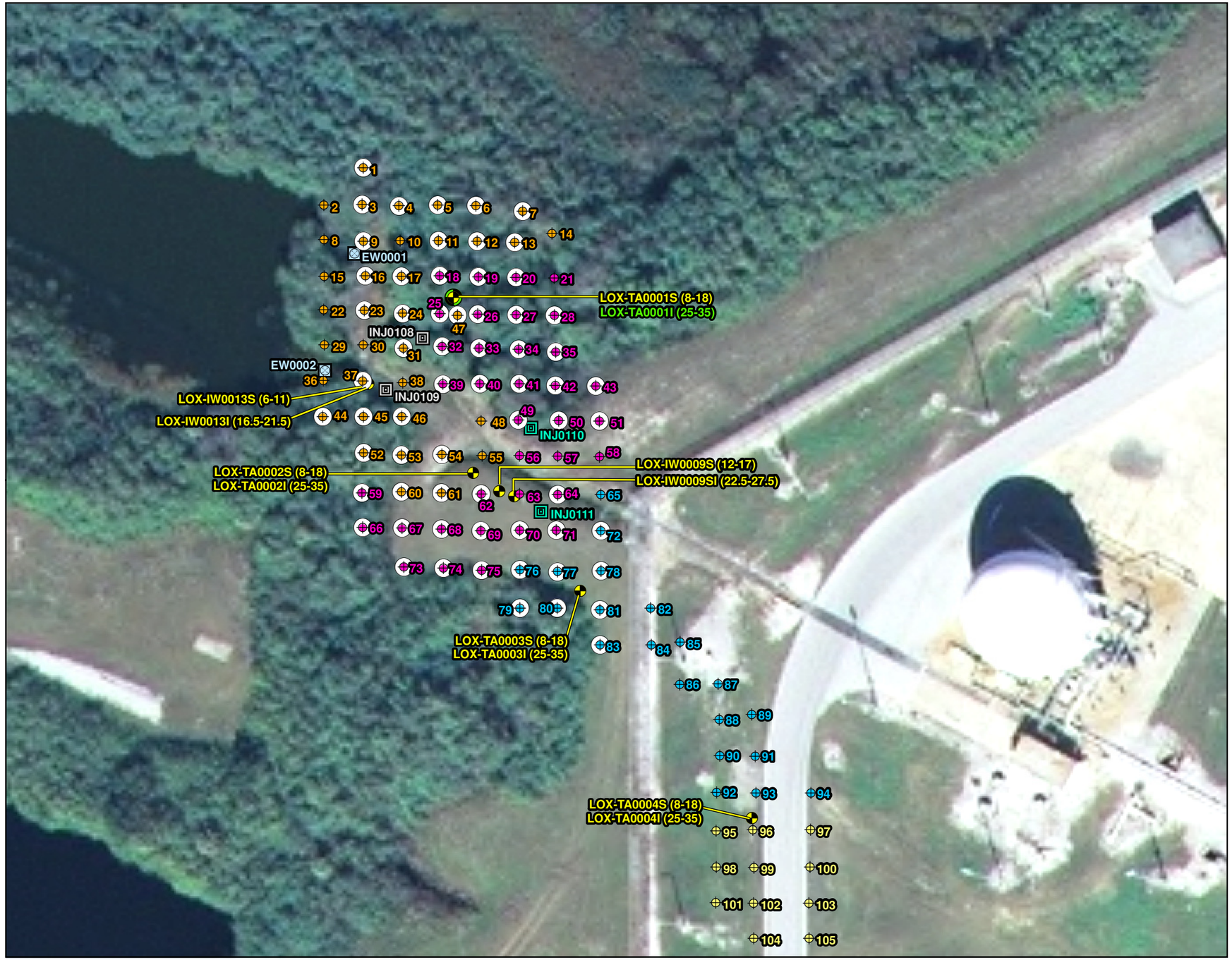
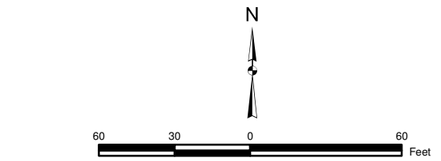
Figure 2-1
MNA Monitoring Well Locations
2-3/2-4





Legend

- Injection Well Location (5-15 ft BLS)
- Injection Well Location (10-20 ft BLS)
- Injection Well Location (15-20 ft BLS)
- Injection Well Location (15-25 ft BLS)
- Destroyed Injection Well Location
- Performance Monitoring Well Location showing screen interval (ft BLS)
- Monitoring Well Location - Not Part of Sampling Plan showing screen interval (ft BLS)

Recirculation System

- Non-operational Injection Well Location (operational from 2005 to 2009)
- Operational Injection Well Location (installed in 2009)
- Extraction Well Location

Note:
ft BLS indicates feet below land surface.

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Figure 2-2
Destroyed Injection Well Locations
2-5/2-6

SECTION III

RESULTS

3.1 OVERVIEW

This section provides a summary of the results of the 2014 groundwater sampling activities, which included performance monitoring and MNA sampling. The results of the O&M activities are also presented in this section.

3.2 PERFORMANCE MONITORING RESULTS

The performance monitoring sampling results for the October 2014 groundwater sampling event, along with historical data, are summarized in Table 3-1 and Table 3-2 and are presented on Figure 3-1.

3.2.1 COMPARISON TO SITE-SPECIFIC REMEDIAL GOALS. Comparing the data from the October 2014 sampling event to the site-specific cleanup levels indicates the following:

- 9 of 9 monitoring wells have TCE concentrations below the site-specific cleanup level of 80.7 µg/L (same as last year);
- 9 of 9 monitoring wells have cDCE concentrations below the site-specific cleanup level of 700 µg/L (same as last year);
- 1 of 9 monitoring wells (LOX-TA0004I) have VC concentrations below the site-specific cleanup level of 2.4 µg/L; and
- monitoring wells LOX-IW0013S and LOX-IW0013I have concentrations of TCE, cDCE, and VC above the site-specific cleanup levels (PQL) for each constituent.

Though CVOC concentrations remain above the PQL in samples collected from monitoring wells LOX-IW0013S and LOX-IW0013I, CVOC concentrations measured at these wells have decreased by an average of 99% (TCE), 92% (cDCE), and 66% (VC) since implementation of CMI activities (bioremediation component) in 2006.

3.2.2 MASS REMOVAL. Monitoring wells screened in the treatment zone (defined as the interval where the injection wells are screened: 5 to 25 feet below land surface) are LOX-TA0001S, LOX-TA0002S, LOX-TA0003S, LOX-TA0004S, LOX-IW0009S, LOX-IW0013S, and LOX-IW0013I. These monitoring wells are used to evaluate the performance of enhanced bioremediation at LC39B.

A comparison of the relative amount of TCE, cDCE, and VC mass present in the treatment zone monitoring wells is shown in Figure 3-2. Each pie chart on Figure 3-2 displays the percent of the total mass that each CVOC constitutes for the sampling events conducted during the initiation of treatment (January 2006) and the October 2014 performance monitoring sampling event. Since January 2006, TCE has decreased from 65.3% of the overall CVOC mass to 5.4% of the remaining mass in October 2014. In general, the distribution of the CVOC mass is similar to that observed in 2013 (2.7% TCE, 37.2% cDCE and *trans*-1,2-dichloroethene [tDCE], and 60.1% VC).

The relative size of the pie chart for October 2014 presented in Figure 3-2 is intended to represent the total CVOC mass removal of approximately 92.1%. The overall mass reduction observed for the past four years (September 2011, September 2012, October 2013, and October 2014) has been approximately 88%, 87%, 86%, and 92%, respectively, and appears to be stable. The lack of an increase in mass removal is likely due to the influx of upgradient CVOC mass from the groundwater impacts identified within the pad. Even with the stable mass reduction observed since 2011, the results suggest that reductive dechlorination is occurring and CVOC mass is being removed.

3.2.3 CVOC TREND EVALUATION. Overall, a decreasing trend in CVOCs has been observed in all treatment zone monitoring wells since EOS® injection in July 2008 (based on visual observation; see trend graphs included in Appendix E), with the exception of LOX-TA0003S and LOX-IW0009S, which show fluctuating concentrations of cDCE and VC, and LOX-TA0004S, which shows fluctuating concentrations of VC. The fluctuating concentrations of cDCE and VC in monitoring wells LOX-TA0003S and LOX-IW0009S has been observed since installation of the new injection wells. While fluctuating concentrations of VC have been observed in monitoring well LOX-TA0004S since the injection of EOS, over the past 5 sampling events (March 2011 to October 2014) the concentration of VC has shown a decreasing trend.

To better evaluate the fluctuating concentrations in these three wells, a comparison of TCE equivalent concentrations for each well was made between the year following the recirculation system injection well installation (July 2009 to July 2010) or the year following the injection activities (October 2008 to September 2009) and 2014. The equivalent TCE concentration for each year was calculated using the geometric mean, which was used instead of the average because it has been suggested that concentration reduction can be described by geometric mean [Newell, 2006]. The TCE equivalent concentration was calculated using the concentration of TCE, cDCE, tDCE, and VC observed in samples collected from the well.

For the samples collected from monitoring well LOX- TA0003S, the TCE equivalent concentrations decreased from 1,531 µg/L (geometric mean July 2009 to July 2010) to 754 µg/L

(2014), which suggest the CVOC concentrations are decreasing in the area of this monitoring well.

For the samples collected from monitoring well LOX-IW0009S, the TCE equivalent concentration increased from 75 µg/L (geometric mean July 2009 to July 2010) to 265 µg/L (2014), which suggests the CVOC concentrations are increasing in the area of this monitoring well.

For the samples collected from monitoring well LOX-TA0004S, the TCE equivalent concentration decreased from 630 µg/L (geometric mean October 2008 to September 2009) to 169 µg/L (2014). The TCE equivalent concentration in previous years is: 458 µg/L (2011), 293 µg/L (2012), and 348 µg/L (2013). The TCE equivalent concentrations observed in 2014 suggest that CVOC concentrations in the area of this monitoring well are decreasing after appearing to stabilize from 2011 to 2013.

There are a few probable reasons for the fluctuating/stable CVOC concentrations observed in the samples collected from monitoring well LOX-TA0003S, LOX-TA0004S, and LOX-IW0009S. Since the fluctuating concentrations of cDCE and VC were observed in monitoring wells LOX-TA0003S and LOX-IW0009S after the new injection wells were installed, it is likely that these wells are within the influence of the recirculation system and the recirculation system is moving impacted groundwater in the area of these wells. Another factor that could be influencing the concentration trends in these wells is that, as discussed in Section 3.2.2, impacts (TCE source area) have been identified within the pad. Since groundwater flow is radially away from the pad, it is likely that there is an influx of mass from within the pad to the LOX area (these wells are located closest to identified groundwater impacts). Additionally, the pH of the site has historically been below the optimum range for biologically mediated reductive dechlorination; therefore, the rate of reductive dechlorination could be affected by the pH (further discussion on pH is included in Section 3.2.4.1 and pH data is presented on trend graphs in Appendix E).

3.2.4 FIELD GEOTECHNICAL PARAMETER EVALUATION. The geochemical parameters collected during performance monitoring are used to indicate if the aquifer conditions are favorable for the reductive dechlorination of CVOCs. A summary of the geochemical parameters collected is provided in Table 3-3. This section will provide an evaluation of the geochemical parameters collected during performance monitoring sampling.

3.2.4.1 pH Evaluation. The site was bioaugmented with a *Dehalococcoides* (*Dhc*; the organism responsible for cDCE to ethene dechlorination) containing culture (KB-1®) and it has been documented that the optimal pH range (fastest dechlorination rate) for *Dhc* is between 6.8 to 7.5 SU in pure culture laboratory studies [Maymo-Gatell 1997] and that a pH below 5.2 SU is inhibitory to *Dhc* [Sirem 2011]. The pH in groundwater samples collected from the performance monitoring wells (in the treatment zone) ranged from 5.4 to 6.2 SU, with an average pH of 5.7 SU. The average pH in the treatment zone monitoring wells has decreased since September 2012 (average pH 6.0 SU). In general, the site pH has remained above 5.2 SU, since the injection of EOS® AquaBupH™ in July 2008, but the average pH from performance monitoring wells falls below the optimal range for *Dhc*. The low pH may be reducing the rate of VC dechlorination to ethene.

3.2.4.2 DO and ORP Evaluation. The absence of DO in groundwater and negative ORP values are an indication that conditions are favorable for anaerobic reductive dechlorination of CVOCs. The average and range of DO and ORP values reported from groundwater collected from the treatment zone monitoring wells are summarized below:

- DO ranged from 0.00 to 0.40 mg/L with an average of 0.22 mg/L; and
- ORP ranged from negative 284 to negative 214 millivolts (mV) with an average of negative 254 mV.

The DO values are generally below where site groundwater is considered anaerobic (0.5 mg/L [Wiedemeier 2006]) within the treatment zone. Also, the ORP values were consistently negative, indicating a reducing, anaerobic environment conducive to the reductive dechlorination of CVOCs.

3.3 MNA GROUNDWATER SAMPLING RESULTS

3.3.1 MNA CVOC GROUNDWATER SAMPLING RESULTS. The results from the 2014 annual MNA CVOC sampling event are summarized in Table 3-4 and on Figure 3-3. Only the point of compliance wells, LOX-IW0012S and LOX-IW0012I, are sampled as part of the MNA program, since supplemental assessment is occurring at the site. It is anticipated that following the completion of supplemental assessment activities in 2015, an Interim Measure or other appropriate action will be implemented to address the impacted groundwater in the ECS and LOX Areas concurrently.

Since the initiation of MNA sampling (January 2006), CVOC concentrations in samples collected at monitoring wells LOX-IW0012S and LOX-IW0012I have remained less than their Surface Water Cleanup Target level (SWCTL) and/or Class G-III (non-potable water use, groundwater in unconfined aquifers which has a TDS content of 10,000 mg/L or greater; or which has TDS 3,000-10,000 mg/L) levels.

3.3.2 MNA METALS GROUNDWATER SAMPLING RESULTS. The results from the 2014 annual MNA metals sampling along with historical data are summarized in Table 3-5 and on Figure 3-4.

One monitoring well, LOX-IW0012S, is sampled as part of the MNA metals sampling event. The samples collected from LOX-IW0012S were analyzed for both dissolved and total aluminum using EPA Method 6020A. The concentrations of total aluminum (3,920 µg/L) and dissolved aluminum (3,840 µg/L) in groundwater collected from this monitoring well were greater than the upper limit of the Range of KSC Background Value of 280 µg/L. These results exhibited the first increase in aluminum concentrations since September 2011, and were the highest concentration measured since January 2006 (12,000 µg/L). The aluminum concentration observed is within the range of historic observations at the location.

One difference during this sampling event was that EPA Method 6020A was utilized instead of EPA Method 6010C, since EPA Method 6010C can bias aluminum concentrations high when chloride concentrations are high. Due to the location of monitoring well LOX-IW0012S, the samples collected from this well generally have a chloride concentration of approximately 20% (see Section 3.3.3.3).

3.3.3 EVALUATION OF GEOCHEMICAL PARAMETERS. The geochemical parameters collected during MNA groundwater monitoring are used to evaluate aquifer conditions. A summary of the geochemical parameters collected is provided in Table 3-6.

3.3.3.1 pH Evaluation. The pH value reported was 4.75 SU (LOX-IW0012S). The pH measured at monitoring well LOX-IW0012S was slightly more acidic than what has been historically observed (Table 3-6), and was below the average pH measured at the monitoring well since 2008 (5.5 SU). This acidic pH could be responsible for the higher than expected aluminum concentration in samples collected from monitoring well LOX-IW0012S, since aluminum has a higher solubility at lower pH values. The cause for the decrease in pH below 5.0 SU is not known.

3.3.3.2 DO and ORP Evaluation. The DO and ORP values reported were 0.33 mg/L and negative 95 mV (LOX-IW0012S). Aluminum concentrations are not generally affected by DO or ORP of groundwater.

3.3.3.3 Salinity Evaluation. High salinity values can affect the concentration of aluminum. The salinity observed in the sample collected from monitoring well LOX-IW-0012S was 27% and the average since 2008 is approximately 21%.

3.4 OPERATION AND MAINTENANCE

This section provides a summary of the O&M activities performed at LC39B during 2014. The recirculation system at LC39B consists of two extraction wells, four injection wells (two currently being utilized for injection), and a mobile trailer that houses the extraction pumps, solar panels, and solar powered batteries that provide power to the pumps. O&M activities at LC39B consisted of bi-weekly inspections of the system and monthly inspections of the sediment blocks.

3.4.1 RECIRCULATION SYSTEM OPERATION AND MAINTENANCE.

The recirculation system at LC39B was installed to minimize potential discharge of the dissolved CVOC plume into the adjacent surface water body and to increase mixing in the treatment zone. A summary of each O&M event was sent to NASA in a monthly status report (by email) with the O&M forms attached to the report. O&M forms are included in Appendix D; therefore, only a brief summary of system operations is included below.

System modifications:

- recirculation well pumps were replaced with SHURflo On-Demand diaphragm pumps when they had reached the end of their useful lives (12 pumps replaced during 2014);
- damaged system piping was replaced following mowing and clearing operations in September and November 2014, respectively;
- tees in the system piping were replaced in May and June 2014; and
- tubing within the recirculation trailer for extraction well EW-1 was replaced in December 2014.

System operation:

- the system recirculated approximately 780,000 gallons from 30 December 2013 to 19 December 2014; and
- the system was operational approximately 81% of the time; downtime was primarily due to system operational issues (18% of the time due mechanical issues and lack of sufficient charge in batteries to run the system) and was also down due to system damage from mowing (1% of the time).

3.4.2 SEDIMENT BLOCK INSPECTION. The sediment blocks were installed to reduce the potential for off-site migration of zinc impacted sediment through the storm water/ditch systems at LC39B. The locations of the sediment blocks are presented on Figure 3-5, along with pictures of the sediment blocks from the December 2014 inspection event. Photos from the December 2013 sediment block inspection are also included on Figure 3-5 for comparison. The sediment block inspection consists of monitoring sediment accumulation at the sediment blocks and removing sediment if significant accumulation occurs. From January to December 2014 there was no accumulation of sediment at the sediment blocks. Maintenance of the sediment blocks included clearing vegetation from the sediment blocks, as necessary.

Table 3-1. Performance Monitoring Well and Surface Water Sampling Results: Chlorinated Volatile Organic Compounds Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Concentration (mg/L)			
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4
LOX-TA0001S	8 to 18	01/12/2006	**5,700**	**1,300**	50.0	**25 U**
		05/03/2006	**6,400**	**1,400**	56.0	**25 U**
		06/22/2006	**5,300**	**1,200**	57.0	0.50 U
		07/06/2006	**3,800**	**1,600**	22 U	**43 U**
		10/31/2006	**420**	**1,500**	37.0	**1,300**
		01/17/2007	**380**	600	36.0	**1,900**
		04/13/2007	**170**	230	42.0	**1,500**
		08/01/2007	**140**	140	30.0	**590**
		09/25/2007	**180**	140	24.0	**850**
		11/08/2007	**370**	200	36.0	**510**
		09/08/2008	**90.5**	102	20.7	**449**
		12/16/2008	69.5	57.9	24.4	**371**
		03/09/2009	**94.5**	79.7	18.1	**315**
		06/15/2009	**99.8**	105	15.9	**269**
		09/10/2009	**162**	174	16.8	**409**
		12/17/2009	80.0	96.0	18.1	**304**
		03/03/2010	**81.9**	135	15.7	**300**
		06/02/2010	**97.5**	181	17.8	**506**
		09/22/2010	48.2	69.3	18.4	**358**
		12/21/2010	35.1	33.6	7.1	**346**
		03/07/2011	28.0	23.8	3.6	**149**
		09/28/2011	13.5	13.9	2.1	**68.2**
		09/25/2012	13.8	15.3	2.5	**77.1**
		10/21/2013	14.4	16.4	2.0	**30.6**
		10/23/2014	17.4	16.9	2.1	**34.5**
LOX-TA0001I	25 to 35	01/12/2006	0.28 U	0.65 U	0.44 U	0.50 U
		05/03/2006	7.0	7.3	0.44 U	0.50 U
		06/22/2006	2.2	4.8	0.44 U	0.50 U
		07/06/2006	1.1 U	2.4	0.44 U	0.50 U
		10/31/2006	2.8	4.8	0.44 U	0.50 U
		10/31/2006*	2.6	4.3	0.44 U	0.50 U
		01/17/2007	2.0	4.2	0.44 U	0.50 U
		04/13/2007	4.6	6.3	0.44 U	**4.1**
		08/01/2007	2.4	3.2	0.44 U	**12.0**
		09/25/2007	3.8	4.8	0.44 U	**28.0**
		11/08/2007	2.9	6.2	1.0 U	**19.7**
		09/08/2008	4.2	9.1	0.51	**9.8**
		12/16/2008	1.6	2.5	0.46 I	**4.2**
		03/09/2009	0.93 I	1.7	0.49 I	1.4
		06/15/2009	1.0	1.9	0.45 U	0.99 I
		09/10/2009	1.6	2.5	0.71 I	1.6
		12/17/2009	1.6	2.7	0.45 U	**2.7**
		03/03/2010	1.3	2.8	0.34 U	**2.7**
		06/02/2010	1.2	2.1	0.34 U	**3.0**
		09/23/2010	0.87 I	1.8	0.34 U	1.0
		12/21/2010	1.0	1.7	0.35 U	1.6
		03/07/2011	0.85 I	1.7	0.35 U	0.92 I
		09/27/2011	0.35 I	1.2	0.35 U	0.22 U
		09/25/2012	0.54 I	0.76 I	0.23 U	0.44 U
		10/21/2013	0.33 I	0.50 I	0.42 I	0.44 U
LOX-TA0002S	8 to 18	01/12/2006	**3,300**	**920**	46 I	**220**
		05/03/2006	**4,800**	**1,000**	43 I	**110**
		06/22/2006	**5,100**	**1,100**	47.0	**290**
		08/06/2006	**1,100**	**880**	29.0	**550**
		10/27/2006	**5,300**	**1,000**	42.0	**100**
		01/17/2007	**3,600**	**860**	33.0	**140**
		04/12/2007	**5,100**	**1,100**	38.0	**130**
		08/01/2007	**3,800**	**1,100**	8.8 U	**10 U**
		09/25/2007	**3,400**	**1,100**	32.0	**240**
		11/08/2007	**2,300**	**1,500**	50 U	**170**

Table 3-1. Performance Monitoring Well and Surface Water Sampling Results: Chlorinated Volatile Organic Compounds Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Concentration (mg/L)			
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4
LOX-TA0002S (cont)	8 to 18 (cont)	09/09/2008	**3,490**	**1,780**	48.9	**429**
		12/16/2008	**3,340**	**2,330**	54.0	**484**
		03/09/2009	**2,000**	**2,380**	41 I	**378**
		06/15/2009	**1,600**	**2,040**	40 I	**341**
		09/10/2009	1.8	223	6.0	**74.1**
		12/18/2009	9.3 I	**1,330**	15 I	**216**
		03/04/2010	7.7 I	**1,230**	16 I	**230**
		06/02/2010	2.4 U	638	11.3	**351**
		09/22/2010	2.5	100	7.9	**523**
		12/21/2010	15.9	76.3	6.0	**235**
		03/08/2011	19.5	152	6.8	**182**
		09/27/2011	11.1	70.2	6.8	**114**
		09/24/2012	7.8	23.9	16.5	**103**
		10/22/2013	9.4	15.2	11.8	**42.8**
		10/23/2014	9.2	16.1	11.0	**48.2**
LOX-TA0002I	25 to 35	01/12/2006	45.0	54.0	1.9	0.50 U
		05/03/2006	39.0	55.0	2.2	0.50 U
		5/3/2006*	48.0	70.0	2.5	0.50 U
		06/22/2006	47.0	120	3.6	0.50 U
		08/06/2006	2.9	8.2	0.44 U	0.50 U
		10/26/2006	29.0	88.0	3.0	**8.1**
		01/17/2007	21.0	67.0	2.6	**11.0**
		04/12/2007	36.0	150	5.8	0.27
		08/01/2007	45.0	71.0	2.2	**40.0**
		09/25/2007	13.0	56.0	4.2	**74.0**
		11/08/2007	27.0	49.0	5.0 U	**22.0**
		09/09/2008	36.3	86.1	5.0	**46.4**
		12/16/2008	29.4	73.5	4.8	**47.0**
		03/09/2009	16.1	55.5	4.6	**49.8**
		06/15/2009	24.5	53.6	4.8	**42.6**
		09/10/2009	31.8	81.4	6.0	**65.2**
		12/18/2009	16.4	23.7	3.9	**42.8**
		03/04/2010	15.5	20.0	6.0	**46.5**
		06/02/2010	20.0	31.4	4.7	**68.7**
		09/23/2010	18.2	35.4	5.8	**66.5**
		12/21/2010	7.6	10.0	5.5	**31.2**
		03/08/2011	7.3	11.4	4.7	**33.6**
		09/28/2011	5.6	21.7	5.8	**96.5**
		09/24/2012	3.1	26.2	3.9	**39.2**
		10/22/2013	2.8	20.2	3.8	**23.2**
		10/23/2014	3.0	7.4	2.8	**16.8**
LOX-TA0003S	8 to 18	01/12/2006	**100**	18.0	1.6	**26.0**
		05/03/2006	**120**	19.0	1.4	**18.0**
		06/22/2006	**93.0**	49.0	1.3	**39.0**
		08/06/2006	3.9	6.0	0.44 U	1.6
		10/26/2006	**1,200**	110	8.8	**72.0**
		01/16/2007	6.3	8.8	0.44 U	**5.1**
		04/12/2007	**250**	260	5.5	**87.0**
		07/26/2007	34.0	4.3	0.44 U	**2.6**
		09/25/2007	**130**	**890**	4.8 I	**53.0**
		11/08/2007	5.0 U	47.0	5.0 U	**6.0**
		09/09/2008	8.5	131	3.4	**35.1**
		12/16/2008	10.4	78.8	16.2	**269**
		03/09/2009	6.8	103	13.1	**152**
		06/16/2009	7.2	202	11.3	**130**
		09/10/2009	72.5	634	34.9	**565**
		12/18/2009	39.1	251	29.4	**885**
		03/04/2010	36.0	295	14.8	**115**
		06/02/2010	**131**	**745**	30.3	**226**
		09/22/2010	80.4	**955**	38.3	**961**
		12/21/2010	42.6	638	32.9	**691**

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Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Concentration (mg/L)			
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4
LOX-TA0003S (cont)	8 to 18 (cont)	03/08/2011	24.5	197	16.9	**254**
		09/27/2011	34.8	309	19.5	**292**
		09/24/2012	23.9	360	17.7	**144**
		10/22/2013	29.6	664	46.0	**548**
		10/22/2014	16.8	222	24.6	**195**
LOX-TA0003I	25 to 35	01/12/2006	**110**	190	13.0	0.62 I
		05/03/2006	**100**	150	13.0	0.50 U
		06/22/2006	10.0	18.0	1.4	0.50
		08/06/2006	**120 J**	210 J	14.0	0.52 U
		10/26/2006	**87.0**	150 J	12.0	**9.3**
		01/16/2007	66 J	110 J	11.0	**45 J**
		04/12/2007	**100**	220	21.0	**150**
		07/26/2007	25.0	46.0	6.1	**58.0**
		09/25/2007	73.0	110	17.0	**130**
		09/25/2007*	65.0	150	15.0	**92.0**
		11/08/2007	73.0	150	18.0	**40.0**
		09/09/2008	55.4	139	13.4	**153**
		12/16/2008	29.3	148	21.6	**280**
		03/09/2009	7.8	48.8	13.9	**124**
		06/16/2009	9.9	35.3	10.4	**88.4**
		09/10/2009	6.7	25.3	12.3	**123**
		12/18/2009	4.7	19.4	10.9	**86.5**
		03/03/2010	5.7	23.2	13.7	**101**
		06/01/2010	10.0	44.9	10.5	**154**
		09/23/2010	7.4	34.5	6.7	**88.0**
		12/21/2010	3.4	13.6	3.9	**80.6**
		03/08/2011	2.1	6.6	1.9	**54.5**
		09/27/2011	3.5	12.5	2.4	**103**
		09/24/2012	5.8	22.1	2.1	**24.3**
		10/22/2013	2.9	9.6	1.4	**12.8**
		10/22/2014	2.3	5.8	0.95 I	**6.2**
LOX-TA0004S	8 to 18	01/12/2006	15.0	130	7.4	**110**
		05/03/2006	5.0	100	7.9	**110**
		06/22/2006	2.1	6.6	3.2	**34.0**
		08/06/2006	0.50 U	6.2	3.0	**21.0**
		10/27/2006	12.0	76.0	12.0	**220**
		01/19/2007	8.7	3.1	5.0	**650**
		04/16/2007	1.7	18.0	9.8	**150**
		07/25/2007	1.1	35.0	9.0	**170**
		09/25/2007	6.9	97.0	17.0	**710**
		11/08/2007	1.0 U	1.5	4.7	**15.1**
		09/09/2008	75.6	122	20.0	**5.6**
		12/16/2008	6.9	83.7	20.6	**309**
		03/09/2009	3.6	50.8	19.1	**339**
		06/16/2009	2.2	28.7	10.4	**209**
		09/10/2009	1.5	15.1	12.1	**218**
		12/17/2009	1.1	12.5	8.8	**247**
		03/03/2010	1.7	22.1	12.8	**195**
		06/02/2010	1.2 U	19.3	9.9	**359**
		09/22/2010	5.7	37.4	5.5	**91.6**
		12/21/2010	4.5	27.0	1.9	**101**
		03/07/2011	1.6	30.0	11.1	**228**
		09/28/2011	2.3	27.3	5.3	**165**
		09/24/2012	0.71 I	20.3	2.1	**125**
		10/22/2013	0.63 U	32.4	1.6 I	**144**
		10/22/2014	0.30 U	1.7	1.5	**78.1**
LOX-TA0004I	25 to 35	01/12/2006	45.0	84.0	16.0	0.50 U
		05/03/2006	35.0	69.0	14.0	0.50 U
		05/03/2006*	40.0	81.0	16.0	0.50 U
		06/22/2006	25.0	49.0	10.0	0.50 U
		08/06/2006	45.0	83.0	16.0	0.50 U

Table 3-1. Performance Monitoring Well and Surface Water Sampling Results: Chlorinated Volatile Organic Compounds Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Concentration (mg/L)			
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4
LOX-TA0004I (cont)	25 to 35 (cont)	10/27/2006	39.0	76.0	15.0	0.50 U
		01/19/2007	37.0	62.0	13.0	0.56 I
		04/16/2007	19.0	39.0	7.9	**5.1**
		07/26/2007	78.0	130	21.0	0.50 U
		09/25/2007	51.0	89.0	17.0	**3.1**
		11/09/2007	47.0	70.0	15.0	**5.0 U**
		09/09/2008	7.4	98.8	23.3	**511**
		12/16/2008	74.3	91.5	22.7	**30.0**
		03/09/2009	68.8	95.9	18.2	**15.7**
		06/16/2009	48.4	79.7	15.2	**9.0**
		09/10/2009	54.1	88.2	17.0	**12.8**
		12/17/2009	49.0	79.8	14.9	**8.4**
		03/03/2010	48.0	78.7	17.6	**12.3**
		06/02/2010	39.5	67.7	15.3	**47.4**
		09/22/2010	36.6	81.3	14.5	**22.2**
		12/21/2010	22.2	87.4	8.8	**22.4**
		03/07/2011	23.1	90.0	9.2	**10.8**
		09/28/2011	37.5	80.1	12.0	**8.7**
		09/24/2012	37.6	82.4	10.6	**4.1**
		10/22/2013	36.9	93.2	11.2	**2.9**
		10/22/2014	38.2	77.8	11.1	1.6
LOX-IW0009S	12 to 17	01/12/2006	**470**	130	5.2	**38.0**
		01/12/2006*	**250 L**	110	5.3	**30.0**
		05/03/2006	63.0	140	5.1	**27.0**
		06/22/2006	41.0	170	9.1	**58.0**
		08/06/2006	9.4	38.0	1.5 U	**9.1**
		10/27/2006	2.3	200	11.0	**400**
		01/17/2007	12.0	44.0	4.0	**36.0**
		04/13/2007	14.0	51.0	4.7	**64.0**
		08/01/2007	5.9	19.0	3.8	0.50 U
		08/01/2007*	14.0	58.0	2.1	**15.0**
		10/06/2007	1.1	11.0	4.0	**21.0**
		11/08/2007	1.1	6.6	3.5	**15.5**
		09/09/2008	0.58	2.9	0.54	**9.5**
		12/16/2008	0.80 I	4.3	0.61 I	**12.6**
		03/09/2009	0.45 I	2.2	0.49 I	**13.2**
		06/15/2009	1.7	11.4	1.3	**49.3**
		09/10/2009	0.90 I	13.0	1.8	**51.5**
		12/17/2009	0.62 I	5.7	1.5	**49.8**
		03/05/2010	0.24 U	1.5	0.34 I	**11.9**
		06/03/2010	0.24 U	13.0	0.34 U	**28.6**
		09/23/2010	3.3	65.3	2.9	**92.7**
		12/22/2010	5.6	62.6	6.7	**230**
		03/08/2011	3.7	48.9	6.4	**118**
		09/27/2011	2.4	6.4	11.5	**77.1**
		09/24/2012	1.2	89.6	11.4	**149**
		10/22/2013	1.7	19.1	5.0	**49.4**
		10/23/2014	9.6	32.7	10.1	**94.6**
LOX-IW0009SI	22.5 to 27.5	01/12/2006	**350**	160	5.9	**2.5**
		05/03/2006	**390**	310	15.0	**2.6**
		06/22/2006	**570**	310	14.0	0.50 U
		08/06/2006	**1,300**	520	24 I	**54.0**
		10/27/2006	**330**	320	19.0	**12.0**
		01/17/2007	**260**	290	18.0	2.0 U
		04/13/2007	73.0	520	19.0	**18.0**
		08/01/2007	**91.0**	600	18.0	**66.0**
		10/06/2007	0.50 U	0.65 U	0.44 U	0.54 U
		11/08/2007	**93.0**	390	27.0	**74.0**
		09/09/2008	62.9	419	19.9	**143**
		12/16/2008	50.6	248	21.0	**186**
		03/09/2009	29.9	211	11.4	**119**

Table 3-1. Performance Monitoring Well and Surface Water Sampling Results: Chlorinated Volatile Organic Compounds Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Concentration (mg/L)			
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4
LOX-IW0009SI (cont)	22.5 to 27.5 (cont)	06/15/2009	14.8	171	15.5	**112**
		09/10/2009	7.6	120	21.1	**322**
		12/17/2009	14.3	95.5	15.1	**142**
		03/04/2010	10.5	71.9	17.0	**162**
		06/03/2010	7.1	17.0	11.4	**139**
		09/23/2010	8.5	41.2	11.2	**91.4**
		12/22/2010	11.9	51.3	6.7	**218**
		03/08/2011	6.4	59.3	8.0	**160**
		09/27/2011	5.2	44.0	10.5	**155**
		09/24/2012	10.6	22.2	6.6	**63.1**
		10/22/2013	2.6	2.7	2.9	**5.9**
		10/23/2014	3.4	4.8	8.9	**12.4**
LOX-SW0001	N/A	12/22/2010	0.26 U	0.26 U	0.35 U	0.22 U

Notes:

1. SWCTL indicates Florida Department of Environmental Protection (FDEP) Surface Water Cleanup Target Level.
2. Baseline sampling occurred in January 2006.
3. µg/L indicates micrograms per liter.
4. ft BLS indicates feet below land surface.
5. U indicates not detected above method detection limit.
6. I indicates result greater than or equal to method detection limit, but less than the reporting limit.
7. J indicates an estimated value.
8. L indicates result detected above calibration range.
9. Bold, yellow shaded text indicates analyte detected above SWCTL or GIII.
10. * indicates a duplicate sample.

Table 3-2. Performance Monitoring Well Sampling Results: Monitoring Well IW0013 Cluster
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Sample Date	Screen Interval (ft BLS)	Concentration (µg/L)							
			TCE	TCE PQL	cDCE	cDCE PQL	tDCE	tDCE PQL	VC	VC PQL
LOX-IW0013S	11/08/2007	6 to 11	**81.0**	5	**50.0**	5	**36.0**	5	**530 L**	5
	09/09/2008		**96.9**	5	**178**	5	**19.5**	5	**408**	5
	12/16/2008		**295**	5	**333**	5	**20.5**	5	**708**	10
	03/09/2009		**10.3**	1	**20.4**	1	1.4	1	**118**	2
	06/16/2009		**11.5**	5	**164**	5	4.4 I	5	**240**	5
	09/10/2009		**42.2**	2	**160**	10	**9.9**	2	**347**	10
	12/18/2009		**7.2**	1	**57.4**	1	**2.3**	1	**80.5**	2
	03/05/2010		**18.0**	1	**33.1**	1	**2.1**	1	**64.2**	1
	06/03/2010		**76.6**	5	**198**	5	**12.0**	5	**308**	5
	09/23/2010		**5.8**	1	**38.9**	1	**39.7**	1	**98.0**	2
	12/22/2010		**23.2**	1	**26.9**	1	**5.1**	1	**140**	2
	03/07/2011		1.3	1	**6.5**	1	**34.4**	1	**31.6**	1
	09/28/2011		**6.4**	1	**13.9**	1	**7.1**	1	**103**	2
	09/25/2012		**30.4**	2	**67.9**	2	**4.9**	2	**190**	2
	10/21/2013		**24.9**	2	**111**	1	**10.1**	1	**158**	2
	10/23/2014		**42.6**	1	**94.1**	1	**10.2**	1	**97.1**	2
LOX-IW0013I	11/08/2007	16.5 to 21.5	**6.8**	1	**4.1**	1	**32.9**	1	**44.6**	1
	09/09/2008		**4.1**	1	**4.9**	1	1.1	1	**11.0**	1
	12/16/2008		**2.9**	1	**4.6**	1	0.71 I	1	**19.9**	1
	03/09/2009		1.1	1	**18.9**	1	0.45 U	1	**292**	5
	06/16/2009		**1.6**	1	**1.8**	1	0.46 I	1	**11.8**	1
	09/10/2009		1.2	1	**2.9**	1	0.76 I	1	**16.4**	1
	12/18/2009		1.3	1	**7.9**	1	**1.8**	1	**27.6**	1
	03/05/2010		**2.2**	1	**70.0**	1	**8.3**	1	**88.5**	2
	06/03/2010		2.7	5	**46.4**	5	**21.7**	5	**120**	5
	09/23/2010		**63.2**	1	**73.4**	1	**9.8**	1	**122**	1
	12/22/2010		**3.4**	1	**12.6**	1	**34.4**	1	**50.0**	1
	03/07/2011		**7.6**	1	**13.2**	1	**5.6**	1	**69.0**	1
	09/28/2011		**5.5**	1	**98.8**	1	**30.0**	1	**180**	5
	09/25/2012		**25.3**	1	**164**	5	**28.0**	1	**250**	5
	10/21/2013		**20.9**	1	**77.9**	1	**18.6**	1	**79.5**	1
	10/23/2014		**14.4**	1	**38.3**	1	**9.3**	1	**52.9**	2

Notes:

1. Baseline sampling occurred in November 2007.
2. µg/L indicates micrograms per liter.
3. ft BLS indicates feet below land surface.
4. U indicates result not detected above method detection limit.
5. I indicates result greater than or equal to method detection limit, but less than the reporting limit.
6. L indicates result detected above calibration range.
7. Bold, yellow shaded text indicates analyte detected above Practical Quantitation Limit (PQL).
8. TCE indicates trichloroethene.
9. cDCE indicates cis-1,2-dichloroethene.
10. tDCE indicates trans-1,2-dichloroethene.
11. VC indicates vinyl chloride.

Table 3-3. Performance Monitoring Well and Surface Water Sampling Results: Field Geochemical Parameters
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LOX-TA0001S	8 to 18	11/08/2007	24.9	5.60	6.2	41.9	3.34	-273	0.51	4.0	clear
		09/08/2008	25.4	6.10	5.7	25.9	0.30	-309	0.00	3.6	black/brown
		12/16/2008	24.7	7.10	5.7	19.7	0.30	-300	0.27	3.6	dark gray
		03/09/2009	22.7	5.81	4.9	15.0	2.73	-154	0.54	3.3	clear yellow
		06/15/2009	23.5	6.00	5.0	9.9	2.54	-318	0.52	2.4	clear
		09/10/2009	26.5	7.00	5.7	19.8	0.30	-243	0.85	3.6	clear/brown
		12/17/2009	23.8	6.00	4.8	1.5	2.50	-262	0.27	3.2	yellowish
		03/03/2010	20.9	6.02	3.7	14.9	1.96	-318	0.43	2.4	yellow
		06/02/2010	23.8	5.84	3.6	11.1	1.87	-304	1.48	2.5	slight yellow
		09/23/2010	25.2	5.92	3.7	19.0	1.97	-223	0.13	2.4	yellow cloudy
		12/21/2010	22.7	5.98	3.2	13.6	1.69	-288	1.05	2.1	slight cloudy
		03/07/2011	21.1	6.64	3.0	9.0	1.53	-94	0.54	1.9	yellow, cloudy
		09/28/2011	26.1	5.91	1.8	15.0	0.93	-260	0.81	1.2	light yellow
		09/25/2012	25.9	6.11**	3.0	6.2	1.54	-292	0.57	2.0	yellow
		10/21/2013	25.9	5.72	2.2	63.7	1.12	-277	0.23	1.4	yellow tint
		10/23/2014	25.5	5.50	3.5	22.9	1.86	-255	0.00	3.5	yellow, cloudy
LOX-TA0001I	25 to 35	11/08/2007	24.1	6.52	38.6	3.9	24.54	-178	0.57	25.5	light yellow
		09/08/2008	25.0	7.14	73.9	0.0	4.00	-210	0.00	45.0	clear
		12/16/2008	24.3	7.62	26.4	10.9	1.60	-298	0.31	16.0	clear
		03/09/2009	24.1	6.93	35.7	8.1	22.90	-63	0.60	23.6	clear
		06/15/2009	23.8	6.83	38.0	1.9	24.18	-237	0.00	19.0	clear
		09/10/2009	25.2	7.08	43.2	2.5	2.60	-51	1.13	27.0	clear
		12/17/2009	23.5	6.61	39.4	3.0	25.08	-173	0.23	25.6	clear
		03/03/2010	21.4	6.81	36.3	2.0	22.97	-155	0.43	23.6	clear
		06/02/2010	24.0	6.75	37.0	0.9	23.43	-260	3.19	24.1	clear
		09/23/2010	24.8	6.72	39.8	6.2	25.35	-22	0.45	25.9	clear
		12/21/2010	22.4	7.03	41.5	1.4	26.64	-217	1.63	27.0	clear
		03/07/2011	22.4	6.75	37.3	2.7	23.75	-104	0.63	24.4	clear
		09/27/2011	24.6	6.66	37.6	3.9	23.87	-304	0.29	24.5	light yellow
		09/25/2012	25.0	6.94**	35.8	1.9	23.21	-309	0.89	24.5	clear
		10/21/2013	24.4	6.81	38.9	3.7	24.75	-372	0.37	25.3	clear
LOX-TA0002S	8 to 18	11/08/2008	25.6	5.39	1.3	16.5	0.62	-254	0.41	0.8	clear
		09/09/2008	25.6	5.35	1.8	2.4	0.10	-263	0.00	1.1	clear
		12/16/2008	23.8	5.21	1.6	9.1	0.84	-268	0.89	1.1	clear
		03/09/2009	22.1	5.07	1.5	10.2	0.81	-127	0.62	1.0	clear yellow
		06/15/2009	23.9	5.58	1.8	11.7	0.91	-245	0.32	1.2	--
		09/10/2009	25.6	6.24	2.1	8.7	0.20	-246	0.82	1.8	clear
		12/18/2009	24.7	5.74	1.7	22.0	0.84	-277	0.93	1.1	brown, yellow, cloudy
		03/04/2010	20.3	6.03	2.0	7.4	1.05	-279	0.43	1.3	orange
		06/02/2010	25.1	5.81	2.1	8.9	1.06	-291	1.20	1.3	clear
		09/22/2010	26.2	5.47	6.3	2.7	3.41	-175	0.10	4.1	yellow
		12/21/2010	22.9	5.58	11.3	1.1	6.43	-266	1.54	7.3	clear
		03/08/2011	21.3	5.90	12.4	3.6	7.18	-247	0.45	8.1	clear
		09/27/2011	25.5	5.49	12.1	5.7	6.92	-266	0.58	9.9	clear
		09/24/2012	24.9	5.45**	7.0	5.9	3.86	-290	0.79	4.6	clear
		10/22/2013	26.1	5.33	6.9	6.6	3.75	-251	0.50	4.5	clear
		10/23/2014	25.5	5.50	5.3	8.0	2.84	-272	0.20	3.4	clear yellow

Table 3-3. Performance Monitoring Well and Surface Water Sampling Results: Field Geochemical Parameters
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LOX-TA0002I	25 to 35	11/08/2008	24.2	5.45	29.0	5.2	17.94	-228	0.33	18.9	clear
		09/09/2008	24.9	6.64	31.3	0.9	2.00	-303	0.00	19.0	clear
		12/16/2008	23.8	6.08	23.7	0.9	14.69	-264	0.77	15.7	clear
		03/09/2009	23.6	6.37	25.4	2.9	15.91	-185	0.67	16.9	clear
		06/15/2009	24.1	6.32	27.0	0.3	16.89	-264	0.33	17.9	--
		09/10/2009	25.4	6.43	30.0	2.5	1.80	-220	0.35	19.0	clear
		12/18/2009	24.2	6.42	26.4	1.4	16.13	-312	0.90	17.1	light yellow
		03/04/2010	21.6	6.86	24.2	0.8	14.70	-344	0.54	15.7	slight yellow
		06/02/2010	24.7	6.48	12.5	0.1	7.18	-326	0.49	8.1	clear
		09/23/2010	24.7	6.39	25.8	1.5	15.74	-253	0.18	16.8	slight yellow
		12/21/2010	23.2	6.69	25.0	0.2	15.22	-316	1.37	16.2	clear
		03/08/2011	23.0	6.20	21.6	1.9	12.99	-303	0.63	14.0	clear
		09/28/2011	24.2	6.40	19.1	0.9	11.35	-282	0.93	12.4	clear
		09/24/2012	25.4	6.03**	8.9	2.8	5.01	-300	0.29	6.3	clear
		10/22/2013	24.6	6.43	21.1	5.4	12.61	-376	0.89	12.7	clear
		10/23/2014	24.6	6.37	20.9	3.6	12.50	-330	0.24	13.6	clear
LOX-TA0003S	8 to 18	11/08/2007	25.3	6.23	0.8	3.8	0.37	-241	0.70	0.5	light yellow
		09/09/2008	26.5	6.07	1.1	4.0	0.00	-219	0.00	0.7	clear
		12/16/2008	24.2	7.22	9.5	8.2	0.50	-331	0.39	6.0	clear
		03/09/2009	21.8	6.16	0.7	17.0	0.00	-289	0.57	0.5	clear
		06/16/2009	24.6	6.17	0.7	5.6	0.37	-257	0.30	0.5	--
		09/10/2009	26.3	6.83	1.0	11.4	0.10	-236	0.91	0.8	clear
		12/18/2009	24.7	6.02	0.7	3.9	0.32	-256	0.56	0.4	clear
		03/04/2010	21.5	6.01	0.6	3.9	0.31	-244	0.37	0.4	slight yellow
		06/02/2010	24.2	5.77	0.6	4.4	0.30	-280	1.21	0.4	slight yellow
		09/22/2010	26.2	6.04	0.7	14.0	0.34	-178	0.11	0.5	yellow
		12/21/2010	23.6	6.55	0.7	16.6	0.33	-282	1.53	0.4	yellow
		03/08/2011	22.4	5.95	0.6	3.7	0.29	-273	0.32	0.4	orange, clear
		09/27/2011	26.8	6.08	0.6	9.3	0.29	-263	0.24	0.4	light yellow
		09/24/2012	25.8	6.35**	0.6	2.9	0.32	-322	0.75	0.4	light yellow
		10/22/2013	26.6	6.00	0.6	16.7	0.29	-237	0.37	0.4	yellow tint
		10/22/2014	25.8	6.15	0.7	6.4**	0.33	-214	0.26**	0.4	clear yellow
LOX-TA0003I	25 to 35	11/08/2007	24.8	6.23	15.0	1.5	8.69	-240	0.65	9.7	light yellow
		09/09/2008	25.8	6.54	15.6	5.1	0.90	-317	0.00	10.0	--
		12/16/2008	24.3	6.80	1.5	8.2	0.10	-331	0.21	1.0	clear
		03/09/2009	22.7	6.33	12.1	7.0	0.70	-320	0.00	8.0	clear
		06/16/2009	25.2	6.43	14.0	0.6	8.05	-275	0.24	9.1	--
		09/10/2009	25.7	7.01	10.6	19.5	2.70	-137	1.25	28.0	clear
		12/18/2009	24.1	6.48	13.4	3.3	7.73	-292	0.87	8.7	clear
		03/03/2010	22.5	6.31	12.1	1.4	6.90	-296	0.46	7.8	clear
		06/01/2010	24.5	6.50	6.9	5.9	3.80	-296	1.15	4.5	clear
		09/22/2010	26.5	6.30	14.2	4.0	NA	-327	0.13	NA	clear
		12/21/2010	23.4	6.56	13.7	1.0	7.92	-320	1.27	8.9	clear
		03/08/2011	22.8	5.98	13.7	2.7	7.94	-132	0.45	9.0	clear
		09/27/2011	25.8	6.31	12.6	5.3	7.22	-292	0.60	8.2	light yellow
		09/24/2012	25.8	6.55**	10.6	2.5	6.03	-335	0.30	6.9	light yellow
		10/21/2013	25.6	6.40	12.2	4.2	6.98	-303	0.60	7.9	clear
		10/22/2014	24.7	6.35	11.4	4.7**	6.47	-305	0.20**	7.4	clear

Table 3-3. Performance Monitoring Well and Surface Water Sampling Results: Field Geochemical Parameters
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LOX-TA0004S	8 to 18	11/08/2007	26.7	6.50	0.8	4.5	0.37	-268	0.65	0.5	light yellow
		09/09/2008	28.3	5.49	0.5	10.7	0.25	-271	0.94	0.3	light brown
		12/16/2008	25.3	7.12	1.0	4.1	0.00	-272	0.61	0.7	clear
		03/09/2009	24.8	5.68	0.4	17.0	0.00	-282	0.00	0.3	yellow
		06/16/2009	26.9	6.20	0.6	9.7	0.30	-248	0.81	0.3	light brown/clear
		09/10/2009	28.5	7.97 *	0.7	11.1	0.34	-367	0.04	0.5	yellow
		12/17/2009	25.5	6.06	0.7	1.9	0.34	-261	0.09	0.5	clear
		03/03/2010	21.8	6.26	0.6	2.4	0.31	-308	0.36	0.4	yellow
		06/02/2010	25.6	6.13	0.7	4.1	0.32	-301	0.42	0.4	yellow
		09/22/2010	28.2	5.98	0.7	7.0	0.35	-171	0.06	0.5	orange
		12/21/2010	24.6	6.20	0.8	4.1	0.41	-274	1.08	0.6	orange
		03/07/2011	21.7	6.28	0.6	6.2	0.31	-183	0.80	0.6	orange
		09/28/2011	27.7	5.90	0.6	8.0	0.30	-175	0.47	0.4	yellow
		09/24/2012	27.5	6.26**	0.6	9.8	0.29	-306	0.69	0.4	amber
		10/22/2013	28.3	5.84	0.5	11.0	0.26	-188	0.45	0.4	yellow
		10/22/2014	27.8	6.03	0.6	11.1**	0.28	-232	0.00**	0.4	yellow
LOX-TA0004I	25 to 35	11/09/2007	25.9	5.78	1.1	7.6	0.00	-283	0.16	0.7	clear
		09/09/2008	26.4	5.24	1.2	0.2	0.58	-268	0.97	0.8	clear
		12/16/2008	25.0	6.98	0.7	9.8	0.00	-295	0.51	0.5	clear
		03/09/2009	25.6	5.78	0.9	15.0	0.00	-283	0.00	0.6	clear
		06/16/2009	26.6	5.75	1.1	8.0	0.53	-264	1.23	0.5	clear
		09/10/2009	27.7	9.44 *	1.2	4.1	0.54	-361	0.03	0.7	clear
		12/17/2009	25.5	6.21	1.2	1.3	0.60	-238	0.20	0.8	clear
		03/03/2010	23.6	5.80	1.2	2.3	0.60	-279	0.33	0.8	yellow
		06/02/2010	25.8	5.80	1.1	2.1	0.57	-280	0.25	0.7	slight yellow
		09/22/2010	26.3	5.92	1.0	4.2	0.51	-157	0.43	0.7	yellow
		12/21/2010	24.2	6.29	1.0	5.4	0.51	-285	1.07	0.7	yellow
		03/07/2011	22.2	6.21	1.0	5.2	0.55	-203	0.79	0.8	yellow
		09/28/2011	26.2	5.96	0.7	5.6	0.34	-202	0.54	0.4	clear
		09/24/2012	25.8	6.25**	0.6	3.5	0.26	-275	0.49	0.4	clear
		10/22/2013	26.9	5.95	0.6	2.7	0.29	-219	1.34	0.4	clear
		10/22/2014	26.3	5.91	0.5	6.0**	0.26	-228	0.36**	0.4	clear yellow
LOX-IW0009S	12 to 17	11/08/2007	25.5	6.60	2.0	33.5	1.00	-320	0.37	1.3	clear
		09/09/2008	26.1	5.95	1.2	4.6	0.61	-277	0.92	0.8	light yellow
		12/16/2008	24.0	6.10	1.3	10.0	0.68	-312	0.76	0.9	clear
		03/09/2009	22.7	6.13	1.3	9.0	0.65	-119	0.40	0.8	clear yellow
		06/15/2009	26.1	6.30	1.6	12.0	0.76	-283	0.19	1.0	--
		09/10/2009	26.6	7.45	3.2	3.5	1.00	-268	1.29	2.0	clear
		12/17/2009	24.6	6.11	2.4	24.0	1.21	-307	1.63	1.5	yellow cloudy
		03/05/2010	21.2	6.05	0.9	16.7	0.42	-239	0.53	0.6	yellow
		06/03/2010	24.1	6.03	0.8	11.0	0.40	-291	1.00	0.5	amber
		09/23/2010	26.5	5.89	0.9	30.3	NA	-305	1.69	NA	green/brown
		12/22/2010	24.0	5.70	16.0	1.4	9.33	-224	0.70	10.4	slight yellow
		03/08/2011	21.3	6.09	12.9	2.3	7.40	-263	0.39	8.4	clear
		09/27/2011	25.7	5.60	4.7	2.7	2.50	-219	0.59	3.1	clear
		09/24/2012	25.1	5.89**	1.0	6.7	0.49	-301	0.93	0.7	amber
		10/22/2013	25.9	5.82	2.2	7.0	1.12	-217	0.62	1.4	yellow tint
		10/23/2014	25.3	5.64	6.8	6.8	3.73	-268	0.23	4.4	clear

Table 3-3. Performance Monitoring Well and Surface Water Sampling Results: Field Geochemical Parameters
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LOX-IW0009SI	22.5 to 27.5	11/08/2007	24.9	6.05	17.7	3.9	10.45	-265	0.23	11.5	clear
		09/09/2008	27.3	6.14	12.6	15.1	7.19	-331	0.93	8.2	clear
		12/16/2008	24.2	5.94	14.0	12.0	8.21	-328	0.77	9.2	clear
		03/09/2009	23.8	6.18	15.3	6.1	9.10	-144	0.40	10.1	clear yellow
		06/15/2009	25.8	6.16	16.5	5.4	9.52	-253	0.24	10.6	--
		09/10/2009	25.6	6.83	13.9	12.5	8.10	-280	1.12	9.5	clear
		12/17/2009	24.1	6.21	14.2	11.0	8.22	-316	0.99	9.2	yellow
		03/04/2010	22.2	6.01	12.4	6.0	7.14	-310	0.77	8.1	slight yellow
		06/03/2010	24.0	6.24	6.2	11.0	3.88	-308	0.66	4.1	clear
		09/23/2010	26.9	6.13	16.5	12.5	NA	-325	0.71	NA	clear
		12/22/2010	23.7	5.80	14.4	1.1	8.37	-281	0.61	9.4	slight yellow
		03/08/2011	22.2	5.79	13.7	2.5	8.05	-276	0.68	9.1	clear
		09/27/2011	24.5	5.80	10.0	615.0	5.62	-274	0.37	6.5	clear
		09/24/2012	24.5	6.03**	7.4	2.1	4.12	-326	0.90	4.9	clear
		10/22/2013	25.2	6.32	4.0	13.2	2.11	-311	0.62	2.6	clear
		10/23/2014	24.9	6.27	8.0	5.4	4.42	-325	0.19	5.2	clear yellow
LOX-IW0010SI	23 to 28	05/29/2008	24.2	5.32	32.5	0.2	2.00	-183	0.37	20.0	light yellow
		09/09/2008	25.2	5.21	26.1	1.0	15.95	-25	1.02	17.0	clear
		12/16/2008	24.5	6.30	18.6	4.2	1.10	-29	0.29	11.0	clear
		03/09/2009	25.4	5.26	26.3	2.7	1.60	-79	0.00	16.0	clear
		06/23/2009	26.8	5.11	27.1	1.3	1.80	-20	0.79	17.0	clear
		09/10/2009	26.3	5.40	20.6	2.1	11.97	-252	0.26	13.1	clear
		12/18/2009	24.3	5.05	23.4	1.3	14.16	-147	0.23	15.2	clear
LOX-IW0011SI	23 to 28	05/29/2008	25.2	7.16	39.4	0.7	2.50	-184	0.24	24.0	light yellow
		09/09/2008	26.0	7.47	36.9	0.0	2.40	-159	0.00	22.0	clear/yellowish
		12/16/2008	25.2	7.05	184.0	6.5	1.20	-122	0.32	12.0	clear
		03/09/2009	24.4	6.27	38.5	4.8	24.36	-34	0.64	24.9	clear
		06/18/2009	25.0	7.03	75.8	1.5	4.00	-94	0.00	48.0	clear
		09/10/2009	26.8	7.26	33.7	9.1	2.90	-62	0.92	28.0	clear
		12/18/2009	24.9	7.08	32.8	2.3	20.50	-112	0.90	21.3	clear
LOX-IW0013S	6 to 11	11/08/2007	24.8	5.41	4.6	5.1	2.46	-268	0.58	3.0	clear
		05/29/2008	23.4	5.75	4.9	1.5	0.30	-312	0.14	3.1	light yellow
		09/09/2008	26.2	5.92	1.8	11.6	0.10	-304	0.00	1.1	clear/blackish
		12/16/2008	23.6	7.01	9.2	2.0	0.50	-291	0.20	5.8	clear
		03/09/2009	20.8	5.79	3.1	16.1	0.20	-313	0.83	2.0	clear
		06/16/2009	25.1	5.80	3.1	8.6	1.60	-274	1.02	1.5	clear
		09/10/2009	25.7	6.43	2.0	13.2	0.10	-280	1.00	1.1	clear
		12/18/2009	23.7	5.78	2.5	3.9	1.28	-224	0.30	1.6	yellow
		03/05/2010	18.4	5.75	2.7	8.0	1.39	-252	0.65	1.7	yellow
		06/03/2010	22.9	5.86	1.5	11.5	0.77	-294	0.52	1.0	yellow orange
		09/23/2010	26.8	5.87	1.8	8.4	0.89	-168	0.16	1.1	yellow
		12/22/2010	21.2	5.92	1.8	6.7	0.91	-298	0.19	1.2	yellow clear
		03/07/2011	19.7	6.49	3.2	14.2	1.80	-198	0.40	2.2	yellow, cloudy
		09/28/2011	26.6	5.93	3.5	2.6	1.82	-259	0.38	2.3	clear
		09/25/2012	25.8	6.12**	4.2	7.0	1.80	-296	0.70	2.3	clear
		10/21/2013	25.6	5.50	8.1	1.7	4.49	-202	0.59	5.3	clear
		10/23/2014	25.5	5.38	8.4	1.8	4.66	-253	0.40	5.5	clear

Table 3-3. Performance Monitoring Well and Surface Water Sampling Results: Field Geochemical Parameters
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LOX-IW0013I	16.5 to 21.5	11/08/2007	24.0	3.16	5.0	2.4	2.67	-308	0.56	3.2	clear
		05/29/2008	24.0	5.88	4.5	2.7	2.41	-220	0.85	2.9	clear/yellowish
		09/09/2008	25.0	6.15	5.1	0.0	0.30	-325	0.00	3.2	black/gray
		12/16/2008	24.0	7.13	5.4	1.6	0.30	-308	0.20	3.4	clear
		03/09/2009	21.8	5.96	3.6	0.0	0.20	-319	0.39	2.3	clear
		06/16/2009	24.8	5.83	4.4	1.5	2.35	-269	0.27	2.9	--
		09/10/2009	25.4	6.80	5.2	16.9	0.30	-288	0.62	3.2	clear
		12/18/2009	24.2	5.61	8.7	1.3	4.85	-241	0.21	5.7	yellow
		03/05/2010	19.8	5.47	12.4	4.3	7.11	-237	0.77	8.0	slight yellow
		06/03/2010	22.9	5.67	14.1	1.2	8.17	-372	1.03	9.2	slight yellow
		09/23/2010	24.8	5.64	15.8	3.0	9.23	-147	0.23	10.3	slight yellow
		12/22/2010	22.9	5.72	16.9	1.8	9.92	-267	0.21	11.0	slight yellow
		03/07/2011	21.3	6.21	16.0	2.9	9.37	-148	0.57	10.4	clear
		09/28/2011	24.6	5.67	17.8	0.9	10.48	-210	0.42	11.6	clear
		09/25/2012	25.1	5.78**	16.3	1.8	9.85	-201	0.21	11.6	clear
		10/21/2013	24.9	5.67	16.4	6.6	9.58	-238	0.30	10.6	clear
		10/23/2014	24.7	5.60	16.9	2.5	9.92	-284	0.26	11.0	clear
LOX-SW0001	N/A	12/22/2010	18.8	8.91	21.2	10.6	12.73	-113	14.57	13.8	hazy

Notes:

1. ft BLS indicates feet below land surface.
2. °C indicates degrees Celsius.
3. pH indicates hydrogen ion concentration.
4. S.U. indicates standard units.
5. mS/cm indicates milliSiemens per centimeter.
6. NTU indicates Nephelometric Turbidity Unit.
7. mV indicates millivolts.
8. mg/L indicates milligram per liter.
9. % indicates percent.
10. g/L indicates gram per liter.
11. * indicates pH meter malfunctioned.
12. -- indicates not recorded.
13. ** indicates respective meter failed the continuing calibration verification.

Table 3-4. Monitored Natural Attenuation Sampling Results: Chlorinated Volatile Organic Compounds and Dissolved Gases
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Sample Date	Screen Interval (ft BLS)	Concentration (µg/L)						
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Methane	Ethane	Ethene
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4	No FDEP SWCTL		
ECS-IW0003I	Sep-96	45 to 50	2.0 U	2.0 U	2.0	**196**	NA	NA	NA
	Jul-98		2.0 U	2.0 U	3.0	**290**	NA	NA	NA
	Jul-99		5.0 U	5.0 U	5.0 U	**360**	NA	NA	NA
	Oct-00		2.0 U	1.8 U	1.8 U	**200**	NA	NA	NA
	Oct-03		1.6 U	2.4 U	1.6 U	**260**	NA	NA	NA
	Apr-04		0.63 J	1.9 J	2.5	**466**	NA	NA	NA
	Jan-06		20 U	20 U	20 U	**607**	NA	NA	NA
	Aug-06		1.2	1.6	2.3	**570**	2,300	0.37 U	3.9
	Apr-07		2.0 U	2.6 U	2.2 I	**340**	1,900	6.4 U	4.5 U
	Sep-07		1.2 I	1.3 U	0.88 U	**220**	400	0.64 U	0.70 I
	Sep-08		1.9	1.9	1.8	**130**	2,020	0.32 U	2.6
	Sep-09		1.9	2.1	1.9	**107**	1,150	6.3	8.4
	Oct-10		1.5	1.7	1.2	**34.7**	1,070	0.32 U	1.6
ECS-IW0004I	Jul-98	41.5 to 46.5	10 U	170	9.0 U	**1,000**	NA	NA	NA
	Jul-99		40 U	36 U	36 U	**1,200**	NA	NA	NA
	Oct-00		12 U	18 U	12 U	**1,600**	NA	NA	NA
	Oct-03		0.78 J	18.3	18.0	**2,110**	NA	NA	NA
	Jan-06		0.28 U	0.65 U	12.0	**1,900**	1,800	0.35 U	15.0
	Sep-07		10 U	13 U	8.8 U	**1,200**	470	0.64 U	8.7
	Sep-08		0.32 U	0.56	12.6	**481**	1,740	1.0	113
	Sep-09		0.33 I	0.43 I	15.2	**262**	1,620	0.82	26.7
	Oct-10		0.24 I	0.48 I	12.1	**196**	1,570	0.66 I	17.2
ECS-IW0004D	Jul-98	57 to 62	10 U	9.0 U	9.0 U	**30.0**	NA	NA	NA
	Jul-99		40 U	36 U	36 U	**36.0**	NA	NA	NA
	Oct-00		0.08 U	9.4	0.08 U	**19.0**	NA	NA	NA
	Oct-03		2.0 U	2.0 U	2.0 U	1.0	NA	NA	NA
	Jan-06		0.28 U	0.65 U	0.44 U	**3.4**	48.0	0.35 U	1.5
	Sep-07		0.28 U	0.65 U	0.44 U	**4.8**	28.0	0.64	0.45
	Sep-07*		0.28 U	0.65 U	0.44 U	**3.5**	9.5	0.64 U	0.45 U
	Sep-08		0.32 U	0.20 U	0.45 U	**3.3**	118	0.32 U	0.19
	Sep-09		0.32 U	0.20 U	0.45 U	**5.8**	NA	NA	NA
	Oct-10		0.24 U	0.32 U	0.34 U	**2.6**	NA	NA	NA
ECS-IW0005SI	Jul-99	23 to 28	2.0 U	1.8 U	1.8 U	**45.0**	NA	NA	NA
	Oct-00		0.08 U	0.12 U	0.08 U	1.3	NA	NA	NA
	Oct-03		3.6	1.4 J	1.9 J	**14.4**	NA	NA	NA
	Apr-04		3.1	1.3 J	3.3	**26.8**	NA	NA	NA
	Oct-06		2.4	1.2	1.1	0.50 U	110	0.37 U	0.36 U
	Apr-07		2.4	2.0	1.6	0.81 I	140	6.4 U	5.1 I
	Sep-07		2.1	0.65 U	1.4	0.50 U	15.0	0.64 U	0.45 U
	Sep-08		2.6	1.3	1.5	2.3	862	0.32 U	0.25
	Sep-09		2.9	1.2	0.82 I	0.30 U	NA	NA	NA
	Oct-10		2.0	1.2	1.2	0.28 U	NA	NA	NA

Table 3-4. Monitored Natural Attenuation Sampling Results: Chlorinated Volatile Organic Compounds and Dissolved Gases
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Sample Date	Screen Interval (ft BLS)	Concentration (µg/L)						
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Methane	Ethane	Ethene
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4	No FDEP SWCTL		
ECS-IW0005I	Jul-99	42 to 47	40 U	24 U	16 U	**3,200**	NA	NA	NA
	Oct-00		16 U	184 J	200 U	**2,500**	NA	NA	NA
	Oct-03		**200 U**	240	36 U	**4,700**	NA	NA	NA
	Apr-04		10 U	199	13.3	**3,710**	NA	NA	NA
	Jan-06		0.28 U	0.65 U	12.0	**690**	1,200	0.35 U	21.0
	Sep-07		25.0 U	33 U	22 U	**2,800**	350	0.64 U	7.9
	Sep-08		0.32 U	2.1	13.5	**1,330**	1,530	0.80	68.6
	Sep-09		0.32 U	0.31 I	11.1	**140**	1,240	0.31	10.5
	Oct-10		0.24 U	0.88 I	10.5	**551**	1,200	1.0	18.9
ECS-IW0006SI	Jul-99	22 to 27	**100**	130	1.8 U	1.8 U	NA	NA	NA
	Oct-00		28.0	75.0	0.40 U	0.45 U	NA	NA	NA
	Oct-03		76.7	79.5	2.8	1.0 U	NA	NA	NA
	Apr-04		**122**	104	4.8	2.0 U	NA	NA	NA
	Jan-06		38.0	24.0	1.9	1.1	NA	NA	NA
	Aug-06		35.0	15.0	1.3	0.61 I	1,200	0.37 U	0.36 U
	May-07		25.0	12.0	1.2	0.50 U	570	0.64 U	0.45 U
	Sep-07		18.0	9.2	1.1	0.50 U	130	0.64 U	0.45 U
	Sep-08		0.32 U	0.20 U	0.45 U	0.30 U	634	0.32 U	0.43 U
	Sep-09		41.5	23.9	1.1	0.30 U	1,490	0.32 U	0.43 U
	Oct-10		15.3	6.4	1.0	0.28 U	855	0.32 U	0.43 U
ECS-IW0006I	Jul-99	32.5 to 37.5	10 U	36 I	9.0 U	**580**	NA	NA	NA
	Oct-00		2.0 U	52.0	2.0 U	**280**	NA	NA	NA
	Oct-03		20 J	45.9	40 U	**923**	NA	NA	NA
	Apr-04		3.0	9.8	4.2	**1,210**	NA	NA	NA
	Jan-06		1.1 U	2.6 U	6.0	**920**	NA	NA	NA
	Aug-06		0.91 I	1.2	6.2	**770**	2,700	0.44 I	10.0
	May-07		2.5 U	3.3 U	6.2	**590**	2,500	3.2 U	9.3
	Sep-07		2.0 U	2.6 U	5.2	**210**	140	0.64 U	0.82 I
	Sep-08		0.33	0.33	1.6	**93.8**	243	0.32 U	1.1
	Sep-09		0.74 I	0.66 I	7.3	**97.2**	706	0.32 U	20.8
	Oct-10		0.24 U	0.32 U	7.7	**115**	1,160	0.32 U	54.3
ECS-IW0007I	Jul-99	33 to 38	0.20 U	0.18 U	0.18 U	0.18 U	NA	NA	NA
	Oct-00		0.08 U	0.12 U	0.08 U	0.09 U	NA	NA	NA
	Oct-03		2.0 U	2.0 U	2.0 U	1.0 U	NA	NA	NA
	Jan-06		0.28 U	0.65 U	0.44 U	0.50 U	NA	NA	NA
	Sep-07		0.50 U	0.65 U	0.44 U	0.50 U	NA	NA	NA
	Sep-08		0.32 U	0.20 U	0.45 U	1.8	NA	NA	NA
	Sep-09		0.32 U	0.20 U	0.45 U	0.30 U	NA	NA	NA
	Oct-10		0.24 U	1.6	0.34 U	1.6	NA	NA	NA

Table 3-4. Monitored Natural Attenuation Sampling Results: Chlorinated Volatile Organic Compounds and Dissolved Gases
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Sample Date	Screen Interval (ft BLS)	Concentration (µg/L)						
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Methane	Ethane	Ethene
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4	No FDEP SWCTL		
ECS-IW0008I	Jul-99	42 to 47	0.20 U,J	0.71 I	0.18 U	**5.8**	NA	NA	NA
	Oct-00		0.08 U	0.77 I	0.08 U	**10.0**	NA	NA	NA
	Oct-03		2.0 U	4.6	2.0 U	**45.6**	NA	NA	NA
	Jan-06		0.28 U	15.0	0.45 U	**130**	NA	NA	NA
	Jan-06*		0.28 U	15.0	0.45 U	**130**	NA	NA	NA
	Sep-07		1.0 U	21.0	0.88 U	**160**	130	0.64 U	0.45 U
	Sep-08		0.32 U	38.7	0.45 U	**141**	NA	NA	NA
	Sep-09		0.64 U	52.0	0.90 U	**222**	NA	NA	NA
	Oct-10		0.24 U	45.3	0.34 U	**198**	NA	NA	NA
LOX-IW0001I	Jul-98	22 to 27	**99.0**	530	12.0 I	**42.0**	NA	NA	NA
	Jul-99		48.0	430	14.0 I	**91.0**	NA	NA	NA
	Oct-00		39.0	330	12.0 I	**120**	NA	NA	NA
	Oct-03		27.1	128	15.2	**52.6**	NA	NA	NA
	Apr-04		35.9	187	17.4	**21.7**	NA	NA	NA
	Jan-06		1.1	37.0	15.0	**68.0**	170	0.35 U	0.33 U
	Aug-06		3.2 U	37.0	14.0	**53.0**	NA	NA	NA
	Apr-07		0.83 I	15.0	13.0 J	**46 J**	510	6.4 U	4.5 U
	Sep-07		0.60 I	18.0	13.0	**49.0**	250	0.64 U	0.45 U
	Sep-08		4.4	58.5	16.0	**41.3**	578	0.32 U	0.68
	Sep-09		0.91 I	22.7	16.5	**92.2**	688	0.32 U	1.1
	Oct-10		0.24 U	0.74 I	15.6	**54.2**	543	0.32 U	0.95 I
	Sep-11		0.57 I	5.1	15.8	**47.6**	798	0.32 U	0.43 U
	Sep-12		1.1	11.1	12.9	**22.6**	895	0.32 U	0.43 U
LOX-IW0012S	Jun-01	7 to 12	0.08 U	0.12 U	0.08 U	0.09 U	NA	NA	NA
	Nov-03		2.0 U	2.0 U	2.0 U	1.0 U	NA	NA	NA
	Apr-04		2.0 U	2.0 U	2.0 U	1.0 U	NA	NA	NA
	Jan-06		0.28 U	0.65 U	0.44 U	0.50 U	NA	NA	NA
	Sep-07		0.50 U	0.65 U	0.44 U	0.50 U	NA	NA	NA
	Sep-08		0.32 U	0.20 U	0.45 U	0.30 U	NA	NA	NA
	Sep-09		0.32 U	0.20 U	0.45 U	0.30 U	NA	NA	NA
	Oct-10		0.24 U	0.32 U	0.34 U	0.28 U	NA	NA	NA
	Sep-11		0.26 U	0.26 U	0.35 U	0.22 U	NA	NA	NA
	Sep-12		0.31 U	0.24 U	0.23 U	0.44 U	NA	NA	NA
	Oct-13		0.31 U	0.24 U	0.23 U	0.44 U	NA	NA	NA
	Oct-14		0.30 U	0.33 U	0.34 U	0.33 U	NA	NA	NA

Table 3-4. Monitored Natural Attenuation Sampling Results: Chlorinated Volatile Organic Compounds and Dissolved Gases
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Sample Date	Screen Interval (ft BLS)	Concentration (µg/L)						
			Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Methane	Ethane	Ethene
			FDEP SWCTL: 80.7	FDEP GIII (non-potable): 700	FDEP SWCTL: 11,000	FDEP SWCTL: 2.4	No FDEP SWCTL		
LOX-IW0012I	Jun-01	23 to 28	0.08 U	0.12 U	0.08 U	0.09 U	NA	NA	NA
	Nov-03		2.0 U	2.0 U	2.0 U	1.0 U	NA	NA	NA
	Apr-04		2.0 U	2.0 U	2.0 U	1.0 U	NA	NA	NA
	Jan-06		NA	NA	NA	NA	2.7	0.35 U	0.35 U
	Sep-07		0.50 U	0.65 U	0.44 U	0.50 U	NA	NA	NA
	Sep-08		0.32 U	0.20 U	0.45 U	0.30 U	NA	NA	NA
	Sep-09		0.32 U	0.20 U	0.45 U	0.30 U	NA	NA	NA
	Oct-10		0.24 U	0.32 U	0.34 U	0.28 U	NA	NA	NA
	Sep-11		0.26 U	0.26 U	0.35 U	0.22 U	NA	NA	NA
	Sep-12		0.31 U	0.24 U	0.23 U	0.44 U	NA	NA	NA
	Oct-13		0.31 U	0.24 U	0.23 U	0.44 U	NA	NA	NA
	Oct-14		0.30 U	0.33 U	0.34U	0.33 U	NA	NA	NA

Notes:
1. SWCTL indicates Florida Department of Environmental Protection (FDEP) Surface Water Cleanup Target Level.
2. MNA indicates Monitored Natural Attenuation.
3. MNA monitoring began in January 2006; Geosyntec began sampling March 2008.
4. µg/L indicates micrograms per liter.
5. ft BLS indicates feet below land surface.
6. U indicates not detected above method detection limit.
7. I indicates result greater than or equal to method detection limit but less than the reporting limit.
8. J indicates estimated value.
9. NA indicates not analyzed.
10. Bold, yellow shaded text indicates analyte detected above SWCTL or GIII.

Table 3-5. Monitored Natural Attenuation Sampling Results: Metals
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Sample Date	Screen Interval (ft BLS)	Concentration (µg/L)				
			Aluminum	Arsenic	Barium	Iron	Thallium
			KSC Background: 280	KSC Background: 28	KSC Background: 410	KSC Background: 10,000	KSC Background: 2
ECS-IW0003I	Sep-96	45 to 50	NA	5.0 U	14.0	NA	2.0 U
	Jul-98		NA	3.1 U	NA	NA	2.0 U
	Jul-99		120 U,J	5.2	20 I	3,300	**13 J**
	Oct-00		NA	NA	NA	1,800 D	NA
	Jan-06		NA	NA	NA	NA	**6.6 U**
	Aug-06		NA	NA	NA	NA	1.8 U
	Apr-07		NA	NA	NA	NA	**6.6 U**
	Sep-07		NA	NA	NA	NA	**6.6 U**
	Sep-08		NA	NA	NA	NA	0.49 I
ECS-IW0004D	Jul-98	57 to 62	**770 I**	6.9 I	52 I	**13,900**	2.0 U
	Jul-99		120 U	3.6 I	46 I	**10,600**	**29 I**
	Oct-00		NA	NA	NA	**13,400 D**	NA
	Jan-06		NA	NA	NA	**14,000**	NA
	Sep-07		NA	NA	NA	7,100	NA
	Sep-07*		NA	NA	NA	**14,000**	0.02 U
	Sep-08		NA	NA	NA	**11,500**	0.23 I
	Sep-09		NA	NA	NA	**10,800**	NA
	Oct-10		NA	NA	NA	**10,900**	NA
	Sep-11		NA	NA	NA	**11,100**	NA
	Sep-12		NA	NA	NA	**10,200**	NA
	Oct-13		NA	NA	NA	9,920	NA
	Oct-13		NA	NA	NA	3,500 F	NA
ECS-IW0005I	Oct-99	42 to 47	**2,700**	4.3 I	44 I	3,500	**7.5 I**
	Oct-00		NA	NA	NA	1,400 D	NA
	Jan-06		230	NA	NA	NA	**6.8**
	Sep-07		160 I	NA	NA	NA	**6.6 U**
	Sep-08		NA	NA	NA	NA	0.55 I
ECS-IW0006SI	Jul-99	22 to 27	**20,400**	11.0	160 I	5,200	**11 I**
	Oct-00		NA	NA	NA	35 U,D	NA
	Jan-06		**2,300**	NA	1.2	510	**6.8 U**
	Aug-06		**2,500**	NA	7.8 I	310	1.8 U
	May-07		**1,200**	NA	6.7 I	730	**6.6 U**
	Sep-07		**1,800**	NA	6.7 I	280	**6.6 U**
	Sep-08		**293**	NA	NA	NA	0.16 I
	Sep-09		**1,410**	NA	NA	NA	NA
	Oct-10		**1,760**	NA	NA	NA	NA
ECS-IW0006I	Jul-99	32.5 to 37.5	170 I	3.0 U	56 I	480	**12.0**
	Oct-00		NA	NA	NA	35 U,D	NA
	Jan-06		NA	NA	NA	NA	**6.6 U**
	Aug-06		NA	NA	NA	NA	1.8 U
	May-07		NA	NA	NA	NA	**6.6 U**
	Sep-07		NA	NA	NA	NA	**6.6 U**
	Sep-08		NA	NA	NA	NA	0.12 U
HOF-IW0005I	May-01	23 to 28	350 U	**61.0**	200 I	5,200	**76.0**
	Oct-03		6.6 U	3.1 U,B	85 U,B	1,800 U	1.5 U
	Jan-06		NA	4.8 U	NA	NA	NA
	Sep-07		NA	**140**	NA	NA	NA
	Sep-08		NA	5.4 U	NA	NA	NA
LOX-IW0012S	Jun-01	7 to 12	**3,400**	5.6 J	210	**14,100**	**60.0**
	Nov-03		NA	NA	NA	165 U,B	NA
	Jan-06		**12,000**	NA	110	1,000	**66.0**
	Sep-07		**580**	NA	110	620	**6.6 U**
	Sep-08		**1,740**	NA	NA	NA	0.12 U
	Sep-09		**3,310**	NA	NA	NA	NA
	Oct-10		**1,140**	NA	NA	NA	NA
	Sep-11		**2,900**	NA	NA	NA	NA
	Sep-12		**936**	NA	NA	NA	NA
	Oct-13		**391**	NA	NA	NA	NA
	Oct-13		**325 F**	NA	NA	NA	NA
	Oct-14		**3,920**	NA	NA	NA	NA
	Oct-14		**3,840 F**	NA	NA	NA	NA
LOX-IW0012I	Jun-01	23 to 28	350 U	**46 J**	290 I	**11,000**	**55.0**
	Nov-03		NA	NA	NA	1,400 U,D	NA
	Jan-06		NA	NA	220	570	**20 U**
	Sep-07		NA	NA	230	420	**20 U**
	Sep-08		NA	NA	NA	NA	0.12 U

Notes:

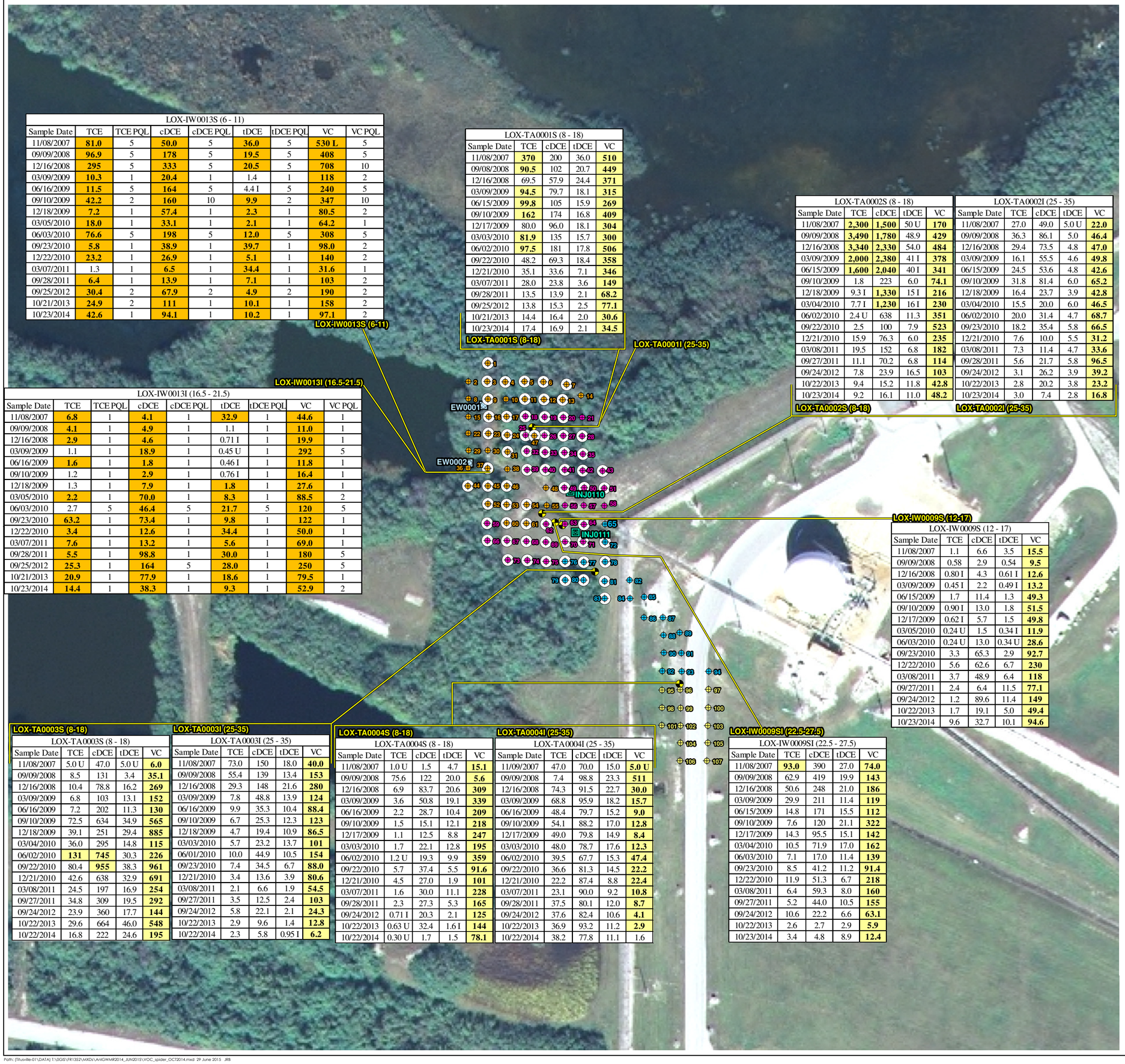
1. The corrective measure objective was to have contaminant concentrations below the upper range of KSC Background Values.
2. MNA indicates Monitored Natural Attenuation.
3. MNA monitoring began in January 2006; Geosyntec began sampling March 2008.
4. µg/L indicates micrograms per liter.
5. ft BLS indicates feet below land surface.
6. U indicates not detected above method detection limit.
7. I indicates result greater than or equal to method detection limit but less than the reporting limit.
8. B indicates constituent detected in associated method blank.
9. D indicates dissolved concentration.
10. J indicates estimated value.
11. NA indicates not analyzed.
12. Bold, yellow shaded text indicates analyte detected above upper limit of KSC Background Value.
13. The dissolved plume MNA sampling plan was modified during the CMI because the monitoring well cluster ECS-IW2 could not be located. ECD-5SI was substituted for ECS-IW2SI, ECS-IW4D with thallium added to analyte list was substituted for ECS-IW2D, and ECS-IW3I was substituted for ECS-IW2I.
14. * indicates a duplicate sample.
15. F indicates sample was filtered.

Table 3-6. Monitored Natural Attenuation Sampling Results: Field Geochemical Parameters
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screen Interval (ft BLS)	Sample Date	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
ECS-IW0003I	45 to 50	09/08/2008	24.9	7.38	1.9	7.0	0.10	-176	0.00	1.2	clear
		09/10/2009	25.8	7.73	2.0	3.1	0.98	-252	0.23	1.3	clear
		10/14/2010	25.1	7.40	1.6	6.4	0.82	-214	1.21	1.1	yellowish
ECS-IW0004I	41.5 to 46.5	09/08/2008	24.9	7.38	1.9	7.0	0.10	-176	0.00	1.2	clear
		09/09/2009	26.4	9.31 *	2.5	2.9	1.22	-360	0.07	1.5	clear
		10/14/2010	26.1	6.71	2.0	8.3	0.96	-172	1.05	1.8	clear
ECS-IW0004D	57 to 62	09/08/2008	25.0	6.79	55.2	7.1	36.58	-125	0.30	35.9	clear
		09/09/2009	27.4	7.97 *	68.0	18.3	42.31	-264	0.07	44.1	clear
		10/14/2010	26.1	6.31	59.3	2.9	31.29	-129	1.05	36.2	clear
		09/28/2011	26.2	6.92	59.2	3.0	39.54	-147	0.83	38.5	clear
		09/25/2012	25.0	7.01	1.3	2.9	2.42	-151	0.95	3.1	clear
		10/23/2013	24.1	6.76	60.0	11.0	40.23	-86	0.41	39.0	clear
ECS-IW0005SI	23 to 28	09/08/2008	24.5	6.21	0.9	15.2	0.00	-286	0.00	0.6	clear/brown
		09/09/2009	26.0	6.24	0.8	3.0	0.41	-253	0.04	0.5	light yellow
		10/14/2010	24.9	6.46	0.9	10.8	0.25	-241	1.00	0.6	clear
ECS-IW0005I	42 to 47	09/08/2008	25.1	7.90	2.3	4.8	0.10	-151	0.00	1.5	clear/brown
		09/09/2009	25.3	9.10 *	1.9	2.4	0.95	-368	0.10	1.2	clear
		10/14/2010	25.2	7.25	2.3	3.9	0.56	-254	1.03	1.0	clear
ECS-IW0006SI	22.5 to 27.5	09/08/2008	25.7	7.15	2.3	1.2	0.11	-244	1.88	0.2	clear
		09/09/2009	26.6	7.99	1.3	6.2	0.65	-332	0.01	0.8	clear
ECS-IW0006I	32.5 to 37.5	09/08/2008	24.7	7.77	0.9	8.9	0.00	-297	0.00	0.7	clear
		09/09/2009	27.0	9.60 *	2.3	8.1	1.12	-421	0.01	1.4	clear
		10/14/2010	25.0	7.70	1.3	7.6	0.51	-282	0.98	0.6	clear
ECS-IW0007I	33 to 38	09/08/2008	24.3	6.47	3.1	0.3	1.61	-256	0.68	2.0	clear
		09/09/2009	26.2	7.23	4.0	2.0	2.07	-328	0.05	2.6	clear
		10/14/2010	25.1	6.62	3.1	1.7	1.14	-253	1.37	2.1	clear
ECS-IW0008I	42 to 47	09/08/2008	24.5	7.32	77.4	0.0	4.00	-156	0.00	48.0	--
		09/10/2009	26.1	7.52	25.2	1.8	15.01	-260	0.04	16.1	clear
		10/14/2010	26.0	7.30	20.2	10.3	12.10	-247	1.10	13.1	clear
HOF-IW0005I	23 to 28	09/08/2008	26.6	5.87	0.7	0.2	0.35	-258	1.37	0.5	yellow
LOX-IW0001I	22 to 27	09/11/2008	26.9	7.38	3.3	2.8	0.20	-259	0.00	2.1	clear
		09/10/2009	26.9	8.87 *	3.8	2.7	1.93	-396	0.03	2.4	clear
		10/14/2010	25.6	7.20	2.1	8.4	1.09	-298	1.13	1.7	clear
		09/28/2011	25.9	7.06	4.1	1.0	2.19	-263	0.57	2.7	clear
		09/25/2012	24.8	7.31	5.1	9.8	2.75	-220	0.78	3.4	clear
LOX-IW0012S	7 to 12	09/09/2008	25.5	4.93	35.3	0.8	22.25	-60	1.24	23.0	clear
		09/10/2009	26.2	6.36	37.4	2.3	23.08	-274	0.08	23.8	clear
		10/15/2010	26.0	6.95	32.3	12.3	22.25	-151	1.17	28.0	clear
		09/28/2011	24.8	4.99	36.3	2.4	22.95	-140	0.54	23.6	clear
		09/24/2012	25.0	5.07	14.7	1.5	8.55	-155	0.28	9.7	clear
		10/22/2013	24.7	5.31	29.4	0.9	18.15	-92	0.50	19.1	clear
		10/22/2014	25.4	4.75	42.1	2.6**	27.39	-95	0.33**	27.4	clear
LOX-IW0012I	7 to 12	09/09/2008	24.3	6.54	66.5	2.7	4.00	-206	0.00	40.0	clear
		09/10/2009	25.7	7.51	56.0	9.3	36.90	-298	0.14	36.2	clear
		10/15/2010	25.1	7.19	56.2	7.8	23.10	-276	1.21	37.3	clear
		09/28/2011	24.8	6.86	55.0	3.4	36.42	589	0.24	35.7	clear
		09/24/2012	24.2	6.25	32.9	6.3	20.67	-172	0.34	21.3	clear
		10/22/2013	23.8	6.08	56.8	1.7	37.84	-74	0.49	36.9	clear
		10/22/2014	24.4	6.02	58.1	1.7**	38.79	-102	0.24**	37.8	clear

Notes:

1. ft BLS = feet below land surface.
2. °C indicates degrees Celsius.
3. pH indicates hydrogen ion concentration.
4. S.U. indicates standard units.
5. mS/cm indicates milliSiemens per centimeter.
6. NTU indicates Nephelometric Turbidity Unit.
7. mV indicates millivolts.
8. mg/L indicates milligram per liter.
9. % indicates percent.
10. g/L indicates gram per liter.
11. * indicates pH meter malfunctioned.
12. -- indicates not recorded.
13. ** indicates the respective meter did not pass the continuing calibration varification at the end of the sampling day.



LOX-IW0013S (6 - 11)

Sample Date	TCE	TCE PQL	cDCE	cDCE PQL	tDCE	tDCE PQL	VC	VC PQL
11/08/2007	**81.0**	5	**50.0**	5	**36.0**	5	**530 L**	5
09/09/2008	**96.9**	5	**178**	5	**19.5**	5	**408**	5
12/16/2008	**295**	5	**333**	5	**20.5**	5	**708**	10
03/09/2009	**10.3**	1	**20.4**	1	1.4	1	**118**	2
06/16/2009	**11.5**	5	**164**	5	4.4 I	5	**240**	5
09/10/2009	**42.2**	2	**160**	10	**9.9**	2	**347**	10
12/18/2009	**7.2**	1	**57.4**	1	**2.3**	1	**80.5**	2
03/05/2010	**18.0**	1	**33.1**	1	**2.1**	1	**64.2**	1
06/03/2010	**76.6**	5	**198**	5	**12.0**	5	**308**	5
09/23/2010	**5.8**	1	**38.9**	1	**39.7**	1	**98.0**	2
12/22/2010	**23.2**	1	**26.9**	1	**5.1**	1	**140**	2
03/07/2011	1.3	1	**6.5**	1	**34.4**	1	**31.6**	1
09/28/2011	**6.4**	1	**13.9**	1	**7.1**	1	**103**	2
09/25/2012	**30.4**	2	**67.9**	2	**4.9**	2	**190**	2
10/21/2013	**24.9**	2	**111**	1	**10.1**	1	**158**	2
10/23/2014	**42.6**	1	**94.1**	1	**10.2**	1	**97.1**	2

LOX-TA0001S (8 - 18)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	**370**	200	36.0	**510**
09/08/2008	**90.5**	102	20.7	**449**
12/16/2008	69.5	57.9	24.4	**371**
03/09/2009	**94.5**	79.7	18.1	**315**
06/15/2009	**99.8**	105	15.9	**269**
09/10/2009	**162**	174	16.8	**409**
12/17/2009	80.0	96.0	18.1	**304**
03/03/2010	**81.9**	135	15.7	**300**
06/02/2010	**97.5**	181	17.8	**506**
09/22/2010	48.2	69.3	18.4	**358**
12/21/2010	35.1	33.6	7.1	**346**
03/07/2011	28.0	23.8	3.6	**149**
09/28/2011	13.5	13.9	2.1	**68.2**
09/25/2012	13.8	15.3	2.5	**77.1**
10/21/2013	14.4	16.4	2.0	**30.6**
10/23/2014	17.4	16.9	2.1	**34.5**

LOX-TA0002S (8 - 18)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	**2,300**	**1,500**	50 U	**170**
09/09/2008	**3,490**	**1,780**	48.9	**429**
12/16/2008	**3,340**	**2,330**	54.0	**484**
03/09/2009	**2,000**	**2,380**	41 I	**378**
06/15/2009	**1,600**	**2,040**	40 I	**341**
09/10/2009	1.8	223	6.0	**74.1**
12/18/2009	9.3 I	**1,330**	15 I	**216**
03/04/2010	7.7 I	**1,230**	16 I	**230**
06/02/2010	2.4 U	638	11.3	**351**
09/22/2010	2.5	100	7.9	**523**
12/21/2010	15.9	76.3	6.0	**235**
03/08/2011	19.5	152	6.8	**182**
09/27/2011	11.1	70.2	6.8	**114**
09/24/2012	7.8	23.9	16.5	**103**
10/22/2013	9.4	15.2	11.8	**42.8**
10/23/2014	9.2	16.1	11.0	**48.2**

LOX-TA0002I (25 - 35)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	27.0	49.0	5.0 U	**22.0**
09/09/2008	36.3	86.1	5.0	**46.4**
12/16/2008	29.4	73.5	4.8	**47.0**
03/09/2009	16.1	55.5	4.6	**49.8**
06/15/2009	24.5	53.6	4.8	**42.6**
09/10/2009	31.8	81.4	6.0	**65.2**
12/18/2009	16.4	23.7	3.9	**42.8**
03/04/2010	15.5	20.0	6.0	**46.5**
06/02/2010	20.0	31.4	4.7	**68.7**
09/23/2010	18.2	35.4	5.8	**66.5**
12/21/2010	7.6	10.0	5.5	**31.2**
03/08/2011	7.3	11.4	4.7	**33.6**
09/28/2011	5.6	21.7	5.8	**96.5**
09/24/2012	3.1	26.2	3.9	**39.2**
10/22/2013	2.8	20.2	3.8	**23.2**
10/23/2014	3.0	7.4	2.8	**16.8**

LOX-IW0013I (16.5 - 21.5)

Sample Date	TCE	TCE PQL	cDCE	cDCE PQL	tDCE	tDCE PQL	VC	VC PQL
11/08/2007	**6.8**	1	**4.1**	1	**32.9**	1	**44.6**	1
09/09/2008	**4.1**	1	**4.9**	1	1.1	1	**11.0**	1
12/16/2008	**2.9**	1	**4.6**	1	0.71 I	1	**19.9**	1
03/09/2009	1.1	1	**18.9**	1	0.45 U	1	**292**	5
06/16/2009	**1.6**	1	**1.8**	1	0.46 I	1	**11.8**	1
09/10/2009	1.2	1	**2.9**	1	0.76 I	1	**16.4**	1
12/18/2009	1.3	1	**7.9**	1	**1.8**	1	**27.6**	1
03/05/2010	**2.2**	1	**70.0**	1	**8.3**	1	**88.5**	2
06/03/2010	2.7	5	**46.4**	5	**21.7**	5	**120**	5
09/23/2010	**63.2**	1	**73.4**	1	**9.8**	1	**122**	1
12/22/2010	**3.4**	1	**12.6**	1	**34.4**	1	**50.0**	1
03/07/2011	**7.6**	1	**13.2**	1	**5.6**	1	**69.0**	1
09/28/2011	**5.5**	1	**98.8**	1	**30.0**	1	**180**	5
09/25/2012	**25.3**	1	**164**	5	**28.0**	1	**250**	5
10/21/2013	**20.9**	1	**77.9**	1	**18.6**	1	**79.5**	1
10/23/2014	**14.4**	1	**38.3**	1	**9.3**	1	**52.9**	2

LOX-IW0009S (12 - 17)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	1.1	6.6	3.5	**15.5**
09/09/2008	0.58	2.9	0.54	**9.5**
12/16/2008	0.80 I	4.3	0.61 I	**12.6**
03/09/2009	0.45 I	2.2	0.49 I	**13.2**
06/15/2009	1.7	11.4	1.3	**49.3**
09/10/2009	0.90 I	13.0	1.8	**51.5**
12/17/2009	0.62 I	5.7	1.5	**49.8**
03/05/2010	0.24 U	1.5	0.34 I	**11.9**
06/03/2010	0.24 U	13.0	0.34 U	**28.6**
09/23/2010	3.3	65.3	2.9	**92.7**
12/22/2010	5.6	62.6	6.7	**230**
03/08/2011	3.7	48.9	6.4	**118**
09/27/2011	2.4	6.4	11.5	**77.1**
09/24/2012	1.2	89.6	11.4	**149**
10/22/2013	1.7	19.1	5.0	**49.4**
10/23/2014	9.6	32.7	10.1	**94.6**

LOX-TA0003S (8 - 18)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	5.0 U	47.0	5.0 U	**6.0**
09/09/2008	8.5	131	3.4	**35.1**
12/16/2008	10.4	78.8	16.2	**269**
03/09/2009	6.8	103	13.1	**152**
06/16/2009	7.2	202	11.3	**130**
09/10/2009	72.5	634	34.9	**565**
12/18/2009	39.1	251	29.4	**885**
03/04/2010	36.0	295	14.8	**115**
06/02/2010	**131**	**745**	30.3	**226**
09/22/2010	80.4	**955**	38.3	**961**
12/21/2010	42.6	638	32.9	**691**
03/08/2011	24.5	197	16.9	**254**
09/27/2011	34.8	309	19.5	**292**
09/24/2012	23.9	360	17.7	**144**
10/22/2013	29.6	664	46.0	**548**
10/22/2014	16.8	222	24.6	**195**

LOX-TA0003I (25 - 35)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	73.0	150	18.0	**40.0**
09/09/2008	55.4	139	13.4	**153**
12/16/2008	29.3	148	21.6	**280**
03/09/2009	7.8	48.8	13.9	**124**
06/16/2009	9.9	35.3	10.4	**88.4**
09/10/2009	6.7	25.3	12.3	**123**
12/18/2009	4.7	19.4	10.9	**86.5**
03/03/2010	5.7	23.2	13.7	**101**
06/01/2010	10.0	44.9	10.5	**154**
09/23/2010	7.4	34.5	6.7	**88.0**
12/21/2010	3.4	13.6	3.9	**80.6**
03/08/2011	2.1	6.6	1.9	**54.5**
09/27/2011	3.5	12.5	2.4	**103**
09/24/2012	5.8	22.1	2.1	**24.3**
10/22/2013	2.9	9.6	1.4	**12.8**
10/22/2014	2.3	5.8	0.95 I	**6.2**

LOX-TA0004S (8 - 18)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	1.0 U	1.5	4.7	**15.1**
09/09/2008	75.6	122	20.0	**5.6**
12/16/2008	6.9	83.7	20.6	**309**
03/09/2009	3.6	50.8	19.1	**339**
06/16/2009	2.2	28.7	10.4	**209**
09/10/2009	1.5	15.1	12.1	**218**
12/17/2009	1.1	12.5	8.8	**247**
03/03/2010	1.7	22.1	12.8	**195**
06/02/2010	1.2 U	19.3	9.9	**359**
09/22/2010	5.7	37.4	5.5	**91.6**
12/21/2010	4.5	27.0	1.9	**101**
03/07/2011	1.6	30.0	11.1	**228**
09/28/2011	2.3	27.3	5.3	**165**
09/24/2012	0.71 I	20.3	2.1	**125**
10/22/2013	0.63 U	32.4	1.6 I	**144**
10/22/2014	0.30 U	1.7	1.5	**78.1**

LOX-TA0004I (25 - 35)

Sample Date	TCE	cDCE	tDCE	VC
11/09/2007	47.0	70.0	15.0	**5.0 U**
09/09/2008	7.4	98.8	23.3	**511**
12/16/2008	74.3	91.5	22.7	**30.0**
03/09/2009	68.8	95.9	18.2	**15.7**
06/16/2009	48.4	79.7	15.2	**9.0**
09/10/2009	54.1	88.2	17.0	**12.8**
12/17/2009	49.0	79.8	14.9	**8.4**
03/03/2010	48.0	78.7	17.6	**12.3**
06/02/2010	39.5	67.7	15.3	**47.4**
09/22/2010	36.6	81.3	14.5	**22.2**
12/21/2010	22.2	87.4	8.8	**22.4**
03/07/2011	23.1	90.0	9.2	**10.8**
09/28/2011	37.5	80.1	12.0	**8.7**
09/24/2012	37.6	82.4	10.6	**4.1**
10/22/2013	36.9	93.2	11.2	**2.9**
10/22/2014	38.2	77.8	11.1	1.6

LOX-IW0009SI (22.5 - 27.5)

Sample Date	TCE	cDCE	tDCE	VC
11/08/2007	**93.0**	390	27.0	**74.0**
09/09/2008	62.9	419	19.9	**143**
12/16/2008	50.6	248	21.0	**186**
03/09/2009	29.9	211	11.4	**119**
06/15/2009	14.8	171	15.5	**112**
09/10/2009	7.6	120	21.1	**322**
12/17/2009	14.3	95.5	15.1	**142**
03/04/2010	10.5	71.9	17.0	**162**
06/03/2010	7.1	17.0	11.4	**139**
09/23/2010	8.5	41.2	11.2	**91.4**
12/22/2010	11.9	51.3	6.7	**218**
03/08/2011	6.4	59.3	8.0	**160**
09/27/2011	5.2	44.0	10.5	**155**
09/24/2012	10.6	22.2	6.6	**63.1**
10/22/2013	2.6	2.7	2.9	**5.9**
10/23/2014	3.4	4.8	8.9	**12.4**

N

80 40 0 80 Feet

Legend

- Injection Well Location (5-15 ft BLS)
- Injection Well Location (10-20 ft BLS)
- Injection Well Location (15-20 ft BLS)
- Injection Well Location (15-25 ft BLS)
- Destroyed Injection Well Location
- Performance Monitoring Well Location showing screen interval (ft BLS)
- Extraction Well Location
- Injection Well Location (recirculation system)

Parameter	Abbreviation	Site Specific Cleanup Level
Trichloroethene	TCE	80.7 (SWCTL)
cis-1,2-dichloroethene	cDCE	700 (GIII non-potable)
trans-1,2-dichloroethene	tDCE	11,000 (SWCTL)
Vinyl Chloride	VC	2.4 (SWCTL)

Notes:
1. SWCTL indicates Florida Department of Environmental Protection (FDEP) Surface Water Cleanup Target Level.
2. Results presented are from when Geosyntec assumed sampling activities in 2007.
3. Results are presented in micrograms per liter (µg/L).
4. ft BLS indicates feet below land surface.
5. U indicates not detected above method detection limit.
6. I indicates result greater than or equal to method detection limit, but less than the reporting limit.
7. Bold, yellow shaded text indicates analyte detected above SWCTL or GIII.
8. Bold, orange shaded text indicates analyte detected above the practical quantitation limit (PQL).
9. Monitoring well LOX-TA0001I was removed from the sampling plan in April 2014; therefore, data is not presented. Historical results are provided in Table 3-1.

Path: (Titusville-01)\DATA] T:\GIS\FR1352\MXDs\AnlGWMR2014_JUN2015\VOC_spider_OCT2014.mxd 29 June 2015 JR8

Figure 3-1
Performance Monitoring Results: CVOCs

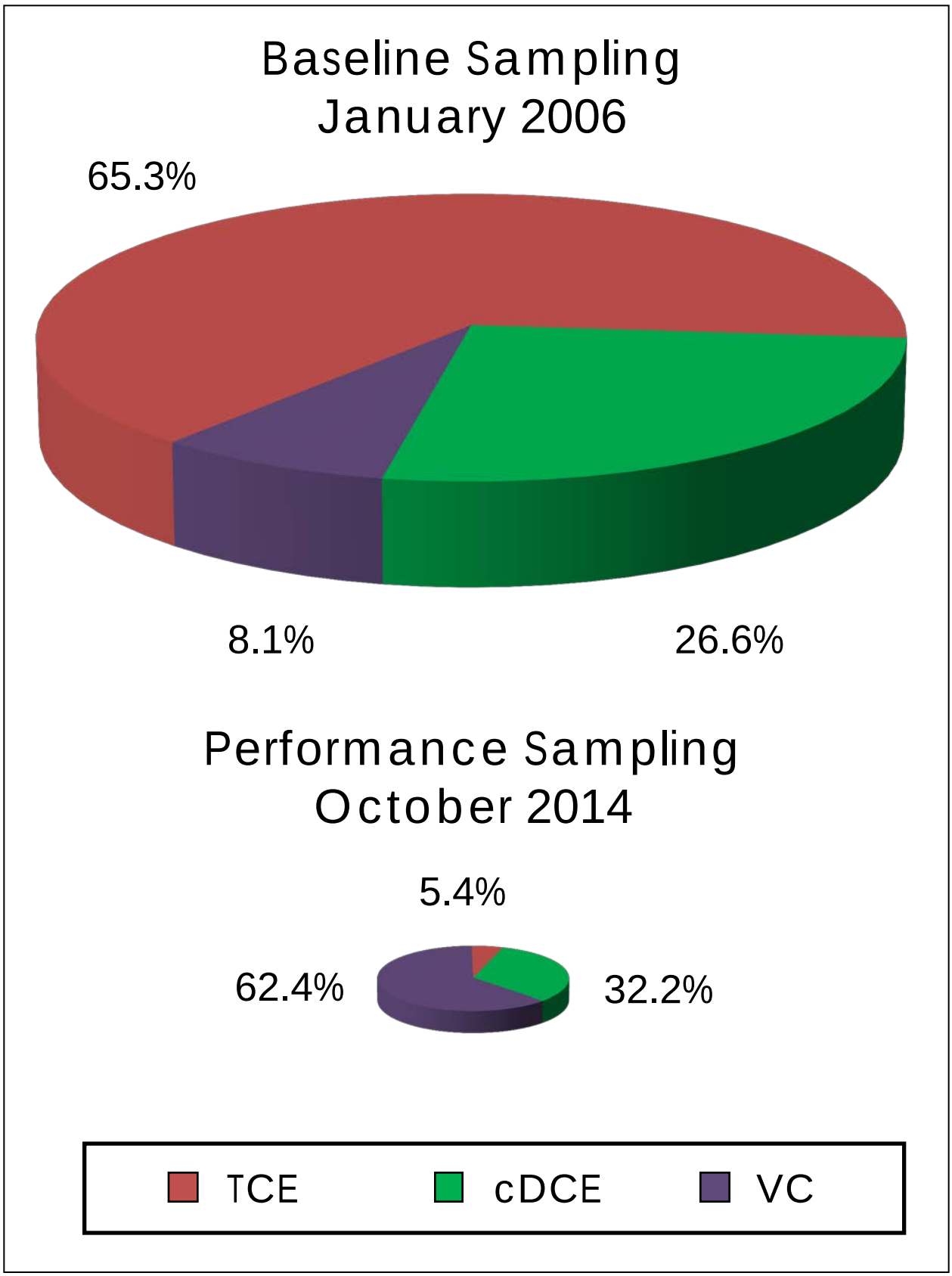
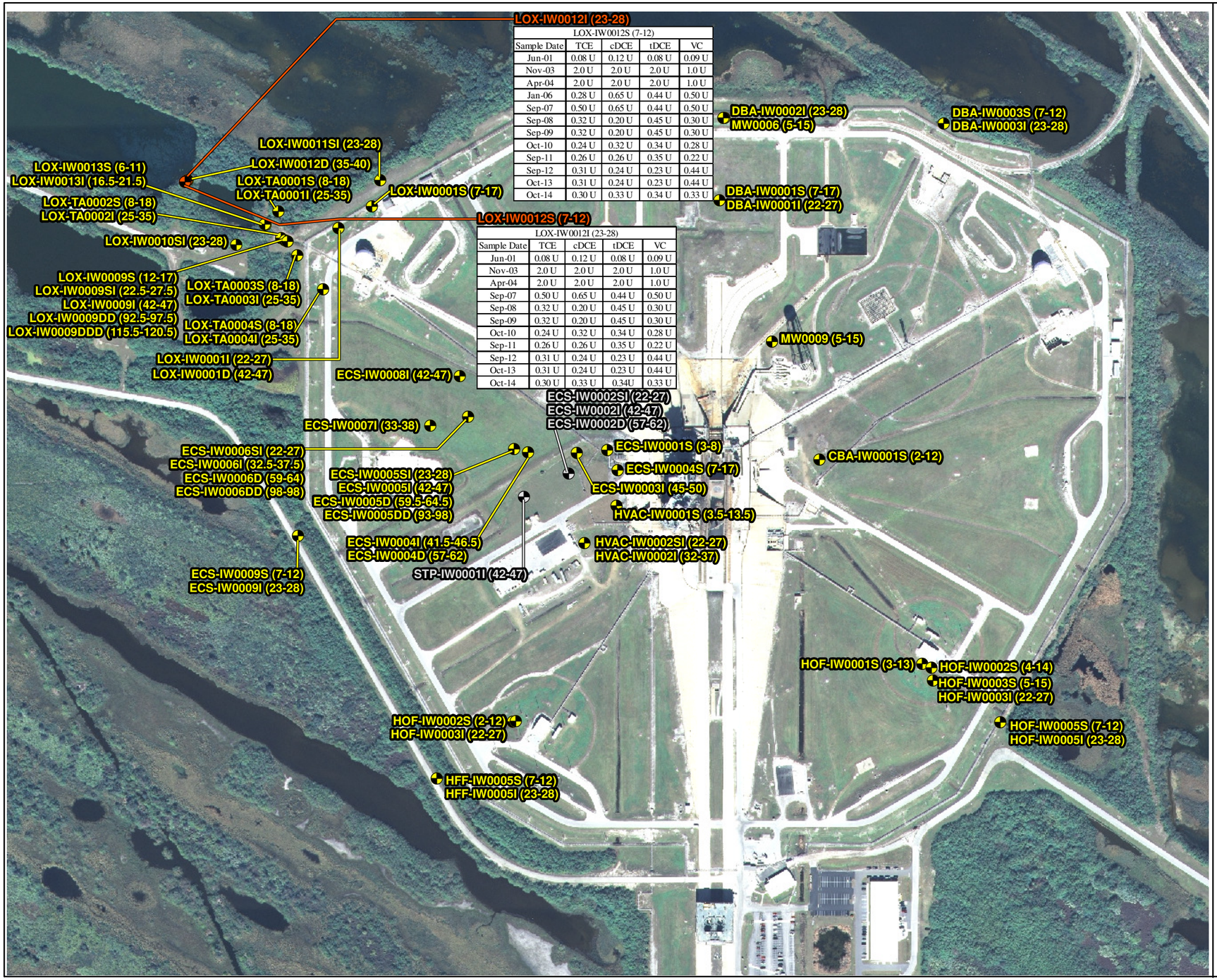
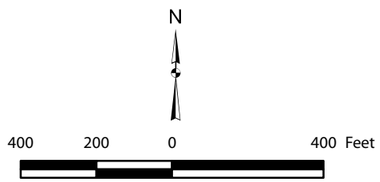


Figure 3-2
Comparison of the Distribution of TCE, cDCE, and VC, in the Treatment Zone Monitoring Wells (TA0001S, TA0002S, TA0003S, TA0004S, IW0009S, IW0013S, IW0013I)





Legend

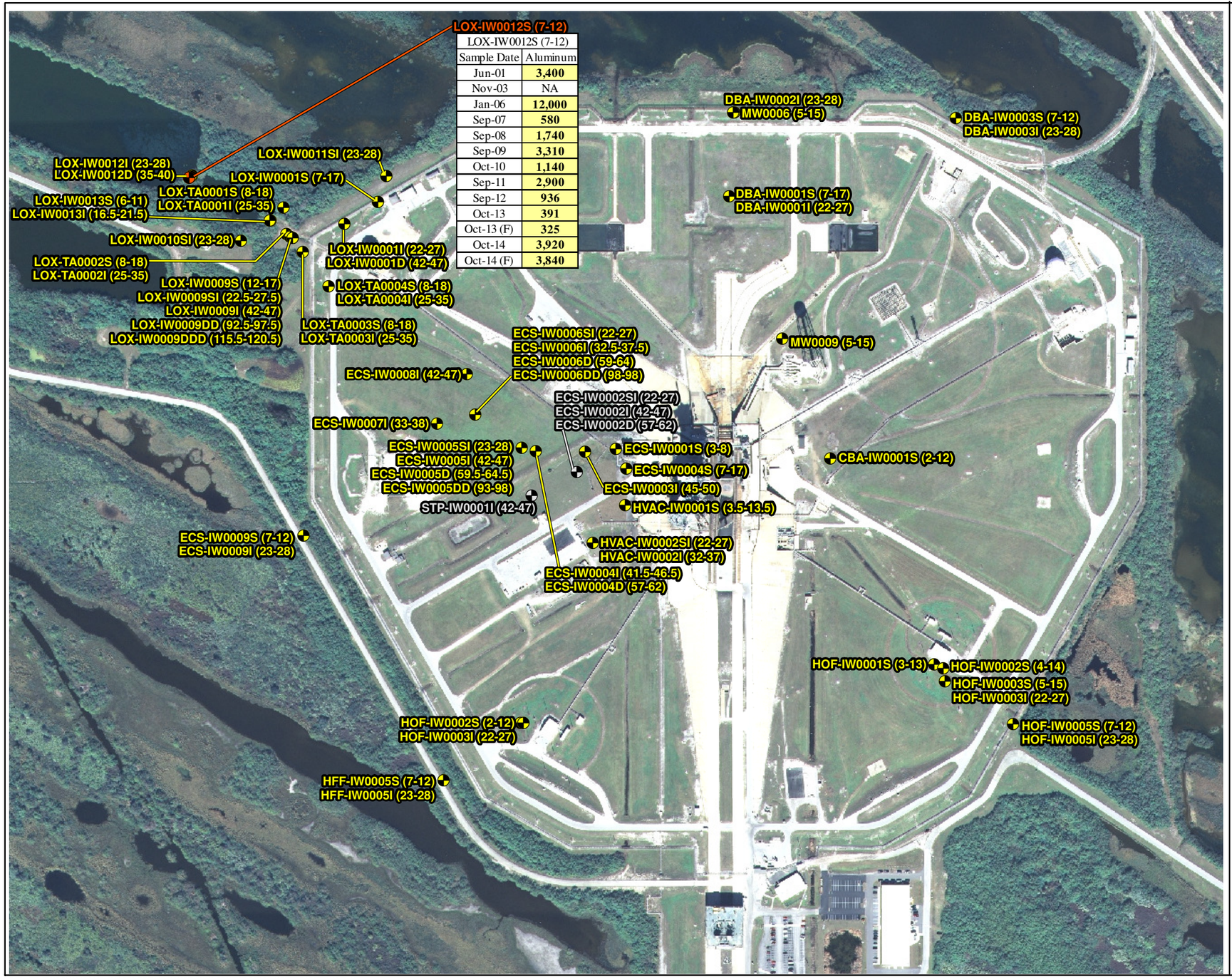
- MNA Monitoring Well Location showing screen interval (ft BLS)
- Monitoring Well not included in MNA showing screen interval (ft BLS)
- Abandoned Monitoring Well showing screen interval (ft BLS)

Parameter	Abbreviation	Site Specific Cleanup Level
Trichloroethene	TCE	80.7 (SWCTL)
cis-1,2-dichloroethene	cDCE	700 (GIII non-potable)
trans-1,2-dichloroethene	tDCE	11,000 (SWCTL)
Vinyl Chloride	VC	2.4 (SWCTL)

Notes:
1. SWCTL indicates Florida Department of Environmental Protection (FDEP) Surface Water Cleanup Target Level.
2. MNA indicates Monitored Natural Attenuation.
3. MNA monitoring began in January 2006; Geosyntec began sampling September 2008.
4. Results are presented in micrograms per liter (µg/L).
5. ft BLS indicates feet below land surface.
6. U indicates not detected above method detection limit.

Path: (Titusville-01\DATA) T:\0GIS\FR1352\MXDs\AnlGWMR2014_JUN2015\MNA_VOCs_OCT2014.mxd 29 June 2015 JRB

Figure 3-3
Historical Data and Monitored Natural Attenuation Results: CVOCs



LOX-IW0012S (7-12)	
Sample Date	Aluminum
Jun-01	**3,400**
Nov-03	NA
Jan-06	**12,000**
Sep-07	**580**
Sep-08	**1,740**
Sep-09	**3,310**
Oct-10	**1,140**
Sep-11	**2,900**
Sep-12	**936**
Oct-13	**391**
Oct-13 (F)	**325**
Oct-14	**3,920**
Oct-14 (F)	**3,840**

N

400 200 0 400 Feet

Legend

- MNA Monitoring Well Location showing screen interval (ft BLS)
- Monitoring Well not included in MNA showing screen interval (ft BLS)
- Abandoned Monitoring Well showing screen interval (ft BLS)

Parameter	KSC Background Value (µg/L)
Aluminum	280
Iron	10,000

Notes:
1. The corrective measure objective was to have contaminant concentrations below the upper range of KSC Background Values.
2. MNA indicates Monitored Natural Attenuation.
3. MNA monitoring began in January 2006; Geosyntec began sampling September 2008.
4. Results are presented in micrograms per liter (µg/L).
5. ft BLS indicates feet below land surface.
6. U indicates not detected above method detection limit.
7. B indicates result was detected in associated method blank.
8. NA indicates not analyzed.
9. Bold, yellow shaded text indicates analyte detected above upper limit of KSC Background Value.
10. F indicates the sample was filtered.

Path: (Titusville-01\DATA) T:\OGIS\FR1352\MXDs\AnlGWMR2014_JUN2015\MNA_Metals_OCT2014.mxd 29 June 2015 JRB

Figure 3-4
Historical Data and Monitored Natural Attenuation Results: Metals

Path: (Titusville-01\Data\)T:\0GIS\FR1352\MXDs\AnlGWMR2014_JUN2015\Sediment_control_Dec2014.mxd 29 June 2015 JRB

Figure 3-5
Sediment Control System - December 2014

SECTION IV

CONCLUSIONS AND RECOMMENDATIONS

The contents of this annual report were presented to the KSC Remediation Team (KSCRT) at the April 2015 Team meeting and the KSCRT agreed with all recommendations below. The meeting minutes are included in Appendix F.

4.1 PERFORMANCE MONITORING

Results from the performance monitoring suggest that enhanced bioremediation is still having a positive impact on the groundwater in the LOX area six years after injection of electron donor. A summary of the conclusions from the performance monitoring is provided below:

- VC was the only constituent detected above the site-specific cleanup criteria (SWCTL), with the exception of the results from samples collected from monitoring well cluster LOX-IW0013, which has the PQL as the cleanup criteria;
- approximately 92% of the CVOC mass has been removed in the treatment zone since 2006;
- VC to ethene dechlorination is occurring, but is most likely rate limited due to low pH in the treatment zone; and
- the TCE source area identified within the pad during supplemental assessment activities is likely contributing mass (dissolved flux) to the treatment area outside the pad (LOX area), since groundwater flow is radial from inside the pad.

Geosyntec recommends discontinuing the performance monitoring in the LOX area. The area was included in the supplemental assessment and will be included into the Engineering Evaluation Process. It is anticipated that the supplemental assessment data will be presented at the July 2015 KSCRT meeting.

4.2 MONITORED NATURAL ATTENUATION

Only one monitoring well cluster, LOX-IW0012 is included in the MNA sampling plan current, since the remainder of the site is in supplemental assessment. The COC data collected suggests that the CVOC plume is not expanding and the aluminum concentrations observed in samples collected from monitoring well LOX-IW0012S are within the range of historic observations.

Geosyntec recommends continuing analysis of groundwater samples for CVOCs from monitoring wells LOX-IW0012S and LOX-IW0012I on an annual basis to evaluate any plume migration to the west of the pond. It is recommended that both filtered and unfiltered samples continue to be

collected for aluminum from monitoring well LOX-IW0012S and that the samples are analyzed using EPA Method 6020A/SW846The MNA monitoring plan is presented in Table 4-1. It is anticipated that the monitoring plan will be modified after the supplemental assessment activities are completed

4.3 OPERATION AND MAINTENANCE

Geosyntec recommends discontinuing the operation of the recirculation system. As mentioned above, the LOX area is included in the supplemental assessment area that will be included in the Engineering Evaluation Process. During the Engineering Evaluation Process, technologies will be evaluated to mitigate discharge to the adjacent Outstanding Florida Waters. In addition, dechlorination of the CVOCs will continue without recirculation system operation. Geosyntec also recommends that the on-site injection wells that have been destroyed (Figure 2-2) be considered abandoned. The remaining injection wells that are not damaged, will be abandoned in the future. It is also recommended that the monthly sediment block inspection continue to occur monthly.

Table 4-1. Monitored Natural Attenuation Sampling Plan
Launch Complex 39B SWMU 009, Kennedy Space Center, Florida

Location	Screened Interval (ft BLS)	Analytical Parameters	Method	Frequency
LOX-IW0012S	7 to 12	CVOCs, aluminum (filtered and unfiltered)	Metals: EPA Method 6020A/SW846 CVOC: EPA Method 8260B/SW846	Annually
LOX-IW0012I	23 to 28	CVOCs	EPA Method 8260B/SW846	

Notes:
1. ft BLS indicates feet below land surface.
2. CVOCs indicates chlorinated volatile organic compounds.

SECTION V

REFERENCES

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APPENDIX A

FIELD FORMS

Geosyntec consultants

DAILY FIELD REPORT

Page 1 of 1

Project: LC39B
Project No.: FR13526
Contractors:

Date: 10/22/14
Task No.: 34#1

Work Performed

Well Installation:
Soil Borings:
DPT:
Well Inventory:
Other:

Sampling Soil:
Sampling SW/Sediment:
Sampling Monitor Wells: X
Sampling Hazardous Waste:
Sampling Drums:

Observations/Issues of Concern

0730- Arrive @ office begin YSI cal & putting supplies in truck
0805 - Equipment calibrated, off to site
0855- Inside pad. Arrive @ ~~MW~~ MB TA4 cluster. Begin sampling activities. See GW sampling forms for detail,
Will remove current dedicated tubing @ each well & replace w/ HDPE tubing (1/8" ID) & ~~tag w/~~ MB mark w/ sharpie on casing if not labeled
1100 - Wells inside pad complete. Leave pad for MWs outside fence & turn in bldg
1110 - Call NASA Security for access to ~~BL~~ MB B5 gate
1330- Break for lunch
1420- Back @ site. Begin to locate wells & start sampling activities,
1430 - Pad for LOX-TA03I is broken (angled) ~~that well appears OK~~ MB and well appears to be broken. Large ant mound cleared out of LOX-~~I~~ MB T TA03S.
Call Rebecca Dapulo (RD) & inform about well. Take pictures & send to her.
1545 - Lift pad & find LOX-TA03I PVC. Talk to RD, will sample well. Develop until no particles visible & compare geochem to TA03S to see if similar (could indicate a break in the PVC well

Plans/Future Activities

1615- Turn off recirc system after conversation w/ Joe Bartleff to allow for IDW to ~~allow for IDW to~~ MB be poured into injection wells. Dispose of IDW.
1630- Begin process of developing & sampling TA03S. GW starts at noticeably more turbid than other wells sampled today
1715- Done sampling for day. Locate wells for tomorrow, dispose of IDW, turn on system, & then get ice & pack cooler for pickup tomorrow
1745- off site; Call NASA Security once out of 39B area.
1930 - Leave office; Jon will handle sample pick up

10/22/14
Signature/Date

Geosyntec consultants

DAILY FIELD REPORT

Page 1 of 1

Project: ER1352C MB
Project No.: 3918
Contractors:

Date: 10/23/14
Task No.: 3491

Work Performed

Well Installation:
Soil Borings:
DPT:
Well Inventory:
Other:

Sampling Soil:
Sampling SW/Sediment:
Sampling Monitor Wells: X
Sampling Hazardous Waste:
Sampling Drums:

Observations/Issues of Concern

0650 - Arrive @ office. Load truck + cal. equipment
0745 - Calibration complete. Leave for site
0815 - On site. Call KSC security and enter barricade BS
0830 - Begin MW sampling activities. See ~~Bret~~ MB MW Sampling forms for details
0845 - Find large ants nest in manhole for LOX-TA2I. Clear out before taking depth to water + sampling.
Will replace dedicated tubing with HDPE tubing again, today
1105 - Need to locate 9S & 9SI
1140 - Wells located LOX09SI has large ant colony. Need for them to leave before sampling
1330 - Break for lunch
1410 - Back on site
1510 - Turn off recirc system to allow for IDW disposal
1610 - Locate TA01S. Clear out large ant colony from manhole before sampling
1745 - Sampling complete. Dispose of IDW in recirculation injection wells. Restart recirc. system + contact NASA security
1810 - Turn off blowpurge system @ MLPV in anticipation for sampling Monday

Plans/Future Activities

1930 - Samples on ice, waiting for Accutest pick up tomorrow. CCV complete for YSI

10/23/14
Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LG98 Project #: FR1352C Field Personnel: M. Burcham

Water Quality Meter - Model/Serial #: YSI 556 MPS 11K100358 Turbidimeter - Model/Serial # HACH 2100Q Q24006

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L)[1]	Reading (mg/L)	Reading (%)	Pass or Fail
						Acceptance Criteria: +/-0.3mg/L		
(CAL) (ICV) CCV		10/22/14	0738	23.73	8.466	8.30 / 8.115	98.1 / 94.9	(P) F
CAL ICV (CCV)		↓	1902	26.65	7.983	7.54	94.3	P (F)
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
						Acceptance Criteria: +/- 5%		
(CAL) (ICV) CCV		10/22/14	0753	1.413	11205	8/28/15	1.403 / 1.413	(P) F
CAL ICV (CCV)		↓	1918	1.413	11205	↓	1.417	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
						Acceptance Criteria: +/-0.2 SU		
(CAL) (ICV) CCV		10/22/14	0741	4.0	2405968	5/31/16	3.83 / 4.00	(P) F
(CAL) (ICV) CCV		↓	0744	7.0	2312885	12/31/15	7.09 / 7.00	(P) F
(CAL) (ICV) CCV			0747	10.0	2406862	12/31/15	10.02 / 10.00	(P) F
CAL ICV (CCV)		10/22/14	1907	4.0	2405968	5/31/16	4.00	(P) F
CAL ICV (CCV)		↓	1912	7.0	2312885	12/31/15	7.01	(P) F
CAL ICV (CCV)			1915	10.0	2406862	12/31/15	10.00	(P) F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
						Geosyntec Acceptance Criteria: +/- 5%		
(CAL) (ICV) CCV		10/22/14	0759	240 @ 25	47769	7/31/17	240.3 / 240.0	(P) F
CAL ICV CCV		↓	1923	↓	↓	↓	234.6	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance Probe Cleaned? Yes (No) Disolved Oxygen membrane Changed? (Yes) No

0.1 - 10 NTU Std 1.0 NTU	Date	Reading (NTU)	Pass or Fail
	Acceptance Criteria: +/- 10%		
(CAL) (ICV) CCV	10/22/14	9.99	(P) F
CAL ICV (CCV)	↓	13.0	P (F)
CAL ICV CCV			P F
CAL ICV CCV			P F

11 - 40 NTU Std 20 NTU	Date	Reading (NTU)	Pass or Fail
	Acceptance Criteria: +/- 8%		
(CAL) (ICV) CCV	10/22/14	19.1	(P) F
CAL ICV (CCV)	↓	25.5	P (F)
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

41 - 100 NTU Std 100 NTU	Date	Reading (NTU)	Pass or Fail
	Acceptance Criteria: +/- 6.5%		
(CAL) (ICV) CCV	10/22/14	99.6	(P) F
CAL ICV (CCV)	↓	116	P (F)
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

>100 NTU Std 200 NTU	Date	Reading (NTU)	Pass or Fail
	Acceptance Criteria: +/- 5%		
(CAL) (ICV) CCV	10/22/14	191	(P) F
CAL ICV (CCV)	10/22/14	203	(P) F
CAL ICV CCV			P F
CAL ICV CCV			P F

1. See Table FS 2200-2 on the back of this form

Comments DO failed CCV (>0.3 mg/L from saturation)

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification
Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings always start with pH 7, add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Geosyntec consultants

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34B Project #: FR1352C Field Personnel: M. Buchan MB # HACH 2100Q 023991

Water Quality Meter - Model/Serial #: YSI 556 MB 11K100358 Turbidimeter - Model/Serial # MB

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L)[1]	Reading (mg/L)	Reading (%)	Pass or Fail
						Acceptance Criteria: +/-0.3mg/L		
(CAL) (ICV) CCV		10/23/14	0717	23.39	8.514	8.55/8.51	100.4/100.0	(P) F
CAL ICV (CCV)		↓	1907	25.14	8.248	8.05	97.6	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
						Acceptance Criteria: +/- 5%		
(CAL) (ICV) CCV		10/23/14	0741	1.413	11205	8/28/15	1.431/1.413	(P) F
CAL ICV (CCV)		↓	1924	↓	↓	↓	1.445	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
						Acceptance Criteria: +/-0.2 SU		
(CAL) (ICV) CCV		10/23/14	0722	4.0	2405963	5/31/16	3.95/4.00	(P) F
(CAL) (ICV) CCV		↓	0726	7.0	2312685	12/31/15	7.16/7.00	(P) F
(CAL) (ICV) CCV			0729	10.0	2406862	12/31/15	9.89/9.98	(P) F
CAL ICV (CCV)		10/23/14 MB	1912	4.0	2405968	5/31/16	3.96	(P) F
CAL ICV (CCV)		↓	1916	7.0	2312885	12/31/15	6.99	(P) F
CAL ICV (CCV)			1920	10.0	2406862	12/31/15	9.95	(P) F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
						Geosyntec Acceptance Criteria: +/- 5%		
(CAL) (ICV) CCV		10/13/14	0733	240@25	4769	7/31/17	237.5/240.2	(P) F
CAL ICV (CCV)		↓	1928	↓	↓	↓	238.8	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance Probe Cleaned? Yes (No) Disolved Oxygen membrane Changed? Yes (No)

0.1 - 10 NTU Std 10 NTU	Date	Reading (NTU)	Pass or Fail
		Acceptance Criteria: +/- 10%	
(CAL) (ICV) CCV	10/23/14	10.3	(P) F
CAL ICV (CCV)	↓	10.2	(P) F
CAL ICV CCV			P F
CAL ICV CCV			P F

11 - 40 NTU Std 20 NTU	Date	Reading (NTU)	Pass or Fail
		Acceptance Criteria: +/- 8%	
(CAL) (ICV) CCV	10/23/14	19.7	(P) F
CAL ICV (CCV)	↓	19.6	(P) F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

41 - 100 NTU Std 100 NTU	Date	Reading (NTU)	Pass or Fail
		Acceptance Criteria: +/- 6.5%	
(CAL) (ICV) CCV	10/23/14	104	(P) F
CAL ICV (CCV)	↓	95.0	(P) F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

>100 NTU Std 800 NTU	Date	Reading (NTU)	Pass or Fail
		Acceptance Criteria: +/- 5%	
(CAL) (ICV) CCV	10/23/14	770	(P) F
CAL ICV (CCV)	↓	762	(P) F
CAL ICV CCV			P F
CAL ICV CCV			P F

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings always start with pH 7, add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments

Geosyntec consultants

Monitori. Well Sampling

Site: LC39B Project No.: FB1352C Task: 34*1 Date: 10/23/14 Sampled By: M. Burchun

Station (Well ID): TA00015 Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~~~0.175~~ ~0.075 gpm MB Water Quality Meter (Make & Model) YSI MPS 556 Water Level Meter: Solinst

Time @ Start of Purging: 1635 Time @ End of Purging: 1732 Total Purging Time: 57 min Depth of Pump or Intake Tubing: ~13 ft. (BTOC)

Water Level: 2.71 ft BTOC Total Well Depth: 18 ft BLS Screen Interval: 8-18 ft BLS Well diameter:) in. Well Volume: 0.041 x 18 = 0.738 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity (NTU) <20	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
1640	0.5 ~~Start~~	25.64	5.94	3.664	165	1.91	-136.9	0.11	2.304	cloudy dark yellow tint	
1645	1.0	25.47	5.68	3.611	138	1.90	-203.8	0.00	MB 2.347	" "	
1650	1.5	25.44	5.54	3.588	84.9	1.88	-237.4	0.00	2.328	" "	
1655	2.0	25.43	5.51	3.556	69.9	1.86	-242.2	0.00	2.312	" "	
1700	2.5	25.47	5.51	3.559	59.6	1.87	-250.1	0.00	2.314	cloudy, yellow tint	
1705	3.0	25.52	5.51	3.613	72.0	1.89	-252.3	0.00	2.330	" "	
1710	3.5	25.53	5.52	3.360	54.2	1.75	-253.3	0.00	2.181	" "	
1715	3.7	25.45	5.46	4.270	46.5	2.40	-249.2	0.01	2.347	" "	
1718	3.8	25.42	5.48	4.261	44.7	2.25	-245.6	0.09	2.672	" "	
1721	3.9	25.41	5.49	MB 3.940	40.7	2.07	-249.7	0.00	2.532	" "	
1724	4.0	25.37	5.50	3.767	30.3	1.92	-246.4	0.02	2.442	" "	
1726	4.1	25.39	5.50	3.652	29.6	1.92	-250.6	0.00	2.371	" "	

pump stopped pulling water, speed decreased

~~to allow for well to recharge~~ MB + line disconnected/reconnected from pump

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 303-LOX-TA00015-013.0-20141023 Time Collected: 1742 Comments: VOCs

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= ___ gal

1/8" ID = 0.0006 x 20 + 0.25 = 0.26

Monitori. Well Sampling

Site: LC39B Project No.: FR1352C Task: 3401 Date: 10/23/14 Sampled By: M. Burches

Station (Well ID): TA00015 Purge Method: Pump ☒ Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) ☒ Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~~~0.075~~ ~0.075 mB gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1635 Time @ End of Purging: 1732 Total Purging Time: 57 min Depth of Pump or Intake Tubing: ~15 ft. (BTOC)

Water Level: 2.71 ft BTOC Total Well Depth: 18 ft BLS Screen Interval: 8-18 ft BLS Well diameter: 1 in. Well Volume: 0.738 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU) I 5 (post 5x well vols)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1728	4.2 ~~Start~~	25.43	5.50	3.534	27.5 ↑	1.88	-252.4	0.00	3.580		
1730	4.3	25.44	5.50	3.554	25.5	1.86	-254.0	0.00	3.551		
1732	4.4	25.45	5.50	3.539	22.9	1.86	-254.8	0.00	3.538		

SAMPLED

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 39B-LOX-TA00015-03.0-20141023 Time Collected: 1742 Comments: VOCs.

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= — gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= — gal

1/8" ID = 0.0006 × 20 + 0.25 = 0.26

Turbidity remained high. Once 15 NTUs + 5x well vol. was purged, sampling occurred

Monitori. Well Sampling

Site: LC39B Project No.: ~~FR05790~~ FRB52C MB Task: 34+1 Date: 10/23/14 Sampled By: M. Burcham

Station (Well ID): TA0002S Purge Method: Pump ☒ Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1028 Time @ End of Purging: 1047 Total Purging Time: 19 min Depth of Pump or Intake Tubing: ~13 ft. (BTOC)

Water Level: 3.18 ft BTOC Total Well Depth: 18 ft BLS Screen Interval: 8-18 ft BLS Well diameter: 1 in. Well Volume: 0.041×18=0.738 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1033	0.5 ~~Start~~	25.33	5.48	5.910	14.5	3.20	-274.8	0.43	3.828	clear, yellow tint	
1037	0.9	25.43	5.49	5.556	7.36	3.00	-274.3	0.03	3.602	" "	
1041	1.3	25.46	5.49	5.426	5.58	2.92	-273.9	0.22	3.521	" "	
1045	1.7	25.47	5.50	5.320	5.27	2.86	-273.2	0.21	3.456	" "	
1047	1.9	25.45	5.50	5.288	7.98	2.84	-272.3	0.20	3.429	" "	

SAMPLED

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 39B-LOX~~0002S~~-TA0002S-013.0-20141023 MB Time Collected: 1057 Comments: VOCs

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= — gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= — gal

1/8" ID =(0.0006×18) + 0.25 ~ 0.261

Monitori_ Well Sampling

Site: LC39B Project No.: FR1352C Task: 34#1 Date: 10/23/14 Sampled By: M. Burham

Station (Well ID): TA0002I Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556/MPS Water Level Meter: Solinst

Time @ Start of Purging: 0931 Time @ End of Purging: 0952 Total Purging Time: 21 min Depth of Pump or Intake Tubing: ~30 ft. (BTOC)

Water Level: 3.35' BTOC Total Well Depth: 35 ft BLS Screen Interval: 25-35 ft BLS Well diameter: 1 in. Well Volume: 0.041 x 35 = 1.435 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity (NTU) <20	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
0935	0.5 ~~Start~~	24.54	6.40	21.85	9.36	13.12	-322.9	0.86	14.17	clear	
0939	0.9	24.67	6.36	21.31	3.36	12.78	-328.4	0.81	13.85	clear	
0943	1.3	24.73	6.37	21.06	6.36	12.61	-334.2	0.44	13.69	clear	
0947	1.7	24.55	6.36	21.01	5.94	12.58	-331.5	0.28	13.65	clear	
0950	2.0	24.54	6.37	20.94	5.99	12.53	-331.6	0.26	13.61	clear	
0952	2.2	24.56	6.37	20.89	3.58	12.50	-330.2	0.24	13.57	clear	
				SAMPLED							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 34B-Low-TA0002I-030.0-20141023-MS Time Collected: 1002 Comments: VOCs

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= ___ gal

¼-in ID = (0.0006 × 35) + 0.25 = 0.271 gal

Monitoring Well Sampling

Site: LC 31B Project No.: FR1352C Task: 34#1 Date: 10/22/14 Sampled By: M. Burchan

Station (Well ID): LOX-TA00035 Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1513 Time @ End of Purging: 1528 Total Purging Time: 15 min Depth of Pump or Intake Tubing: ~13 ft. (BTOC)

Water Level: 2.20 Ft BTOC Total Well Depth: 18 ft BLS Screen Interval: 8-18 ft BLS Well diameter: 1 in. Well Volume: 0.738 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity mB (NTU) ±10% <20	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
1518	0.5 ~~Start~~	25.90	6.28	0.790	7.44	0.38	-210.9	0.48	0.506	clear yellow tint	
1522	0.9	25.88	6.21	0.707	5.25	0.34	-216.2	0.34	0.459	" "	
1525	1.2	25.82	6.18	0.693	6.91	0.34	-216.8	0.34	0.450	" "	
1528	1.5	25.83	6.15	0.687	6.44	0.33	-214.2	0.26	0.446	" "	
				SAMPLED							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 31B-LOXTA00035-013.0-20141022 Time Collected: 1534 Comments: VOCs; DO failed CCV

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= — gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= — gal

⅛" ID 0.0006×20 + 0.25 = 0.262

Monitori_ Well Sampling

Site: 39B Project No.: FR1352C Task: 34*1 Date: 10/22/14 Sampled By: M. Buchan

Station (Well ID): LOX-TA0003I Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geo pump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 16:32 Time @ End of Purging: 1658 Total Purging Time: 26 min Depth of Pump or Intake Tubing: 30 ft. (BTOC)

Water Level: 2.21 FT BTOC Total Well Depth: 35 ft BLS Screen Interval: 25-35 ft BLS Well diameter: 1" in. Well Volume: 0.041*35=1.435 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity (NTU) <20	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
1637	0.5 ~~Start~~	24.92	6.42	11.99	30.2	6.83	-275.4	0.49	7.744	clear	
1641	0.9	24.76	6.38	12.07	16.8	6.88	-279.5	0.32	7.816	" "	
1645	1.3	24.77	6.37	11.60	8.72	6.60	-284.9	0.32	7.534	" "	
1649	1.7	24.75	6.36	11.48	5.43	6.53	-293.2	0.28	7.457	" "	
1653	2.1	24.69	6.36	11.44	4.00	6.50	-297.9	0.23	7.430	" "	
1658	2.6	24.66	6.35	11.39	4.72	6.47	-304.5	0.20	7.399	" "	
		SAMPLED									

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 39B-LOX-TA0003I-030.0-20141022 mb Time Collected: 1708 Comments: VOCs; DO failed QC

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= — gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= — gal

1/8" ID = 0.0006 × 35 + 0.25 = 0.271

Monitori_ Well Sampling

Site: LC39B Project No.: FR1352C Task: 3401 Date: 10/22/14 Sampled By: M. Burchum

Station (Well ID): TA045 Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: ~~1017~~ MB 1020 Time @ End of Purging: 1037 Total Purging Time: 17 min Depth of Pump or Intake Tubing: ~13 ft. (BTOC)

Water Level: 3.20 BTOC Total Well Depth: 18 ft BLS Screen Interval: 8-18 ft BLS Well diameter: 1 in. Well Volume: 0.41x18=0.737 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ± 0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity (NTU) <20	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
~~0925~~ 1025	~~.4~~ Start	27.88	6.06	0.591	30.1	0.28	-173.9	0.00	0.384	yellow	
1030	.8	27.94	6.04	0.579	17.6	0.28	-216.1	0.00	0.377	" "	
1034	1.1	27.88	6.03	0.577	15.1	0.28	-222.1	0.00	0.375	" "	
1037	1.3	27.83	6.03	0.573	11.1	0.28	-231.5	0.00	0.373		

SAMPLED

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: FB-LOX-TA00045-0130-20141023 Time Collected: 1043 Comments: mp ORP; DO failed CCV

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.262 gal

1/8" ID = 0.0006 × Length + 0.25 = 20

Monitoring Well Sampling

Site: LC39B Project No.: FR1352C Task: 34*1 Date: 10/22/14 Sampled By: M. Burcham

Station (Well ID): TA0004I Purge Method: Pump [X] Bailer [ ] Pump Type: ___ Submersible (__ Teflon __ SS __ Other) [X] Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 0932 Time @ End of Purging: 0953 Total Purging Time: 21 min Depth of Pump or Intake Tubing: ~30 ft. (BTOC)

Water Level: 3.95 ft BTOC Total Well Depth: 35 ft BLS Screen Interval: 25-35 ft BLS Well diameter: 1" in. Well Volume: .041x35=1.435 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ± 0.2	pH ±0.2	Conductivity (mS/cm) ± 5%	Turbidity (NTU) <20 NTU	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
0936	~~Start~~ 0.5	26.60	5.98	0.556	7.83	0.22	-187.2	0.71	0.362	clear/yellow	
0940	0.9	26.55	5.96	0.556	5.32	0.27	-235.6	1.16	0.359	" "	
0944	1.3	26.74	5.96	0.539	4.78	0.26	-229.3	0.79	0.349	" "	
0947	1.6	26.33	5.93	0.528	4.79	0.25	-229.5	0.61	0.343	" "	
0950	1.9	26.35	5.92	0.535	5.90	0.26	-223.5	0.46	0.349	" "	
0953	2.2	26.31	5.91	0.542	5.95	0.26	-227.8	0.36	0.353	" "	
		SAMPLED →									

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 39B-LOX-TA4I-030.0-20141022 (MB 003) Time Collected: 0957 Comments: VOCs; DO failed CCV

When using 3/16-in. ID tubing EV=((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)=0.27 gal

1/8-in ID =(0.0006 × length) + 0.25 = 35

Monitor. _ Well Sampling

Site: LC34B Project No.: FR1352C Task: 34#1 Date: 10/23/14 Sampled By: M. Burnham

Station (Well ID): LWD095 Purge Method: Pump X Bailer □ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1205 Time @ End of Purging: 1221 Total Purging Time: 16 mm Depth of Pump or Intake Tubing: ~15 ft. (BTOC)

Water Level: ~~2.88~~ 4.05 ft BTOC Total Well Depth: 17 ft BLS Screen Interval: 12-17 ft BLS Well diameter: 2 in. Well Volume: 17×0.163 = 2.77 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1210	0.5 ~~Start~~	25.27	5.71	6.758	8.25	3.70	-248.7	0.45	4.402	clear	
1214	0.9	25.14	5.66	6.804	6.24	3.72	-257.5	0.33	4.423	"	
1218	1.3	25.23	5.66	6.806	7.42	3.72	-264.9	0.25	4.425	"	
1221	1.6	25.29	5.64	6.811	6.76	3.73	-268.1	0.23	4.428	"	

SAMPLED

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 34B-LOXTWD0095-0145-20141023 MB Time Collected: 1231 Comments: VOCs

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .30 gal

18 0.25

Monitoring Well Sampling

Site: LC39B Project No.: FR1352C Task: 34#1 Date: 10/23/14 Sampled By: M. Burcham

Station (Well ID): IW0095I Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1245 Time @ End of Purging: 1310 Total Purging Time: 25 min Depth of Pump or Intake Tubing: ~25 ft. (BTOC)

Water Level: 3.81 ft BTOC Total Well Depth: 27.5 ft BLS Screen Interval: 22.5-27.5 Well diameter: 2 in. Well Volume: 0.163x29.5= 4.16 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1250	0.5 ~~Start~~	24.83	6.19	~~4.340~~ 7.534	23.4	4.15	-295.3	0.40	4.891	clear w/ particulates	o yellow tint
1254	0.9	25.10	6.21	7.761	26.7	4.30	-310.2	0.31	5.096	" "	
1259	1.4	25.05	6.27	8.517	13.0	4.73	-322.4	0.26	5.510	" "	
1303	1.8	24.94	6.27	8.150	7.51	4.52	-325.6	0.22	5.294	" "	
1307	2.2	24.94	6.28	8.028	4.71	4.44	-326.7	0.19	5.215	" "	
1310	2.5	24.92	6.27	7.994	5.35	4.42	-325.3	0.19	5.196		
				SAMPLED							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 39B-LOXIW0095I-025.0-20141023 Time Collected: 1320 Comments: VOCs

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)=0.33 gal

30 0.25

Monitori_ Well Sampling

Site: LC39B Project No.: FR1352C Task: 34*1 Date: 10/22/14 Sampled By: M. Burcham

Station (Well ID): Lox-IW12S Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1254 Time @ End of Purging: 1313 Total Purging Time: 19 min Depth of Pump or Intake Tubing: ~9.5 ft. (BTOC)

Water Level: 4.34 ft BTOC Total Well Depth: 12 ft BLS Screen Interval: 7-12 ft BLS Well diameter: 2 in. Well Volume: 0.163x12 = 1.96 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ±5%	Turbidity (NTU) <20	Salinity (%)	ORP (mV)	DO (mg/L) mg/L 20%	TDS (g/L)	Color	Comments
1258	0. ~~Start~~	25.29	4.84	42.22	2.74	27.09	-102.0	31. 2.70	27.43	clear	
1302	0.9	25.53	4.78	42.10	2.14	27.00	mB/ -93.0	12 1.11	27.37	clear	
1306	1.3	25.38	4.75	42.22	2.14	27.09	-95.1	0.72	27.44	" "	
1310	1.7	25.36	4.75	42.19	1.82	27.07	-96.1	0.37	27.41	" "	
1313	2.0	25.36	4.75	42.14	2.64	27.39	-94.5	0.33	27.40	" "	

SAMPLED

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 393-LOX-IW MS-0125-009.5-20141022 Time Collected: 1323 Comments: VOCs; Aluminum (filtered + unfiltered [not filtered in field])

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)=0.261 gal

1/8" ID = (0.0026 x 18) + 0.25 =

DO failed QCV

Monitori. Well Sampling

Site: LC39B Project No.: FR1352C Task: 3411 Date: 10/22/14 Sampled By: M. Buchan

Station (Well ID): LOX-IW12I Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): GeoPump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Sol. Inst

Time @ Start of Purging: 1216 Time @ End of Purging: 1231 Total Purging Time: 15 min Depth of Pump or Intake Tubing: ~25.5 ft. (BTOC)

Water Level: 4.58 mo BTOC Total Well Depth: 28 ft BLS Screen Interval: 23-28 ft BLS Well diameter: 2 in. Well Volume: 4.564 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) ± 5%	Turbidity (NTU) <20	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
1220	.5 ~~Start~~	24.53	5.90	57.33	2.33	38.22	-91.2	0.26	37.31	clear/yellow	
1224	.9	24.35	5.93	57.73	1.89	38.51	-95.0	0.46	37.54	" "	
1228	1.3	24.38	5.99	57.97	1.86	38.70	-95.3	0.25	37.70	clear	
1231	1.6	24.43	6.02	58.11	1.71	38.79	-101.9	0.24	37.78	clear	
		SAMPLED									

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 39B-LOX-IW0012I-025.5-20141022 Time Collected: 1236 Comments: VOCs; DO failed CCV

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .271 gal

1/8" ID = (0.0006 x 35) + 0.25 = ~

Monitori_ Well Sampling

Site: LC39R Project No.: FR1352C Task: 34#1 Date: 10/23/14 Sampled By: M. Buchan

Station (Well ID): IW0035 Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1524 Time @ End of Purging: 1539 Total Purging Time: 15 min Depth of Pump or Intake Tubing: ~8.5 ft. (BTOC)

Water Level: 3.33 ft BTOC Total Well Depth: 11 ft BLS Screen Interval: 6-11 ft BLS Well diameter: 1 in. Well Volume: 0.041x11=0.451 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C) ±0.2	pH ±0.2	Conductivity (mS/cm) 25%	Turbidity (NTU) <20	Salinity (%)	ORP (mV)	DO (mg/L) <20%	TDS (g/L)	Color	Comments
1529	0.5 ~~Start~~	25.53	5.41	8.529	5.14	4.74	-252.0	0.83	5.544	clear	
1534	1.0	25.49	5.38	8.446	1.91	4.69	-247.6	6.49	5.487	"	
1537	1.3	25.46	5.38	8.400	1.87	4.66	-251.6	0.41	5.460	"	
1539	1.5	25.47	5.38	8.395	1.78	4.66	-253.3	0.40	5.454	"	
				SAMPLED							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 313-10x-IW0035-0085-20142027 Time Collected: 1549 Comments: VOCs

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= — gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= — gal

1/8" ID = 0.0006x15 + 0.25 ~ 0.26

Monitori. _ Well Sampling

Site: LC34B Project No.: FR1352C Task: 34#1 Date: 10/23/14 Sampled By: M. Burbon

Station (Well ID): IW0013I Purge Method: Pump X Bailer ☐ Pump Type: ___ Submersible (__ Teflon __ SS __ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1443 Time @ End of Purging: 1458 Total Purging Time: 15 min Depth of Pump or Intake Tubing: ~19 ft. (BTOC)

Water Level: 2.50 ft BTOC Total Well Depth: 21.5 ft BLS Screen Interval: 16.5-21.5 ft BLS Well diameter: 1 in. Well Volume: 0.041 * 21.5 = 0.882 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1448	0.5 ~~Start~~	24.71	5.62	17.23	10.13	7.10	-268.2	0.67	11.18	clear/yellow tint	
1453	1.0	24.66	5.60	17.00	4.83	9.98	-276.9	0.32	11.04	" "	
1456	1.3	24.70	5.60	16.90	2.89	9.92	-281.6	0.28	10.99	" "	
1458	1.5	24.65	5.60	16.89	2.48	9.92	-284.4	0.26	10.97	clear	

SAMPLED

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 39B-LOX-IW0013I-019.0-20141023 Time Collected: 1508 Comments: VOCs

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ___ gal

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= ~~0.27~~ gal mD

1/8" ID = 0.0006 x 25 + 0.25 = 0.27

APPENDIX B

LABORATORY ANALYTICAL DATA

Southeast
ACCUTEST LABORATORIES

11/03/14

Technical Report for

Geosyntec Consultants

LC-39B, KSC, FL

FR1352C

Accutest Job Number: FA19358

Sampling Date: 10/22/14

Report to:

Geosyntec Consultants
6770 South Washington Ave Suite 3
Titusville, FL 32780
RDaprato@Geosyntec.com; Elawson@GeoSyntec.com

ATTN: Rebecca Daprato

Total number of pages in report: **111**

NELAP ACCREDITED TNI LABORATORY

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL (E83510), LA (03051), KS (E-10327), IA (366), IL (200063), NC (573), NJ (FL002), SC (96038001) DoD ELAP (L-A-B L2229), CA (04226CA), TX (T104704404), PA (68-03573), VA (460177), AK, AR, GA, KY, MA, NV, OK, UT, WA

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Sample Summary

Geosyntec Consultants

Job No: FA19358

LC-39B, KSC, FL
Project No: FR1352C

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA19358-1	10/22/14	09:57	MB	10/24/14	AQ	Ground Water	39B-LOX-TA0004I-030.0-20141022
FA19358-2	10/22/14	10:43	MB	10/24/14	AQ	Ground Water	39B-LOX-TA0004S-013.0-20141022
FA19358-3	10/22/14	12:36	MB	10/24/14	AQ	Ground Water	39B-LOX-IW0012I-025.5-20141022
FA19358-4	10/22/14	13:23	MB	10/24/14	AQ	Ground Water	39B-LOX-IW0012S-009.5-20141022
FA19358-4F	10/22/14	13:23	MB	10/24/14	AQ	Groundwater Filtered	39B-LOX-IW0012S-009.5-20141022
FA19358-5	10/22/14	15:34	MB	10/24/14	AQ	Ground Water	39B-LOX-TA0003S-013.0-20141022
FA19358-6	10/22/14	17:08	MB	10/24/14	AQ	Ground Water	39B-LOX-TA0003I-030.0-20141022

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Geosyntec Consultants **Job No:** FA19358

Site: LC-39B, KSC, FL **Report Date:** 11/3/2014 3:39:03 PM

6 Sample(s) were collected on 10/22/2014 and were received at Accutest SE on 10/24/2014 properly preserved, at 2.8 Deg. C and intact. These Samples received an Accutest job number of FA19358. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: AQ **Batch ID:** VN3547

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA19534-17MS, FA19534-17MSD were used as the QC samples indicated.

Matrix Spike/Matrix Spike Duplicate Recovery(s) for Tetrachloroethylene are outside control limits. Outside control limits due to high level in sample relative to spike amount. For method performance in a clean matrix, refer to Blank Spike. % RPD was within control limits in MS/MSD.

RPD(s) for MSD for Acetone are outside control limits for sample FA19534-17MSD. Probable cause is due to sample non-homogeneity.

Matrix: AQ **Batch ID:** VN3549

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA19358-5MS, FA19358-5MSD were used as the QC samples indicated.

Blank Spike Recovery(s) for 2-Hexanone, Acetone are outside control limits. Recoveries above upper control limits, but samples were ND for 2-Hexanone, Acetone. Data integrity not adversely affected.

Matrix Spike Recovery(s) for cis-1,2-Dichloroethylene are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

FA19358-6 for Acetone: Associated BS recovery outside control limits.

FA19358-6 for 2-Hexanone: Associated BS recovery outside control limits.

Metals By Method SW846 6020A

Matrix: AQ **Batch ID:** N: MP82882

FA19358-4 for Aluminum: Analysis performed at Accutest Laboratories, Dayton, NJ.

FA19358-4F for Aluminum: Analysis performed at Accutest Laboratories, Dayton, NJ.

Accutest Laboratories Southeast (ALSE) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALSE and as stated on the COC. ALSE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALSE Quality Manual except as noted above. This report is to be used in its entirety. ALSE is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

_____ Date: November 3, 2014

Kim Benham, Client Services (signature on file)

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Accutest Laboratories Southeast, Inc.	**Job No**	FA19358
Site:	GSYNFLTI: LC-39B, KSC, FL	**Report Date**	11/3/2014 11:47:54 A

On 10/29/2014, 1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 1.6 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of FA19358 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Metals By Method SW846 6020A

Matrix: AQ **Batch ID:** MP82882

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB80352-2MS, JB80352-2MSD, JB80352-2SDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Aluminum are outside control limits for sample MP82882-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover

Summary of Hits

Job Number: FA19358
Account: Geosyntec Consultants
Project: LC-39B, KSC, FL
Collected: 10/22/14

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	PQL	MDL	Units	Method
FA19358-1	**39B-LOX-TA0004I-030.0-20141022**					
1,1-Dichloroethylene		0.44 I	1.0	0.25	ug/l	SW846 8260B
cis-1,2-Dichloroethylene		77.8	2.5	0.82	ug/l	SW846 8260B
trans-1,2-Dichloroethylene		11.1	1.0	0.34	ug/l	SW846 8260B
Trichloroethylene		38.2	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride		1.6	1.0	0.33	ug/l	SW846 8260B
FA19358-2	**39B-LOX-TA0004S-013.0-20141022**					
cis-1,2-Dichloroethylene		1.7	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene		1.5	1.0	0.34	ug/l	SW846 8260B
Toluene		0.24 I	1.0	0.20	ug/l	SW846 8260B
Vinyl chloride		78.1	1.0	0.33	ug/l	SW846 8260B
FA19358-3	**39B-LOX-IW0012I-025.5-20141022**					
No hits reported in this sample.						
FA19358-4	**39B-LOX-IW0012S-009.5-20141022**					
Aluminum [a]		3920	250	16	ug/l	SW846 6020A
FA19358-4F	**39B-LOX-IW0012S-009.5-20141022**					
Aluminum [a]		3840	50	3.2	ug/l	SW846 6020A
FA19358-5	**39B-LOX-TA0003S-013.0-20141022**					
1,1-Dichloroethylene		0.98 I	1.0	0.25	ug/l	SW846 8260B
cis-1,2-Dichloroethylene		222	5.0	1.6	ug/l	SW846 8260B
trans-1,2-Dichloroethylene		24.6	1.0	0.34	ug/l	SW846 8260B
Toluene		0.21 I	1.0	0.20	ug/l	SW846 8260B
Trichloroethylene		16.8	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride		195	5.0	1.6	ug/l	SW846 8260B
FA19358-6	**39B-LOX-TA0003I-030.0-20141022**					
cis-1,2-Dichloroethylene		5.8	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene		0.95 I	1.0	0.34	ug/l	SW846 8260B
Toluene		1.5	1.0	0.20	ug/l	SW846 8260B
Trichloroethylene		2.3	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride		6.2	1.0	0.33	ug/l	SW846 8260B

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

Southeast ACCUTEST LABORATORIES

4

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: 39B-LOX-TA0004I-030.0-20141022
Lab Sample ID: FA19358-1
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/22/14
Date Received: 10/24/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N0080528.D	1	10/31/14	RB	n/a	n/a	VN3547
Run #2	N0080575.D	2.5	11/02/14	RB	n/a	n/a	VN3549

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.44	1.0	0.25	ug/l	I
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	77.8 [a]	2.5	0.82	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	11.1	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	38.2	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-TA0004I-030.0-20141022		
Lab Sample ID:	FA19358-1	**Date Sampled:**	10/22/14
Matrix:	AQ - Ground Water	**Date Received:**	10/24/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	1.6	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	92%	103%	79-125%
2037-26-5	Toluene-D8	90%	98%	85-112%
460-00-4	4-Bromofluorobenzene	97%	101%	83-118%

(a) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-TA0004S-013.0-20141022
Lab Sample ID: FA19358-2
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/22/14
Date Received: 10/24/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N0080529.D	1	10/31/14	RB	n/a	n/a	VN3547
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	1.7	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	1.5	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.24	1.0	0.20	ug/l	I
79-01-6	Trichloroethylene	0.30 U	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-TA0004S-013.0-20141022		
Lab Sample ID:	FA19358-2	**Date Sampled:**	10/22/14
Matrix:	AQ - Ground Water	**Date Received:**	10/24/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	78.1	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	92%		79-125%
2037-26-5	Toluene-D8	90%		85-112%
460-00-4	4-Bromofluorobenzene	97%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-IW0012I-025.5-20141022
Lab Sample ID: FA19358-3
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/22/14
Date Received: 10/24/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N0080530.D	1	10/31/14	RB	n/a	n/a	VN3547
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.33 U	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.34 U	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	0.30 U	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0012I-025.5-20141022		
Lab Sample ID:	FA19358-3	**Date Sampled:**	10/22/14
Matrix:	AQ - Ground Water	**Date Received:**	10/24/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	0.33 U	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		83-118%
17060-07-0	1,2-Dichloroethane-D4	98%		79-125%
2037-26-5	Toluene-D8	88%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-IW0012S-009.5-20141022
Lab Sample ID: FA19358-4
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/22/14
Date Received: 10/24/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N0080531.D	1	10/31/14	RB	n/a	n/a	VN3547
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.33 U	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.34 U	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	0.30 U	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0012S-009.5-20141022		
Lab Sample ID:	FA19358-4	**Date Sampled:**	10/22/14
Matrix:	AQ - Ground Water	**Date Received:**	10/24/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	0.33 U	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		83-118%
17060-07-0	1,2-Dichloroethane-D4	96%		79-125%
2037-26-5	Toluene-D8	89%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0012S-009.5-20141022		
Lab Sample ID:	FA19358-4	**Date Sampled:**	10/22/14
Matrix:	AQ - Ground Water	**Date Received:**	10/24/14
		Percent Solids:	n/a
Project:	LC-39B, KSC, FL		

Total Metals Analysis

Analyte	Result	PQL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum [a]	3920	250	16	ug/l	10	10/30/14	10/31/14	ANJ	SW846 6020A [1]	SW846 3010A [2]

(1) Instrument QC Batch: N:MA35299
(2) Prep QC Batch: N:MP82882

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

PQL = Practical Quantitation Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
I = Indicates a result > = MDL but < PQL

Report of Analysis

Client Sample ID:	39B-LOX-IW0012S-009.5-20141022		
Lab Sample ID:	FA19358-4F	**Date Sampled:**	10/22/14
Matrix:	AQ - Groundwater Filtered	**Date Received:**	10/24/14
		Percent Solids:	n/a
Project:	LC-39B, KSC, FL		

Dissolved Metals Analysis

Analyte	Result	PQL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Aluminum [a]	3840	50	3.2	ug/l	2	10/30/14	10/31/14	ANJ	SW846 6020A [1]	SW846 3010A [2]

(1) Instrument QC Batch: N:MA35299
(2) Prep QC Batch: N:MP82882

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

PQL = Practical Quantitation Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
I = Indicates a result > = MDL but < PQL

Report of Analysis

Client Sample ID: 39B-LOX-TA0003S-013.0-20141022
Lab Sample ID: FA19358-5
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/22/14
Date Received: 10/24/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N0080532.D	1	10/31/14	RB	n/a	n/a	VN3547
Run #2	N0080576.D	5	11/02/14	RB	n/a	n/a	VN3549

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.98	1.0	0.25	ug/l	I
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	222 [a]	5.0	1.6	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	24.6	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.21	1.0	0.20	ug/l	I
79-01-6	Trichloroethylene	16.8	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-TA0003S-013.0-20141022		
Lab Sample ID:	FA19358-5	**Date Sampled:**	10/22/14
Matrix:	AQ - Ground Water	**Date Received:**	10/24/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	195 [a]	5.0	1.6	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	93%	104%	79-125%
2037-26-5	Toluene-D8	90%	97%	85-112%
460-00-4	4-Bromofluorobenzene	95%	102%	83-118%

(a) Result is from Run# 2

U = Not detected MDL = Method Detection Limit
PQL = Practical Quantitation Limit
L = Indicates value exceeds calibration range
I = Result > = MDL but < PQL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-TA0003I-030.0-20141022
Lab Sample ID: FA19358-6
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/22/14
Date Received: 10/24/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N0080573.D	1	11/02/14	RB	n/a	n/a	VN3549
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone [a]	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	5.8	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.95	1.0	0.34	ug/l	I
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone [a]	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	1.5	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	2.3	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-TA0003I-030.0-20141022		
Lab Sample ID:	FA19358-6	**Date Sampled:**	10/22/14
Matrix:	AQ - Ground Water	**Date Received:**	10/24/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	6.2	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	102%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	100%		83-118%

(a) Associated BS recovery outside control limits.

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Southeast ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Southeast
Chain of Custody

ACCUTEST LABORATORIES

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 • FAX: 407-425-0707
www.accutest.com

Accutest JOB # FA19358 PAGE 1 OF 1

Accutest Quote # AC8/2014-610 SKIFF#

Client / Reporting Information

Company Name: Geosyntec Consultants
Address: 6770 South Washington
City: Titusville State: FL Zip: 32780
Project Contact: Rebecca Dugrato E-mail: RDugrato@Geosyntec.com
Phone#: 321-795-1302
Sampler(s) Name(s) (Printed): Mike Burcham

Project Information

Project Name: LC39B
Street:
City: KSC State: FL
Project #: FR1352C
Fax #:
Client Purchase Order #:

Analytical Information

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe

Accutest Sample #	Field ID / Point of Collection	Collection Date	Collection Time	Sampled By	Matrix	Total # of Bottles	Container Information	VOC (SW846 8260B)	Alkalinity (6020A; filtered)	LAB USE ONLY
1	39B-LOX-TA0004T-030.0-20141022	10/22/14	0957	MB	GW	3	3 HCl	3		
2	39B-LOX-TA0004B-013.0-20141022	10/22/14	1043	MB	GW	3	3 HCl	3		
3	39B-LOX-TA0013T-025.5-20141022	10/22/14	1236	MB	GW	3	3 HCl	3		
4	39B-LOX-TA0012.5-009.5-20141022	10/22/14	1323	MB	GW	5	1 None; 3 HCl; 1 NaOH	3	2	
5	39B-LOX-TA0003S-013.0-20141022	10/22/14	1534	MB	GW	3	3 HCl	3		
6	39B-LOX-TA0003T-030.0-20141022	10/22/14	1708	MB	GW	3	3 HCl	3		

TURNAROUND TIME (Business Days)

Approved By: / Rush Code

- [ ] 10 Days Standard
- [ ] 7 Day RUSH
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] OTHER

Emergency or Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULT1 (EPA LEVEL 4)
- [x] EDD'S

Comments / Remarks

DAll sample labels do not include date suffix of "20141022"

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished by:	Date Time:	Received By:
1	10/22/14 1920	2 James Flores 10-23-14 1035	3 James Flores	10-23-14 1700	4 10.24.14 800
Relinquished by:	Date Time:	Received By:	Relinquished by:	Date Time:	Received By:
5		6	7		8

Lab Use Only: Custody Seal in Place: Y N Temp Blank Provided: Y N Preserved where Applicable: Y N Total # of Coolers: Cooler Temperature (s) Celsius: 2.8

5.1 5

FA19358: Chain of Custody
Page 1 of 3

ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

ACCUTEST'S JOB NUMBER: FA19358 CLIENT: GeoSyntec PROJECT: LC39B

DATE/TIME RECEIVED: 10-24-14 800 {MM/DD/YY 24:00} NUMBER OF COOLERS RECEIVED: 1

METHOD OF DELIVERY: FEDEX UPS ACCUTEST COURIER GREYHOUND DELIVERY OTHER

AIRBILL NUMBERS:

COOLER INFORMATION

- [ ] CUSTODY SEAL NOT PRESENT OR NOT INTACT
- [ ] CHAIN OF CUSTODY NOT RECEIVED (COC)
- [ ] ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- [ ] SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- [ ] TEMPERATURE CRITERIA NOT MET

TRIP BLANK INFORMATION

- [x] TRIP BLANK PROVIDED
- [ ] TRIP BLANK NOT PROVIDED
- [x] TRIP BLANK NOT ON COC
- [x] TRIP BLANK INTACT
- [ ] TRIP BLANK NOT INTACT
- [x] RECEIVED WATER TRIP BLANK 2
- [ ] RECEIVED SOIL TRIP BLANK

MISC. INFORMATION

NUMBER OF ENCORES ? 25-GRAM 5-GRAM

NUMBER OF 5035 FIELD KITS ?

NUMBER OF LAB FILTERED METALS ? 1

TEMPERATURE INFORMATION

- [ ] IR THERM ID 1 CORR. FACTOR +0.4
- [ ] OBSERVED TEMPS: 2.4
- [ ] CORRECTED TEMPS: 2.8

SAMPLE INFORMATION

- [ ] INCORRECT NUMBER OF CONTAINERS USED
- [ ] SAMPLE RECEIVED IMPROPERLY PRESERVED
- [ ] INSUFFICIENT VOLUME FOR ANALYSIS
- [ ] DATES/TIMES ON COC DO NOT MATCH SAMPLE LABEL
- [ ] ID'S ON COC DO NOT MATCH LABEL
- [ ] VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- [ ] BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- [ ] NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- [ ] UNCLEAR FILTERING OR COMPOSITING INSTRUCTIONS
- [ ] SAMPLE CONTAINER(S) RECEIVED BROKEN
- [ ] 5035 FIELD KITS NOT RECEIVED WITHIN 48 HOURS
- [ ] BULK VOA SOIL JARS NOT RECEIVED WITHIN 48 HOURS
- [ ] % SOLIDS JAR NOT RECEIVED
- [ ] RESIDUAL CHLORINE PRESENT

{APPICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS}

SUMMARY OF COMMENTS:

TECHNICIAN SIGNATURE/DATE 10-24-14 REVIEWER SIGNATURE/DATE 10/24/14

RS 04/14 receipt confirmation 041514.xls

5.1 5

FA19358: Chain of Custody
Page 2 of 3

Job Change Order: FA19358_10/24/2014

Requested Date:	10/24/2014	**Received Date:**	10/24/2014
Account Name:	Geosyntec Consultants	**Due Date:**	10/31/2014
Project	LC-39B, KSC, FL	**Deliverable:**	REDT1
CSR:	AC	**TAT (Days):**	7

Sample #: FA19358-3 **Change:** Please change sample ID to 39B-LOX-IW0012I-025.5-20141022.

39B-LOX-TA0012I-025.5-20141022

Sample #: FA19358-4, 4F **Change:** Please change sample ID to 39B-LOX-IW0012S-009.5-20141022.

Above Changes Per: Mike Burcham **Date:** 10/24/2014

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service

Page 1 of 1

FA19358: Chain of Custody
Page 3 of 3

Southeast ACCUTEST LABORATORIES

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3547-MB	N0080526.D	1	10/31/14	RB	n/a	n/a	VN3547

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-2, FA19358-3, FA19358-4, FA19358-5

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	11	ug/l	
71-43-2	Benzene	ND	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.26	ug/l	
75-25-2	Bromoform	ND	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.24	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
67-66-3	Chloroform	ND	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.28	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	1.0	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.53	ug/l	
75-09-2	Methylene chloride	ND	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	1.5	ug/l	
100-42-5	Styrene	ND	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.26	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.30	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.66	ug/l	

Method Blank Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3547-MB	N0080526.D	1	10/31/14	RB	n/a	n/a	VN3547

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-2, FA19358-3, FA19358-4, FA19358-5

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	103%	83-118%
17060-07-0	1,2-Dichloroethane-D4	94%	79-125%
2037-26-5	Toluene-D8	90%	85-112%
460-00-4	4-Bromofluorobenzene	96%	83-118%

Method Blank Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3549-MB	N0080572.D	1	11/02/14	RB	n/a	n/a	VN3549

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-5, FA19358-6

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	11	ug/l	
71-43-2	Benzene	ND	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.26	ug/l	
75-25-2	Bromoform	ND	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.24	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
67-66-3	Chloroform	ND	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.28	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	1.0	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.53	ug/l	
75-09-2	Methylene chloride	ND	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	1.5	ug/l	
100-42-5	Styrene	ND	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.26	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.30	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.66	ug/l	

Method Blank Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3549-MB	N0080572.D	1	11/02/14	RB	n/a	n/a	VN3549

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-5, FA19358-6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	79-125%
2037-26-5	Toluene-D8	98%	85-112%
460-00-4	4-Bromofluorobenzene	103%	83-118%

Blank Spike Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3547-BS	N0080524.D	1	10/31/14	RB	n/a	n/a	VN3547

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-2, FA19358-3, FA19358-4, FA19358-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	125	100	50-147
71-43-2	Benzene	25	28.2	113	81-122
75-27-4	Bromodichloromethane	25	24.5	98	79-123
75-25-2	Bromoform	25	23.0	92	66-123
108-90-7	Chlorobenzene	25	30.1	120	82-124
75-00-3	Chloroethane	25	27.5	110	62-144
67-66-3	Chloroform	25	26.2	105	80-124
75-15-0	Carbon disulfide	25	33.1	132	66-148
56-23-5	Carbon tetrachloride	25	27.2	109	76-136
75-34-3	1,1-Dichloroethane	25	28.5	114	81-122
75-35-4	1,1-Dichloroethylene	25	29.8	119	78-137
107-06-2	1,2-Dichloroethane	25	25.0	100	75-125
78-87-5	1,2-Dichloropropane	25	27.2	109	76-124
124-48-1	Dibromochloromethane	25	24.6	98	78-122
156-59-2	cis-1,2-Dichloroethylene	25	26.4	106	78-120
10061-01-5	cis-1,3-Dichloropropene	25	24.9	100	75-118
156-60-5	trans-1,2-Dichloroethylene	25	27.8	111	76-127
10061-02-6	trans-1,3-Dichloropropene	25	25.1	100	80-120
100-41-4	Ethylbenzene	25	27.2	109	81-121
591-78-6	2-Hexanone	125	118	94	61-129
108-10-1	4-Methyl-2-pentanone	125	116	93	66-122
74-83-9	Methyl bromide	25	25.9	104	59-143
74-87-3	Methyl chloride	25	28.6	114	50-159
75-09-2	Methylene chloride	25	25.8	103	69-135
78-93-3	Methyl ethyl ketone	125	113	90	56-143
100-42-5	Styrene	25	26.9	108	78-119
71-55-6	1,1,1-Trichloroethane	25	27.3	109	75-130
79-34-5	1,1,2,2-Tetrachloroethane	25	27.3	109	72-120
79-00-5	1,1,2-Trichloroethane	25	26.1	104	76-119
127-18-4	Tetrachloroethylene	25	24.7	99	76-135
108-88-3	Toluene	25	27.2	109	80-120
79-01-6	Trichloroethylene	25	29.1	116	81-126
75-01-4	Vinyl chloride	25	29.5	118	69-159
1330-20-7	Xylene (total)	75	84.6	113	80-126

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3547-BS	N0080524.D	1	10/31/14	RB	n/a	n/a	VN3547

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-2, FA19358-3, FA19358-4, FA19358-5

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	87%	79-125%
2037-26-5	Toluene-D8	91%	85-112%
460-00-4	4-Bromofluorobenzene	94%	83-118%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3549-BS	N0080570.D	1	11/02/14	RB	n/a	n/a	VN3549

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-5, FA19358-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	200	160*	50-147
71-43-2	Benzene	25	26.9	108	81-122
75-27-4	Bromodichloromethane	25	25.8	103	79-123
75-25-2	Bromoform	25	23.1	92	66-123
108-90-7	Chlorobenzene	25	28.7	115	82-124
75-00-3	Chloroethane	25	30.5	122	62-144
67-66-3	Chloroform	25	26.5	106	80-124
75-15-0	Carbon disulfide	25	31.3	125	66-148
56-23-5	Carbon tetrachloride	25	26.5	106	76-136
75-34-3	1,1-Dichloroethane	25	26.3	105	81-122
75-35-4	1,1-Dichloroethylene	25	30.1	120	78-137
107-06-2	1,2-Dichloroethane	25	26.0	104	75-125
78-87-5	1,2-Dichloropropane	25	26.3	105	76-124
124-48-1	Dibromochloromethane	25	25.0	100	78-122
156-59-2	cis-1,2-Dichloroethylene	25	26.8	107	78-120
10061-01-5	cis-1,3-Dichloropropene	25	22.7	91	75-118
156-60-5	trans-1,2-Dichloroethylene	25	28.4	114	76-127
10061-02-6	trans-1,3-Dichloropropene	25	25.9	104	80-120
100-41-4	Ethylbenzene	25	27.6	110	81-121
591-78-6	2-Hexanone	125	164	131*	61-129
108-10-1	4-Methyl-2-pentanone	125	140	112	66-122
74-83-9	Methyl bromide	25	29.7	119	59-143
74-87-3	Methyl chloride	25	24.2	97	50-159
75-09-2	Methylene chloride	25	27.6	110	69-135
78-93-3	Methyl ethyl ketone	125	155	124	56-143
100-42-5	Styrene	25	24.6	98	78-119
71-55-6	1,1,1-Trichloroethane	25	26.5	106	75-130
79-34-5	1,1,2,2-Tetrachloroethane	25	24.6	98	72-120
79-00-5	1,1,2-Trichloroethane	25	25.6	102	76-119
127-18-4	Tetrachloroethylene	25	27.5	110	76-135
108-88-3	Toluene	25	26.9	108	80-120
79-01-6	Trichloroethylene	25	28.1	112	81-126
75-01-4	Vinyl chloride	25	25.5	102	69-159
1330-20-7	Xylene (total)	75	87.4	117	80-126

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN3549-BS	N0080570.D	1	11/02/14	RB	n/a	n/a	VN3549

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-5, FA19358-6

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	83-118%
17060-07-0	1,2-Dichloroethane-D4	98%	79-125%
2037-26-5	Toluene-D8	102%	85-112%
460-00-4	4-Bromofluorobenzene	100%	83-118%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA19534-17MS	N0080543.D	10	10/31/14	RB	n/a	n/a	VN3547
FA19534-17MSD	N0080544.D	10	10/31/14	RB	n/a	n/a	VN3547
FA19534-17 [a]	N0080535.D	1	10/31/14	RB	n/a	n/a	VN3547
FA19534-17 [a]	N0080536.D	10	10/31/14	RB	n/a	n/a	VN3547

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-2, FA19358-3, FA19358-4, FA19358-5

CAS No.	Compound	FA19534-17 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		1250	1210	97	1250	942	75	25*	50-147/21
71-43-2	Benzene	ND		250	270	108	250	258	103	5	81-122/14
75-27-4	Bromodichloromethane	ND		250	238	95	250	233	93	2	79-123/19
75-25-2	Bromoform	ND		250	218	87	250	209	84	4	66-123/21
108-90-7	Chlorobenzene	ND		250	284	114	250	278	111	2	82-124/14
75-00-3	Chloroethane	ND		250	254	102	250	217	87	16	62-144/20
67-66-3	Chloroform	ND		250	248	99	250	235	94	5	80-124/15
75-15-0	Carbon disulfide	ND		250	337	135	250	349	140	3	66-148/23
56-23-5	Carbon tetrachloride	ND		250	248	99	250	237	95	5	76-136/23
75-34-3	1,1-Dichloroethane	ND		250	267	107	250	252	101	6	81-122/15
75-35-4	1,1-Dichloroethylene	2.2		250	274	109	250	258	102	6	78-137/18
107-06-2	1,2-Dichloroethane	ND		250	241	96	250	238	95	1	75-125/14
78-87-5	1,2-Dichloropropane	ND		250	251	100	250	250	100	0	76-124/14
124-48-1	Dibromochloromethane	ND		250	232	93	250	231	92	0	78-122/19
156-59-2	cis-1,2-Dichloroethylene	92.2		250	317	90	250	304	85	4	78-120/15
10061-01-5	cis-1,3-Dichloropropene	ND		250	228	91	250	233	93	2	75-118/23
156-60-5	trans-1,2-Dichloroethylene	0.59	J	250	263	105	250	246	98	7	76-127/17
10061-02-6	trans-1,3-Dichloropropene	ND		250	229	92	250	232	93	1	80-120/22
100-41-4	Ethylbenzene	ND		250	256	102	250	248	99	3	81-121/14
591-78-6	2-Hexanone	ND		1250	1120	90	1250	1080	86	4	61-129/18
108-10-1	4-Methyl-2-pentanone	ND		1250	1110	89	1250	1110	89	0	66-122/16
74-83-9	Methyl bromide	ND		250	256	102	250	238	95	7	59-143/19
74-87-3	Methyl chloride	ND		250	280	112	250	271	108	3	50-159/19
75-09-2	Methylene chloride	ND		250	248	99	250	237	95	5	69-135/16
78-93-3	Methyl ethyl ketone	ND		1250	1080	86	1250	1020	82	6	56-143/18
100-42-5	Styrene	ND		250	247	99	250	243	97	2	78-119/23
71-55-6	1,1,1-Trichloroethane	ND		250	255	102	250	239	96	6	75-130/16
79-34-5	1,1,2,2-Tetrachloroethane	ND		250	259	104	250	264	106	2	72-120/14
79-00-5	1,1,2-Trichloroethane	ND		250	252	101	250	251	100	0	76-119/14
127-18-4	Tetrachloroethylene	727 [c]		250	803	30* [b]	250	756	12* [b]	6	76-135/16
108-88-3	Toluene	ND		250	254	102	250	247	99	3	80-120/14
79-01-6	Trichloroethylene	159 [c]		250	403	98	250	386	91	4	81-126/15
75-01-4	Vinyl chloride	ND		250	277	111	250	262	105	6	69-159/18
1330-20-7	Xylene (total)	ND		750	789	105	750	765	102	3	80-126/15

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA19534-17MS	N0080543.D	10	10/31/14	RB	n/a	n/a	VN3547
FA19534-17MSD	N0080544.D	10	10/31/14	RB	n/a	n/a	VN3547
FA19534-17 [a]	N0080535.D	1	10/31/14	RB	n/a	n/a	VN3547
FA19534-17 [a]	N0080536.D	10	10/31/14	RB	n/a	n/a	VN3547

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-2, FA19358-3, FA19358-4, FA19358-5

CAS No.	Surrogate Recoveries	MS	MSD	FA19534-17	FA19534-17	Limits
1868-53-7	Dibromofluoromethane	101%	100%	103%	104%	83-118%
17060-07-0	1,2-Dichloroethane-D4	89%	92%	93%	95%	79-125%
2037-26-5	Toluene-D8	91%	91%	89%	91%	85-112%
460-00-4	4-Bromofluorobenzene	91%	93%	98%	96%	83-118%

(a) Sample was not preserved to a pH < 2.
(b) Outside control limits due to high level in sample relative to spike amount.
(c) Result is from Run #2.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA19358-5MS	N0080589.D	5	11/03/14	RB	n/a	n/a	VN3549
FA19358-5MSD	N0080590.D	5	11/03/14	RB	n/a	n/a	VN3549
FA19358-5	N0080576.D	5	11/02/14	RB	n/a	n/a	VN3549

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-5, FA19358-6

CAS No.	Compound	FA19358-5 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	130	U	625	439	70	625	455	73	4	50-147/21
71-43-2	Benzene	5.0	U	125	122	98	125	125	100	2	81-122/14
75-27-4	Bromodichloromethane	5.0	U	125	120	96	125	121	97	1	79-123/19
75-25-2	Bromoform	5.0	U	125	98.9	79	125	100	80	1	66-123/21
108-90-7	Chlorobenzene	5.0	U	125	131	105	125	131	105	0	82-124/14
75-00-3	Chloroethane	10	U	125	142	114	125	147	118	3	62-144/20
67-66-3	Chloroform	5.0	U	125	126	101	125	127	102	1	80-124/15
75-15-0	Carbon disulfide	10	U	125	139	111	125	140	112	1	66-148/23
56-23-5	Carbon tetrachloride	5.0	U	125	121	97	125	125	100	3	76-136/23
75-34-3	1,1-Dichloroethane	5.0	U	125	121	97	125	122	98	1	81-122/15
75-35-4	1,1-Dichloroethylene	5.0	U	125	132	106	125	137	110	4	78-137/18
107-06-2	1,2-Dichloroethane	5.0	U	125	124	99	125	125	100	1	75-125/14
78-87-5	1,2-Dichloropropane	5.0	U	125	116	93	125	119	95	3	76-124/14
124-48-1	Dibromochloromethane	5.0	U	125	109	87	125	110	88	1	78-122/19
156-59-2	cis-1,2-Dichloroethylene	222		125	315	74*	125	328	85	4	78-120/15
10061-01-5	cis-1,3-Dichloropropene	5.0	U	125	97.4	78	125	96.6	77	1	75-118/23
156-60-5	trans-1,2-Dichloroethylene	17.6		125	145	102	125	150	106	3	76-127/17
10061-02-6	trans-1,3-Dichloropropene	5.0	U	125	111	89	125	111	89	0	80-120/22
100-41-4	Ethylbenzene	5.0	U	125	124	99	125	125	100	1	81-121/14
591-78-6	2-Hexanone	50	U	625	580	93	625	602	96	4	61-129/18
108-10-1	4-Methyl-2-pentanone	25	U	625	635	102	625	657	105	3	66-122/16
74-83-9	Methyl bromide	10	U	125	136	109	125	133	106	2	59-143/19
74-87-3	Methyl chloride	10	U	125	130	104	125	121	97	7	50-159/19
75-09-2	Methylene chloride	25	U	125	128	102	125	129	103	1	69-135/16
78-93-3	Methyl ethyl ketone	25	U	625	520	83	625	542	87	4	56-143/18
100-42-5	Styrene	5.0	U	125	102	82	125	105	84	3	78-119/23
71-55-6	1,1,1-Trichloroethane	5.0	U	125	124	99	125	126	101	2	75-130/16
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	125	116	93	125	118	94	2	72-120/14
79-00-5	1,1,2-Trichloroethane	5.0	U	125	116	93	125	117	94	1	76-119/14
127-18-4	Tetrachloroethylene	5.0	U	125	122	98	125	123	98	1	76-135/16
108-88-3	Toluene	5.0	U	125	119	95	125	120	96	1	80-120/14
79-01-6	Trichloroethylene	11.3		125	138	101	125	141	104	2	81-126/15
75-01-4	Vinyl chloride	195		125	281	69	125	293	78	4	69-159/18
1330-20-7	Xylene (total)	15	U	375	388	103	375	390	104	1	80-126/15

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA19358-5MS	N0080589.D	5	11/03/14	RB	n/a	n/a	VN3549
FA19358-5MSD	N0080590.D	5	11/03/14	RB	n/a	n/a	VN3549
FA19358-5	N0080576.D	5	11/02/14	RB	n/a	n/a	VN3549

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19358-1, FA19358-5, FA19358-6

CAS No.	Surrogate Recoveries	MS	MSD	FA19358-5	Limits
1868-53-7	Dibromofluoromethane	103%	104%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	103%	104%	79-125%
2037-26-5	Toluene-D8	99%	97%	97%	85-112%
460-00-4	4-Bromofluorobenzene	98%	99%	102%	83-118%

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample:	VN3528-BFB	**Injection Date:**	10/15/14
Lab File ID:	N0080068.D	**Injection Time:**	11:01
Instrument ID:	GCMSN		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	24317	16.0		Pass
75	30.0 - 60.0% of mass 95	69885	45.9		Pass
95	Base peak, 100% relative abundance	152377	100.0		Pass
96	5.0 - 9.0% of mass 95	10396	6.82		Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) [a]	Pass
174	50.0 - 100.0% of mass 95	134485	88.3		Pass
175	5.0 - 9.0% of mass 174	10509	6.90	(7.81) [a]	Pass
176	95.0 - 101.0% of mass 174	131541	86.3	(97.8) [a]	Pass
177	5.0 - 9.0% of mass 176	9301	6.10	(7.07) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VN3528-IC3528	N0080069.D	10/15/14	11:34	00:33	Initial cal 1
VN3528-IC3528	N0080070.D	10/15/14	12:12	01:11	Initial cal 1
VN3528-IC3528	N0080071.D	10/15/14	12:48	01:47	Initial cal 2
VN3528-IC3528	N0080072.D	10/15/14	13:17	02:16	Initial cal 3
VN3528-ICC3528	N0080073.D	10/15/14	13:47	02:46	Initial cal 4
VN3528-IC3528	N0080074.D	10/15/14	14:16	03:15	Initial cal 5
VN3528-IC3528	N0080075.D	10/15/14	14:46	03:45	Initial cal 6
VN3528-ICV3528	N0080077.D	10/15/14	15:44	04:43	Initial cal verification 4
VN3528-ICV3528	N0080078.D	10/15/14	16:56	05:55	Initial cal verification 4

Instrument Performance Check (BFB)

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample:	VN3547-BFB	**Injection Date:**	10/31/14
Lab File ID:	N0080521.D	**Injection Time:**	06:43
Instrument ID:	GCMSN		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	22555	15.6		Pass
75	30.0 - 60.0% of mass 95	64957	44.9		Pass
95	Base peak, 100% relative abundance	144717	100.0		Pass
96	5.0 - 9.0% of mass 95	10627	7.34		Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) [a]	Pass
174	50.0 - 100.0% of mass 95	131779	91.1		Pass
175	5.0 - 9.0% of mass 174	9439	6.52	(7.16) [a]	Pass
176	95.0 - 101.0% of mass 174	128931	89.1	(97.8) [a]	Pass
177	5.0 - 9.0% of mass 176	8452	5.84	(6.56) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VN3547-CC3528	N0080523.D	10/31/14	08:05	01:22	Continuing cal 4
VN3547-BS	N0080524.D	10/31/14	08:42	01:59	Blank Spike
VN3547-MB	N0080526.D	10/31/14	09:41	02:58	Method Blank
ZZZZZZ	N0080527.D	10/31/14	10:50	04:07	(unrelated sample)
FA19358-1	N0080528.D	10/31/14	11:19	04:36	39B-LOX-TA0004I-030.0-20141022
FA19358-2	N0080529.D	10/31/14	11:49	05:06	39B-LOX-TA0004S-013.0-20141022
FA19358-3	N0080530.D	10/31/14	12:18	05:35	39B-LOX-IW0012I-025.5-20141022
FA19358-4	N0080531.D	10/31/14	12:48	06:05	39B-LOX-IW0012S-009.5-20141022
FA19358-5	N0080532.D	10/31/14	13:15	06:32	39B-LOX-TA0003S-013.0-20141022
ZZZZZZ	N0080534.D	10/31/14	14:12	07:29	(unrelated sample)
FA19534-17	N0080535.D	10/31/14	14:52	08:09	(used for QC only; not part of job FA19358)
FA19534-17	N0080536.D	10/31/14	15:45	09:02	(used for QC only; not part of job FA19358)
ZZZZZZ	N0080537.D	10/31/14	16:14	09:31	(unrelated sample)
ZZZZZZ	N0080538.D	10/31/14	16:44	10:01	(unrelated sample)
ZZZZZZ	N0080539.D	10/31/14	17:13	10:30	(unrelated sample)
ZZZZZZ	N0080540.D	10/31/14	17:57	11:14	(unrelated sample)
ZZZZZZ	N0080541.D	10/31/14	18:27	11:44	(unrelated sample)
FA19534-17MS	N0080543.D	10/31/14	19:32	12:49	Matrix Spike
FA19534-17MSD	N0080544.D	10/31/14	20:01	13:18	Matrix Spike Duplicate

Instrument Performance Check (BFB)

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample:	VN3548-BFB	**Injection Date:**	11/01/14
Lab File ID:	N0080554.D	**Injection Time:**	16:39
Instrument ID:	GCMSN		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	10112	19.4		Pass
75	30.0 - 60.0% of mass 95	23179	44.6		Pass
95	Base peak, 100% relative abundance	52005	100.0		Pass
96	5.0 - 9.0% of mass 95	3446	6.63		Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) [a]	Pass
174	50.0 - 100.0% of mass 95	49685	95.5		Pass
175	5.0 - 9.0% of mass 174	3720	7.15	(7.49) [a]	Pass
176	95.0 - 101.0% of mass 174	47851	92.0	(96.3) [a]	Pass
177	5.0 - 9.0% of mass 176	3245	6.24	(6.78) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VN3548-IC3548	N0080559.D	11/01/14	19:40	03:01	Initial cal 1
VN3548-IC3548	N0080560.D	11/01/14	20:09	03:30	Initial cal 2
VN3548-IC3548	N0080561.D	11/01/14	20:40	04:01	Initial cal 3
VN3548-ICC3548	N0080562.D	11/01/14	21:09	04:30	Initial cal 4
VN3548-IC3548	N0080563.D	11/01/14	21:39	05:00	Initial cal 5
VN3548-IC3548	N0080564.D	11/01/14	22:08	05:29	Initial cal 6
VN3548-ICV3548	N0080566.D	11/01/14	23:08	06:29	Initial cal verification 4

Instrument Performance Check (BFB)

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample:	VN3549-BFB	**Injection Date:**	11/02/14
Lab File ID:	N0080568.D	**Injection Time:**	15:08
Instrument ID:	GCMSN		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	26421	19.2		Pass
75	30.0 - 60.0% of mass 95	61320	44.5		Pass
95	Base peak, 100% relative abundance	137696	100.0		Pass
96	5.0 - 9.0% of mass 95	9534	6.92		Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) [a]	Pass
174	50.0 - 100.0% of mass 95	130787	95.0		Pass
175	5.0 - 9.0% of mass 174	9783	7.10	(7.48) [a]	Pass
176	95.0 - 101.0% of mass 174	125117	90.9	(95.7) [a]	Pass
177	5.0 - 9.0% of mass 176	8546	6.21	(6.83) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VN3549-CC3548	N0080569.D	11/02/14	15:51	00:43	Continuing cal 4
VN3549-BS	N0080570.D	11/02/14	16:35	01:27	Blank Spike
VN3550-BS	N0080570.D	11/02/14	16:35	01:27	Blank Spike
OP53756-LB	N0080571.D	11/02/14	17:02	01:54	Leachate Blank
VN3549-MB	N0080572.D	11/02/14	17:31	02:23	Method Blank
FA19358-6	N0080573.D	11/02/14	18:11	03:03	39B-LOX-TA0003I-030.0-20141022
ZZZZZZ	N0080574.D	11/02/14	18:41	03:33	(unrelated sample)
FA19358-1	N0080575.D	11/02/14	19:10	04:02	39B-LOX-TA0004I-030.0-20141022
FA19358-5	N0080576.D	11/02/14	19:36	04:28	39B-LOX-TA0003S-013.0-20141022
ZZZZZZ	N0080577.D	11/02/14	20:04	04:56	(unrelated sample)
D63640-28	N0080578.D	11/02/14	20:33	05:25	(used for QC only; not part of job FA19358)
D63640-28DUP	N0080579.D	11/02/14	21:03	05:55	Duplicate
ZZZZZZ	N0080580.D	11/02/14	21:33	06:25	(unrelated sample)
ZZZZZZ	N0080581.D	11/02/14	22:01	06:53	(unrelated sample)
ZZZZZZ	N0080582.D	11/02/14	22:30	07:22	(unrelated sample)
ZZZZZZ	N0080583.D	11/02/14	23:00	07:52	(unrelated sample)
ZZZZZZ	N0080584.D	11/02/14	23:30	08:22	(unrelated sample)
ZZZZZZ	N0080585.D	11/02/14	23:59	08:51	(unrelated sample)
ZZZZZZ	N0080586.D	11/03/14	00:29	09:21	(unrelated sample)
ZZZZZZ	N0080587.D	11/03/14	00:59	09:51	(unrelated sample)
ZZZZZZ	N0080588.D	11/03/14	01:26	10:18	(unrelated sample)
FA19358-5MS	N0080589.D	11/03/14	01:56	10:48	Matrix Spike
FA19358-5MSD	N0080590.D	11/03/14	02:25	11:17	Matrix Spike Duplicate
D63640-28MS	N0080591.D	11/03/14	02:55	11:47	Matrix Spike

Instrument Performance Check (BFB)

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample:	VN3549-BFB	**Injection Date:**	11/02/14
Lab File ID:	N0080568.D	**Injection Time:**	15:08
Instrument ID:	GCMSN		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
D63640-28MSD	N0080592.D	11/03/14	03:24	12:16	Matrix Spike Duplicate

Volatile Internal Standard Area Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Check Std:	VN3547-CC3528	**Injection Date:**	10/31/14
Lab File ID:	N0080523.D	**Injection Time:**	08:05
Instrument ID:	GCMSN	**Method:**	SW846 8260B

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
Initial Cal [a]	982366	7.56	783749	10.65	474504	13.02	97970	5.15
Check Std [b]	999570	7.56	853719	10.65	530322	13.02	82499	5.16
Upper Limit [c]	1999140	8.06	1707438	11.15	1060644	13.52	164998	5.66
Lower Limit [d]	499785	7.06	426860	10.15	265161	12.52	41250	4.66

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
VN3547-BS	1008066	7.56	837870	10.65	508004	13.02	86951	5.16
VN3547-MB	925878	7.56	766719	10.66	409321	13.02	71665	5.17
ZZZZZZ	885777	7.56	721665	10.66	406291	13.02	57704	5.16
FA19358-1	904209	7.56	740194	10.66	395125	13.03	69895	5.18
FA19358-2	897230	7.56	724348	10.66	384718	13.02	71421	5.17
FA19358-3	843583	7.56	707062	10.66	376119	13.02	101888	5.17
FA19358-4	869725	7.56	701671	10.66	376580	13.02	87145	5.17
FA19358-5	959494	7.56	761432	10.66	410483	13.02	80181	5.17
ZZZZZZ	889772	7.56	732664	10.66	396286	13.02	68383	5.17
FA19534-17	898888	7.56	754688	10.66	394193	13.02	62925	5.15
FA19534-17	884127	7.56	729384	10.66	390865	13.02	64047	5.17
ZZZZZZ	900853	7.56	749683	10.66	395600	13.02	60202	5.17
ZZZZZZ	809977	7.56	671873	10.66	347230	13.02	43521	5.17
ZZZZZZ	878982	7.56	744119	10.66	397761	13.02	52700	5.17
ZZZZZZ	864095	7.56	702818	10.66	370999	13.02	52183	5.17
ZZZZZZ	827405	7.56	670407	10.66	354345	13.03	49085	5.16
FA19534-17MS	947831	7.56	781128	10.65	483756	13.02	75902	5.17
FA19534-17MSD	955969	7.56	800705	10.66	477645	13.02	77226	5.17

IS 1 = Fluorobenzene
IS 2 = Chlorobenzene-D5
IS 3 = 1,4-Dichlorobenzene-d4
IS 4 = Tert Butyl Alcohol-D10

(a) Initial Cal is: VN3528-ICC3528 N0080073.D 10/15/14 13:47
(b) Check Std Limit = -50 to + 100% of initial cal area.
(c) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(d) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Internal Standard Area Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Check Std:	VN3549-CC3548	**Injection Date:**	11/02/14
Lab File ID:	N0080569.D	**Injection Time:**	15:51
Instrument ID:	GCMSN	**Method:**	SW846 8260B

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
Initial Cal [a]	719097	7.56	590423	10.65	368831	13.01	62360	5.17
Check Std [b]	733763	7.56	604653	10.65	372865	13.01	58953	5.15
Upper Limit [c]	1467526	8.06	1209306	11.15	745730	13.51	117906	5.65
Lower Limit [d]	366882	7.06	302327	10.15	186433	12.51	29477	4.65

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
VN3549-BS	750822	7.56	614968	10.65	376746	13.01	66250	5.15
VN3550-BS	750822	7.56	614968	10.65	376746	13.01	66250	5.15
OP53756-LB	721026	7.56	610396	10.65	342037	13.02	59919	5.15
VN3549-MB	702411	7.56	597236	10.66	331749	13.02	61784	5.15
FA19358-6	677591	7.56	571686	10.66	320713	13.02	62465	5.15
ZZZZZZ	691565	7.56	586006	10.66	321566	13.02	54258	5.16
FA19358-1	686004	7.56	586509	10.66	322456	13.02	58561	5.15
FA19358-5	645425	7.56	554428	10.66	303378	13.02	57296	5.15
ZZZZZZ	659751	7.56	564318	10.66	311993	13.02	57854	5.16
D63640-28	670183	7.56	570524	10.66	315590	13.02	58908	5.15
D63640-28DUP	660505	7.56	569829	10.66	316825	13.02	55724	5.15
ZZZZZZ	658317	7.56	567520	10.66	318240	13.02	56625	5.16
ZZZZZZ	658191	7.56	565143	10.66	312761	13.02	58175	5.16
ZZZZZZ	627274	7.56	533459	10.66	295841	13.02	56905	5.16
ZZZZZZ	672498	7.56	564146	10.66	316223	13.02	58618	5.17
ZZZZZZ	637316	7.56	531959	10.66	297361	13.02	54566	5.15
ZZZZZZ	640035	7.56	546957	10.66	299039	13.02	55259	5.15
ZZZZZZ	640033	7.56	550259	10.66	296521	13.02	56608	5.15
ZZZZZZ	646557	7.56	548182	10.66	298602	13.02	56754	5.16
ZZZZZZ	633692	7.56	539194	10.66	299168	13.02	55958	5.16
FA19358-5MS	693206	7.56	590752	10.65	359828	13.02	70275	5.16
FA19358-5MSD	687530	7.56	588721	10.65	354107	13.02	69691	5.16
D63640-28MS	706711	7.56	593684	10.65	361845	13.02	74744	5.15
D63640-28MSD	667327	7.56	573807	10.65	346069	13.02	69785	5.15

IS 1 = Fluorobenzene
IS 2 = Chlorobenzene-D5
IS 3 = 1,4-Dichlorobenzene-d4
IS 4 = Tert Butyl Alcohol-D10

(a) Initial Cal is: VN3548-ICC3548 N0080562.D 11/01/14 21:09
(b) Check Std Limit = -50 to + 100% of initial cal area.
(c) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.

Volatile Internal Standard Area Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Check Std:	VN3549-CC3548	**Injection Date:**	11/02/14
Lab File ID:	N0080569.D	**Injection Time:**	15:51
Instrument ID:	GCMSN	**Method:**	SW846 8260B

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT

(d) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Surrogate Recovery Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Method: SW846 8260B **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
FA19358-1	N0080575.D	101	103	98	101
FA19358-1	N0080528.D	104	92	90	97
FA19358-2	N0080529.D	102	92	90	97
FA19358-3	N0080530.D	105	98	88	96
FA19358-4	N0080531.D	105	96	89	96
FA19358-5	N0080576.D	102	104	97	102
FA19358-5	N0080532.D	103	93	90	95
FA19358-6	N0080573.D	101	102	98	100
FA19358-5MS	N0080589.D	103	102	99	98
FA19358-5MSD	N0080590.D	104	103	97	99
FA19534-17MS	N0080543.D	101	89	91	91
FA19534-17MSD	N0080544.D	100	92	91	93
VN3547-BS	N0080524.D	100	87	91	94
VN3547-MB	N0080526.D	103	94	90	96
VN3549-BS	N0080570.D	99	98	102	100
VN3549-MB	N0080572.D	100	102	98	103

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	83-118%
S2 = 1,2-Dichloroethane-D4	79-125%
S3 = Toluene-D8	85-112%
S4 = 4-Bromofluorobenzene	83-118%

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICC3528
Lab FileID: N0080073.D

Response Factor Report MSVOA8

Method : C:\MSDchem\2\MET...260SCOXY101514.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Wed Oct 15 16:17:07 2014
Response via : Initial Calibration

Calibration Files
1 =N0080070.D 2 =N0080071.D 3 =N0080072.D 4 =N0080073.D
5 =N0080074.D 6 =N0080075.D

		Compound	1	2	3	4	5	6	Avg	%RSD
1)	I	Fluorobenzene	----------ISTD----------							
2)		Dichlorodifluoromet	0.452	0.510	0.430	0.428	0.406	0.384	0.435	10.02
3)	P	Chloromethane	0.409	0.498	0.450	0.436	0.428	0.386	0.434	8.83
4)	C	Vinyl Chloride	0.277	0.461	0.412	0.405	0.393	0.364	0.385	15.99
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9964								
		Response Ratio = 0.00000 + 0.37735 *A								
5)		Bromomethane	0.264	0.322	0.289	0.252	0.237	0.202	0.261	15.91
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9990								
		Response Ratio = 0.00000 + 0.30166 *A + -0.04924 *A^2								
6)		Chloroethane	0.219	0.273	0.227	0.193	0.162	0.124	0.200	26.29
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9995								
		Response Ratio = 0.00000 + 0.24697 *A + -0.06160 *A^2								
7)		Trichlorofluorometh	0.346	0.593	0.516	0.485	0.448	0.400	0.465	18.77
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9998								
		Response Ratio = 0.00000 + 0.54885 *A + -0.07413 *A^2								
8)		Ethyl Ether	0.216	0.255	0.260	0.256	0.221	0.222	0.238	8.68
9)		1,2-Dichlorotrifluo	1.016	0.380	0.364	0.355	0.295	0.296	0.451	61.87
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9962								
		Response Ratio = 0.00000 + 0.36298 *A + -0.03588 *A^2								
10)	C	1,1-Dichloroethene	0.350	0.460	0.432	0.428	0.365	0.365	0.400	11.37
11)		Freon 113	0.272	0.369	0.349	0.348	0.290	0.293	0.320	12.48
12)		Carbon Disulfide	0.676	0.843	0.811	0.796	0.708	0.691	0.754	9.42
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9991								
		Response Ratio = 0.00000 + 0.82654 *A + -0.07046 *A^2								
13)		Iodomethane	0.595	0.689	0.751	0.728	0.648	0.641	0.675	8.65
14)		Methylene Chloride	0.529	0.503	0.496	0.454	0.401	0.399	0.464	11.80
15)		Acetone	0.044	0.039	0.038	0.037	0.033	0.032	0.037	12.08
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9991								
		Response Ratio = 0.00000 + 0.03845 *A + -0.00067 *A^2								
16)		Methyl acetate	0.053	0.055	0.061	0.062	0.056	0.060	0.058	6.47
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9978								
		Response Ratio = 0.00000 + 0.05815 *A + 0.00014 *A^2								
17)		trans-1,2-Dichloroe	0.401	0.500	0.526	0.514	0.441	0.449	0.472	10.38
18)		Hexane	0.260	0.279	0.296	0.300	0.247	0.259	0.274	7.91
19)		Methyl Tert Butyl E	0.992	1.172	1.232	1.208	1.088	1.105	1.133	7.84
20)		Di-isopropyl ether	0.958	1.116	1.200	1.172	1.035	1.052	1.089	8.38
21)	P	1,1-Dichloroethane	0.524	0.639	0.666	0.658	0.570	0.581	0.606	9.34
22)		Acrylonitrile	0.133	0.150	0.132	0.137	0.119	0.125	0.133	7.98

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICC3528
Lab FileID: N0080073.D

23)		ETBE	0.946	1.104	1.172	1.136	1.009	1.018	1.064	8.16
24)		Vinyl acetate	0.698	0.798	0.765	0.757	0.620	0.598	0.706	11.61
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9983								
		Response Ratio = 0.00000 + 0.81128 *A + -0.02243 *A^2								
25)		cis-1,2-Dichloroeth	0.455	0.444	0.458	0.445	0.390	0.405	0.433	6.58
26)		2,2-Dichloropropane	0.560	0.569	0.563	0.553	0.474	0.473	0.532	8.58
27)		Bromochloromethane	0.216	0.226	0.251	0.249	0.219	0.228	0.232	6.48
28)		Cyclohexane	0.521	0.597	0.642	0.636	0.545	0.548	0.581	8.81
29)	C	Chloroform	0.727	0.698	0.718	0.701	0.603	0.617	0.677	7.87
30)		Tetrahydrofuran	0.098	0.155	0.117	0.111	0.098	0.103	0.114	18.90
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9965								
		Response Ratio = 0.00000 + 0.10280 *A								
31)	S	Dibromofluoromethan	0.268	0.307	0.310	0.263	0.296	0.307	0.292	7.19
		---- Linear regression ---- Coefficient = 0.9906								
		Response Ratio = -0.07318 + 0.34584 *A								
32)		Carbon Tetrachlorid	0.420	0.531	0.565	0.564	0.497	0.492	0.511	10.72
33)		1,1,1-Trichloroetha	0.584	0.570	0.622	0.609	0.525	0.533	0.574	6.85
34)		2-Butanone	0.236	0.137	0.151	0.156	0.140	0.144	0.161	23.44
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9981								
		Response Ratio = 0.00000 + 0.14422 *A								
35)		1,1-Dichloropropene	0.332	0.463	0.511	0.514	0.436	0.452	0.451	14.71
36)		tert-Butyl Formate	0.272	0.445	0.336	0.326	0.291	0.276	0.324	19.99
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9950								
		Response Ratio = 0.00000 + 0.28673 *A								
37)		Benzene	1.260	1.432	1.519	1.498	1.276	1.288	1.379	8.54
38)		TAME	1.026	1.116	1.216	1.189	1.079	1.104	1.122	6.26
39)	S	1,2-Dichloroethane-	0.276	0.318	0.322	0.267	0.305	0.316	0.301	7.80
40)		1,2-Dichloroethane	0.460	0.470	0.493	0.488	0.432	0.444	0.464	5.16
41)		Trichloroethene	0.515	0.366	0.394	0.398	0.347	0.358	0.396	15.48
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9970								
		Response Ratio = 0.00000 + 0.35945 *A								
42)		Methylcyclohexane	0.648	0.693	0.720	0.718	0.605	0.619	0.667	7.53
43)		Dibromomethane	0.235	0.235	0.257	0.257	0.230	0.240	0.243	4.88
44)	C	1,2-Dichloropropane	0.256	0.349	0.375	0.375	0.333	0.342	0.338	12.93
45)		Bromodichloromethan	0.406	0.479	0.522	0.524	0.461	0.476	0.478	9.08
46)		2-Chloroethyl vinyl	0.107	0.151	0.178	0.179	0.160	0.164	0.157	17.02
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9976								
		Response Ratio = 0.00000 + 0.16432 *A								
47)		cis-1,3-Dichloropro	0.442	0.588	0.653	0.660	0.584	0.601	0.588	13.42
48)	I	Chlorobenzene-d5	----------ISTD----------							
49)	S	Toluene-d8	1.171	1.359	1.362	1.207	1.297	1.324	1.287	6.21
50)	C	Toluene	1.572	1.984	2.112	2.067	1.774	1.772	1.880	11.09
51)		2-Nitropropane	0.132	0.104	0.116	0.116	0.105	0.109	0.114	9.03
52)		4-Methyl-2-pentanon	0.322	0.370	0.396	0.389	0.345	0.349	0.362	7.82
53)		trans-1,3-Dichlorop	0.410	0.618	0.698	0.697	0.620	0.634	0.613	17.26
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9974								
		Response Ratio = 0.00000 + 0.63716 *A								
54)		Tetrachloroethene	0.444	0.658	0.714	0.730	0.622	0.634	0.634	16.14
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9969								
		Response Ratio = 0.00000 + 0.72151 *A + -0.04788 *A^2								

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICC3528
Lab FileID: N0080073.D

55)		1,1,2-Trichloroetha	0.277	0.351	0.382	0.367	0.329	0.343	0.341	10.71
56)		Dibromochloromethan	0.410	0.544	0.587	0.588	0.534	0.551	0.536	12.21
57)		1,3-Dichloropropane	0.551	0.699	0.758	0.751	0.672	0.698	0.688	10.85
58)		1,2-Dibromoethane	0.395	0.456	0.494	0.496	0.450	0.467	0.460	8.04
59)		2-hexanone	0.103	0.274	0.261	0.270	0.247	0.252	0.235	27.81
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9986								
		Response Ratio = 0.00000 + 0.25257 *A								
60)		1-Chlorohexane	0.353	0.623	0.724	0.734	0.621	0.645	0.617	22.40
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9948								
		Response Ratio = 0.00000 + 0.64820 *A								
61)	C	Ethylbenzene	1.988	2.252	2.304	2.260	1.924	1.913	2.107	8.73
62)	P	Chlorobenzene	1.057	1.293	1.374	1.356	1.178	1.196	1.242	9.75
63)		1,1,1,2-Tetrachloro	0.427	0.545	0.579	0.571	0.514	0.522	0.526	10.47
64)		m,p-Xylene	1.494	1.590	1.736	1.686	1.402	1.351	1.543	10.00
65)		o-Xylene	1.445	1.678	1.819	1.777	1.528	1.540	1.631	9.19
66)		Styrene	1.084	1.403	1.590	1.589	1.416	1.436	1.420	13.03
67)	P	Bromoform	0.300	0.372	0.413	0.416	0.380	0.400	0.380	11.35
68)		Isopropylbenzene	1.742	2.219	2.361	2.283	1.949	1.927	2.080	11.66
69)	I	1,4-Dichlorobenzene-d ----------ISTD----------								
70)	S	4-Bromofluorobenzen	0.828	0.910	0.924	0.827	0.902	0.944	0.889	5.60
		---- Linear regression ---- Coefficient = 0.9966								
		Response Ratio = -0.20626 + 1.04050 *A								
71)		n-Propylbenzene	3.145	3.977	4.157	4.108	3.449	3.443	3.713	11.35
72)		Bromobenzene	0.890	1.078	1.179	1.181	1.042	1.076	1.074	9.96
73)	P	1,1,2,2-Tetrachloro	0.743	0.945	0.955	0.958	0.852	0.893	0.891	9.40
74)		1,3,5-Trimethylbenz	3.147	3.497	3.656	3.544	2.997	2.986	3.305	8.97
75)		2-Chlorotoluene	2.122	2.787	2.873	2.841	2.419	2.458	2.583	11.58
76)		trans-1,4-Dichloro-	0.356	0.239	0.242	0.265	0.247	0.262	0.268	16.43
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9981								
		Response Ratio = 0.00000 + 0.25744 *A								
77)		1,2,3-Trichloroprop	0.239	0.298	0.301	0.307	0.275	0.291	0.285	8.86
78)		Cyclohexanone	0.024	0.085	0.064	0.065	0.060	0.060	0.060	33.25
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9983								
		Response Ratio = 0.00000 + 0.06050 *A								
79)		4-Chlorotoluene	2.321	2.258	2.557	2.593	2.254	2.292	2.379	6.48
80)		tert-Butylbenzene	1.467	1.735	1.788	1.769	1.538	1.561	1.643	8.36
81)		1,2,4-Trimethylbenz	2.864	3.359	3.625	3.592	3.046	3.037	3.254	9.77
82)		sec-Butylbenzene	3.273	3.943	4.228	4.181	3.510	3.493	3.771	10.60
83)		4-Isopropyltoluene	3.082	3.597	3.847	3.771	3.197	3.199	3.449	9.57
84)		1,3-Dichlorobenzene	1.384	1.797	2.045	2.051	1.816	1.872	1.827	13.34
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9973								
		Response Ratio = 0.00000 + 1.87640 *A								
85)		1,4-Dichlorobenzene	1.995	2.163	2.325	2.301	2.022	2.076	2.147	6.58
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9970								
		Response Ratio = 0.00000 + 2.08755 *A								
86)		n-Butylbenzene	1.521	1.909	2.119	2.114	1.806	1.866	1.889	11.76
87)		Benzyl Chloride	0.331	0.398	0.478	0.482	0.436	0.460	0.431	13.43
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9978								
		Response Ratio = 0.00000 + 0.45552 *A								
88)		1,2-Dichlorobenzene	1.683	1.913	2.083	2.051	1.810	1.850	1.898	7.97
89)		1,2-Dibromo-3-Chlor	0.153	0.156	0.167	0.168	0.151	0.165	0.160	4.64

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICC3528
Lab FileID: N0080073.D

```
 90)     Hexachlorobutadiene 0.598 0.695 0.765 0.775 0.666 0.682 0.697   9.48
 91)     1,2,4-Trichlorobenz 1.174 1.461 1.589 1.586 1.424 1.437 1.445  10.50
 92)     Naphthalene         2.459 2.704 2.898 2.926 2.668 2.709 2.727   6.24
 93)     1,2,3-Trichlorobenz 1.065 1.223 1.294 1.299 1.182 1.211 1.212   7.08

 94) I   Tert Butyl Alcohol-d1 ----------------ISTD--------------------
 95)     Ethanol             0.080 0.183 0.160 0.140 0.117 0.111 0.132  27.98
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9964
               Response Ratio = 0.00000 + 0.15438 *A + -0.00559 *A^2

 96)     acrolein            1.681 1.860 1.708 1.638 1.573 1.584 1.674   6.30
 97)     Tert Butyl Alcohol  1.649 1.623 1.583 1.617 1.505 1.562 1.590   3.25
 98)     tert Amyl alcohol   0.979 1.152 1.267 1.350 1.245 1.303 1.216  10.99
 99)     Isobutyl alcohol    0.283 0.510 0.395 0.400 0.390 0.392 0.395  18.22
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
               Response Ratio = 0.00000 + 0.39237 *A

100)     1,4-Dioxane               0.098 0.134 0.151 0.144 0.155 0.136  16.74
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9976
               Response Ratio = 0.00000 + 0.15055 *A

101)     3,3-Dimethyl-1-buta 1.200 1.756 1.377 1.425 1.326 1.319 1.401  13.53
 ---------------------------------------------------------------------------
 (#) = Out of Range

           8260SCOXY101514.m        Wed Oct 15 19:24:33 2014
```

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080077.D

Evaluate Continuing Calibration Report

Data File : C:\MSDchem\2\DATA\101514\N0080077.D Vial: 8
Acq On : 15 Oct 2014 3:44 pm Operator: rayb
Sample : icv3528-4 Inst : MSVOA8
Misc : MS28641,VN3528,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\MSDchem\2\MET...260SCOXY101514.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Wed Oct 15 16:17:07 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	104	0.00	7.56
2		Dichlorodifluoromethane	0.435	0.455	-4.6	110	0.01	2.67
3	P	Chloromethane	0.434	0.440	-1.4	105	0.00	2.86
			Amount	Calc.	%Drift			
4	C	Vinyl Chloride	40.000	46.431	-16.1	112	-0.01	3.01
5		Bromomethane	40.000	44.306	-10.8	117	0.00	3.39
6		Chloroethane	40.000	39.239	1.9	105	0.00	3.53
7		Trichlorofluoromethane	40.000	42.233	-5.6	110	0.00	3.75
			AvgRF	CCRF	%Dev			
8		Ethyl Ether	0.238	0.257	-8.0	104	0.00	4.01
			Amount	Calc.	%Drift			
9		1,2-Dichlorotrifluoroetha	40.000	45.186	-13.0	109	-0.02	4.24
			AvgRF	CCRF	%Dev			
10	C	1,1-Dichloroethene	0.400	0.436	-9.0	106	0.00	4.28
11		Freon 113	0.320	0.349	-9.1	104	-0.02	4.33
			Amount	Calc.	%Drift			
12		Carbon Disulfide	40.000	54.701	-36.8#	133	0.00	4.37
			AvgRF	CCRF	%Dev			
13		Iodomethane	0.675	0.761	-12.7	108	0.00	4.47
14		Methylene Chloride	0.464	0.463	0.2	106	0.00	4.91
			Amount	Calc.	%Drift			
15		Acetone	200.000	272.487	-36.2#	133	0.00	4.94
16		Methyl acetate	200.000	298.055	-49.0#	147	0.00	5.05
			AvgRF	CCRF	%Dev			
17		trans-1,2-Dichloroethene	0.472	0.498	-5.5	101	0.00	5.07
18		Hexane	0.274	0.302	-10.2	104	0.00	5.13
19		Methyl Tert Butyl Ether	1.133	1.205	-6.4	103	0.00	5.17
20		Di-isopropyl ether	1.089	1.178	-8.2	104	0.00	5.54
21	P	1,1-Dichloroethane	0.606	0.640	-5.6	101	0.00	5.73
22		Acrylonitrile	0.133	0.133	0.0	101	0.00	5.77
23		ETBE	1.064	1.152	-8.3	105	0.00	5.93
			Amount	Calc.	%Drift			
24		Vinyl acetate	200.000	89.234	55.4#	47	0.00	5.94

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080077.D

			AvgRF	CCRF	%Dev			
25		cis-1,2-Dichloroethene	0.433	0.436	-0.7	101	0.00	6.29
26		2,2-Dichloropropane	0.532	0.527	0.9	99	0.00	6.41
27		Bromochloromethane	0.232	0.249	-7.3	104	0.00	6.50
28		Cyclohexane	0.581	0.619	-6.5	101	0.00	6.53
29	C	Chloroform	0.677	0.680	-0.4	100	0.00	6.55
			Amount	Calc.	%Drift			
30		Tetrahydrofuran	40.000	43.310	-8.3	104	0.00	6.74
31	S	Dibromofluoromethane	50.000	49.102	1.8	105	0.00	6.75
			AvgRF	CCRF	%Dev			
32		Carbon Tetrachloride	0.511	0.573	-12.1	105	0.00	6.73
33		1,1,1-Trichloroethane	0.574	0.589	-2.6	100	0.00	6.80
			Amount	Calc.	%Drift			
34		2-Butanone	200.000	226.686	-13.3	109	0.00	6.85
			AvgRF	CCRF	%Dev			
35		1,1-Dichloropropene	0.451	0.510	-13.1	103	0.00	6.91
			Amount	Calc.	%Drift			
36		tert-Butyl Formate	400.000	410.633	-2.7	94	0.00	7.00
			AvgRF	CCRF	%Dev			
37		Benzene	1.379	1.462	-6.0	101	0.00	7.16
38		TAME	1.122	1.178	-5.0	103	0.00	7.23
39	S	1,2-Dichloroethane-d4	0.301	0.268	11.0	104	0.00	7.30
40		1,2-Dichloroethane	0.464	0.487	-5.0	103	0.00	7.36
			Amount	Calc.	%Drift			
41		Trichloroethene	40.000	43.780	-9.5	103	0.00	7.74
			AvgRF	CCRF	%Dev			
42		Methylcyclohexane	0.667	0.715	-7.2	103	0.00	7.75
43		Dibromomethane	0.243	0.254	-4.5	102	0.00	8.17
44	C	1,2-Dichloropropane	0.338	0.370	-9.5	102	-0.02	8.26
45		Bromodichloromethane	0.478	0.511	-6.9	101	0.00	8.31
			Amount	Calc.	%Drift			
46		2-Chloroethyl vinyl ether	200.000	154.254	22.9#	73	0.00	8.82
			AvgRF	CCRF	%Dev			
47		cis-1,3-Dichloropropene	0.588	0.630	-7.1	99	0.00	8.92
48	I	Chlorobenzene-d5	1.000	1.000	0.0	102	0.00	10.65
49	S	Toluene-d8	1.287	1.209	6.1	103	0.00	9.11
50	C	Toluene	1.880	2.010	-6.9	100	0.00	9.16
51		2-Nitropropane	0.114	0.114	0.0	101	0.00	9.38
52		4-Methyl-2-pentanone	0.362	0.404	-11.6	107	0.00	9.49
			Amount	Calc.	%Drift			
53		trans-1,3-Dichloropropene	40.000	45.872	-14.7	107	0.00	9.55
54		Tetrachloroethene	40.000	50.787	-27.0#	120	0.00	9.56
			AvgRF	CCRF	%Dev			
55		1,1,2-Trichloroethane	0.341	0.363	-6.5	102	0.00	9.72
56		Dibromochloromethane	0.536	0.585	-9.1	102	0.00	9.91
57		1,3-Dichloropropane	0.688	0.758	-10.2	104	0.00	10.00

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080077.D

58		1,2-Dibromoethane	0.460	0.497	-8.0	103	0.00	10.17
		----------	Amount	Calc.	%Drift	----------		
59		2-hexanone	200.000	237.932	-19.0	114	0.00	10.31
60		1-Chlorohexane	40.000	42.084	-5.2	95	0.00	10.60
		----------	AvgRF	CCRF	%Dev	----------		
61	C	Ethylbenzene	2.107	2.215	-5.1	100	0.00	10.67
62	P	Chlorobenzene	1.242	1.421	-14.4	107	0.00	10.67
63		1,1,1,2-Tetrachloroethane	0.526	0.580	-10.3	104	0.00	10.73
64		m,p-Xylene	1.543	1.694	-9.8	103	0.00	10.81
65		o-Xylene	1.631	1.867	-14.5	108	0.00	11.25
66		Styrene	1.420	1.581	-11.3	102	0.00	11.30
67	P	Bromoform	0.380	0.404	-6.3	100	0.00	11.36
68		Isopropylbenzene	2.080	2.416	-16.2	108	0.00	11.55
69	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	102	0.00	13.02
		----------	Amount	Calc.	%Drift	----------		
70	S	4-Bromofluorobenzene	50.000	49.782	0.4	102	0.00	11.87
		----------	AvgRF	CCRF	%Dev	----------		
71		n-Propylbenzene	3.713	4.383	-18.0	108	0.00	11.97
72		Bromobenzene	1.074	1.180	-9.9	101	0.00	11.99
73	P	1,1,2,2-Tetrachloroethane	0.891	0.963	-8.1	102	0.00	12.04
74		1,3,5-Trimethylbenzene	3.305	3.459	-4.7	99	0.00	12.16
75		2-Chlorotoluene	2.583	3.024	-17.1	108	0.00	12.16
		----------	Amount	Calc.	%Drift	----------		
76		trans-1,4-Dichloro-2-Bute	40.000	38.920	2.7	96	0.00	12.23
		----------	AvgRF	CCRF	%Dev	----------		
77		1,2,3-Trichloropropane	0.285	0.317	-11.2	105	0.00	12.20
		----------	Amount	Calc.	%Drift	----------		
78		Cyclohexanone	200.000	49.957	75.0#	23	0.00	12.27
		----------	AvgRF	CCRF	%Dev	----------		
79		4-Chlorotoluene	2.379	2.841	-19.4	111	0.00	12.33
80		tert-Butylbenzene	1.643	1.906	-16.0	109	0.00	12.50
81		1,2,4-Trimethylbenzene	3.254	3.534	-8.6	100	0.00	12.56
82		sec-Butylbenzene	3.771	4.483	-18.9	109	0.00	12.68
83		4-Isopropyltoluene	3.449	3.978	-15.3	107	0.00	12.81
		----------	Amount	Calc.	%Drift	----------		
84		1,3-Dichlorobenzene	40.000	47.895	-19.7	111	0.00	12.95
85		1,4-Dichlorobenzene	40.000	44.663	-11.7	103	0.00	13.03
		----------	AvgRF	CCRF	%Dev	----------		
86		n-Butylbenzene	1.889	2.038	-7.9	98	0.00	13.25
		----------	Amount	Calc.	%Drift	----------		
87		Benzyl Chloride	40.000	37.497	6.3	90	0.00	13.28
		----------	AvgRF	CCRF	%Dev	----------		
88		1,2-Dichlorobenzene	1.898	2.242	-18.1	111	0.00	13.46
89		1,2-Dibromo-3-Chloropropa	0.160	0.172	-7.5	104	0.00	14.22
90		Hexachlorobutadiene	0.697	0.778	-11.6	102	0.00	14.77
91		1,2,4-Trichlorobenzene	1.445	1.605	-11.1	103	0.00	14.81
92		Naphthalene	2.727	2.946	-8.0	102	0.00	15.09

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080077.D

93		1,2,3-Trichlorobenzene	1.212	1.308	-7.9	102	0.00	15.26
94	I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	108	0.00	5.16
			Amount	Calc.	%Drift			
95		Ethanol	800.000	806.014	-0.8	106	0.02	4.19
			AvgRF	CCRF	%Dev			
96		acrolein	1.674	1.757	-5.0	116	0.00	4.64
97		Tert Butyl Alcohol	1.590	1.604	-0.9	107	0.01	5.25
98		tert Amyl alcohol	1.216	1.336	-9.9	107	0.00	7.40
			Amount	Calc.	%Drift			
99		Isobutyl alcohol	800.000	865.194	-8.1	115	0.00	7.29
100		1,4-Dioxane	800.000	801.251	-0.2	108	0.00	8.49
			AvgRF	CCRF	%Dev			
101		3,3-Dimethyl-1-butanol	1.401	1.499	-7.0	114	0.00	10.26

(#) = Out of Range SPCC's out = 0 CCC's out = 0
N0080073.D 8260SCOXY101514.m Wed Oct 15 19:24:12 2014

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080078.D

Evaluate Continuing Calibration Report

Data File : C:\MSDchem\2\DATA\101514\N0080078.D Vial: 9
Acq On : 15 Oct 2014 4:56 pm Operator: rayb
Sample : icv3528-4 Inst : MSVOA8
Misc : MS28641,VN3528,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\MSDchem\2\MET...260SCOXY101514.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Wed Oct 15 16:17:07 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	107	0.00	7.56
2		Dichlorodifluoromethane	0.435	0.429	1.4	107	0.01	2.67
3	P	Chloromethane	0.434	0.451	-3.9	110	0.01	2.87
			Amount	Calc.	%Drift			
4	C	Vinyl Chloride	40.000	45.359	-13.4	113	-0.01	3.01
5		Bromomethane	40.000	40.832	-2.1	113	0.00	3.39
6		Chloroethane	40.000	36.489	8.8	102	0.00	3.53
7		Trichlorofluoromethane	40.000	40.734	-1.8	109	0.00	3.75
			AvgRF	CCRF	%Dev			
8		Ethyl Ether	0.238	0.257	-8.0	107	0.00	4.00
			Amount	Calc.	%Drift			
9		1,2-Dichlorotrifluoroetha	40.000	53.589	-34.0#	131	-0.02	4.24
			AvgRF	CCRF	%Dev			
10	C	1,1-Dichloroethene	0.400	0.512	-28.0#	127	0.00	4.28
11		Freon 113	0.320	0.396	-23.8#	121	-0.02	4.33
			Amount	Calc.	%Drift			
12		Carbon Disulfide	40.000	59.198	-48.0#	147	0.00	4.37
			AvgRF	CCRF	%Dev			
13		Iodomethane	0.675	0.749	-11.0	110	0.00	4.46
14		Methylene Chloride	0.464	0.457	1.5	107	0.00	4.90
			Amount	Calc.	%Drift			
15		Acetone	200.000	269.415	-34.7#	135	0.00	4.93
16		Methyl acetate	200.000	234.835	-17.4	119	0.00	5.04
			AvgRF	CCRF	%Dev			
17		trans-1,2-Dichloroethene	0.472	0.507	-7.4	105	0.00	5.07
18		Hexane	0.274	0.322	-17.5	114	0.00	5.12
19		Methyl Tert Butyl Ether	1.133	1.189	-4.9	105	0.00	5.17
20		Di-isopropyl ether	1.089	1.166	-7.1	106	0.00	5.54
21	P	1,1-Dichloroethane	0.606	0.651	-7.4	105	0.00	5.72
22		Acrylonitrile	0.133	0.139	-4.5	108	0.00	5.77
23		ETBE	1.064	1.121	-5.4	105	0.00	5.93
			Amount	Calc.	%Drift			
24		Vinyl acetate	200.000	180.563	9.7	93	0.00	5.93

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080078.D

			AvgRF	CCRF	%Dev			
25		cis-1,2-Dichloroethene	0.433	0.440	-1.6	105	0.00	6.29
26		2,2-Dichloropropane	0.532	0.577	-8.5	111	0.00	6.41
27		Bromochloromethane	0.232	0.248	-6.9	106	0.00	6.50
28		Cyclohexane	0.581	0.636	-9.5	107	0.00	6.53
29	C	Chloroform	0.677	0.681	-0.6	104	0.00	6.55
			Amount	Calc.	%Drift			
30		Tetrahydrofuran	40.000	42.108	-5.3	104	0.00	6.73
31	S	Dibromofluoromethane	50.000	49.068	1.9	108	0.00	6.74
			AvgRF	CCRF	%Dev			
32		Carbon Tetrachloride	0.511	0.567	-11.0	107	0.00	6.73
33		1,1,1-Trichloroethane	0.574	0.619	-7.8	108	0.00	6.80
			Amount	Calc.	%Drift			
34		2-Butanone	200.000	232.099	-16.0	114	0.00	6.85
			AvgRF	CCRF	%Dev			
35		1,1-Dichloropropene	0.451	0.531	-17.7	110	0.00	6.91
			Amount	Calc.	%Drift			
36		tert-Butyl Formate	400.000	437.494	-9.4	103	0.00	7.00
			AvgRF	CCRF	%Dev			
37		Benzene	1.379	1.480	-7.3	105	0.00	7.16
38		TAME	1.122	1.160	-3.4	104	0.00	7.23
39	S	1,2-Dichloroethane-d4	0.301	0.269	10.6	108	0.00	7.29
40		1,2-Dichloroethane	0.464	0.483	-4.1	106	0.00	7.36
			Amount	Calc.	%Drift			
41		Trichloroethene	40.000	43.486	-8.7	105	0.00	7.74
			AvgRF	CCRF	%Dev			
42		Methylcyclohexane	0.667	0.734	-10.0	109	0.00	7.75
43		Dibromomethane	0.243	0.251	-3.3	104	0.00	8.17
44	C	1,2-Dichloropropane	0.338	0.364	-7.7	103	-0.02	8.26
45		Bromodichloromethane	0.478	0.505	-5.6	103	0.00	8.31
			Amount	Calc.	%Drift			
46		2-Chloroethyl vinyl ether	200.000	148.626	25.7#	73	0.00	8.82
			AvgRF	CCRF	%Dev			
47		cis-1,3-Dichloropropene	0.588	0.635	-8.0	102	0.00	8.92
48	I	Chlorobenzene-d5	1.000	1.000	0.0	105	0.00	10.65
49	S	Toluene-d8	1.287	1.220	5.2	106	0.00	9.11
50	C	Toluene	1.880	2.035	-8.2	103	0.00	9.16
51		2-Nitropropane	0.114	0.114	0.0	103	0.00	9.38
52		4-Methyl-2-pentanone	0.362	0.397	-9.7	107	0.00	9.49
			Amount	Calc.	%Drift			
53		trans-1,3-Dichloropropene	40.000	46.343	-15.9	111	0.00	9.55
54		Tetrachloroethene	40.000	36.935	7.7	91	0.00	9.55
			AvgRF	CCRF	%Dev			
55		1,1,2-Trichloroethane	0.341	0.363	-6.5	104	0.00	9.72
56		Dibromochloromethane	0.536	0.586	-9.3	105	0.00	9.91
57		1,3-Dichloropropane	0.688	0.744	-8.1	104	0.00	10.00

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080078.D

58		1,2-Dibromoethane	0.460	0.489	-6.3	104	0.00	10.17
		----------	Amount	Calc.	%Drift	----------		
59		2-hexanone	200.000	232.837	-16.4	114	0.00	10.31
60		1-Chlorohexane	40.000	43.829	-9.6	102	0.00	10.60
		----------	AvgRF	CCRF	%Dev	----------		
61	C	Ethylbenzene	2.107	2.247	-6.6	104	0.00	10.67
62	P	Chlorobenzene	1.242	1.433	-15.4	111	0.00	10.67
63		1,1,1,2-Tetrachloroethane	0.526	0.575	-9.3	106	0.00	10.72
64		m,p-Xylene	1.543	1.722	-11.6	107	0.00	10.81
65		o-Xylene	1.631	1.879	-15.2	111	0.00	11.25
66		Styrene	1.420	1.598	-12.5	106	0.00	11.30
67	P	Bromoform	0.380	0.410	-7.9	103	0.00	11.36
68		Isopropylbenzene	2.080	2.474	-18.9	114	0.00	11.55
69	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	108	0.00	13.02
		----------	Amount	Calc.	%Drift	----------		
70	S	4-Bromofluorobenzene	50.000	49.204	1.6	106	0.00	11.87
		----------	AvgRF	CCRF	%Dev	----------		
71		n-Propylbenzene	3.713	4.374	-17.8	115	0.00	11.97
72		Bromobenzene	1.074	1.168	-8.8	106	0.00	11.99
73	P	1,1,2,2-Tetrachloroethane	0.891	0.940	-5.5	105	0.00	12.04
74		1,3,5-Trimethylbenzene	3.305	3.402	-2.9	103	0.00	12.16
75		2-Chlorotoluene	2.583	2.973	-15.1	113	0.00	12.16
		----------	Amount	Calc.	%Drift	----------		
76		trans-1,4-Dichloro-2-Bute	40.000	38.199	4.5	100	0.00	12.23
		----------	AvgRF	CCRF	%Dev	----------		
77		1,2,3-Trichloropropane	0.285	0.306	-7.4	107	0.00	12.20
		----------	Amount	Calc.	%Drift	----------		
78		Cyclohexanone	200.000	80.805	59.6#	40	0.00	12.27
		----------	AvgRF	CCRF	%Dev	----------		
79		4-Chlorotoluene	2.379	2.828	-18.9	117	0.00	12.33
80		tert-Butylbenzene	1.643	1.874	-14.1	114	0.00	12.50
81		1,2,4-Trimethylbenzene	3.254	3.455	-6.2	103	0.00	12.56
82		sec-Butylbenzene	3.771	4.427	-17.4	114	0.00	12.68
83		4-Isopropyltoluene	3.449	3.992	-15.7	114	0.00	12.81
		----------	Amount	Calc.	%Drift	----------		
84		1,3-Dichlorobenzene	40.000	47.819	-19.5	118	0.00	12.95
85		1,4-Dichlorobenzene	40.000	44.417	-11.0	108	0.00	13.04
		----------	AvgRF	CCRF	%Dev	----------		
86		n-Butylbenzene	1.889	2.084	-10.3	106	0.00	13.25
		----------	Amount	Calc.	%Drift	----------		
87		Benzyl Chloride	40.000	41.921	-4.8	107	0.00	13.28
		----------	AvgRF	CCRF	%Dev	----------		
88		1,2-Dichlorobenzene	1.898	2.189	-15.3	115	0.00	13.47
89		1,2-Dibromo-3-Chloropropa	0.160	0.164	-2.5	105	0.00	14.22
90		Hexachlorobutadiene	0.697	0.788	-13.1	109	0.00	14.77
91		1,2,4-Trichlorobenzene	1.445	1.560	-8.0	106	0.00	14.81
92		Naphthalene	2.727	2.880	-5.6	106	0.00	15.09

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3528-ICV3528
Lab FileID: N0080078.D

93		1,2,3-Trichlorobenzene	1.212	1.314	-8.4	109	0.00	15.26
94	I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	114	0.00	5.15
			Amount	Calc.	%Drift			
95		Ethanol	800.000	1094.104	-36.8#	144	0.01	4.18
			AvgRF	CCRF	%Dev			
96		acrolein	1.674	2.571	-53.6#	179	0.00	4.64
97		Tert Butyl Alcohol	1.590	1.580	0.6	111	0.00	5.23
98		tert Amyl alcohol	1.216	1.299	-6.8	110	0.00	7.40
			Amount	Calc.	%Drift			
99		Isobutyl alcohol	800.000	858.424	-7.3	120	-0.01	7.28
100		1,4-Dioxane	800.000	951.171	-18.9	135	0.00	8.49
			AvgRF	CCRF	%Dev			
101		3,3-Dimethyl-1-butanol	1.401	1.535	-9.6	123	0.00	10.26

(#) = Out of Range SPCC's out = 0 CCC's out = 1
N0080073.D 8260SCOXY101514.m Wed Oct 15 19:24:14 2014

Continuing Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3547-CC3528
Lab FileID: N0080523.D

Evaluate Continuing Calibration Report

Data File : C:\MSDchem\2\DATA\103114\N0080523.D Vial: 1
Acq On : 31 Oct 2014 8:05 am Operator: rayb
Sample : cc3528-4 Inst : MSVOA8
Misc : MS28742,VN3547,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\MSDchem\2\MET...260SCOXY101514.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Fri Oct 31 10:26:16 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	102	0.00	7.56
2		Dichlorodifluoromethane	0.435	0.377	13.3	90	0.01	2.67
3	P	Chloromethane	0.434	0.401	7.6	93	0.00	2.86
			Amount	Calc.	%Drift			
4	C	Vinyl Chloride	40.000	37.308	6.7	89	-0.02	3.00
5		Bromomethane	40.000	33.282	16.8	90	0.00	3.39
6		Chloroethane	40.000	36.622	8.4	97	0.00	3.53
7		Trichlorofluoromethane	40.000	39.425	1.4	101	0.00	3.75
			AvgRF	CCRF	%Dev			
8		Ethyl Ether	0.238	0.252	-5.9	100	0.00	4.01
			Amount	Calc.	%Drift			
9		1,2-Dichlorotrifluoroetha	40.000	44.864	-12.2	106	-0.01	4.24
			AvgRF	CCRF	%Dev			
10	C	1,1-Dichloroethene	0.400	0.435	-8.7	104	0.00	4.28
11		Freon 113	0.320	0.395	-23.4#	115	-0.02	4.33
			Amount	Calc.	%Drift			
12		Carbon Disulfide	40.000	43.716	-9.3	107	0.00	4.36
			AvgRF	CCRF	%Dev			
13		Iodomethane	0.675	0.775	-14.8	108	0.00	4.47
14		Methylene Chloride	0.464	0.480	-3.4	108	0.00	4.90
			Amount	Calc.	%Drift			
15		Acetone	200.000	217.294	-8.6	106	0.00	4.94
16		Methyl acetate	200.000	290.625	-45.3#	141	0.00	5.04
			AvgRF	CCRF	%Dev			
17		trans-1,2-Dichloroethene	0.472	0.521	-10.4	103	0.00	5.07
18		Hexane	0.274	0.374	-36.5#	127	0.00	5.12
19		Methyl Tert Butyl Ether	1.133	1.091	3.7	92	0.00	5.17
20		Di-isopropyl ether	1.089	1.116	-2.5	97	0.00	5.54
21	P	1,1-Dichloroethane	0.606	0.691	-14.0	107	0.00	5.72
22		Acrylonitrile	0.133	0.119	10.5	89	0.00	5.77
23		ETBE	1.064	1.052	1.1	94	0.00	5.93
			Amount	Calc.	%Drift			
24		Vinyl acetate	200.000	87.724	56.1#	45	0.00	5.93

Continuing Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3547-CC3528
Lab FileID: N0080523.D

			AvgRF	CCRF	%Dev			
25		cis-1,2-Dichloroethene	0.433	0.460	-6.2	105	0.00	6.29
26		2,2-Dichloropropane	0.532	0.514	3.4	95	0.00	6.41
27		Bromochloromethane	0.232	0.262	-12.9	107	0.00	6.50
28		Cyclohexane	0.581	0.685	-17.9	109	0.00	6.53
29	C	Chloroform	0.677	0.721	-6.5	105	0.00	6.55
			Amount	Calc.	%Drift			
30		Tetrahydrofuran	40.000	37.398	6.5	88	0.00	6.73
31	S	Dibromofluoromethane	50.000	50.370	-0.7	106	0.00	6.74
			AvgRF	CCRF	%Dev			
32		Carbon Tetrachloride	0.511	0.540	-5.7	97	0.00	6.73
33		1,1,1-Trichloroethane	0.574	0.606	-5.6	101	0.00	6.80
			Amount	Calc.	%Drift			
34		2-Butanone	200.000	206.846	-3.4	97	0.00	6.85
			AvgRF	CCRF	%Dev			
35		1,1-Dichloropropene	0.451	0.519	-15.1	103	0.00	6.91
			Amount	Calc.	%Drift			
36		tert-Butyl Formate	400.000	258.276	35.4#	58	0.00	7.00
			AvgRF	CCRF	%Dev			
37		Benzene	1.379	1.554	-12.7	106	0.00	7.16
38		TAME	1.122	1.091	2.8	93	0.00	7.23
39	S	1,2-Dichloroethane-d4	0.301	0.266	11.6	102	0.00	7.29
40		1,2-Dichloroethane	0.464	0.486	-4.7	101	0.00	7.36
			Amount	Calc.	%Drift			
41		Trichloroethene	40.000	46.322	-15.8	107	0.00	7.73
			AvgRF	CCRF	%Dev			
42		Methylcyclohexane	0.667	0.756	-13.3	107	0.00	7.74
43		Dibromomethane	0.243	0.259	-6.6	102	0.00	8.17
44	C	1,2-Dichloropropane	0.338	0.379	-12.1	103	-0.02	8.25
45		Bromodichloromethane	0.478	0.504	-5.4	98	0.00	8.31
			Amount	Calc.	%Drift			
46		2-Chloroethyl vinyl ether	200.000	274.782	-37.4#	128	0.00	8.82
			AvgRF	CCRF	%Dev			
47		cis-1,3-Dichloropropene	0.588	0.644	-9.5	99	0.00	8.92
48	I	Chlorobenzene-d5	1.000	1.000	0.0	109	0.00	10.65
49	S	Toluene-d8	1.287	1.162	9.7	105	0.00	9.10
50	C	Toluene	1.880	2.010	-6.9	106	0.00	9.16
51		2-Nitropropane	0.114	0.081	28.9#	76	0.00	9.38
52		4-Methyl-2-pentanone	0.362	0.351	3.0	98	0.00	9.49
			Amount	Calc.	%Drift			
53		trans-1,3-Dichloropropene	40.000	39.538	1.2	98	0.00	9.55
54		Tetrachloroethene	40.000	37.636	5.9	96	0.00	9.55
			AvgRF	CCRF	%Dev			
55		1,1,2-Trichloroethane	0.341	0.372	-9.1	111	0.00	9.72
56		Dibromochloromethane	0.536	0.551	-2.8	102	0.00	9.91
57		1,3-Dichloropropane	0.688	0.736	-7.0	107	0.00	10.00

Continuing Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3547-CC3528
Lab FileID: N0080523.D

58		1,2-Dibromoethane	0.460	0.477	-3.7	105	0.00	10.17
			Amount	Calc.	%Drift			
59		2-hexanone	200.000	206.912	-3.5	105	0.00	10.31
60		1-Chlorohexane	40.000	43.686	-9.2	105	0.00	10.60
			AvgRF	CCRF	%Dev			
61	C	Ethylbenzene	2.107	2.215	-5.1	107	0.00	10.67
62	P	Chlorobenzene	1.242	1.372	-10.5	110	0.00	10.67
63		1,1,1,2-Tetrachloroethane	0.526	0.538	-2.3	103	0.00	10.72
64		m,p-Xylene	1.543	1.633	-5.8	106	0.00	10.81
65		o-Xylene	1.631	1.687	-3.4	103	0.00	11.25
66		Styrene	1.420	1.560	-9.9	107	0.00	11.30
67	P	Bromoform	0.380	0.383	-0.8	100	0.00	11.36
68		Isopropylbenzene	2.080	2.217	-6.6	106	0.00	11.55
69	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	112	0.00	13.02
			Amount	Calc.	%Drift			
70	S	4-Bromofluorobenzene	50.000	46.023	8.0	102	0.00	11.87
			AvgRF	CCRF	%Dev			
71		n-Propylbenzene	3.713	4.029	-8.5	110	0.00	11.97
72		Bromobenzene	1.074	1.203	-12.0	114	0.00	11.99
73	P	1,1,2,2-Tetrachloroethane	0.891	0.980	-10.0	114	0.00	12.04
74		1,3,5-Trimethylbenzene	3.305	3.387	-2.5	107	0.00	12.16
75		2-Chlorotoluene	2.583	2.780	-7.6	109	0.00	12.16
			Amount	Calc.	%Drift			
76		trans-1,4-Dichloro-2-Bute	40.000	34.789	13.0	94	0.00	12.23
			AvgRF	CCRF	%Dev			
77		1,2,3-Trichloropropane	0.285	0.306	-7.4	111	0.00	12.20
			Amount	Calc.	%Drift			
78		Cyclohexanone	200.000	76.711	61.6#	40	0.00	12.27
			AvgRF	CCRF	%Dev			
79		4-Chlorotoluene	2.379	2.531	-6.4	109	0.00	12.33
80		tert-Butylbenzene	1.643	1.669	-1.6	105	0.00	12.49
81		1,2,4-Trimethylbenzene	3.254	3.482	-7.0	108	0.00	12.56
82		sec-Butylbenzene	3.771	4.079	-8.2	109	0.00	12.68
83		4-Isopropyltoluene	3.449	3.699	-7.2	110	0.00	12.81
			Amount	Calc.	%Drift			
84		1,3-Dichlorobenzene	40.000	45.083	-12.7	115	0.00	12.95
85		1,4-Dichlorobenzene	40.000	46.074	-15.2	117	0.00	13.03
			AvgRF	CCRF	%Dev			
86		n-Butylbenzene	1.889	2.094	-10.9	111	0.00	13.25
			Amount	Calc.	%Drift			
87		Benzyl Chloride	40.000	33.638	15.9	89	0.00	13.28
			AvgRF	CCRF	%Dev			
88		1,2-Dichlorobenzene	1.898	2.115	-11.4	115	0.00	13.46
89		1,2-Dibromo-3-Chloropropa	0.160	0.149	6.9	99	0.00	14.22
90		Hexachlorobutadiene	0.697	0.836	-19.9	121	0.00	14.77
91		1,2,4-Trichlorobenzene	1.445	1.658	-14.7	117	0.00	14.81
92		Naphthalene	2.727	2.828	-3.7	108	0.00	15.09

Continuing Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3547-CC3528
Lab FileID: N0080523.D

93		1,2,3-Trichlorobenzene	1.212	1.397	-15.3	120	0.00	15.26
94	I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	84	0.00	5.16
			Amount	Calc.	%Drift			
95		Ethanol	800.000	962.556	-20.3#	96	0.02	4.19
			AvgRF	CCRF	%Dev			
96		acrolein	1.674	2.277	-36.0#	117	0.00	4.64
97		Tert Butyl Alcohol	1.590	1.610	-1.3	84	0.00	5.23
98		tert Amyl alcohol	1.216	1.316	-8.2	82	0.00	7.40
			Amount	Calc.	%Drift			
99		Isobutyl alcohol	800.000	814.955	-1.9	84	-0.01	7.28
100		1,4-Dioxane	800.000	1362.406	-70.3#	143	0.00	8.49
			AvgRF	CCRF	%Dev			
101		3,3-Dimethyl-1-butanol	1.401	1.289	8.0	76	0.00	10.26

(#) = Out of Range SPCC's out = 0 CCC's out = 0
N0080073.D 8260SCOXY101514.m Fri Oct 31 10:45:37 2014

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3548-ICC3548
Lab FileID: N0080562.D

Response Factor Report MSVOA8

Method : C:\MSDchem\2\MET...8260nnew110114.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Sun Nov 02 16:39:22 2014
Response via : Initial Calibration

Calibration Files
1 =N0080559.D 2 =N0080560.D 3 =N0080561.D 4 =N0080562.D
5 =N0080563.D 6 =N0080564.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1) I	Fluorobenzene	----------ISTD----------							
2)	Dichlorodifluoromet	0.770	0.607	0.590	0.564	0.530	0.525	0.598	15.10
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9992								
	Response Ratio = 0.00000 + 0.53194 *A								
3) P	Chloromethane	1.076	0.818	0.759	0.719	0.663	0.664	0.783	19.78
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9988								
	Response Ratio = 0.00000 + 0.67149 *A								
4) C	Vinyl Chloride	0.689	0.506	0.508	0.497	0.489	0.495	0.531	14.70
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9999								
	Response Ratio = 0.00000 + 0.49385 *A								
5)	Bromomethane	0.574	0.338	0.300	0.273	0.245	0.235	0.328	38.57
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9963								
	Response Ratio = 0.00000 + 0.24341 *A								
6)	Chloroethane	0.488	0.259	0.259	0.239	0.206	0.198	0.275	39.09
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9937								
	Response Ratio = 0.00000 + 0.20605 *A								
7)	Trichlorofluorometh	0.746	0.616	0.587	0.565	0.529	0.522	0.594	13.83
8)	Ethyl Ether	0.526	0.421	0.319	0.314	0.293	0.306	0.363	25.33
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9987								
	Response Ratio = 0.00000 + 0.30381 *A								
9)	1,2-Dichlorotrifluo	0.716	0.532	0.409	0.394	0.354	0.371	0.463	30.11
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9980								
	Response Ratio = 0.00000 + 0.36944 *A								
10) C	1,1-Dichloroethene	0.864	0.695	0.543	0.530	0.477	0.505	0.602	24.72
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9977								
	Response Ratio = 0.00000 + 0.50064 *A								
11)	Freon 113	0.636	0.533	0.410	0.395	0.351	0.367	0.449	25.01
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9976								
	Response Ratio = 0.00000 + 0.36620 *A								
12)	Carbon Disulfide	1.914	1.326	0.942	0.902	0.747	0.786	1.103	40.59
	---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9938								
	Response Ratio = 0.00000 + 0.89468 *A + -0.06237 *A^2								
13)	Iodomethane	1.378	1.027	0.808	0.815	0.732	0.704	0.911	28.04
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9970								
	Response Ratio = 0.00000 + 0.72575 *A								

Initial Calibration Summary

Job Number: FA19358
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Sample: VN3548-ICC3548
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```
14)      Methylene Chloride  1.317 0.903 0.697 0.663 0.588 0.610 0.796  34.99
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9977
               Response Ratio = 0.00000 + 0.61102 *A

15)      Acetone             0.099 0.066 0.052 0.050 0.041 0.042 0.059  37.37
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9947
               Response Ratio = 0.00000 + 0.05058 *A + -0.00091 *A^2

16)      Methyl acetate      0.123 0.096 0.077 0.079 0.072 0.074 0.087  22.81
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9990
               Response Ratio = 0.00000 + 0.07378 *A

17)      trans-1,2-Dichloroe 1.039 0.813 0.657 0.644 0.575 0.585 0.719  24.81
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9982
               Response Ratio = 0.00000 + 0.59000 *A

18)      Hexane              0.765 0.662 0.503 0.468 0.422 0.425 0.541  26.03
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9982
               Response Ratio = 0.00000 + 0.43050 *A

19)      Methyl Tert Butyl E 1.923 1.405 1.115 1.148 1.039 1.101 1.289  26.07
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9978
               Response Ratio = 0.00000 + 1.08827 *A

20)      Di-isopropyl ether  2.355 1.871 1.537 1.548 1.414 1.466 1.699  21.15
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9987
               Response Ratio = 0.00000 + 1.46086 *A

21) P    1,1-Dichloroethane  1.336 1.052 0.818 0.805 0.723 0.752 0.915  25.93
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9981
               Response Ratio = 0.00000 + 0.75089 *A

22)      Acrylonitrile       0.198 0.157 0.165 0.163 0.159 0.153 0.166   9.71
23)      ETBE                2.032 1.620 1.358 1.366 1.235 1.298 1.485  20.09
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9981
               Response Ratio = 0.00000 + 1.28839 *A

24)      Vinyl acetate       0.613 0.525 0.562 0.543 0.526 0.489 0.543   7.69
25)      cis-1,2-Dichloroeth 0.757 0.595 0.473 0.469 0.428 0.447 0.528  23.90
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9985
               Response Ratio = 0.00000 + 0.44470 *A

26)      2,2-Dichloropropane 0.788 0.658 0.538 0.531 0.488 0.507 0.585  19.84
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9987
               Response Ratio = 0.00000 + 0.50442 *A

27)      Bromochloromethane  0.437 0.336 0.268 0.271 0.242 0.254 0.301  24.58
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9979
               Response Ratio = 0.00000 + 0.25235 *A

28)      Cyclohexane         1.241 1.088 0.908 0.909 0.807 0.831 0.964  17.41
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9979
               Response Ratio = 0.00000 + 0.83357 *A

29) C    Chloroform          1.275 0.964 0.743 0.729 0.655 0.681 0.841  28.43
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9982
               Response Ratio = 0.00000 + 0.67979 *A

30)      Tetrahydrofuran     0.229 0.164 0.114 0.125 0.116 0.119 0.144  31.42
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9987
```

```
              Response Ratio = 0.00000 + 0.11846 *A

31) S   Dibromofluoromethan 0.281 0.278 0.275 0.275 0.264 0.261 0.272   2.96
32)     Carbon Tetrachlorid 0.926 0.699 0.583 0.601 0.524 0.561 0.649  22.79
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9965
              Response Ratio = 0.00000 + 0.55476 *A

33)     1,1,1-Trichloroetha 0.998 0.785 0.634 0.641 0.583 0.604 0.708  22.47
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9986
              Response Ratio = 0.00000 + 0.60262 *A

34)     2-Butanone          0.397 0.267 0.199 0.197 0.172 0.177 0.235  36.82
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9975
              Response Ratio = 0.00000 + 0.17832 *A

35)     1,1-Dichloropropene 0.758 0.647 0.523 0.526 0.481 0.503 0.573  18.77
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9985
              Response Ratio = 0.00000 + 0.49925 *A

36)     tert-Butyl Formate                                     0.000  -1.00
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.0000
              Response Ratio = 0.00000 + 0.00000 *A

37)     Benzene             2.540 2.070 1.587 1.566 1.410 1.451 1.771  25.12
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9984
              Response Ratio = 0.00000 + 1.45437 *A

38)     TAME                1.525 1.252 1.033 1.069 0.988 1.052 1.153  17.66
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9980
              Response Ratio = 0.00000 + 1.03457 *A

39) S   1,2-Dichloroethane- 0.311 0.305 0.295 0.292 0.283 0.281 0.294   4.06
40)     1,2-Dichloroethane  1.028 0.753 0.572 0.555 0.512 0.534 0.659  30.39
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9986
              Response Ratio = 0.00000 + 0.53075 *A

41)     Trichloroethene     0.725 0.564 0.422 0.414 0.379 0.390 0.482  28.29
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9988
              Response Ratio = 0.00000 + 0.39033 *A

42)     Methylcyclohexane   1.039 0.927 0.762 0.754 0.680 0.702 0.811  17.45
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9983
              Response Ratio = 0.00000 + 0.70222 *A

43)     Dibromomethane      0.418 0.337 0.255 0.257 0.235 0.250 0.292  24.46
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9977
              Response Ratio = 0.00000 + 0.24689 *A

44) C   1,2-Dichloropropane 0.709 0.566 0.433 0.433 0.402 0.429 0.495  24.16
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9978
              Response Ratio = 0.00000 + 0.42206 *A

45)     Bromodichloromethan 0.748 0.611 0.495 0.499 0.468 0.500 0.553  19.42
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9979
              Response Ratio = 0.00000 + 0.49040 *A

46)     2-Chloroethyl vinyl 0.281 0.273 0.235 0.237 0.220 0.224 0.245  10.43
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9992
              Response Ratio = 0.00000 + 0.22441 *A
```

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3548-ICC3548
Lab FileID: N0080562.D

```
47)     cis-1,3-Dichloropro 0.811 0.707 0.607 0.622 0.589 0.631 0.661  12.67

48) I   Chlorobenzene-d5      ----------------ISTD--------------------
49) S   Toluene-d8          1.105 1.149 1.149 1.168 1.168 1.177 1.153   2.23
50) C   Toluene             3.349 2.644 2.057 2.068 1.878 1.917 2.319  24.80
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9988
              Response Ratio = 0.00000 + 1.92440 *A

51)     2-Nitropropane      0.127 0.103 0.093 0.101 0.098 0.105 0.104  11.37
52)     4-Methyl-2-pentanon 0.695 0.577 0.457 0.459 0.402 0.400 0.498  23.22
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9971
              Response Ratio = 0.00000 + 0.40796 *A

53)     trans-1,3-Dichlorop 0.765 0.687 0.592 0.622 0.597 0.634 0.649  10.16
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9983
              Response Ratio = 0.00000 + 0.62099 *A

54)     Tetrachloroethene   0.969 0.833 0.638 0.649 0.592 0.617 0.716  21.02
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9985
              Response Ratio = 0.00000 + 0.61380 *A

55)     1,1,2-Trichloroetha 0.607 0.465 0.357 0.363 0.336 0.349 0.413  25.58
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9989
              Response Ratio = 0.00000 + 0.34709 *A

56)     Dibromochloromethan 0.755 0.626 0.526 0.556 0.532 0.574 0.595  14.50
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9973
              Response Ratio = 0.00000 + 0.55928 *A

57)     1,3-Dichloropropane 1.152 0.904 0.711 0.726 0.675 0.719 0.815  22.61
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9980
              Response Ratio = 0.00000 + 0.70685 *A

58)     1,2-Dibromoethane   0.660 0.581 0.458 0.476 0.449 0.484 0.518  16.25
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9974
              Response Ratio = 0.00000 + 0.47284 *A

59)     2-hexanone          0.413 0.371 0.321 0.327 0.294 0.299 0.337  13.54
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9984
              Response Ratio = 0.00000 + 0.30100 *A

60)     1-Chlorohexane      0.833 0.810 0.694 0.714 0.677 0.716 0.741   8.73
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9986
              Response Ratio = 0.00000 + 0.70388 *A

61) C   Ethylbenzene        3.841 2.993 2.345 2.292 2.077 2.086 2.606  26.55
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9986
              Response Ratio = 0.00000 + 2.11036 *A

62) P   Chlorobenzene       2.323 1.827 1.397 1.377 1.249 1.287 1.577  26.66
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9986
              Response Ratio = 0.00000 + 1.28778 *A

63)     1,1,1,2-Tetrachloro 0.777 0.662 0.536 0.554 0.516 0.559 0.601  16.65
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9971
              Response Ratio = 0.00000 + 0.54586 *A

64)     m,p-Xylene          2.574 2.179 1.745 1.712 1.520 1.486 1.869  22.73
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9970
              Response Ratio = 0.00000 + 1.52429 *A
```

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3548-ICC3548
Lab FileID: N0080562.D

```
65)     o-Xylene            2.326 2.062 1.722 1.758 1.632 1.664 1.861  14.77
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9992
              Response Ratio = 0.00000 + 1.66601 *A

66)     Styrene             1.677 1.746 1.538 1.593 1.490 1.549 1.599   6.00
67) P   Bromoform           0.483 0.413 0.351 0.383 0.363 0.398 0.398  11.79
68)     Isopropylbenzene    2.884 2.741 2.314 2.355 2.104 2.148 2.424  13.15
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9982
              Response Ratio = 0.00000 + 2.15947 *A


69) I   1,4-Dichlorobenzene-d ----------------ISTD---------------------
70) S   4-Bromofluorobenzen 0.788 0.793 0.780 0.775 0.785 0.780 0.783   0.81
71)     n-Propylbenzene     6.553 5.623 4.326 4.187 3.820 3.774 4.714  23.85
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9985
              Response Ratio = 0.00000 + 3.84223 *A

72)     Bromobenzene        2.163 1.641 1.236 1.212 1.135 1.177 1.427  28.35
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9990
              Response Ratio = 0.00000 + 1.17011 *A

73) P   1,1,2,2-Tetrachloro 1.862 1.310 0.974 0.940 0.883 0.914 1.147  33.44
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9991
              Response Ratio = 0.00000 + 0.90927 *A

74)     1,3,5-Trimethylbenz 5.172 4.585 3.613 3.553 3.237 3.213 3.896  20.54
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9986
              Response Ratio = 0.00000 + 3.26358 *A

75)     2-Chlorotoluene     4.986 4.028 3.025 2.885 2.607 2.627 3.360  28.34
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9985
              Response Ratio = 0.00000 + 2.65747 *A

76)     trans-1,4-Dichloro- 0.142 0.134 0.133 0.171 0.186 0.210 0.163  19.40
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9905
              Response Ratio = 0.00000 + 0.19750 *A

77)     1,2,3-Trichloroprop 0.506 0.386 0.299 0.301 0.278 0.297 0.345  25.45
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9978
              Response Ratio = 0.00000 + 0.29236 *A

78)     Cyclohexanone       0.009 0.014 0.016 0.019 0.019 0.020 0.016  26.15
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9993
              Response Ratio = 0.00000 + 0.01678 *A + 0.00033 *A^2

79)     4-Chlorotoluene     4.176 3.321 2.672 2.641 2.477 2.549 2.973  22.28
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9993
              Response Ratio = 0.00000 + 2.54097 *A

80)     tert-Butylbenzene   2.693 2.228 1.740 1.763 1.623 1.700 1.958  21.40
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9985
              Response Ratio = 0.00000 + 1.68539 *A

81)     1,2,4-Trimethylbenz 5.059 4.686 3.671 3.625 3.298 3.334 3.946  18.83
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9987
              Response Ratio = 0.00000 + 3.36129 *A

82)     sec-Butylbenzene    6.397 5.646 4.383 4.271 3.873 3.863 4.739  22.00
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9985
```

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```
              Response Ratio = 0.00000 + 3.91948 *A

83)     4-Isopropyltoluene  5.194 4.974 3.953 3.888 3.551 3.563 4.187  17.13
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9988
              Response Ratio = 0.00000 + 3.60196 *A

84)     1,3-Dichlorobenzene 3.327 2.764 2.162 2.174 2.013 2.102 2.424  21.32
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9987
              Response Ratio = 0.00000 + 2.08537 *A

85)     1,4-Dichlorobenzene 4.504 3.430 2.456 2.445 2.238 2.318 2.899  30.99
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9987
              Response Ratio = 0.00000 + 2.31186 *A

86)     n-Butylbenzene      2.670 2.549 2.116 2.187 1.996 2.058 2.263  12.31
87)     Benzyl Chloride     0.218 0.301 0.308 0.375 0.372 0.415 0.332  21.25
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9944
              Response Ratio = 0.00000 + 0.39616 *A

88)     1,2-Dichlorobenzene 3.692 2.851 2.182 2.169 1.982 2.072 2.491  26.65
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9984
              Response Ratio = 0.00000 + 2.05919 *A

89)     1,2-Dibromo-3-Chlor 0.217 0.175 0.133 0.151 0.140 0.152 0.161  19.18
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9964
              Response Ratio = 0.00000 + 0.14803 *A

90)     Hexachlorobutadiene 1.507 1.190 0.887 0.908 0.835 0.869 1.033  25.70
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9986
              Response Ratio = 0.00000 + 0.86400 *A

91)     1,2,4-Trichlorobenz 2.430 2.039 1.613 1.693 1.587 1.657 1.836  18.20
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9988
              Response Ratio = 0.00000 + 1.63979 *A

92)     Naphthalene         3.965 3.196 2.808 3.006 2.807 2.947 3.121  14.02
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9987
              Response Ratio = 0.00000 + 2.90901 *A

93)     1,2,3-Trichlorobenz 2.188 1.802 1.396 1.442 1.325 1.402 1.593  21.14
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9981
              Response Ratio = 0.00000 + 1.38437 *A


94) I   Tert Butyl Alcohol-d1 ----------------ISTD--------------------
95)     Ethanol                                                0.000  -1.00
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.0000
              Response Ratio = 0.00000 + 0.00000 *A + 0.00000 *A^2

96)     acrolein            2.563 2.191 2.745 2.723 2.930 2.977 2.688  10.64
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 2.65088 *A + 0.16868 *A^2

97)     Tert Butyl Alcohol  3.151 2.281 1.640 1.672 1.574 1.622 1.990  31.51
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9992
              Response Ratio = 0.00000 + 1.61423 *A

98)     tert Amyl alcohol   1.932 1.518 1.315 1.419 1.338 1.458 1.497  15.09
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9968
              Response Ratio = 0.00000 + 1.41635 *A
```

Initial Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3548-ICC3548
Lab FileID: N0080562.D

```
 99)     Isobutyl alcohol                                          0.000  -1.00
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.0000
               Response Ratio = 0.00000 + 0.00000 *A

100)     1,4-Dioxane         0.147 0.191 0.172 0.182 0.186 0.199 0.179  10.30
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9974
               Response Ratio = 0.00000 + 0.19300 *A

101)     3,3-Dimethyl-1-buta                                       0.000  -1.00
 ---------------------------------------------------------------------------
 (#) = Out of Range

           8260nnew110114.m        Sun Nov 02 16:46:52 2014
```

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3548-ICV3548
Lab FileID: N0080566.D

Evaluate Continuing Calibration Report

Data File : C:\MSDchem\2\DATA\110114\N0080566.D Vial: 8
Acq On : 1 Nov 2014 11:08 pm Operator: rayb
Sample : icv3548-4 Inst : MSVOA8
Misc : MS28784,VN3548,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\MSDchem\2\MET...8260nnew110114.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Sun Nov 02 16:39:22 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	98	0.00	7.56
			Amount	Calc.	%Drift			
2		Dichlorodifluoromethane	40.000	36.624	8.4	85	0.02	2.67
3	P	Chloromethane	40.000	37.377	6.6	86	0.01	2.87
4	C	Vinyl Chloride	40.000	38.895	2.8	95	0.00	3.01
5		Bromomethane	40.000	44.182	-10.5	97	0.00	3.39
6		Chloroethane	40.000	44.599	-11.5	95	0.00	3.54
			AvgRF	CCRF	%Dev			
7		Trichlorofluoromethane	0.594	0.551	7.2	96	0.00	3.75
			Amount	Calc.	%Drift			
8		Ethyl Ether	40.000	42.380	-6.0	100	0.00	4.01
9		1,2-Dichlorotrifluoroetha	40.000	44.830	-12.1	103	-0.01	4.24
10	C	1,1-Dichloroethene	40.000	43.614	-9.0	101	0.00	4.28
11		Freon 113	40.000	41.539	-3.8	95	-0.02	4.33
12		Carbon Disulfide	40.000	46.972	-17.4	107	0.00	4.36
13		Iodomethane	40.000	38.687	3.3	85	0.00	4.47
14		Methylene Chloride	40.000	42.211	-5.5	95	0.00	4.91
15		Acetone	200.000	244.774	-22.4#	111	0.00	4.94
16		Methyl acetate	200.000	166.971	16.5	77	0.00	5.04
17		trans-1,2-Dichloroethene	40.000	42.244	-5.6	95	0.00	5.07
18		Hexane	40.000	43.021	-7.6	97	0.00	5.12
19		Methyl Tert Butyl Ether	40.000	41.938	-4.8	98	0.00	5.17
20		Di-isopropyl ether	40.000	42.239	-5.6	98	0.00	5.54
21	P	1,1-Dichloroethane	40.000	39.859	0.4	91	0.00	5.72
			AvgRF	CCRF	%Dev			
22		Acrylonitrile	0.166	0.157	5.4	95	0.00	5.77
			Amount	Calc.	%Drift			
23		ETBE	40.000	41.924	-4.8	97	0.00	5.93
			AvgRF	CCRF	%Dev			
24		Vinyl acetate	0.543	0.785	-44.6#	142	0.00	5.93
			Amount	Calc.	%Drift			
25		cis-1,2-Dichloroethene	40.000	40.860	-2.1	95	0.00	6.29
26		2,2-Dichloropropane	40.000	40.869	-2.2	95	0.00	6.42
27		Bromochloromethane	40.000	41.914	-4.8	96	0.00	6.50
28		Cyclohexane	40.000	41.151	-2.9	93	0.00	6.53

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3548-ICV3548
Lab FileID: N0080566.D

29	C	Chloroform	40.000	40.593	-1.5	93	0.00	6.55
30		Tetrahydrofuran	40.000	43.353	-8.4	101	0.00	6.73
		----------	AvgRF	CCRF	%Dev	----------		
31	S	Dibromofluoromethane	0.272	0.271	0.4	97	0.00	6.74
		----------	Amount	Calc.	%Drift	----------		
32		Carbon Tetrachloride	40.000	40.941	-2.4	93	0.00	6.73
33		1,1,1-Trichloroethane	40.000	39.780	0.5	92	0.00	6.79
34		2-Butanone	200.000	209.045	-4.5	93	0.00	6.85
35		1,1-Dichloropropene	40.000	41.932	-4.8	98	0.00	6.91
36		tert-Butyl Formate		----------NA----------				
37		Benzene	40.000	40.510	-1.3	92	0.00	7.16
38		TAME	40.000	41.900	-4.7	100	0.00	7.23
		----------	AvgRF	CCRF	%Dev	----------		
39	S	1,2-Dichloroethane-d4	0.294	0.286	2.7	96	0.00	7.29
		----------	Amount	Calc.	%Drift	----------		
40		1,2-Dichloroethane	40.000	41.180	-2.9	97	0.00	7.36
41		Trichloroethene	40.000	41.251	-3.1	96	0.00	7.73
42		Methylcyclohexane	40.000	42.562	-6.4	97	0.00	7.74
43		Dibromomethane	40.000	40.419	-1.0	95	0.00	8.17
44	C	1,2-Dichloropropane	40.000	40.542	-1.4	97	-0.02	8.25
45		Bromodichloromethane	40.000	39.820	0.4	96	0.00	8.31
46		2-Chloroethyl vinyl ether	200.000	125.418	37.3#	58	0.00	8.82
		----------	AvgRF	CCRF	%Dev	----------		
47		cis-1,3-Dichloropropene	0.661	0.587	11.2	93	0.00	8.92
48	I	Chlorobenzene-d5	1.000	1.000	0.0	98	0.00	10.65
49	S	Toluene-d8	1.153	1.170	-1.5	98	0.00	9.10
		----------	Amount	Calc.	%Drift	----------		
50	C	Toluene	40.000	41.383	-3.5	95	0.00	9.16
		----------	AvgRF	CCRF	%Dev	----------		
51		2-Nitropropane	0.104	0.099	4.8	97	0.00	9.38
		----------	Amount	Calc.	%Drift	----------		
52		4-Methyl-2-pentanone	200.000	215.344	-7.7	94	0.00	9.49
53		trans-1,3-Dichloropropene	40.000	41.663	-4.2	102	0.00	9.55
54		Tetrachloroethene	40.000	40.674	-1.7	95	0.00	9.55
55		1,1,2-Trichloroethane	40.000	41.170	-2.9	97	0.00	9.72
56		Dibromochloromethane	40.000	39.784	0.5	98	0.00	9.91
57		1,3-Dichloropropane	40.000	40.375	-0.9	97	0.00	10.00
58		1,2-Dibromoethane	40.000	40.006	-0.0	98	0.00	10.17
59		2-hexanone	200.000	220.360	-10.2	100	0.00	10.31
60		1-Chlorohexane	40.000	40.673	-1.7	99	0.00	10.60
61	C	Ethylbenzene	40.000	42.112	-5.3	95	0.00	10.67
62	P	Chlorobenzene	40.000	44.541	-11.4	102	0.00	10.67
63		1,1,1,2-Tetrachloroethane	40.000	39.850	0.4	96	0.00	10.72
64		m,p-Xylene	80.000	89.378	-11.7	98	0.00	10.81
65		o-Xylene	40.000	44.061	-10.2	103	0.00	11.24
		----------	AvgRF	CCRF	%Dev	----------		
66		Styrene	1.599	1.541	3.6	95	0.00	11.30
67	P	Bromoform	0.398	0.363	8.8	93	0.00	11.36
		----------	Amount	Calc.	%Drift	----------		

Initial Calibration Verification

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3548-ICV3548
Lab FileID: N0080566.D

68		Isopropylbenzene	40.000	44.926	-12.3	101	0.00	11.55
			AvgRF	CCRF	%Dev			
69	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	98	0.00	13.01
70	S	4-Bromofluorobenzene	0.783	0.769	1.8	97	0.00	11.87
			Amount	Calc.	%Drift			
71		n-Propylbenzene	40.000	45.363	-13.4	102	0.00	11.97
72		Bromobenzene	40.000	39.806	0.5	94	0.00	11.99
73	P	1,1,2,2-Tetrachloroethane	40.000	38.791	3.0	92	0.00	12.04
74		1,3,5-Trimethylbenzene	40.000	40.455	-1.1	91	0.00	12.16
75		2-Chlorotoluene	40.000	43.494	-8.7	98	0.00	12.16
76		trans-1,4-Dichloro-2-Bute	40.000	35.398	11.5	100	0.00	12.22
77		1,2,3-Trichloropropane	40.000	39.248	1.9	93	0.00	12.20
78		Cyclohexanone	200.000	715.588	-257.8#	396	0.00	12.27
79		4-Chlorotoluene	40.000	43.569	-8.9	102	0.00	12.33
80		tert-Butylbenzene	40.000	42.127	-5.3	98	0.00	12.49
81		1,2,4-Trimethylbenzene	40.000	40.451	-1.1	92	0.00	12.56
82		sec-Butylbenzene	40.000	43.987	-10.0	99	0.00	12.67
83		4-Isopropyltoluene	40.000	43.209	-8.0	98	0.00	12.81
84		1,3-Dichlorobenzene	40.000	43.045	-7.6	101	0.00	12.95
85		1,4-Dichlorobenzene	40.000	40.071	-0.2	93	0.00	13.03
			AvgRF	CCRF	%Dev			
86		n-Butylbenzene	2.263	2.007	11.3	90	0.00	13.25
			Amount	Calc.	%Drift			
87		Benzyl Chloride	40.000	33.225	16.9	86	0.00	13.27
88		1,2-Dichlorobenzene	40.000	42.397	-6.0	98	0.00	13.46
89		1,2-Dibromo-3-Chloropropa	40.000	36.758	8.1	88	0.00	14.22
90		Hexachlorobutadiene	40.000	37.714	5.7	88	0.00	14.76
91		1,2,4-Trichlorobenzene	40.000	37.363	6.6	88	0.00	14.81
92		Naphthalene	40.000	36.194	9.5	86	0.00	15.09
93		1,2,3-Trichlorobenzene	40.000	36.642	8.4	86	0.00	15.26
			AvgRF	CCRF	%Dev			
94	I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	96	0.00	5.16
			Amount	Calc.	%Drift			
95		Ethanol		----------NA----------				
96		acrolein	200.000	124.728	37.6#	60	0.00	4.64
97		Tert Butyl Alcohol	400.000	447.275	-11.8	104	0.00	5.24
98		tert Amyl alcohol	400.000	411.468	-2.9	99	0.00	7.40
99		Isobutyl alcohol		----------NA----------				
100		1,4-Dioxane	800.000	867.542	-8.4	110	0.00	8.49
			AvgRF	CCRF	%Dev			
101		3,3-Dimethyl-1-butanol	0.000	0.326	0.0	0#	0.04	10.31

(#) = Out of Range SPCC's out = 0 CCC's out = 0
N0080562.D 8260nnew110114.m Sun Nov 02 16:46:38 2014

Continuing Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3549-CC3548
Lab FileID: N0080569.D

Evaluate Continuing Calibration Report

Data File : C:\MSDchem\2\DATA\110114\N0080569.D Vial: 1
Acq On : 2 Nov 2014 3:51 pm Operator: rayb
Sample : cc3548-4 Inst : MSVOA8
Misc : MS28784,VN3549,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\MSDchem\2\MET...8260nnew110114.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Sun Nov 02 16:39:22 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	102	0.00	7.56
			Amount	Calc.	%Drift			
2		Dichlorodifluoromethane	40.000	40.823	-2.1	98	0.01	2.67
3	P	Chloromethane	40.000	40.767	-1.9	97	0.01	2.87
4	C	Vinyl Chloride	40.000	40.017	-0.0	101	0.00	3.01
5		Bromomethane	40.000	44.226	-10.6	101	0.00	3.39
6		Chloroethane	40.000	47.354	-18.4	104	0.00	3.53
			AvgRF	CCRF	%Dev			
7		Trichlorofluoromethane	0.594	0.566	4.7	102	0.00	3.75
			Amount	Calc.	%Drift			
8		Ethyl Ether	40.000	42.446	-6.1	105	0.00	4.01
9		1,2-Dichlorotrifluoroetha	40.000	42.341	-5.9	101	-0.01	4.24
10	C	1,1-Dichloroethene	40.000	41.414	-3.5	100	0.00	4.28
11		Freon 113	40.000	42.113	-5.3	100	-0.01	4.34
12		Carbon Disulfide	40.000	38.206	4.5	92	-0.01	4.35
13		Iodomethane	40.000	39.159	2.1	89	0.00	4.47
14		Methylene Chloride	40.000	41.492	-3.7	98	0.00	4.90
15		Acetone	200.000	257.441	-28.7#	121	0.00	4.93
16		Methyl acetate	200.000	213.654	-6.8	102	0.00	5.04
17		trans-1,2-Dichloroethene	40.000	42.045	-5.1	98	0.00	5.07
18		Hexane	40.000	43.041	-7.6	101	0.00	5.12
19		Methyl Tert Butyl Ether	40.000	41.598	-4.0	101	0.00	5.17
20		Di-isopropyl ether	40.000	42.172	-5.4	102	0.00	5.54
21	P	1,1-Dichloroethane	40.000	41.555	-3.9	99	0.00	5.72
			AvgRF	CCRF	%Dev			
22		Acrylonitrile	0.166	0.161	3.0	101	0.00	5.77
			Amount	Calc.	%Drift			
23		ETBE	40.000	42.088	-5.2	101	0.00	5.93
			AvgRF	CCRF	%Dev			
24		Vinyl acetate	0.543	0.534	1.7	100	0.00	5.93
			Amount	Calc.	%Drift			
25		cis-1,2-Dichloroethene	40.000	40.217	-0.5	97	0.00	6.29
26		2,2-Dichloropropane	40.000	42.162	-5.4	102	0.00	6.41
27		Bromochloromethane	40.000	41.151	-2.9	98	0.00	6.50
28		Cyclohexane	40.000	42.543	-6.4	100	0.00	6.53

Continuing Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3549-CC3548
Lab FileID: N0080569.D

29	C	Chloroform	40.000	42.175	-5.4	100	0.00	6.55
30		Tetrahydrofuran	40.000	44.288	-10.7	107	-0.01	6.72
			AvgRF	CCRF	%Dev			
31	S	Dibromofluoromethane	0.272	0.269	1.1	100	-0.01	6.74
			Amount	Calc.	%Drift			
32		Carbon Tetrachloride	40.000	40.328	-0.8	95	0.00	6.73
33		1,1,1-Trichloroethane	40.000	41.261	-3.2	99	0.00	6.80
34		2-Butanone	200.000	229.861	-14.9	106	0.00	6.85
35		1,1-Dichloropropene	40.000	41.600	-4.0	101	0.00	6.91
36		tert-Butyl Formate		----------NA----------				
37		Benzene	40.000	42.731	-6.8	101	0.00	7.16
38		TAME	40.000	41.142	-2.9	102	0.00	7.23
			AvgRF	CCRF	%Dev			
39	S	1,2-Dichloroethane-d4	0.294	0.289	1.7	101	0.00	7.29
			Amount	Calc.	%Drift			
40		1,2-Dichloroethane	40.000	42.373	-5.9	103	0.00	7.36
41		Trichloroethene	40.000	42.455	-6.1	102	0.00	7.73
42		Methylcyclohexane	40.000	42.350	-5.9	101	0.00	7.74
43		Dibromomethane	40.000	41.335	-3.3	101	0.00	8.17
44	C	1,2-Dichloropropane	40.000	41.364	-3.4	103	-0.02	8.25
45		Bromodichloromethane	40.000	41.269	-3.2	103	0.00	8.30
46		2-Chloroethyl vinyl ether	200.000	215.922	-8.0	104	0.00	8.82
			AvgRF	CCRF	%Dev			
47		cis-1,3-Dichloropropene	0.661	0.626	5.3	103	0.00	8.92
48	I	Chlorobenzene-d5	1.000	1.000	0.0	102	0.00	10.65
49	S	Toluene-d8	1.153	1.160	-0.6	102	0.00	9.10
			Amount	Calc.	%Drift			
50	C	Toluene	40.000	42.457	-6.1	101	0.00	9.16
			AvgRF	CCRF	%Dev			
51		2-Nitropropane	0.104	0.105	-1.0	107	0.00	9.38
			Amount	Calc.	%Drift			
52		4-Methyl-2-pentanone	200.000	224.653	-12.3	102	0.00	9.49
53		trans-1,3-Dichloropropene	40.000	40.978	-2.4	105	0.00	9.55
54		Tetrachloroethene	40.000	42.213	-5.5	102	0.00	9.55
55		1,1,2-Trichloroethane	40.000	41.764	-4.4	102	0.00	9.72
56		Dibromochloromethane	40.000	40.179	-0.4	103	0.00	9.91
57		1,3-Dichloropropane	40.000	41.447	-3.6	103	0.00	10.00
58		1,2-Dibromoethane	40.000	40.978	-2.4	104	-0.01	10.17
59		2-hexanone	200.000	235.875	-17.9	111	0.00	10.31
60		1-Chlorohexane	40.000	40.669	-1.7	103	0.00	10.60
61	C	Ethylbenzene	40.000	43.135	-7.8	102	0.00	10.67
62	P	Chlorobenzene	40.000	42.751	-6.9	102	0.00	10.67
63		1,1,1,2-Tetrachloroethane	40.000	40.219	-0.5	101	0.00	10.72
64		m,p-Xylene	80.000	89.033	-11.3	101	0.00	10.81
65		o-Xylene	40.000	42.070	-5.2	102	0.00	11.24
			AvgRF	CCRF	%Dev			
66		Styrene	1.599	1.577	1.4	101	0.00	11.30
67	P	Bromoform	0.398	0.384	3.5	103	0.00	11.36
			Amount	Calc.	%Drift			

Continuing Calibration Summary

Job Number: FA19358
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VN3549-CC3548
Lab FileID: N0080569.D

68		Isopropylbenzene	40.000	42.688	-6.7	100	0.00	11.55
			AvgRF	CCRF	%Dev			
69	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	101	0.00	13.01
70	S	4-Bromofluorobenzene	0.783	0.765	2.3	100	0.00	11.86
			Amount	Calc.	%Drift			
71		n-Propylbenzene	40.000	43.284	-8.2	100	0.00	11.97
72		Bromobenzene	40.000	41.022	-2.6	100	0.00	11.99
73	P	1,1,2,2-Tetrachloroethane	40.000	41.404	-3.5	101	0.00	12.04
74		1,3,5-Trimethylbenzene	40.000	43.059	-7.6	100	0.00	12.16
75		2-Chlorotoluene	40.000	42.667	-6.7	99	0.00	12.16
76		trans-1,4-Dichloro-2-Bute	40.000	45.942	-14.9	134	0.00	12.22
77		1,2,3-Trichloropropane	40.000	40.948	-2.4	100	0.00	12.20
78		Cyclohexanone	200.000	199.981	0.0	97	0.00	12.27
79		4-Chlorotoluene	40.000	41.244	-3.1	100	0.00	12.33
80		tert-Butylbenzene	40.000	41.562	-3.9	100	0.00	12.49
81		1,2,4-Trimethylbenzene	40.000	42.836	-7.1	100	0.00	12.56
82		sec-Butylbenzene	40.000	43.065	-7.7	100	0.00	12.67
83		4-Isopropyltoluene	40.000	43.148	-7.9	101	0.00	12.81
84		1,3-Dichlorobenzene	40.000	41.501	-3.8	101	0.00	12.95
85		1,4-Dichlorobenzene	40.000	41.716	-4.3	100	0.00	13.03
			AvgRF	CCRF	%Dev			
86		n-Butylbenzene	2.263	2.129	5.9	98	0.00	13.25
			Amount	Calc.	%Drift			
87		Benzyl Chloride	40.000	38.811	3.0	104	0.00	13.27
88		1,2-Dichlorobenzene	40.000	41.820	-4.6	100	0.00	13.46
89		1,2-Dibromo-3-Chloropropa	40.000	41.682	-4.2	103	0.00	14.22
90		Hexachlorobutadiene	40.000	41.612	-4.0	100	0.00	14.77
91		1,2,4-Trichlorobenzene	40.000	41.129	-2.8	101	0.00	14.81
92		Naphthalene	40.000	41.031	-2.6	100	0.00	15.09
93		1,2,3-Trichlorobenzene	40.000	41.253	-3.1	100	0.00	15.26
			AvgRF	CCRF	%Dev			
94	I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	95	0.00	5.15
			Amount	Calc.	%Drift			
95		Ethanol		----------NA----------				
96		acrolein	200.000	241.542	-20.8#	118	0.00	4.64
97		Tert Butyl Alcohol	400.000	443.746	-10.9	101	0.00	5.23
98		tert Amyl alcohol	400.000	425.295	-6.3	100	-0.01	7.39
99		Isobutyl alcohol		----------NA----------				
100		1,4-Dioxane	800.000	870.837	-8.9	109	0.00	8.49
			AvgRF	CCRF	%Dev			
101		3,3-Dimethyl-1-butanol		----------NA----------				

(#) = Out of Range SPCC's out = 0 CCC's out = 0
N0080562.D 8260nnew110114.m Sun Nov 02 17:20:48 2014

Southeast ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

(Accutest New Jersey)

Includes the following where applicable:

- Chain of Custody

ACCUTEST LABORATORIES

CHAIN OF CUSTODY

4405 Vineland Rd, Suite C-15, Orlando, FL 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.accutest.com

FED-EX Tracking # 6127 2750 5479 | Bottle Order Control #
Accutest Quote # | Accutest Job # FA19358

Client / Reporting Information

Company Name: Accutest Laboratories
Street Address: 4405 Vineland Rd, Suite C-15
City: Orlando State: FL Zip: 32811
Project Contact: andreac E-mail: andreac@accutest.com
Phone #: 407-425-6700 Fax #:
Sampler(s) Name(s): MB Phone:

Project Information

Project Name: LC-39B, KSC, FL
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention: see comments

Requested Analysis (see TEST CODE sheet)

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	ALMS by 6020	LAB USE ONLY
4F	39B-LOX-TA0012S-009.5-20141022		10/22/14	1:23:00 PM	MB	AQ	1			1						X	
4	39B-LOX-TA0012S-009.5-20141022		10/22/14	1:23:00 PM	MB	AQ	1			1						X	FL

Turnaround Time (Business days)

Approved By (Accutest PM): / Date:

- [ ] 10 Day (business)
- [ ] 5-7 Day
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [X] other 7

Rush T/A data available VIA Lablink

Data Deliverable Information

- [ ] Commercial "A" (Level 1, Results Only)
- [ ] Commercial "B" (Level 2, Results + QC summary)
- [ ] REDT1 (Level 3)
- [ ] FULT1 (Level 4)
- [ ] DOD FULT1 (Level 4)
- [X] Other REDT1
- [ ] EDD Format

Comments / Special Instructions

ALNJ

REVISED

This sample was already filtered & preserved by ALSE 10/29 TH

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date/Time	Received By:	Relinquished By:	Date/Time	Received By:
1	10/28/14 1700	1 FED EX	2 FED EX	10/29/14 10:10	2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # ALSE seal [ ] Intact [ ] Not intact	Preserved where applicable: NA	On Ice: X Cooler Temp. 1.6°C

3B HL

IP JM

7.1 7

FA19358: Chain of Custody
Page 1 of 3
Accutest New Jersey

ACCUTEST LABORATORIES

CHAIN OF CUSTODY

4405 Vineland Rd, Suite C-15, Orlando, FL 32811
TEL 407-425-6700 FAX: 407-425-0707
www.accutest.com

FED-EX Tracking # 6127 2750 5479 | Bottle Order Control #
Accutest Quote # | Accutest Job # FA19358

Client / Reporting Information

Company Name: Accutest Laboratories
Street Address: 4405 Vineland Rd, Suite C-15
City: Orlando State: FL Zip: 32811
Project Contact: andreac E-mail: andreac@accutest.com
Phone #: 407-425-6700 Fax #:
Sampler(s) Name(s): MB Phone:

Project Information

Project Name: LC-39B, KSC, FL
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	ALMS by 6020	LAB USE ONLY
4F	39B-LOX-TA0012S-009.5-20141022		10/22/14	1:23:00 PM	MB	AQ	1				1					X	
4	39B-LOX-TA0012S-009.5-20141022		10/22/14	1:23:00 PM	MB	AQ	1			1						X	FL

see counts

Turnaround Time (Business days)

Approved By (Accutest PM): / Date:

- [ ] 10 Day (business)
- [ ] 5-7 Day
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [X] other 7

Rush T/A data available VIA Lablink

Data Deliverable Information

- [ ] Commercial "A" (Level 1, Results Only)
- [ ] Commercial "B" (Level 2, Results + QC summary)
- [ ] REDT1 (Level 3)
- [ ] FULT1 (Level 4)
- [ ] DOD FULT1 (Level 4)
- [X] Other REDT1
- [ ] EDD Format

Comments / Special Instructions

ALNJ

REVISED

This sample was already filtered & preserved by ALSE 10/29 TH

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date/Time	Received By:	Relinquished By:	Date Time	Received By:
1	10/28/14 1700	1 FED EX	2 FED EX	10/29/14 10:10	2
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3		3	4		4
Relinquished by:	Date Time:	Received By:	Custody Seal # ALSE seal	Intact / Not intact	Preserved where applicable: TH	On Ice: X	Cooler Temp. 1.6°C
5		5					

3B HL

IP JR

7.1 7

FA19358: Chain of Custody
Page 2 of 3

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: FA19358 **Client:** **Project:**

Date / Time Received: 10/29/2014 **Delivery Method:** **Airbill #'s:**

Cooler Temps (Initial/Adjusted): #1: (1.6/1.6); 0

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservatio	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:732.329.0200

2235 US Highway 130
F: 732.329.3499

Dayton, New Jersey
www/accutest.com

7.1
7

FA19358: Chain of Custody
Page 3 of 3

Southeast ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

(Accutest New Jersey)

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:11	MA35299-STD1	1		STDA
13:15	MA35299-STD2	1		STDA
13:20	MA35299-STD3	1		STDB
13:25	MA35299-STD4	1		STDC
13:29	MA35299-STD5	1		STDD
13:34	MA35299-STD6	1		STDE
13:39	MA35299-STD7	1		STDF
13:43	MA35299-STD8	1		STDG
13:48	MA35299-STD9	1		STDH
13:53	MA35299-STD10	1		STDI
13:57	MA35299-STD11	1		STDJ
14:02	MA35299-STD12	1		STDI
14:07	MA35299-ICV1	1		60ppb Al only
14:11	MA35299-ICVA1	1		
14:16	MA35299-ICB1	1		
14:21	MA35299-CRIB1	1		
14:25	MA35299-CCVA1	1		
14:30	MA35299-CCB1	1		
14:34	MA35299-ICSA1	1		
14:39	MA35299-ICSAB1	1		
14:44	ZZZZZZ	1		
14:48	MP82882-MB1	2		
14:53	ZZZZZZ	10		
14:58	ZZZZZZ	2		
15:02	FA19358-4F	2		
15:07	ZZZZZZ	1		
15:12	MA35299-CCVA2	1		
15:16	MA35299-CCB2	1		
15:21	ZZZZZZ	1		
15:26	MA35299-CCVA3	1		
15:30	MA35299-CCB3	1		
15:35	ZZZZZZ	10		
15:39	ZZZZZZ	10		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Dilution Factor	PS Recov	Comments
15:47	MP82882-B1	10		
15:51	FA19358-4	10		
15:56	ZZZZZZ	10		
16:04	FA19358-4F	10		Not needed.
16:09	ZZZZZZ	1		
16:13	ZZZZZZ	1		
16:18	ZZZZZZ	1		
16:23	MA35299-CCVA4	1		
16:27	MA35299-CCB4	1		
16:32	MA35299-CRIB2	1		
16:37	MP82882-S1	10		
16:41	MP82882-S2	10		
16:46	ZZZZZZ	1		
16:51	JB80352-2	2		(sample used for QC only; not part of login FA19358)
16:55	MP82882-SD1	10		
17:00	ZZZZZZ	2		
17:04	ZZZZZZ	2		
17:09	ZZZZZZ	2		
17:14	ZZZZZZ	1		
17:18	MA35299-CCVA5	1		
17:23	MA35299-CCB5	1		
17:28	MP82890-MB1	5		
17:32	MP82890-B1	25		
17:37	MP82890-S1	25		
17:41	MP82890-S2	25		
17:46	ZZZZZZ	1		
17:51	JB80261-1	5		(sample used for QC only; not part of login FA19358)
17:55	MP82890-SD1	25		
18:00	MP82890-PS1	5		
18:04	ZZZZZZ	1		
18:09	MA35299-CCVA6	1		
18:14	MA35299-CCB6	1		
18:18	MP82890-S1	100		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Dilution Factor	PS Recov	Comments
18:23	MP82890-S2	100		
18:28	JB80261-1	25		(sample used for QC only; not part of login FA19358)
18:32	MP82890-SD1	125		
18:37	MP82890-PS1	25		
18:41	MP82882-S1	50		
18:46	MP82882-S2	50		
18:51	JB80352-2	50		(sample used for QC only; not part of login FA19358)
18:55	MP82882-SD1	250		
---------->	Last reportable sample/prep for job FA19358			
19:00	ZZZZZZ	1		
19:04	MA35299-CCVA7	1		
19:09	MA35299-CCB7	1		
19:14	MA35299-CRIB3	1		
19:18	MP82891A-MB1	5		
19:23	MP82891A-B1	10		
19:28	MP82891A-S1	10		
19:32	MP82891A-S2	10		
19:37	ZZZZZZ	1		
19:41	JB80133-1	5		(sample used for QC only; not part of login FA19358)
19:46	MP82891A-SD1	25		
19:51	ZZZZZZ	1		
19:55	MA35299-CCVA8	1		
20:00	MA35299-CCB8	1		
---------->	Last reportable CCB for job FA19358			
20:05	ZZZZZZ	5		
20:09	ZZZZZZ	5		
20:14	MP82923A-MB1	5		
20:18	MP82923A-B1	10		
20:23	MP82923A-S1	10		
20:28	MP82923A-S2	10		
20:32	ZZZZZZ	1		
20:37	JB80133-1A	5		(sample used for QC only; not part of login FA19358)
20:42	MP82923A-SD1	25		
20:46	ZZZZZZ	1		
20:51	MA35299-CCVA9	1		High RSD.

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Dilution Factor	PS Recov	Comments
20:55	MA35299-CCB9	1		
21:00	MP82925A-MB1	5		
21:05	MP82925A-B1	10		
21:09	MP82925A-S1	10		
21:14	MP82925A-S2	10		
21:19	ZZZZZZ	1		
21:23	JB80134-1A	5		(sample used for QC only; not part of login FA19358)
21:28	MP82925A-SD1	25		
21:33	ZZZZZZ	1		
21:37	ZZZZZZ	1		
21:42	MA35299-CCVA10	1		
21:46	MA35299-CCB10	1		
21:51	MA35299-CRIB4	1		Sb and Se out for DOD.
21:56	MA35299-CCVA11	1		
22:00	MA35299-CCB11	1		
22:05	ZZZZZZ	1		
22:09	ZZZZZZ	1		
22:14	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
13:11	MA35299-STD1	100	100	100	100	100	100	100	100
13:15	MA35299-STD2	100	100	100	100	100	100	100	100
13:20	MA35299-STD3	99.75	100.139	103.297	100.277	101.066	100.365	99.357	99.256
13:25	MA35299-STD4	100.91	100.005	103.518	100.31	100.283	101.314	100.583	99.855
13:29	MA35299-STD5	100.129	99.374	102.919	100.243	100.091	100.881	100.134	99.607
13:34	MA35299-STD6	99.793	99.833	101.555	98.167	100.964	99.395	97.614	98.806
13:39	MA35299-STD7	98.446	98.533	99.653	97.597	99.896	98.406	98.763	99.212
13:43	MA35299-STD8	97.768	98.021	100.219	98.246	97.716	98.166	97.52	97.009
13:48	MA35299-STD9	98.115	98.431	100.756	98.613	98.801	98.953	97.426	98.122
13:53	MA35299-STD10	97.939	98.846	96.954	97.604	98.431	93.948	98.628	98.297
13:57	MA35299-STD11	97.558	100.106	102.738	96.899	98.572	98.429	96.628	98.693
14:02	MA35299-STD12	99.345	100.516	103.732	97.092	99.313	100.144	96.873	99.448
14:07	MA35299-ICV1	99.433	99.941	102.028	97.367	100.094	100.116	98.585	99.941
14:11	MA35299-ICVA1	99.421	102.513	103.646	99.43	101.39	101.645	98.268	100.641
14:16	MA35299-ICB1	100.106	101.501	103.026	100.057	101.207	100.755	99.393	100.116
14:21	MA35299-CRIB1	99.771	101.283	104.931	100.442	100.374	101.51	99.205	100.297
14:25	MA35299-CCVA1	100.505	104.154	105.836	99.235	102.135	102.003	99.652	102.152
14:30	MA35299-CCB1	100.207	101.918	98.846	98.27	101.941	97.679	99.049	101.516
14:34	MA35299-ICSA1	94.165	99.849	102.782	97.836	99.597	99.34	96.523	95.844
14:39	MA35299-ICSAB1	93.519	101.918	103.121	98.633	101.658	100.178	97.428	98.052
14:44	ZZZZZZ	95.43	101.376	101.749	99.221	100.976	101.367	99.666	101.166
14:48	MP82882-MB1	91.09	96.82	97.429	97.682	100.731	100.197	101.309	100.203
14:53	ZZZZZZ	352.521 !	329.213 !	355.14 !	356.3 !	331.124 !	338.588 !	334.643 !	330.545 !
14:58	ZZZZZZ	360.419 !	333.371 !	347.708 !	322.436 !	334.35 !	331.895 !	303.958 !	336.151 !
15:02	FA19358-4F	75.847	88.712	109.142	103.6	85.666	98.707	94.85	83.601
15:07	ZZZZZZ	126.643	139.707 !	141.873 !	131.288 !	134.327 !	134.302 !	126.255	133.102 !
15:12	MA35299-CCVA2	117.789	122.162	122.411	112.926	119.365	116.326	110.73	118.737
15:16	MA35299-CCB2	109.463	113.997	113.68	104.872	111.9	112.49	105.342	112.165
15:21	ZZZZZZ	107.073	110.587	111.482	104.715	109.563	110.071	104.315	109.707
15:26	MA35299-CCVA3	104.246	108.097	110.434	101.179	106.849	108.294	101.709	107.4
15:30	MA35299-CCB3	104.579	108.11	107.863	103.47	107.361	107.77	104.056	107.125
15:35	ZZZZZZ	419.767 !	389.476 !	369.494 !	356.106 !	389.857 !	350.518 !	338.194 !	388.326 !
15:39	ZZZZZZ	385.068 !	351.61 !	358.939 !	335.197 !	353.659 !	342.362 !	316.948 !	353.994 !

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
15:47	MP82882-B1	106.321	108.939	110.327	101.171	107.224	109.26	99.989	107.589
15:51	FA19358-4	103.108	114.399	122.346	114.063	105.601	110.848	104.475	104.779
15:56	ZZZZZZ	121.242	123.456	121.308	110.532	120.844	118.815	110.166	119.912
16:04	FA19358-4F	No results reported for the elements associated with this internal standard.							
16:09	ZZZZZZ	122.727	127.365	127.096	115.333	124.377	122.078	113.564	122.909
16:13	ZZZZZZ	115.496	115.889	116.682	109.69	113.94	115.039	109.084	112.143
16:18	ZZZZZZ	113.366	114.04	113.765	105.982	111.846	111.962	104.333	110.881
16:23	MA35299-CCVA4	108.298	110.501	109.545	101.669	108.748	107.148	101.461	107.985
16:27	MA35299-CCB4	106.327	108.557	107.296	102.003	106.686	108.627	101.985	106.602
16:32	MA35299-CRIB2	107.001	109.655	108.886	101.959	109.005	108.125	101.699	107.751
16:37	MP82882-S1	107.237	110.011	110.246	101.044	107.938	108.354	99.866	108.29
16:41	MP82882-S2	105.925	109.037	110.127	100.67	108.406	107.974	101.009	107.76
16:46	ZZZZZZ	101.462	105.065	105.616	99.6	105.226	105.264	99.97	103.525
16:51	JB80352-2	97.534	102.356	101.485	97.351	108.423	108.118	103.73	106.866
16:55	MP82882-SD1	106.693	109.505	111.429	107.794	110.028	110.833	108	109.206
17:00	ZZZZZZ	99.682	108.619	104.305	99.411	112.959	108.628	104.912	111.912
17:04	ZZZZZZ	95.624	102.247	99.991	96.131	106.64	105.045	103.247	105.712
17:09	ZZZZZZ	93.668	99.541	100.687	96.725	104.207	104.827	101.946	103.879
17:14	ZZZZZZ	101.8	105.817	106.615	99.583	104.776	105.096	100.014	104.598
17:18	MA35299-CCVA5	99.202	104.337	104.158	97.876	102.305	101.298	98.67	102.942
17:23	MA35299-CCB5	100.905	104.89	102.583	99.629	103.67	100.821	99.091	103.333
17:28	MP82890-MB1	101.491	104.384	105.947	100.237	104.974	105.332	100.296	105.399
17:32	MP82890-B1	107.659	111.954	111.466	101.51	109.988	110.411	100.899	110.304
17:37	MP82890-S1	106.627	110.437	110.602	101.767	108.05	107.702	100.361	108.919
17:41	MP82890-S2	106.792	110.243	113.15	105.401	108.406	109.095	102.228	107.599
17:46	ZZZZZZ	99.853	104.029	103.737	97.791	102.666	103.901	98.349	103.461
17:51	JB80261-1	101.276	109.878	109.688	101.371	106.398	106.312	100.44	105.493
17:55	MP82890-SD1	110.95	114.812	117.34	102.999	113.145	114.202	104.873	113.205
18:00	MP82890-PS1	103.685	111.997	110.802	102.906	108.432	106.978	101.19	107.534
18:04	ZZZZZZ	104.095	109.589	110.167	102.993	107.959	107.871	102.94	108.515
18:09	MA35299-CCVA6	103.619	110.047	108.104	100.726	107.957	105.908	98.997	107.374
18:14	MA35299-CCB6	103.616	108.672	108.199	101.155	106.714	105.254	100.78	106.145
18:18	MP82890-S1	111.109	115.439	117.354	105.775	113.501	113.803	106.263	112.626

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
18:23	MP82890-S2	112.084	115.706	117.226	105.098	113.804	114.783	104.905	113.814
18:28	JB80261-1	110.427	114.103	113.959	105.192	110.892	111.043	104.736	111.546
18:32	MP82890-SD1	111.592	115.881	117.715	105.936	115.186	116.014	106.131	113.717
18:37	MP82890-PS1	110.828	115.43	115.6	105.417	112.378	111.779	104.418	112.276
18:41	MP82882-S1	109.01	115.565	115.267	104.166	112.183	113.098	103.529	112
18:46	MP82882-S2	108.33	113.137	113.888	105.237	110.795	111.778	103.496	110.222
18:51	JB80352-2	97.749	96.98	114.28	103.39	99.191	111.668	103.562	98.306
18:55	MP82882-SD1	110.513	113.779	116.844	105.532	111.315	112.905	105.075	110.696
19:00	ZZZZZZ	101.608	106.822	106.659	100.429	105.084	104.639	101.142	104.437
19:04	MA35299-CCVA7	101.773	108.967	107.381	99.554	105.534	103.329	97.888	105.351
19:09	MA35299-CCB7	89.475	94.76	106.665	99.479	91.283	105.038	98.556	91.289
19:14	MA35299-CRIB3	101.641	107.005	107.703	100.311	104.335	104.328	99.559	103.517
19:18	MP82891A-MB1	101.916	108.852	104.266	98.354	106.477	105.216	99.272	109.16
19:23	MP82891A-B1	102.611	107.496	106.217	97.657	104.859	102.699	95.18	104.457
19:28	MP82891A-S1	101.81	105.607	107.222	96.026	102.525	101.386	95.621	102.708
19:32	MP82891A-S2	102.65	105.067	105.177	98.359	102.006	101.648	95.851	101.507
19:37	ZZZZZZ	99.064	102.91	102.27	95.948	101.238	99.832	96.131	100.562
19:41	JB80133-1	99.995	103.249	104.386	99.254	102.792	102.37	99.357	103.266
19:46	MP82891A-SD1	107.384	109.691	110.58	100.482	107.453	108.619	100.405	107.481
19:51	ZZZZZZ	100.427	104.985	102.169	88.995	102.383	102.694	90.653	102.479
19:55	MA35299-CCVA8	100.473	105.805	104.329	97.46	101.954	100.806	96.232	101.477
20:00	MA35299-CCB8	100.331	104.74	103.359	98.007	102.399	102.326	97.663	102.266
20:05	ZZZZZZ	96.739	102.008	101.819	96.718	100.697	99.433	95.417	99.482
20:09	ZZZZZZ	94.778	101.994	99.435	91.118	100.359	96.043	90.046	98.303
20:14	MP82923A-MB1	92.681	96.626	96.298	91.68	96.158	96.536	91.99	96.083
20:18	MP82923A-B1	99.166	103.927	104.979	97.228	100.657	102.44	95.997	100.568
20:23	MP82923A-S1	102.331	107.748	107.011	94.809	104.25	103.518	93.233	104.766
20:28	MP82923A-S2	102.288	107.082	106.57	98.918	104.136	103.463	95.75	104.628
20:32	ZZZZZZ	97.409	102.018	100.551	95.14	100.672	98.4	94.712	99.342
20:37	JB80133-1A	99.717	104.652	102.285	97.081	102.322	100.68	95.867	101.626
20:42	MP82923A-SD1	105.42	108.897	108.367	100.587	105.509	106.457	99.331	105.987
20:46	ZZZZZZ	98.006	102.829	99.428	95.011	100.443	98.046	94.029	100.974
20:51	MA35299-CCVA9	106.855	115.548	102.706	95.922	108.577	99.767	94.665	108.626

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4	Istd#5	Istd#6	Istd#7	Istd#8
20:55	MA35299-CCB9	85.119	91.793	102.31	95.851	88.243	100.543	95.988	87.665
21:00	MP82925A-MB1	94.18	103.028	102.983	99.572	98.391	98.513	94.575	97.605
21:05	MP82925A-B1	101.301	108.664	106.71	106.126	102.933	100.853	98.645	103.168
21:09	MP82925A-S1	98.811	106.151	105.983	97.889	101.742	101.634	95.779	101.631
21:14	MP82925A-S2	98.819	106.803	106.942	99.243	101.427	102.21	95.795	101.312
21:19	ZZZZZZ	98.736	103.367	101.154	95.142	101.069	99.776	94.975	100.707
21:23	JB80134-1A	94.986	103.294	104.602	97.409	98.682	100.151	94.729	98.519
21:28	MP82925A-SD1	105.43	110.602	110.882	101.267	107.589	109.017	101.042	106.571
21:33	ZZZZZZ	98.59	104.572	102.008	95.079	101.395	100.195	94.968	101.708
21:37	ZZZZZZ	98.08	101.875	99.99	93.892	99.626	99.234	94.06	99.263
21:42	MA35299-CCVA10	96.205	101.235	99.768	92.722	98.172	97.75	91.971	98.268
21:46	MA35299-CCB10	97.747	102.442	93.527	94.936	99.841	92.332	94.503	99.814
21:51	MA35299-CRIB4	97.404	102.74	100.088	94.945	99.746	99.96	94.12	98.811
21:56	MA35299-CCVA11	96.347	101.308	99.094	92.574	97.927	97.192	91.79	98.115
22:00	MA35299-CCB11	97.615	102.51	99.607	94.529	99.843	98.724	94.86	98.753
22:05	ZZZZZZ	98.233	102.141	99.606	94.942	99.652	98.393	94.294	99.902
22:09	ZZZZZZ	97.803	102.975	100.12	95.375	100.052	99.082	94.715	99.467
22:14	ZZZZZZ	98.245	102.156	101.247	94.652	99.463	99.337	94.297	99.605

! = Outside limits.

LEGEND: Istd#	Parameter	Limits	CCV/CCB Limits
Istd#1	Lithium	70-130 %	70-130 %
Istd#2	Scandium (45-1)	70-130 %	70-130 %
Istd#3	Scandium (45-2)	70-130 %	70-130 %
Istd#4	Scandium (45-3)	70-130 %	70-130 %
Istd#5	Germanium (72-1)	70-130 %	70-130 %
Istd#6	Germanium (72-2)	70-130 %	70-130 %
Istd#7	Germanium (72-3)	70-130 %	70-130 %
Istd#8	Germanium (74-1)	70-130 %	70-130 %

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
13:11	MA35299-STD1	100	100	100	100	100	100	100	100
13:15	MA35299-STD2	100	100	100	100	100	100	100	100
13:20	MA35299-STD3	100.741	99.956	100.823	101.879	99.39	100.847	100.924	100.8
13:25	MA35299-STD4	101.428	99.483	101.226	101.929	99.278	100.514	101.023	101.183
13:29	MA35299-STD5	101.527	99.558	101.346	100.978	99.82	100.187	100.245	100.554
13:34	MA35299-STD6	100.21	98.563	100.284	100.443	98.145	99.367	100.264	100.414
13:39	MA35299-STD7	98.955	98.622	100.103	98.681	96.951	98.619	98.222	100.765
13:43	MA35299-STD8	99.181	98.154	98.784	98.749	97.78	99.211	100.608	99.778
13:48	MA35299-STD9	98.46	97.082	98.878	99.651	96.743	99.064	99.776	100.046
13:53	MA35299-STD10	93.19	97.388	98.014	93.023	95.152	98.367	93.882	99.472
13:57	MA35299-STD11	98.807	96.672	97.48	95.834	93.462	98.54	97.933	101.41
14:02	MA35299-STD12	100.08	97.166	100.025	98.626	95.069	100.347	99.815	101.995
14:07	MA35299-ICV1	100.364	98.256	101.604	100.756	98.65	101.224	100.249	101.131
14:11	MA35299-ICVA1	101.725	98.472	99.913	98.499	95.788	100.357	99.467	101.891
14:16	MA35299-ICB1	101.354	99.592	102.548	102.493	98.76	102.59	101.861	101.39
14:21	MA35299-CRIB1	102.116	99.116	102.411	102.482	99.549	102.46	102.301	102.782
14:25	MA35299-CCVA1	101.879	99.118	102.045	99.755	96.617	102.025	101.654	102.895
14:30	MA35299-CCB1	96.696	98.888	103.211	98.353	98.725	102.328	97.305	102.411
14:34	MA35299-ICSA1	96.894	93.274	91.409	88.087	84.425	95.082	92.561	98.214
14:39	MA35299-ICSAB1	97.582	94.533	93.373	89.062	85.123	96.761	93.822	100.316
14:44	ZZZZZZ	101.898	99.602	104.114	103.212	100.425	104.147	101.922	104.325
14:48	MP82882-MB1	100.474	101.021	100.38	99.792	98.935	100.136	97.491	101.246
14:53	ZZZZZZ	336.433 !	334.424 !	342.135 !	366.275 !	371.262 !	354.715 !	373.051 !	371.613 !
14:58	ZZZZZZ	332.599 !	305.29 !	344.915 !	359.621 !	332.591 !	357.428 !	367.003 !	375.366 !
15:02	FA19358-4F	98.093	94.788	65.93 !	63.774 !	64.007 !	70.138	78.044	68.9 !
15:07	ZZZZZZ	134.228 !	124.766	130.996 !	124.335	118.658	130.246 !	127.6	119.637
15:12	MA35299-CCVA2	117.29	109.902	116.666	111.74	108.246	117.362	113.184	114.758
15:16	MA35299-CCB2	111.182	104.975	113.812	112.477	105.231	114.071	110.869	112.448
15:21	ZZZZZZ	110.443	105.08	112.321	111.112	105.298	112.204	110.096	110.867
15:26	MA35299-CCVA3	107.688	102.171	107.092	105.505	100.62	108.393	107.154	109.271
15:30	MA35299-CCB3	108.456	103.744	108.9	108.625	104.325	109.545	107.546	110.041
15:35	ZZZZZZ	350.642 !	338.153 !	395.528 !	376.282 !	370.186 !	405.574 !	386.739 !	421.452 !
15:39	ZZZZZZ	343.13 !	317.102 !	361.959 !	364.976 !	349.733 !	373.363 !	377.936 !	384.334 !

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
15:47	MP82882-B1	107.815	100.221	109.532	106.709	100.23	109.685	107.84	111.055
15:51	FA19358-4	111.062	104.836	98.105	94.695	90.034	102.658	104.464	102.551
15:56	ZZZZZZ	117.588	109.624	118.648	113.309	105.711	120.232	116.436	116.749
16:04	FA19358-4F	No results reported for the elements associated with this internal standard.							
16:09	ZZZZZZ	122.375	112.792	123.174	118.65	111.141	122.172	118.778	117.326
16:13	ZZZZZZ	114.974	108.776	114.818	112.88	106.787	114.331	112.282	112.549
16:18	ZZZZZZ	111.741	104.764	113.289	111.652	104.891	113.167	110.644	111.104
16:23	MA35299-CCVA4	107.555	101.489	107.878	105.203	99.156	108.931	105.618	109.995
16:27	MA35299-CCB4	108.114	102.586	109.905	107.934	102.379	109.785	107.797	109.13
16:32	MA35299-CRIB2	107.954	101.918	109.907	109.367	102.955	110.128	108.113	109.631
16:37	MP82882-S1	108.234	100.524	108.961	105.476	98.842	108.713	105.585	109.26
16:41	MP82882-S2	108.032	100.754	108.587	106.16	98.015	109.797	106.59	110.627
16:46	ZZZZZZ	105.89	99.282	107.344	107.311	100.494	107.697	104.765	107.199
16:51	JB80352-2	107.663	104.134	101.172	100.373	94.966	103.338	99.219	105.365
16:55	MP82882-SD1	111.108	107.255	110.373	109.156	106.746	111.368	109.306	111.148
17:00	ZZZZZZ	109.349	104.547	104.949	99.974	94.523	108.625	99.64	110.624
17:04	ZZZZZZ	105.917	101.856	100.465	99.203	94.036	102.8	97.605	105.6
17:09	ZZZZZZ	106.505	102.177	99.857	99.523	95.507	100.751	97.594	104.144
17:14	ZZZZZZ	105.477	100.621	108.359	106.916	100.923	107.857	105.354	108.237
17:18	MA35299-CCVA5	102.264	98.12	103.473	101.467	95.868	104.587	100.953	106.374
17:23	MA35299-CCB5	101.676	99.64	107.259	103.295	99.724	107.42	101.2	106.79
17:28	MP82890-MB1	104.452	100.866	107.032	105.917	100.198	107.049	103.168	106.825
17:32	MP82890-B1	109.361	100.918	111.992	108.819	100.249	112.601	108.837	110.925
17:37	MP82890-S1	108.562	100.122	109.314	106.078	98.937	109.5	107.288	109.529
17:41	MP82890-S2	108.881	102.284	109.748	107.81	101.934	110.6	108.266	109.202
17:46	ZZZZZZ	103.273	98.154	106.737	104.857	98.04	105.76	102.988	106.721
17:51	JB80261-1	104.806	99.924	107.073	104.322	97.622	108.015	104.146	108.017
17:55	MP82890-SD1	113.637	103.894	114.629	111.814	100.63	114.452	112.101	111.611
18:00	MP82890-PS1	106.367	99.814	108.599	104.581	97.095	108.326	104.172	108.722
18:04	ZZZZZZ	108.186	102.151	110.871	108.72	101.695	110.554	107.049	108.893
18:09	MA35299-CCVA6	105.912	99.631	107.679	104.024	96.158	107.943	102.523	108.535
18:14	MA35299-CCB6	106.421	100.997	109.899	106.765	99.752	108.42	104.618	107.989
18:18	MP82890-S1	114.814	104.598	114.209	111.941	102.838	113.757	112.148	111.1

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
18:23	MP82890-S2	115.571	104.777	115.338	112.037	102.322	113.995	112.488	112.115
18:28	JB80261-1	111.149	104.437	113.748	108.987	102.501	113.679	108.965	111.578
18:32	MP82890-SD1	115.676	106.337	115.637	113.051	103.169	115.061	113.114	111.203
18:37	MP82890-PS1	112.417	103.817	114.043	110.623	101.235	113.844	110.915	111.673
18:41	MP82882-S1	113.387	103.845	114.64	111.25	101.625	114.894	111.292	111.826
18:46	MP82882-S2	112.148	103.303	112.524	108.938	101.629	112.39	110.028	110.62
18:51	JB80352-2	112.734	102.314	97.259	110.438	100.949	97.375	111.161	94.656
18:55	MP82882-SD1	114.077	104.605	114.425	111.511	102.321	113.493	112.339	110.211
19:00	ZZZZZZ	104.885	100.542	108.314	106.771	98.651	108.143	102.942	105.541
19:04	MA35299-CCVA7	104.481	98.875	106.152	102.832	95.621	106.425	101.907	107.335
19:09	MA35299-CCB7	104.652	98.317	95.849	105.583	97.854	95.387	102.716	94.013
19:14	MA35299-CRIB3	104.922	98.808	107.599	105.947	97.87	107.207	103.666	105.407
19:18	MP82891A-MB1	104.953	98.711	110.235	103.947	97.022	109.519	100.872	109.006
19:23	MP82891A-B1	101.961	95.093	106.352	102.282	93.851	106.817	100.835	106.399
19:28	MP82891A-S1	102.534	94.048	105.734	103.746	92.267	105.327	101.171	106.573
19:32	MP82891A-S2	102.533	95.985	105.072	101.451	94.469	105.287	98.714	105.592
19:37	ZZZZZZ	101.105	96.368	104.042	102.662	95.957	104.556	99.509	104.754
19:41	JB80133-1	101.904	99.559	107.504	104.822	98.624	106.917	101.048	106.114
19:46	MP82891A-SD1	107.793	100.322	112.288	109.387	100.945	112.727	106.862	109.075
19:51	ZZZZZZ	102.11	90.499	106.559	102.63	91.073	106.404	99.548	106.19
19:55	MA35299-CCVA8	101.417	95.34	103.583	100.619	92.819	105.39	98.666	105.954
20:00	MA35299-CCB8	102.4	97.543	106.947	103.551	96.642	105.67	100.804	105.704
20:05	ZZZZZZ	99.773	95.306	101.185	99.291	92.372	102.945	95.892	104.301
20:09	ZZZZZZ	95.68	87.862	100.844	95.076	85.207	102.614	92.1	104.622
20:14	MP82923A-MB1	96.808	93.306	101.078	98.721	92.678	100.983	95.451	101.584
20:18	MP82923A-B1	102.26	95.84	104.963	101.668	94.363	104.869	100.042	105.491
20:23	MP82923A-S1	103.656	93.599	106.496	102.867	91.094	106.997	101.774	107.495
20:28	MP82923A-S2	102.864	96.79	106.304	102.459	93.109	107.515	100.756	108
20:32	ZZZZZZ	98.907	95.036	103.636	101.438	94.458	104.053	98.01	104.114
20:37	JB80133-1A	100.559	96.786	105.77	103.887	96.072	107.088	99.173	105.851
20:42	MP82923A-SD1	106.065	99.299	109.761	107.967	98.89	110.718	105.733	108.707
20:46	ZZZZZZ	98.725	94.305	105.385	101.535	94.511	105.533	98.025	104.497
20:51	MA35299-CCVA9	98.331	94.955	114.242	97.924	92.071	115.541	96.104	116.579

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#9	Istd#10	Istd#11	Istd#12	Istd#13	Istd#14	Istd#15	Istd#16
20:55	MA35299-CCB9	100.573	94.651	92.947	102.073	95.338	92.664	98.05	91.882
21:00	MP82925A-MB1	97.999	94.955	97.328	94.572	89.021	100.1	94.352	100.78
21:05	MP82925A-B1	100.352	99.164	101.72	96.318	97.584	103.807	96.761	104.495
21:09	MP82925A-S1	102.243	95.507	100.077	95.01	87.727	102.111	96.118	103.679
21:14	MP82925A-S2	101.77	95.374	99.689	96.161	88.674	101.594	96.988	104.346
21:19	ZZZZZZ	99.121	94.786	104.298	101.327	93.12	104.714	97.259	104.004
21:23	JB80134-1A	99.489	94.425	96.229	93.072	87.914	99.29	93.982	102.178
21:28	MP82925A-SD1	108.368	100.406	107.773	103.695	95.144	109.881	104.586	108.54
21:33	ZZZZZZ	99.977	94.366	104.885	101.278	94.227	104.707	98.389	103.757
21:37	ZZZZZZ	99.3	94.203	104.203	100.545	93.659	104.157	96.366	103.903
21:42	MA35299-CCVA10	98.136	92.85	100.469	96.447	89.924	100.86	94.324	102.723
21:46	MA35299-CCB10	92.909	94.234	103.92	94.568	93.934	104.197	90.53	103.145
21:51	MA35299-CRIB4	100.272	93.707	104.07	100.73	92.755	104.052	96.801	102.62
21:56	MA35299-CCVA11	97.173	92.505	100.28	96.85	89.913	101.482	94.419	102.898
22:00	MA35299-CCB11	99.129	94.152	103.547	100.479	93.087	103.303	96.921	103.798
22:05	ZZZZZZ	98.006	94.423	104.109	100.721	93.368	103.606	96.589	102.27
22:09	ZZZZZZ	98.55	94.477	103.832	101.959	93.831	103.926	97.545	103.825
22:14	ZZZZZZ	98.829	93.293	104.341	100.626	93.113	103.733	96.015	103.119

! = Outside limits.

LEGEND:			CCV/CCB
Istd#	Parameter	Limits	Limits
Istd#9	Germanium (74-2)	70-130 %	70-130 %
Istd#10	Germanium (74-3)	70-130 %	70-130 %
Istd#11	Rhodium (103-1)	70-130 %	70-130 %
Istd#12	Rhodium (103-2)	70-130 %	70-130 %
Istd#13	Rhodium (103-3)	70-130 %	70-130 %
Istd#14	Indium (115-1)	70-130 %	70-130 %
Istd#15	Indium (115-2)	70-130 %	70-130 %
Istd#16	Terbium (159-1)	70-130 %	70-130 %

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
13:11	MA35299-STD1	100	100	100	100	100	100
13:15	MA35299-STD2	100	100	100	100	100	100
13:20	MA35299-STD3	101.871	100.481	101.022	101.905	100.035	101.363
13:25	MA35299-STD4	102.232	99.672	101.604	102.055	101.447	101.491
13:29	MA35299-STD5	101.65	100.274	100.336	101.463	101.364	101.74
13:34	MA35299-STD6	101.65	99.179	100.784	101.36	101.592	101.758
13:39	MA35299-STD7	100.538	99.034	100.222	100.87	101.024	101.713
13:43	MA35299-STD8	101.61	99.486	99.896	100.832	99.291	100.139
13:48	MA35299-STD9	101.572	99.453	100.134	101.513	100.525	100.531
13:53	MA35299-STD10	97.02	98.615	100.076	95.872	98.177	95.943
13:57	MA35299-STD11	100.769	98.061	100.908	101.514	96.836	96.338
14:02	MA35299-STD12	102.694	98.962	101.49	101.934	100.172	98.402
14:07	MA35299-ICV1	100.135	99.013	100.418	99.936	100.187	100.265
14:11	MA35299-ICVA1	101.792	99.409	101.576	102.174	99.454	99.232
14:16	MA35299-ICB1	102.412	100.257	101.553	102.392	101.328	102.263
14:21	MA35299-CRIB1	103.251	100.781	102.271	102.147	102.138	101.794
14:25	MA35299-CCVA1	102.943	100.073	103.14	103.474	100.15	100.03
14:30	MA35299-CCB1	98.387	99.693	102.174	97.105	102.738	100.517
14:34	MA35299-ICSA1	96.503	92.021	97.946	96.447	90.312	87.767
14:39	MA35299-ICSAB1	97.667	93.009	100.01	96.945	91.123	87.496
14:44	ZZZZZZ	104.765	102.67	103.918	103.612	104.709	102.597
14:48	MP82882-MB1	101.504	101.05	101.259	100.588	108.621	112.573
14:53	ZZZZZZ	388.64 !	385.203 !	373.068 !	388.568 !	369.764 !	410.673 !
14:58	ZZZZZZ	382.513 !	347.143 !	376.392 !	383.11 !	374.993 !	403.884 !
15:02	FA19358-4F	71.109	65.486 !	68.634 !	70.862	57.201 !	55.812 !
15:07	ZZZZZZ	117.673	113.605	118.479	115.121	112.856	117.257
15:12	MA35299-CCVA2	112.542	109.866	114.296	112.796	108.174	110.756
15:16	MA35299-CCB2	111.333	107.601	112.002	110.926	109.608	117.583
15:21	ZZZZZZ	111.796	108.467	110.407	111.509	109.728	117.076
15:26	MA35299-CCVA3	109.16	106.408	109.657	109.216	105.713	110.633
15:30	MA35299-CCB3	108.679	107.068	109.591	108.585	108.698	115.241
15:35	ZZZZZZ	399.327 !	386.756 !	419.872 !	398.735 !	414.523 !	422.331 !
15:39	ZZZZZZ	388.886 !	363.572 !	385.263 !	389.58 !	381.665 !	409.5 !

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
15:47	MP82882-B1	110.5	104.346	110.355	109.399	109.21	114.972
15:51	FA19358-4	100.313	96.311	101.405	99.505	86.288	84.567
15:56	ZZZZZZ	113.686	110.156	116.143	113.677	111.979	118.024
16:04	FA19358-4F	No results reported for the elements associated with this internal standard.					
16:09	ZZZZZZ	113.875	111.172	116.57	112.967	111.514	118.484
16:13	ZZZZZZ	112.214	109.819	111.634	111.421	110.559	117.377
16:18	ZZZZZZ	110.339	107.642	110.289	110.109	108.761	115.763
16:23	MA35299-CCVA4	109.207	105.425	109.05	109.681	105.342	110.046
16:27	MA35299-CCB4	108.583	106.007	108.23	108.687	108.21	114.88
16:32	MA35299-CRIB2	108.964	106.515	108.582	108.667	107.468	115.547
16:37	MP82882-S1	108.626	104.289	109.123	108.294	107.07	110.46
16:41	MP82882-S2	109.333	103.629	109.172	108.496	107.553	111.127
16:46	ZZZZZZ	107.391	104.681	106.148	107.211	106.925	111.551
16:51	JB80352-2	105.674	102.942	105.09	105.037	106.73	102.58
16:55	MP82882-SD1	111.294	112.071	109.618	111.421	109.587	116.856
17:00	ZZZZZZ	104.893	103.528	109.745	105.591	107.692	103.621
17:04	ZZZZZZ	103.977	102.727	105.856	104.768	104.067	99.988
17:09	ZZZZZZ	103.863	103.105	103.907	104.529	101.959	99.38
17:14	ZZZZZZ	107.896	105.678	107.697	107.684	107.173	113.358
17:18	MA35299-CCVA5	105.189	102.405	106.067	105.525	103.326	101.557
17:23	MA35299-CCB5	103.159	103.785	106.522	103.693	106.07	107.397
17:28	MP82890-MB1	106.456	104.648	106.938	105.105	107.722	110.189
17:32	MP82890-B1	109.258	104.56	110.129	109.362	108.53	116.34
17:37	MP82890-S1	108.146	103.383	109.368	107.773	108.55	111.857
17:41	MP82890-S2	107.882	106.972	108.835	108.891	108.045	115.156
17:46	ZZZZZZ	105.646	101.912	106.276	105.097	105.884	102.473
17:51	JB80261-1	106.993	102.168	107.81	106.089	107.218	106.647
17:55	MP82890-SD1	112.034	103.786	110.682	110.432	112.167	119.097
18:00	MP82890-PS1	107.21	102.102	107.85	106.774	106.103	103.811
18:04	ZZZZZZ	108.091	104.317	108.423	107.54	106.943	106.751
18:09	MA35299-CCVA6	106.562	102.081	107.455	105.89	103.462	100.328
18:14	MA35299-CCB6	107.397	103.908	107.26	106.188	105.99	112.43
18:18	MP82890-S1	111.995	106.239	110.757	111.513	108.824	118.361

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
18:23	MP82890-S2	111.152	105.804	111.338	111.119	108.478	117.919
18:28	JB80261-1	109.381	105.597	110.416	109.246	110.594	112.996
18:32	MP82890-SD1	112.005	105.878	110.628	111.428	106.097	118.242
18:37	MP82890-PS1	110.222	104.665	111.427	109.775	110.243	116.737
18:41	MP82882-S1	110.374	104.566	111.107	109.578	107.13	115.639
18:46	MP82882-S2	110.296	105.728	109.937	108.947	106.898	114.713
18:51	JB80352-2	110.428	103.829	94.109	110.192	94.663	114.636
18:55	MP82882-SD1	110.416	104.898	109.902	109.291	103.525	114.503
19:00	ZZZZZZ	105.972	102.388	104.836	104.767	105.071	101.579
19:04	MA35299-CCVA7	105.168	101.417	107.07	105.069	102.692	98.809
19:09	MA35299-CCB7	105.961	101.175	93.455	104.789	91.972	104.029
19:14	MA35299-CRIB3	104.97	102.588	104.947	104.452	104.759	108.196
19:18	MP82891A-MB1	104.266	101.604	108.03	104.126	109.194	105.78
19:23	MP82891A-B1	103.628	99.746	105.723	103.397	103.865	99.269
19:28	MP82891A-S1	105.918	98.309	106.667	105.777	106.154	107.993
19:32	MP82891A-S2	105.364	100.754	105.347	104.598	106.353	104.974
19:37	ZZZZZZ	103.435	100.709	104.032	103.913	103.801	106.396
19:41	JB80133-1	105.022	103.304	105.186	104.401	107.979	110.939
19:46	MP82891A-SD1	108.622	103.679	109.327	108.094	110.737	117.944
19:51	ZZZZZZ	102.584	92.641	105.342	102.19	104.353	98.497
19:55	MA35299-CCVA8	103.635	99.603	105.183	103.22	101.062	96.543
20:00	MA35299-CCB8	103.602	101.237	105.004	104.152	104.121	99.453
20:05	ZZZZZZ	102.547	99.401	103.711	102.342	119.029	124.529
20:09	ZZZZZZ	99.036	91.978	103.966	98.941	105.718	98.265
20:14	MP82923A-MB1	101.336	98.933	101.46	100.41	104.343	98.984
20:18	MP82923A-B1	103.81	100.193	105.723	103.662	105.115	99.27
20:23	MP82923A-S1	105.572	96.85	107.332	105.653	105.033	104.714
20:28	MP82923A-S2	103.934	99.7	107.254	104.271	105.415	100.314
20:32	ZZZZZZ	101.193	99.34	103.58	101.615	103.226	97.666
20:37	JB80133-1A	103.17	100.907	105.688	103.48	106.829	101.116
20:42	MP82923A-SD1	107.378	104.792	108.215	107.11	109.598	116.57
20:46	ZZZZZZ	102.071	99.54	104.121	101.206	103.665	97.643
20:51	MA35299-CCVA9	101.189	99.346	115.887	101.156	110.664	94.989

INTERNAL STANDARD SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
Analyst: VC Run ID: MA35299
Parameters: Al

Time	Sample Description	Istd#17	Istd#18	Istd#19	Istd#20	Istd#21	Istd#22
20:55	MA35299-CCB9	103.024	99.907	91.922	102.419	90.274	97.968
21:00	MP82925A-MB1	99.022	97.575	100.796	98.828	94.458	89.238
21:05	MP82925A-B1	100.473	104.849	104.419	100.171	98.769	91.616
21:09	MP82925A-S1	101.999	98.164	103.807	101.448	97.584	91.677
21:14	MP82925A-S2	102.541	98.078	104.157	101.66	97.575	92.204
21:19	ZZZZZZ	101.135	98.637	103.695	100.31	102.26	96.772
21:23	JB80134-1A	99.678	98.331	101.651	99.954	95.399	89.75
21:28	MP82925A-SD1	106.952	102.238	108.485	106.429	104.363	98.74
21:33	ZZZZZZ	101.757	99.688	103.104	101.584	102.376	97.003
21:37	ZZZZZZ	100.932	99.188	102.974	100.351	101.461	95.628
21:42	MA35299-CCVA10	101.187	97.758	102.292	100.158	99.034	93.68
21:46	MA35299-CCB10	94.625	99.351	103.257	94.295	102.906	93.191
21:51	MA35299-CRIB4	101.162	98.677	102.266	100.698	102.706	94.835
21:56	MA35299-CCVA11	100.68	97.271	101.864	100.367	99.645	93.186
22:00	MA35299-CCB11	101.533	98.816	102.77	100.986	102.11	96.649
22:05	ZZZZZZ	100.606	98.493	102.199	100.696	102.324	95.883
22:09	ZZZZZZ	100.629	99.677	103.147	100.686	101.435	95.52
22:14	ZZZZZZ	101.241	98.608	102.842	100.049	102.284	95.716

! = Outside limits.

LEGEND:			CCV/CCB
Istd#	Parameter	Limits	Limits
Istd#17	Terbium (159-2)	70-130 %	70-130 %
Istd#18	Terbium (159-3)	70-130 %	70-130 %
Istd#19	Holmium (165-1)	70-130 %	70-130 %
Istd#20	Holmium (165-2)	70-130 %	70-130 %
Istd#21	Bismuth (209-1)	70-130 %	70-130 %
Istd#22	Bismuth (209-2)	70-130 %	70-130 %

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: result < LOD Run ID: MA35299 Units: ug/l

Time: / Sample ID:				14:16 ICB1		14:30 CCB1		15:16 CCB2	
Metal	RL	IDL	LOD	raw	final	raw	final	raw	final
Aluminum	25	.43	20	0.17	<25	0.071	<25	0.10	<25
Antimony	0.50	.13	0.50						
Arsenic	0.50	.028	0.40						
Barium	1.0	.0077	0.50						
Beryllium	0.50	.0035	0.25						
Boron	5.0	1.6	2.5						
Cadmium	0.50	.023	0.30						
Calcium	250	1.7	50						
Chromium	1.0	.027	0.50						
Cobalt	0.50	.0045	0.25						
Copper	1.0	.027	0.50						
Iron	25	.26	13						
Lead	0.50	.0077	0.25						
Magnesium	250	.29	130						
Manganese	1.0	.026	0.50						
Molybdenum	1.0	.017	0.50						
Nickel	1.0	.011	1.0						
Potassium	250	2.2	50						
Selenium	0.50	.034	0.50						
Silver	0.50	.0059	0.25						
Sodium	250	1.2	50						
Strontium	5.0	.0057	2.5						
Thallium	0.50	.0051	0.35						
Tin	5.0	.038	2.5						
Titanium	1.0	.059	0.50						
Vanadium	1.0	.026	0.50						
Zinc	2.0	.059	1.5						

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: result < LOD Run ID: MA35299 Units: ug/l

Time: / Sample ID:				15:30 CCB3		16:27 CCB4		17:23 CCB5	
Metal	RL	IDL	LOD	raw	final	raw	final	raw	final
Aluminum	25	.43	20	0.23	<25	0.17	<25	0.27	<25
Antimony	0.50	.13	0.50						
Arsenic	0.50	.028	0.40						
Barium	1.0	.0077	0.50						
Beryllium	0.50	.0035	0.25						
Boron	5.0	1.6	2.5						
Cadmium	0.50	.023	0.30						
Calcium	250	1.7	50						
Chromium	1.0	.027	0.50						
Cobalt	0.50	.0045	0.25						
Copper	1.0	.027	0.50						
Iron	25	.26	13						
Lead	0.50	.0077	0.25						
Magnesium	250	.29	130						
Manganese	1.0	.026	0.50						
Molybdenum	1.0	.017	0.50						
Nickel	1.0	.011	1.0						
Potassium	250	2.2	50						
Selenium	0.50	.034	0.50						
Silver	0.50	.0059	0.25						
Sodium	250	1.2	50						
Strontium	5.0	.0057	2.5						
Thallium	0.50	.0051	0.35						
Tin	5.0	.038	2.5						
Titanium	1.0	.059	0.50						
Vanadium	1.0	.026	0.50						
Zinc	2.0	.059	1.5						

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: result < LOD Run ID: MA35299 Units: ug/l

Time: / Sample ID:				18:14 CCB6		19:09 CCB7		20:00 CCB8	
Metal	RL	IDL	LOD	raw	final	raw	final	raw	final
Aluminum	25	.43	20	0.18	<25	0.39	<25	0.23	<25
Antimony	0.50	.13	0.50						
Arsenic	0.50	.028	0.40						
Barium	1.0	.0077	0.50						
Beryllium	0.50	.0035	0.25						
Boron	5.0	1.6	2.5						
Cadmium	0.50	.023	0.30						
Calcium	250	1.7	50						
Chromium	1.0	.027	0.50						
Cobalt	0.50	.0045	0.25						
Copper	1.0	.027	0.50						
Iron	25	.26	13						
Lead	0.50	.0077	0.25						
Magnesium	250	.29	130						
Manganese	1.0	.026	0.50						
Molybdenum	1.0	.017	0.50						
Nickel	1.0	.011	1.0						
Potassium	250	2.2	50						
Selenium	0.50	.034	0.50						
Silver	0.50	.0059	0.25						
Sodium	250	1.2	50						
Strontium	5.0	.0057	2.5						
Thallium	0.50	.0051	0.35						
Tin	5.0	.038	2.5						
Titanium	1.0	.059	0.50						
Vanadium	1.0	.026	0.50						
Zinc	2.0	.059	1.5						

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: 90 to 110 % Recovery Run ID: MA35299 Units: ug/l

Time:		14:07			14:11			14:25	
Sample ID:	ICV	ICV1		ICVA	ICVA1		CCVA	CCVA1	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	60	56.9	94.8	5500	5580	101.5	5000	5020	100.4
Antimony									
Arsenic									
Barium									
Beryllium									
Boron									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Molybdenum									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc									

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: 90 to 110 % Recovery Run ID: MA35299 Units: ug/l

Time:		15:12			15:26			16:23	
Sample ID:	CCVA	CCVA2		CCVA	CCVA3		CCVA	CCVA4	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	5000	4980	99.6	5000	4930	98.6	5000	4970	99.4
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Potassium	anr								
Selenium	anr								
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: 90 to 110 % Recovery Run ID: MA35299 Units: ug/l

Time:		17:18			18:09			19:04	
Sample ID:	CCVA	CCVA5		CCVA	CCVA6		CCVA	CCVA7	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	5000	4980	99.6	5000	4990	99.8	5000	4940	98.8
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Potassium	anr								
Selenium	anr								
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: 90 to 110 % Recovery Run ID: MA35299 Units: ug/l

Time:		19:55	
Sample ID:	CCVA	CCVA8	
Metal	True	Results	% Rec
Aluminum	5000	4940	98.8
Antimony	anr		
Arsenic	anr		
Barium	anr		
Beryllium	anr		
Boron			
Cadmium	anr		
Calcium	anr		
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	anr		
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Potassium	anr		
Selenium	anr		
Silver	anr		
Sodium	anr		
Strontium			
Thallium	anr		
Tin			
Titanium			
Vanadium	anr		
Zinc	anr		

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: 80 to 120 % Recovery Run ID: MA35299 Units: ug/l

Time:		14:21		16:32		19:14	
Sample ID:	CRIB	CRIB1		CRIB2		CRIB3	
Metal	True	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	25	23.4	93.6	24.0	96.0	23.4	93.6
Antimony	0.50						
Arsenic	0.50						
Barium	1.0						
Beryllium	0.50						
Boron	5.0						
Cadmium	0.50						
Calcium	250						
Chromium	1.0						
Cobalt	0.50						
Copper	1.0						
Iron	25						
Lead	0.50						
Magnesium	250						
Manganese	0.50						
Molybdenum	1.0						
Nickel	1.0						
Potassium	250						
Selenium	0.50						
Silver	0.50						
Sodium	250						
Strontium	5.0						
Thallium	0.50						
Tin	5.0						
Titanium	1.0						
Vanadium	1.0						
Zinc	2.0						

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

File ID: XA103114M1L.CSV Date Analyzed: 10/31/14 Methods: SW846 6020A
QC Limits: 80 to 120 % Recovery Run ID: MA35299 Units: ug/l

Time:			14:34		14:39	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1	
Metal	True	True	Results	% Rec	Results	% Rec
Aluminum	100000	100000	92400	92.4	91800	91.8
Antimony			0.044		0.054	
Arsenic		20	0.041		19.2	96.0
Barium			0.092		0.12	
Beryllium			0.015		0.014	
Boron			0.66		-0.0043	
Cadmium		20	0.46		19.1	95.5
Calcium	100000	100000	92300	92.3	91900	91.9
Chromium		20	1.3		20.3	101.5
Cobalt		20	0.010		18.6	93.0
Copper		20	0.42		17.8	89.0
Iron	100000	100000	91500	91.5	91100	91.1
Lead			0.20		0.24	
Magnesium	100000	100000	91500	91.5	90600	90.6
Manganese		20	0.43		19.6	98.0
Molybdenum	2000	2000	2150	107.5	2140	107.0
Nickel		20	0.14		17.9	89.5
Potassium	100000	100000	93400	93.4	93900	93.9
Selenium		20	0.032		22.7	113.5
Silver		20	0.029		18.2	91.0
Sodium	100000	100000	93500	93.5	93100	93.1
Strontium			0.66		0.66	
Thallium			0.0065		0.0076	
Tin			0.049		0.047	
Titanium	2000	2000	1980	99.0	1980	99.0
Vanadium		20	-0.13		20.1	100.5
Zinc		20	0.77		18.4	92.0

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

QC Batch ID: MP82882
Matrix Type: AQUEOUS

Methods: SW846 6020A
Units: ug/l

Prep Date: 10/30/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	.87	3.2	4.1	<50
Antimony	1.0	.25	.12		
Arsenic	1.0	.055	.23		
Barium	2.0	.015	.2		
Beryllium	1.0	.007	.026		
Boron	10	3.2	1.3		
Cadmium	1.0	.047	.22		
Calcium	500	3.4	8.5		
Chromium	2.0	.053	.3		
Cobalt	1.0	.009	.038		
Copper	2.0	.054	.22		
Iron	50	.53	6.3		
Lead	1.0	.015	.027		
Magnesium	500	.58	.73		
Manganese	2.0	.052	.11		
Molybdenum	2.0	.033	.17		
Nickel	2.0	.022	.062		
Potassium	500	4.4	6.7		
Selenium	1.0	.067	.087		
Silver	1.0	.012	.1		
Sodium	500	2.4	4.9		
Strontium	10	.011	.028		
Thallium	1.0	.01	.17		
Tin	10	.075	.25		
Titanium	2.0	.12	.84		
Vanadium	2.0	.053	.23		
Zinc	4.0	.12	.93		

Associated samples MP82882: FA19358-4, FA19358-4F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

QC Batch ID: MP82882
Matrix Type: AQUEOUS

Methods: SW846 6020A
Units: ug/l

Prep Date: 10/30/14

Metal	JB80352-2 Original	MS	Spikelot MPSPK	% Rec	QC Limits
Aluminum	6.8	25500	25000	102.0	75-125
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron	anr				
Lead					
Magnesium					
Manganese	anr				
Molybdenum					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Vanadium					
Zinc	anr				

Associated samples MP82882: FA19358-4, FA19358-4F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

QC Batch ID: MP82882
Matrix Type: AQUEOUS

Methods: SW846 6020A
Units: ug/l

Prep Date: 10/30/14

Metal	JB80352-2 Original	MSD	Spikelot MPSPK	% Rec	MSD RPD	QC Limit
Aluminum	6.8	25800	25000	103.2	1.2	20
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron	anr					
Lead						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Vanadium						
Zinc	anr					

Associated samples MP82882: FA19358-4, FA19358-4F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

QC Batch ID: MP82882
Matrix Type: AQUEOUS

Methods: SW846 6020A
Units: ug/l

Prep Date: 10/30/14

Metal	BSP Result	Spikelot MPSPK	% Rec	QC Limits
Aluminum	24300	25000	97.2	80-120
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP82882: FA19358-4, FA19358-4F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: FA19358
Account: ALSE - Accutest Laboratories Southeast, Inc.
Project: GSYNFLTI: LC-39B, KSC, FL

QC Batch ID: MP82882
Matrix Type: AQUEOUS

Methods: SW846 6020A
Units: ug/l

Prep Date: 10/30/14

Metal	JB80352-2 Original	SDL 2:10	%DIF	QC Limits
Aluminum	6.83	11.1	61.9 (a)	0-10
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	anr			

Associated samples MP82882: FA19358-4, FA19358-4F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Southeast
ACCUTEST LABORATORIES

11/04/14

Technical Report for

Geosyntec Consultants

LC-39B, KSC, FL

FR1352C

Accutest Job Number: FA19407

Sampling Date: 10/23/14

Report to:

Geosyntec Consultants
6770 South Washington Ave Suite 3
Titusville, FL 32780
RDaprato@Geosyntec.com; Elawson@GeoSyntec.com

ATTN: Rebecca Daprato

Total number of pages in report: **69**

NELAP ACCREDITED TNI LABORATORY

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL (E83510), LA (03051), KS (E-10327), IA (366), IL (200063), NC (573), NJ (FL002), SC (96038001) DoD ELAP (L-A-B L2229), CA (04226CA), TX (T104704404), PA (68-03573), VA (460177), AK, AR, GA, KY, MA, NV, OK, UT, WA

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Sample Summary

Geosyntec Consultants

Job No: FA19407

LC-39B, KSC, FL
Project No: FR1352C

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA19407-1	10/23/14	17:42	MB	10/25/14	AQ	Ground Water	39B-LOX-TA0001S-013.0-20141023
FA19407-2	10/23/14	10:57	MB	10/25/14	AQ	Ground Water	39B-LOX-TA0002S-013.0-20141023
FA19407-3	10/23/14	10:02	MB	10/25/14	AQ	Ground Water	39B-LOX-TA0002I-030.0-20141023
FA19407-4	10/23/14	12:31	MB	10/25/14	AQ	Ground Water	39B-LOX-IW0009S-014.5-20141023
FA19407-5	10/23/14	13:20	MB	10/25/14	AQ	Ground Water	39B-LOX-IW0009SI-025.0-20141023
FA19407-6	10/23/14	15:49	MB	10/25/14	AQ	Ground Water	39B-LOX-IW0013S-008.5-20141023
FA19407-7	10/23/14	15:08	MB	10/25/14	AQ	Ground Water	39B-LOX-IW0013I-013.0-20141023

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Geosyntec Consultants **Job No:** FA19407

Site: LC-39B, KSC, FL **Report Date:** 11/4/2014 2:57:51 PM

7 Sample(s) were collected on 10/23/2014 and were received at Accutest SE on 10/25/2014 properly preserved, at 3 Deg. C and intact. These Samples received an Accutest job number of FA19407. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: AQ **Batch ID:** VI538

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA19473-14MS, FA19473-14MSD were used as the QC samples indicated.

Matrix Spike Duplicate Recovery(s) for cis-1,3-Dichloropropene, trans-1,3-Dichloropropene are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike. % RPD was within control limits in MS/MSD.

FA19407-1: Sample was treated with an anti-foaming agent.

FA19407-2: Sample was treated with an anti-foaming agent.

FA19407-4: Sample was treated with an anti-foaming agent.

FA19407-5: Sample was treated with an anti-foaming agent.

FA19407-7: Sample was treated with an anti-foaming agent.

Matrix: AQ **Batch ID:** VZ1145

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA19400-1MS, FA19400-1MSD were used as the QC samples indicated.

FA19407-1: Sample was treated with an anti-foaming agent.

FA19407-2: Sample was treated with an anti-foaming agent.

FA19407-3: Sample was treated with an anti-foaming agent.

FA19407-5: Sample was treated with an anti-foaming agent.

FA19407-7: Sample was treated with an anti-foaming agent.

Accutest Laboratories Southeast (ALSE) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALSE and as stated on the COC. ALSE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALSE Quality Manual except as noted above. This report is to be used in its entirety. ALSE is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

_____

Kim Benham, Client Services (signature on file)

Date: November 4, 2014

Summary of Hits

Job Number: FA19407
Account: Geosyntec Consultants
Project: LC-39B, KSC, FL
Collected: 10/23/14

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	PQL	MDL	Units	Method
FA19407-1	**39B-LOX-TA0001S-013.0-20141023**					
1,1-Dichloroethylene [a]		1.1	1.0	0.25	ug/l	SW846 8260B
cis-1,2-Dichloroethylene [a]		16.9	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene [a]		2.1	1.0	0.34	ug/l	SW846 8260B
Toluene [a]		0.27 I	1.0	0.20	ug/l	SW846 8260B
Trichloroethylene [a]		17.4	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride [a]		34.5	1.0	0.33	ug/l	SW846 8260B
FA19407-2	**39B-LOX-TA0002S-013.0-20141023**					
cis-1,2-Dichloroethylene [a]		16.1	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene [a]		11.0	1.0	0.34	ug/l	SW846 8260B
Trichloroethylene [a]		9.2	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride [a]		48.2	1.0	0.33	ug/l	SW846 8260B
FA19407-3	**39B-LOX-TA0002I-030.0-20141023**					
cis-1,2-Dichloroethylene		7.4	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene		2.8	1.0	0.34	ug/l	SW846 8260B
Toluene		0.28 I	1.0	0.20	ug/l	SW846 8260B
Trichloroethylene		3.0	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride [a]		16.8	1.0	0.33	ug/l	SW846 8260B
FA19407-4	**39B-LOX-IW0009S-014.5-20141023**					
cis-1,2-Dichloroethylene [a]		32.7	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene [a]		10.1	1.0	0.34	ug/l	SW846 8260B
Toluene [a]		0.27 I	1.0	0.20	ug/l	SW846 8260B
Trichloroethylene [a]		9.6	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride		94.6	2.0	0.65	ug/l	SW846 8260B
FA19407-5	**39B-LOX-IW0009SI-025.0-20141023**					
cis-1,2-Dichloroethylene [a]		4.8	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene [a]		8.9	1.0	0.34	ug/l	SW846 8260B
Trichloroethylene [a]		3.4	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride [a]		12.4	1.0	0.33	ug/l	SW846 8260B
FA19407-6	**39B-LOX-IW0013S-008.5-20141023**					
1,1-Dichloroethylene		0.58 I	1.0	0.25	ug/l	SW846 8260B
cis-1,2-Dichloroethylene		94.1	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene		10.2	1.0	0.34	ug/l	SW846 8260B
Toluene		0.38 I	1.0	0.20	ug/l	SW846 8260B

Summary of Hits

Job Number: FA19407
Account: Geosyntec Consultants
Project: LC-39B, KSC, FL
Collected: 10/23/14

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	PQL	MDL	Units	Method
Trichloroethylene		42.6	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride		97.1	2.0	0.65	ug/l	SW846 8260B
FA19407-7	**39B-LOX-IW0013I-013.0-20141023**					
cis-1,2-Dichloroethylene [a]		38.3	1.0	0.33	ug/l	SW846 8260B
trans-1,2-Dichloroethylene [a]		9.3	1.0	0.34	ug/l	SW846 8260B
Toluene [a]		0.26 I	1.0	0.20	ug/l	SW846 8260B
Trichloroethylene [a]		14.4	1.0	0.30	ug/l	SW846 8260B
Vinyl chloride [a]		52.9	1.0	0.33	ug/l	SW846 8260B

(a) Sample was treated with an anti-foaming agent.

Southeast ACCUTEST LABORATORIES

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Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: 39B-LOX-TA0001S-013.0-20141023
Lab Sample ID: FA19407-1
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/23/14
Date Received: 10/25/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I24932.D	1	11/01/14	EG	n/a	n/a	VI538
Run #2 [a]	Z29653.D	1	11/03/14	MM	n/a	n/a	VZ1145

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	1.1	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	16.9	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	2.1	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.27	1.0	0.20	ug/l	I
79-01-6	Trichloroethylene	17.4	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-TA0001S-013.0-20141023		
Lab Sample ID:	FA19407-1	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	34.5 [b]	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	107%	83-118%
17060-07-0	1,2-Dichloroethane-D4	110%	106%	79-125%
2037-26-5	Toluene-D8	102%	94%	85-112%
460-00-4	4-Bromofluorobenzene	106%	109%	83-118%

(a) Sample was treated with an anti-foaming agent.
(b) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-TA0002S-013.0-20141023
Lab Sample ID: FA19407-2
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/23/14
Date Received: 10/25/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I24933.D	1	11/01/14	EG	n/a	n/a	VI538
Run #2 [a]	Z29654.D	1	11/03/14	MM	n/a	n/a	VZ1145

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	16.1	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	11.0	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	9.2	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-TA0002S-013.0-20141023		
Lab Sample ID:	FA19407-2	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	48.2 [b]	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	110%	83-118%
17060-07-0	1,2-Dichloroethane-D4	111%	106%	79-125%
2037-26-5	Toluene-D8	101%	93%	85-112%
460-00-4	4-Bromofluorobenzene	108%	109%	83-118%

(a) Sample was treated with an anti-foaming agent.
(b) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-TA0002I-030.0-20141023
Lab Sample ID: FA19407-3
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/23/14
Date Received: 10/25/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I24934.D	1	11/01/14	EG	n/a	n/a	VI538
Run #2 [a]	Z29655.D	1	11/03/14	MM	n/a	n/a	VZ1145

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	7.4	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	2.8	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.28	1.0	0.20	ug/l	I
79-01-6	Trichloroethylene	3.0	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit
PQL = Practical Quantitation Limit
L = Indicates value exceeds calibration range
I = Result > = MDL but < PQL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-TA0002I-030.0-20141023		
Lab Sample ID:	FA19407-3	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	16.8 [b]	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	107%	83-118%
17060-07-0	1,2-Dichloroethane-D4	117%	108%	79-125%
2037-26-5	Toluene-D8	103%	96%	85-112%
460-00-4	4-Bromofluorobenzene	99%	108%	83-118%

(a) Sample was treated with an anti-foaming agent.
(b) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0009S-014.5-20141023		
Lab Sample ID:	FA19407-4	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I24935.D	1	11/01/14	EG	n/a	n/a	VI538
Run #2	Z29656.D	2	11/03/14	MM	n/a	n/a	VZ1145

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	32.7	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	10.1	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.27	1.0	0.20	ug/l	I
79-01-6	Trichloroethylene	9.6	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0009S-014.5-20141023		
Lab Sample ID:	FA19407-4	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	94.6 [b]	2.0	0.65	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%	109%	83-118%
17060-07-0	1,2-Dichloroethane-D4	113%	109%	79-125%
2037-26-5	Toluene-D8	102%	95%	85-112%
460-00-4	4-Bromofluorobenzene	107%	110%	83-118%

(a) Sample was treated with an anti-foaming agent.
(b) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-IW0009SI-025.0-20141023
Lab Sample ID: FA19407-5
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/23/14
Date Received: 10/25/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I24936.D	1	11/01/14	EG	n/a	n/a	VI538
Run #2 [a]	Z29657.D	1	11/03/14	MM	n/a	n/a	VZ1145

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	4.8	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	8.9	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	3.4	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0009SI-025.0-20141023		
Lab Sample ID:	FA19407-5	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	12.4 [b]	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	108%	83-118%
17060-07-0	1,2-Dichloroethane-D4	112%	107%	79-125%
2037-26-5	Toluene-D8	103%	94%	85-112%
460-00-4	4-Bromofluorobenzene	109%	109%	83-118%

(a) Sample was treated with an anti-foaming agent.
(b) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-IW0013S-008.5-20141023
Lab Sample ID: FA19407-6
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/23/14
Date Received: 10/25/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I24937.D	1	11/02/14	EG	n/a	n/a	VI538
Run #2	Z29658.D	2	11/03/14	MM	n/a	n/a	VZ1145

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.58	1.0	0.25	ug/l	I
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	94.1	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	10.2	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.38	1.0	0.20	ug/l	I
79-01-6	Trichloroethylene	42.6	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0013S-008.5-20141023		
Lab Sample ID:	FA19407-6	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	97.1 [a]	2.0	0.65	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	108%	83-118%
17060-07-0	1,2-Dichloroethane-D4	116%	110%	79-125%
2037-26-5	Toluene-D8	104%	95%	85-112%
460-00-4	4-Bromofluorobenzene	100%	107%	83-118%

(a) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 39B-LOX-IW0013I-013.0-20141023
Lab Sample ID: FA19407-7
Matrix: AQ - Ground Water
Method: SW846 8260B
Project: LC-39B, KSC, FL

Date Sampled: 10/23/14
Date Received: 10/25/14
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I24938.D	1	11/02/14	EG	n/a	n/a	VI538
Run #2 [a]	Z29659.D	1	11/03/14	MM	n/a	n/a	VZ1145

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
67-64-1	Acetone	11 U	25	11	ug/l	
71-43-2	Benzene	0.24 U	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	0.26 U	1.0	0.26	ug/l	
75-25-2	Bromoform	0.38 U	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	0.24 U	1.0	0.24	ug/l	
75-00-3	Chloroethane	0.50 U	2.0	0.50	ug/l	
67-66-3	Chloroform	0.31 U	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	0.20 U	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	0.40 U	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	0.26 U	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	0.25 U	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	0.24 U	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	0.36 U	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	0.36 U	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	38.3	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	9.3	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.21 U	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	0.28 U	1.0	0.28	ug/l	
591-78-6	2-Hexanone	2.0 U	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	1.0 U	5.0	1.0	ug/l	
74-83-9	Methyl bromide	0.54 U	2.0	0.54	ug/l	
74-87-3	Methyl chloride	0.53 U	2.0	0.53	ug/l	
75-09-2	Methylene chloride	2.0 U	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	1.5 U	5.0	1.5	ug/l	
100-42-5	Styrene	0.23 U	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34 U	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.27 U	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	0.32 U	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	0.26 U	1.0	0.26	ug/l	
108-88-3	Toluene	0.26	1.0	0.20	ug/l	I
79-01-6	Trichloroethylene	14.4	1.0	0.30	ug/l	

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	39B-LOX-IW0013I-013.0-20141023		
Lab Sample ID:	FA19407-7	**Date Sampled:**	10/23/14
Matrix:	AQ - Ground Water	**Date Received:**	10/25/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	LC-39B, KSC, FL		

VOA TCL List

CAS No.	Compound	Result	PQL	MDL	Units	Q
75-01-4	Vinyl chloride	52.9 [b]	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	0.66 U	3.0	0.66	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	113%	83-118%
17060-07-0	1,2-Dichloroethane-D4	118%	113%	79-125%
2037-26-5	Toluene-D8	102%	95%	85-112%
460-00-4	4-Bromofluorobenzene	108%	110%	83-118%

(a) Sample was treated with an anti-foaming agent.
(b) Result is from Run# 2

U = Not detected MDL = Method Detection Limit I = Result > = MDL but < PQL J = Estimated value
PQL = Practical Quantitation Limit V = Indicates analyte found in associated method blank
L = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Southeast ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

FA19407

ACCUTEST.

CHAIN OF CUSTODY

4405 Vineland Rd., Suite C15
Orlando, FL 32811
407.425.6700, fax 407.425.0707

Accutest Job #:

Accutest Quote #: AC8/2014-610

Client Information

Name: Geosyntec Consultants

Address: 6770 South Washington Ave Suite 3

City: Titusville, Fl 32780 State: Zip:

Send Report to: Rdaprato@Geosyntec.com

Phone #: 321-795-1303

Facility Information

Project Name: LC39B

Location: KSC, FL

Project No.: FR1352C

FAX #: 321-269-5813

Analytical Information

	Field ID / Point of Collection	Collection: Date	Time	Sampled By	Matrix	# of bottles	Preservation: HCL	NaOH	HNO3	ZnAc	H2SO4	Other	None	VOCs (SW846 8260B)
1	39B-LOX-TA0001S-013.0-20141023	10/23/2014	1742	MB	GW	3	3							3
2	39B-LOX-TA0002S-013.0-20141023	10/23/2014	1057	MB	GW	3	3							3
3	39B-LOX-TA0002I-030.0-20141023	10/23/2014	1002	MB	GW	3	3							3
4	39B-LOX-IW0009S-014.5-20141023	10/23/2014	1231	MB	GW	3	3							3
5	39B-LOX-IW0009SI-025.0-20141023	10/23/2014	1320	MB	GW	3	3							3
6	39B-LOX-IW0013S-008.5-20141023	10/23/2014	1549	MB	GW	3	3							3
7	39B-LOX-IW0013I-013.0-20141023	10/23/2014	1508	MB	GW	3	3							3

Turnaround Information

- [ ] 21 Day Standard — Approved By:
- [X] 14 Day
- [ ] 7 Days *EMERGENCY*
- [ ] Other _____ (Days)

RUSH TAT is for FAX data
Data unless previously approved.

Data Deliverable Information

- [ ] NJ Reduced
- [ ] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [X] Other (Specify): NASA KEDD
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] ASP Category B
- [ ] State Forms

Comments / Remarks

1) All vials' sample IDs do not contain the suffix of "-20141023"

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1	Date Time: 10/24/14 1540	Received By: 1	15:40 10-24-14	Relinquished By: 2	Date Time: 10-24-14 18:45
Received By: 2	10-25-14 800	Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4
Date Time:	Received By: 4	Relinquished by Sampler: 5	Date Time:	Received By: 5	Seal #
Preserved where applicable	On Ice: 30				

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FA19407: Chain of Custody
Page 1 of 2

ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

ACCUTEST'S JOB NUMBER: FA19407 CLIENT: Geosyntec PROJECT: LC39B

DATE/TIME RECEIVED: 10-25-14 800 {MM/DD/YY 24:00} NUMBER OF COOLERS RECEIVED: 1

METHOD OF DELIVERY: FEDEX UPS (ACCUTEST COURIER) GREYHOUND DELIVERY OTHER

AIRBILL NUMBERS:

COOLER INFORMATION

- [ ] CUSTODY SEAL NOT PRESENT OR NOT INTACT
- [ ] CHAIN OF CUSTODY NOT RECEIVED (COC)
- [ ] ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- [ ] SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- [ ] TEMPERATURE CRITERIA NOT MET

TRIP BLANK INFORMATION

- [X] TRIP BLANK PROVIDED
- [ ] TRIP BLANK NOT PROVIDED
- [X] TRIP BLANK NOT ON COC
- [Y] TRIP BLANK INTACT
- [ ] TRIP BLANK NOT INTACT
- [X] RECEIVED WATER TRIP BLANK
- [ ] RECEIVED SOIL TRIP BLANK

MISC. INFORMATION

NUMBER OF ENCORES ? 25-GRAM_____ 5-GRAM_____

NUMBER OF 5035 FIELD KITS ? _____

NUMBER OF LAB FILTERED METALS ? _____

TEMPERATURE INFORMATION

- [ ] IR THERM ID 1 CORR. FACTOR +0.4
- [ ] OBSERVED TEMPS: 2.6
- [ ] CORRECTED TEMPS: 3.0

SAMPLE INFORMATION

- [ ] INCORRECT NUMBER OF CONTAINERS USED
- [ ] SAMPLE RECEIVED IMPROPERLY PRESERVED
- [ ] INSUFFICIENT VOLUME FOR ANALYSIS
- [ ] DATES/TIMES ON COC DO NOT MATCH SAMPLE LABEL
- [ ] ID'S ON COC DO NOT MATCH LABEL
- [ ] VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- [ ] BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- [ ] NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- [ ] UNCLEAR FILTERING OR COMPOSITING INSTRUCTIONS
- [ ] SAMPLE CONTAINER(S) RECEIVED BROKEN
- [ ] 5035 FIELD KITS NOT RECEIVED WITHIN 48 HOURS
- [ ] BULK VOA SOIL JARS NOT RECEIVED WITHIN 48 HOURS
- [ ] % SOLIDS JAR NOT RECEIVED
- [ ] RESIDUAL CHLORINE PRESENT

{APPICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS}

SUMMARY OF COMMENTS:

TECHNICIAN SIGNATURE/DATE: 10-25-14 REVIEWER SIGNATURE/DATE: 10/25/14

RS 04/14

receipt confirmation 041514.xls

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FA19407: Chain of Custody
Page 2 of 2

Southeast ACCUTEST LABORATORIES

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI538-MB	I24919.D	1	11/01/14	EG	n/a	n/a	VI538

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	11	ug/l	
71-43-2	Benzene	ND	1.0	0.24	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.26	ug/l	
75-25-2	Bromoform	ND	1.0	0.38	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.24	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
67-66-3	Chloroform	ND	1.0	0.31	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.20	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.40	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.26	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.25	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.24	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.36	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.36	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.33	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.34	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.28	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	1.0	ug/l	
74-83-9	Methyl bromide	ND	2.0	0.54	ug/l	
74-87-3	Methyl chloride	ND	2.0	0.53	ug/l	
75-09-2	Methylene chloride	ND	5.0	2.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	1.5	ug/l	
100-42-5	Styrene	ND	1.0	0.23	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.34	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.27	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.32	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.26	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.30	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.66	ug/l	

Method Blank Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI538-MB	I24919.D	1	11/01/14	EG	n/a	n/a	VI538

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	97%	83-118%
17060-07-0	1,2-Dichloroethane-D4	107%	79-125%
2037-26-5	Toluene-D8	102%	85-112%
460-00-4	4-Bromofluorobenzene	96%	83-118%

Method Blank Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ1145-MB	Z29648.D	1	11/03/14	MM	n/a	n/a	VZ1145

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl chloride	ND	1.0	0.33	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	107%	83-118%
17060-07-0	1,2-Dichloroethane-D4	105%	79-125%
2037-26-5	Toluene-D8	94%	85-112%
460-00-4	4-Bromofluorobenzene	103%	83-118%

Blank Spike Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI538-BS	I24917.D	1	11/01/14	EG	n/a	n/a	VI538

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	178	142	50-147
71-43-2	Benzene	25	24.7	99	81-122
75-27-4	Bromodichloromethane	25	26.9	108	79-123
75-25-2	Bromoform	25	29.2	117	66-123
108-90-7	Chlorobenzene	25	29.3	117	82-124
75-00-3	Chloroethane	25	31.9	128	62-144
67-66-3	Chloroform	25	26.4	106	80-124
75-15-0	Carbon disulfide	25	33.9	136	66-148
56-23-5	Carbon tetrachloride	25	28.9	116	76-136
75-34-3	1,1-Dichloroethane	25	26.6	106	81-122
75-35-4	1,1-Dichloroethylene	25	32.6	130	78-137
107-06-2	1,2-Dichloroethane	25	27.6	110	75-125
78-87-5	1,2-Dichloropropane	25	25.0	100	76-124
124-48-1	Dibromochloromethane	25	27.2	109	78-122
156-59-2	cis-1,2-Dichloroethylene	25	25.1	100	78-120
10061-01-5	cis-1,3-Dichloropropene	25	25.2	101	75-118
156-60-5	trans-1,2-Dichloroethylene	25	25.8	103	76-127
10061-02-6	trans-1,3-Dichloropropene	25	27.6	110	80-120
100-41-4	Ethylbenzene	25	27.6	110	81-121
591-78-6	2-Hexanone	125	159	127	61-129
108-10-1	4-Methyl-2-pentanone	125	134	107	66-122
74-83-9	Methyl bromide	25	34.5	138	59-143
74-87-3	Methyl chloride	25	31.7	127	50-159
75-09-2	Methylene chloride	25	26.9	108	69-135
78-93-3	Methyl ethyl ketone	125	155	124	56-143
100-42-5	Styrene	25	26.2	105	78-119
71-55-6	1,1,1-Trichloroethane	25	27.1	108	75-130
79-34-5	1,1,2,2-Tetrachloroethane	25	25.4	102	72-120
79-00-5	1,1,2-Trichloroethane	25	27.4	110	76-119
127-18-4	Tetrachloroethylene	25	28.0	112	76-135
108-88-3	Toluene	25	25.6	102	80-120
79-01-6	Trichloroethylene	25	27.1	108	81-126
1330-20-7	Xylene (total)	75	86.3	115	80-126

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI538-BS	I24917.D	1	11/01/14	EG	n/a	n/a	VI538

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	96%	83-118%
17060-07-0	1,2-Dichloroethane-D4	107%	79-125%
2037-26-5	Toluene-D8	96%	85-112%
460-00-4	4-Bromofluorobenzene	90%	83-118%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ1145-BS	Z29646.D	1	11/03/14	MM	n/a	n/a	VZ1145

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-01-4	Vinyl chloride	25	30.3	121	69-159

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	83-118%
17060-07-0	1,2-Dichloroethane-D4	101%	79-125%
2037-26-5	Toluene-D8	94%	85-112%
460-00-4	4-Bromofluorobenzene	96%	83-118%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA19473-14MS	I24939.D	5	11/02/14	EG	n/a	n/a	VI538
FA19473-14MSD	I24940.D	5	11/02/14	EG	n/a	n/a	VI538
FA19473-14 [a]	I24925.D	5	11/01/14	EG	n/a	n/a	VI538

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Compound	FA19473-14 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	130 U		625	463	74	625	460	74	1	50-147/21
71-43-2	Benzene	5.0 U		125	118	94	125	113	90	4	81-122/14
75-27-4	Bromodichloromethane	5.0 U		125	128	102	125	115	92	11	79-123/19
75-25-2	Bromoform	5.0 U		125	104	83	125	93.5	75	11	66-123/21
108-90-7	Chlorobenzene	5.0 U		125	133	106	125	133	106	0	82-124/14
75-00-3	Chloroethane	10 U		125	147	118	125	152	122	3	62-144/20
67-66-3	Chloroform	5.0 U		125	130	104	125	127	102	2	80-124/15
75-15-0	Carbon disulfide	10 U		125	168	134	125	147	118	13	66-148/23
56-23-5	Carbon tetrachloride	5.0 U		125	140	112	125	124	99	12	76-136/23
75-34-3	1,1-Dichloroethane	5.0 U		125	124	99	125	120	96	3	81-122/15
75-35-4	1,1-Dichloroethylene	5.0 U		125	164	131	125	162	130	1	78-137/18
107-06-2	1,2-Dichloroethane	5.0 U		125	139	111	125	138	110	1	75-125/14
78-87-5	1,2-Dichloropropane	5.0 U		125	115	92	125	110	88	4	76-124/14
124-48-1	Dibromochloromethane	5.0 U		125	115	92	125	104	83	10	78-122/19
156-59-2	cis-1,2-Dichloroethylene	4.3	J	125	120	93	125	115	89	4	78-120/15
10061-01-5	cis-1,3-Dichloropropene	5.0 U		125	97.9	78	125	82.5	66*	17	75-118/23
156-60-5	trans-1,2-Dichloroethylene	5.0 U		125	125	100	125	117	94	7	76-127/17
10061-02-6	trans-1,3-Dichloropropene	5.0 U		125	103	82	125	89.9	72*	14	80-120/22
100-41-4	Ethylbenzene	5.0 U		125	130	104	125	127	102	2	81-121/14
591-78-6	2-Hexanone	50 U		625	546	87	625	599	96	9	61-129/18
108-10-1	4-Methyl-2-pentanone	25 U		625	565	90	625	612	98	8	66-122/16
74-83-9	Methyl bromide	10 U		125	157	126	125	160	128	2	59-143/19
74-87-3	Methyl chloride	10 U		125	117	94	125	134	107	14	50-159/19
75-09-2	Methylene chloride	25 U		125	129	103	125	126	101	2	69-135/16
78-93-3	Methyl ethyl ketone	25 U		625	506	81	625	518	83	2	56-143/18
100-42-5	Styrene	5.0 U		125	126	101	125	123	98	2	78-119/23
71-55-6	1,1,1-Trichloroethane	5.0 U		125	142	114	125	134	107	6	75-130/16
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U		125	116	93	125	116	93	0	72-120/14
79-00-5	1,1,2-Trichloroethane	5.0 U		125	121	97	125	124	99	2	76-119/14
127-18-4	Tetrachloroethylene	5.0 U		125	135	108	125	127	102	6	76-135/16
108-88-3	Toluene	5.0 U		125	120	96	125	121	97	1	80-120/14
79-01-6	Trichloroethylene	5.0 U		125	134	107	125	131	105	2	81-126/15
1330-20-7	Xylene (total)	15 U		375	403	107	375	395	105	2	80-126/15

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA19473-14MS	I24939.D	5	11/02/14	EG	n/a	n/a	VI538
FA19473-14MSD	I24940.D	5	11/02/14	EG	n/a	n/a	VI538
FA19473-14 [a]	I24925.D	5	11/01/14	EG	n/a	n/a	VI538

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Surrogate Recoveries	MS	MSD	FA19473-14	Limits
1868-53-7	Dibromofluoromethane	102%	102%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	114%	111%	109%	79-125%
2037-26-5	Toluene-D8	94%	98%	103%	85-112%
460-00-4	4-Bromofluorobenzene	89%	89%	98%	83-118%

(a) Sample was not preserved to a pH < 2.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA19400-1MS	Z29665.D	1	11/03/14	MM	n/a	n/a	VZ1145
FA19400-1MSD	Z29666.D	1	11/03/14	MM	n/a	n/a	VZ1145
FA19400-1	Z29649.D	1	11/03/14	MM	n/a	n/a	VZ1145

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA19407-1, FA19407-2, FA19407-3, FA19407-4, FA19407-5, FA19407-6, FA19407-7

CAS No.	Compound	FA19400-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
75-01-4	Vinyl chloride	1.0	U	25	24.1	96	25	26.5	106	9	69-159/18

CAS No.	Surrogate Recoveries	MS	MSD	FA19400-1	Limits
1868-53-7	Dibromofluoromethane	108%	109%	106%	83-118%
17060-07-0	1,2-Dichloroethane-D4	108%	108%	104%	79-125%
2037-26-5	Toluene-D8	87%	90%	95%	85-112%
460-00-4	4-Bromofluorobenzene	94%	97%	100%	83-118%

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-BFB
Lab File ID: I24618.D
Instrument ID: GCMSI
Injection Date: 10/22/14
Injection Time: 09:25

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	49987	20.2		Pass
75	30.0 - 60.0% of mass 95	118325	47.9		Pass
95	Base peak, 100% relative abundance	247040	100.0		Pass
96	5.0 - 9.0% of mass 95	16673	6.75		Pass
173	Less than 2.0% of mass 174	1403	0.57	(0.62) [a]	Pass
174	50.0 - 100.0% of mass 95	227648	92.2		Pass
175	5.0 - 9.0% of mass 174	16692	6.76	(7.33) [a]	Pass
176	95.0 - 101.0% of mass 174	220480	89.2	(96.9) [a]	Pass
177	5.0 - 9.0% of mass 176	13747	5.56	(6.24) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VI527-IC527	I24619.D	10/22/14	09:46	00:21	Initial cal 1
VI527-IC527	I24620.D	10/22/14	10:11	00:46	Initial cal 2
VI527-IC527	I24621.D	10/22/14	10:36	01:11	Initial cal 3
VI527-ICC527	I24622.D	10/22/14	11:02	01:37	Initial cal 4
VI527-IC527	I24623.D	10/22/14	11:27	02:02	Initial cal 5
VI527-IC527	I24624.D	10/22/14	11:53	02:28	Initial cal 6
VI527-ICV527	I24626.D	10/22/14	12:44	03:19	Initial cal verification 4
VI527-BS	I24627.D	10/22/14	13:09	03:44	Blank Spike
VI527-MB	I24629.D	10/22/14	14:16	04:51	Method Blank
ZZZZZZ	I24630.D	10/22/14	14:41	05:16	(unrelated sample)
FA19174-2	I24631.D	10/22/14	15:06	05:41	(used for QC only; not part of job FA19407)
ZZZZZZ	I24632.D	10/22/14	15:32	06:07	(unrelated sample)
ZZZZZZ	I24633.D	10/22/14	15:57	06:32	(unrelated sample)
ZZZZZZ	I24634.D	10/22/14	16:22	06:57	(unrelated sample)
ZZZZZZ	I24635.D	10/22/14	16:47	07:22	(unrelated sample)
ZZZZZZ	I24636.D	10/22/14	17:12	07:47	(unrelated sample)
ZZZZZZ	I24637.D	10/22/14	17:38	08:13	(unrelated sample)
ZZZZZZ	I24638.D	10/22/14	18:03	08:38	(unrelated sample)
ZZZZZZ	I24639.D	10/22/14	18:28	09:03	(unrelated sample)
ZZZZZZ	I24640.D	10/22/14	18:54	09:29	(unrelated sample)
ZZZZZZ	I24641.D	10/22/14	19:19	09:54	(unrelated sample)
ZZZZZZ	I24642.D	10/22/14	19:45	10:20	(unrelated sample)
ZZZZZZ	I24643.D	10/22/14	20:10	10:45	(unrelated sample)
ZZZZZZ	I24644.D	10/22/14	20:35	11:10	(unrelated sample)

Instrument Performance Check (BFB)

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample:	VI527-BFB	**Injection Date:**	10/22/14
Lab File ID:	I24618.D	**Injection Time:**	09:25
Instrument ID:	GCMSI		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	I24645.D	10/22/14	21:00	11:35	(unrelated sample)
FA19174-2MS	I24646.D	10/22/14	21:25	12:00	Matrix Spike
FA19174-2MSD	I24647.D	10/22/14	21:50	12:25	Matrix Spike Duplicate
VI528-CC527	I24651.D	10/23/14	10:06	24:41	Continuing cal 4

Instrument Performance Check (BFB)

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI538-BFB
Lab File ID: I24915.D
Instrument ID: GCMSI
Injection Date: 11/01/14
Injection Time: 14:00

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	37795	23.6		Pass
75	30.0 - 60.0% of mass 95	82104	51.3		Pass
95	Base peak, 100% relative abundance	160000	100.0		Pass
96	5.0 - 9.0% of mass 95	11024	6.89		Pass
173	Less than 2.0% of mass 174	890	0.56	(0.61) [a]	Pass
174	50.0 - 100.0% of mass 95	146560	91.6		Pass
175	5.0 - 9.0% of mass 174	10850	6.78	(7.40) [a]	Pass
176	95.0 - 101.0% of mass 174	144464	90.3	(98.6) [a]	Pass
177	5.0 - 9.0% of mass 176	8908	5.57	(6.17) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VI538-CC527	I24916.D	11/01/14	14:18	00:18	Continuing cal 4
VI538-BS	I24917.D	11/01/14	15:08	01:08	Blank Spike
VI538-MB	I24919.D	11/01/14	16:40	02:40	Method Blank
ZZZZZZ	I24920.D	11/01/14	17:05	03:05	(unrelated sample)
ZZZZZZ	I24921.D	11/01/14	17:31	03:31	(unrelated sample)
ZZZZZZ	I24922.D	11/01/14	17:57	03:57	(unrelated sample)
ZZZZZZ	I24923.D	11/01/14	18:22	04:22	(unrelated sample)
ZZZZZZ	I24924.D	11/01/14	18:47	04:47	(unrelated sample)
FA19473-14	I24925.D	11/01/14	19:12	05:12	(used for QC only; not part of job FA19407)
ZZZZZZ	I24926.D	11/01/14	19:37	05:37	(unrelated sample)
ZZZZZZ	I24927.D	11/01/14	20:02	06:02	(unrelated sample)
ZZZZZZ	I24928.D	11/01/14	20:28	06:28	(unrelated sample)
ZZZZZZ	I24929.D	11/01/14	20:53	06:53	(unrelated sample)
ZZZZZZ	I24930.D	11/01/14	21:19	07:19	(unrelated sample)
ZZZZZZ	I24931.D	11/01/14	21:44	07:44	(unrelated sample)
FA19407-1	I24932.D	11/01/14	22:09	08:09	39B-LOX-TA0001S-013.0-20141023
FA19407-2	I24933.D	11/01/14	22:35	08:35	39B-LOX-TA0002S-013.0-20141023
FA19407-3	I24934.D	11/01/14	23:00	09:00	39B-LOX-TA0002I-030.0-20141023
FA19407-4	I24935.D	11/01/14	23:25	09:25	39B-LOX-IW0009S-014.5-20141023
FA19407-5	I24936.D	11/01/14	23:50	09:50	39B-LOX-IW0009SI-025.0-20141023
FA19407-6	I24937.D	11/02/14	00:15	10:15	39B-LOX-IW0013S-008.5-20141023
FA19407-7	I24938.D	11/02/14	00:40	10:40	39B-LOX-IW0013I-013.0-20141023
FA19473-14MS	I24939.D	11/02/14	01:05	11:05	Matrix Spike
FA19473-14MSD	I24940.D	11/02/14	01:30	11:30	Matrix Spike Duplicate

Instrument Performance Check (BFB)

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample:	VZ1144-BFB	**Injection Date:**	11/01/14
Lab File ID:	Z29630.D	**Injection Time:**	12:03
Instrument ID:	GCMSZ		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	45784	24.8		Pass
75	30.0 - 60.0% of mass 95	79739	43.2		Pass
95	Base peak, 100% relative abundance	184725	100.0		Pass
96	5.0 - 9.0% of mass 95	11871	6.43		Pass
173	Less than 2.0% of mass 174	1528	0.83	(0.90) [a]	Pass
174	50.0 - 100.0% of mass 95	169984	92.0		Pass
175	5.0 - 9.0% of mass 174	11700	6.33	(6.88) [a]	Pass
176	95.0 - 101.0% of mass 174	162795	88.1	(95.8) [a]	Pass
177	5.0 - 9.0% of mass 176	10367	5.61	(6.37) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VZ1144-IC1144	Z29632.D	11/01/14	13:45	01:42	Initial cal 1
VZ1144-IC1144	Z29633.D	11/01/14	14:07	02:04	Initial cal 2
VZ1144-IC1144	Z29634.D	11/01/14	14:29	02:26	Initial cal 3
VZ1144-ICC1144	Z29635.D	11/01/14	14:52	02:49	Initial cal 4
VZ1144-IC1144	Z29636.D	11/01/14	15:14	03:11	Initial cal 5
VZ1144-IC1144	Z29637.D	11/01/14	15:36	03:33	Initial cal 6
VZ1144-ICV1144	Z29638.D	11/01/14	15:58	03:55	Initial cal verification 7

Instrument Performance Check (BFB)

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1145-BFB
Lab File ID: Z29641.D
Instrument ID: GCMSZ
Injection Date: 11/03/14
Injection Time: 07:42

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	45824	23.8		Pass
75	30.0 - 60.0% of mass 95	83291	43.3		Pass
95	Base peak, 100% relative abundance	192149	100.0		Pass
96	5.0 - 9.0% of mass 95	11736	6.11		Pass
173	Less than 2.0% of mass 174	1484	0.77	(0.83) [a]	Pass
174	50.0 - 100.0% of mass 95	178944	93.1		Pass
175	5.0 - 9.0% of mass 174	13527	7.04	(7.56) [a]	Pass
176	95.0 - 101.0% of mass 174	174080	90.6	(97.3) [a]	Pass
177	5.0 - 9.0% of mass 176	11313	5.89	(6.50) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VZ1145-CC1144	Z29642.D	11/03/14	08:10	00:28	Continuing cal 4
VZ1145-BS	Z29646.D	11/03/14	10:09	02:27	Blank Spike
VZ1145-MB	Z29648.D	11/03/14	11:19	03:37	Method Blank
FA19400-1	Z29649.D	11/03/14	11:41	03:59	(used for QC only; not part of job FA19407)
ZZZZZZ	Z29650.D	11/03/14	12:03	04:21	(unrelated sample)
ZZZZZZ	Z29651.D	11/03/14	12:26	04:44	(unrelated sample)
ZZZZZZ	Z29652.D	11/03/14	12:48	05:06	(unrelated sample)
FA19407-1	Z29653.D	11/03/14	13:10	05:28	39B-LOX-TA0001S-013.0-20141023
FA19407-2	Z29654.D	11/03/14	13:32	05:50	39B-LOX-TA0002S-013.0-20141023
FA19407-3	Z29655.D	11/03/14	13:55	06:13	39B-LOX-TA0002I-030.0-20141023
FA19407-4	Z29656.D	11/03/14	14:17	06:35	39B-LOX-IW0009S-014.5-20141023
FA19407-5	Z29657.D	11/03/14	14:39	06:57	39B-LOX-IW0009SI-025.0-20141023
FA19407-6	Z29658.D	11/03/14	15:02	07:20	39B-LOX-IW0013S-008.5-20141023
FA19407-7	Z29659.D	11/03/14	15:24	07:42	39B-LOX-IW0013I-013.0-20141023
ZZZZZZ	Z29660.D	11/03/14	15:46	08:04	(unrelated sample)
ZZZZZZ	Z29661.D	11/03/14	16:08	08:26	(unrelated sample)
ZZZZZZ	Z29662.D	11/03/14	16:31	08:49	(unrelated sample)
ZZZZZZ	Z29663.D	11/03/14	16:53	09:11	(unrelated sample)
ZZZZZZ	Z29664.D	11/03/14	17:16	09:34	(unrelated sample)
FA19400-1MS	Z29665.D	11/03/14	17:38	09:56	Matrix Spike
FA19400-1MSD	Z29666.D	11/03/14	17:58	10:16	Matrix Spike Duplicate

Volatile Internal Standard Area Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Check Std:	VI538-CC527	**Injection Date:**	11/01/14
Lab File ID:	I24916.D	**Injection Time:**	14:18
Instrument ID:	GCMSI	**Method:**	SW846 8260B

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
Initial Cal [a]	1420265	7.55	1228507	10.66	676645	13.03	78540	5.17
Check Std [b]	1241863	7.55	1047814	10.66	598406	13.03	80485	5.16
Upper Limit [c]	2483726	8.05	2095628	11.16	1196812	13.53	160970	5.66
Lower Limit [d]	620932	7.05	523907	10.16	299203	12.53	40243	4.66

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
VI538-BS	1283934	7.55	1071745	10.66	628337	13.03	71758	5.16
VI538-MB	1215481	7.55	913456	10.66	458389	13.03	65075	5.17
ZZZZZZ	1035937	7.55	771787	10.66	386754	13.03	57431	5.14
ZZZZZZ	1089926	7.55	834372	10.66	394203	13.03	57257	5.16
ZZZZZZ	1024087	7.55	809986	10.66	391074	13.03	49909	5.15
ZZZZZZ	965327	7.55	748961	10.66	362272	13.03	47225	5.15
ZZZZZZ	979144	7.55	745566	10.66	368821	13.03	44915	5.15
FA19473-14	940035	7.55	724036	10.66	361925	13.03	46092	5.16
ZZZZZZ	949492	7.55	726820	10.66	359860	13.03	47878	5.16
ZZZZZZ	935484	7.55	737438	10.66	347595	13.03	45161	5.15
ZZZZZZ	921662	7.55	706712	10.66	345661	13.03	47193	5.16
ZZZZZZ	923718	7.55	722467	10.66	345768	13.03	48726	5.18
ZZZZZZ	886240	7.55	698777	10.66	345337	13.03	45783	5.16
ZZZZZZ	905913	7.55	693131	10.66	335384	13.03	52805	5.16
FA19407-1 [e]	897059	7.55	697224	10.66	360033	13.03	48610	5.16
FA19407-2 [e]	915992	7.55	725815	10.66	377518	13.03	48666	5.15
FA19407-3	877959	7.55	691310	10.66	349071	13.03	55527	5.16
FA19407-4 [e]	894156	7.55	705592	10.66	363359	13.03	48632	5.15
FA19407-5 [e]	878903	7.55	683115	10.66	351919	13.03	50031	5.14
FA19407-6	887364	7.55	685270	10.66	341882	13.03	43519	5.14
FA19407-7 [e]	857423	7.55	680972	10.66	338717	13.03	52067	5.16
FA19473-14MS	940238	7.55	813434	10.66	464015	13.03	52530	5.15
FA19473-14MSD	1000650	7.55	843056	10.66	471902	13.03	60506	5.16

IS 1 = Fluorobenzene
IS 2 = Chlorobenzene-D5
IS 3 = 1,4-Dichlorobenzene-d4
IS 4 = Tert Butyl Alcohol-D10

(a) Initial Cal is: VI527-ICC527 I24622.D 10/22/14 11:02
(b) Check Std Limit = -50 to + 100% of initial cal area.
(c) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(d) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Internal Standard Area Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Check Std:	VI538-CC527	**Injection Date:**	11/01/14
Lab File ID:	I24916.D	**Injection Time:**	14:18
Instrument ID:	GCMSI	**Method:**	SW846 8260B

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT

(e) Sample was treated with an anti-foaming agent.

Volatile Internal Standard Area Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Check Std:	VZ1145-CC1144	**Injection Date:**	11/03/14
Lab File ID:	Z29642.D	**Injection Time:**	08:10
Instrument ID:	GCMSZ	**Method:**	SW846 8260B

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
Initial Cal [a]	921803	7.74	827013	10.84	473635	13.20	96321	5.27
Check Std [b]	1039338	7.74	1033732	10.84	606552	13.20	130915	5.26
Upper Limit [c]	2078676	8.24	2067464	11.34	1213104	13.70	261830	5.76
Lower Limit [d]	519669	7.24	516866	10.34	303276	12.70	65458	4.76

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
VZ1145-BS	878349	7.74	881092	10.84	524739	13.20	111664	5.25
VZ1145-MB	790764	7.74	767289	10.84	409341	13.20	94729	5.27
FA19400-1	739883	7.74	721927	10.84	401257	13.20	74043	5.26
ZZZZZZ	776095	7.74	746024	10.84	415540	13.20	83055	5.27
ZZZZZZ	766617	7.74	727247	10.84	405897	13.20	87422	5.26
ZZZZZZ	738902	7.74	708629	10.84	376170	13.20	84774	5.27
FA19407-1 [e]	703167	7.74	676173	10.84	394610	13.20	76338	5.27
FA19407-2 [e]	711074	7.74	695665	10.84	391344	13.20	78422	5.26
FA19407-3 [e]	714854	7.74	664284	10.84	365850	13.20	100713	5.27
FA19407-4	672587	7.74	647033	10.84	354837	13.20	67006	5.27
FA19407-5 [e]	662730	7.74	637921	10.84	341840	13.20	70606	5.25
FA19407-6	611341	7.74	585939	10.84	310792	13.20	56247*	5.25
FA19407-7 [e]	598272	7.74	570985	10.84	306031	13.20	74412	5.25
ZZZZZZ	565633	7.74	554793	10.84	294008*	13.20	58731*	5.27
ZZZZZZ	555484	7.74	542449	10.84	284312*	13.20	54650*	5.27
ZZZZZZ	533788	7.74	526379	10.84	289787*	13.20	59838*	5.27
ZZZZZZ	531307	7.74	524631	10.84	279518*	13.20	66196	5.25
ZZZZZZ	526674	7.74	526458	10.84	276867*	13.20	59701*	5.27
FA19400-1MS	623955	7.74	665187	10.84	409084	13.20	78344	5.27
FA19400-1MSD	740834	7.74	766110	10.84	455037	13.20	93955	5.27

IS 1 = Fluorobenzene
IS 2 = Chlorobenzene-D5
IS 3 = 1,4-Dichlorobenzene-d4
IS 4 = Tert Butyl Alcohol-D10

(a) Initial Cal is: VZ1144-ICC1144 Z29635.D 11/01/14 14:52
(b) Check Std Limit = -50 to + 100% of initial cal area.
(c) Upper Limit = + 100% of check standard area; Retention time + 0.5 minutes.
(d) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.
(e) Sample was treated with an anti-foaming agent.

Volatile Surrogate Recovery Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Method: SW846 8260B **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
FA19407-1	Z29653.D	107	106	94	109
FA19407-1	I24932.D	104	110	102	106
FA19407-2	Z29654.D	110	106	93	109
FA19407-2	I24933.D	99	111	101	108
FA19407-3	Z29655.D	107	108	96	108
FA19407-3	I24934.D	104	117	103	99
FA19407-4	Z29656.D	109	109	95	110
FA19407-4	I24935.D	105	113	102	107
FA19407-5	Z29657.D	108	107	94	109
FA19407-5	I24936.D	104	112	103	109
FA19407-6	Z29658.D	108	110	95	107
FA19407-6	I24937.D	102	116	104	100
FA19407-7	Z29659.D	113	113	95	110
FA19407-7	I24938.D	104	118	102	108
FA19400-1MS	Z29665.D	108	108	87	94
FA19400-1MSD	Z29666.D	109	108	90	97
FA19473-14MS	I24939.D	102	114	94	89
FA19473-14MSD	I24940.D	102	111	98	89
VI538-BS	I24917.D	96	107	96	90
VI538-MB	I24919.D	97	107	102	96
VZ1145-BS	Z29646.D	105	101	94	96
VZ1145-MB	Z29648.D	107	105	94	103

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	83-118%
S2 = 1,2-Dichloroethane-D4	79-125%
S3 = Toluene-D8	85-112%
S4 = 4-Bromofluorobenzene	83-118%

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICC527
Lab FileID: I24622.D

Response Factor Report MSVOA16

Method : C:\msdchem\2\METHODS\8260i102214.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Wed Oct 22 13:04:07 2014
Response via : Initial Calibration

Calibration Files
1 =I24619.D 2 =I24620.D 3 =I24621.D 4 =I24622.D
5 =I24623.D 6 =I24624.D

	Compound	1	2	3	4	5	6	Avg	%RSD
1) I	Fluorobenzene	----------ISTD----------							
2)	Dichlorodifluoromet	0.417	0.387	0.424	0.429	0.458	0.450	0.428	5.96
	---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9994								
	Response Ratio = 0.00000 + 0.43253 *A + 0.01042 *A^2								
3) P	Chloromethane	0.593	0.496	0.582	0.591	0.625	0.611	0.583	7.75
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9994								
	Response Ratio = 0.00000 + 0.61217 *A								
4) C	Vinyl Chloride	0.498	0.463	0.551	0.559	0.593	0.598	0.544	9.80
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9994								
	Response Ratio = 0.00000 + 0.59173 *A								
5)	Bromomethane	0.420	0.352	0.397	0.387	0.410	0.404	0.395	6.00
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9996								
	Response Ratio = 0.00000 + 0.40388 *A								
6)	Chloroethane	0.299	0.261	0.316	0.306	0.333	0.322	0.306	8.27
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9988								
	Response Ratio = 0.00000 + 0.32340 *A								
7)	Trichlorofluorometh	0.722	0.656	0.761	0.744	0.821	0.835	0.756	8.74
	---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9995								
	Response Ratio = 0.00000 + 0.72586 *A + 0.05639 *A^2								
8)	Ethyl Ether	0.280	0.237	0.255	0.279	0.283	0.298	0.272	8.08
	---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9998								
	Response Ratio = 0.00000 + 0.25468 *A + 0.02164 *A^2								
9)	1,2-Dichlorotrifluo	0.486	0.393	0.443	0.499	0.480	0.509	0.468	9.27
	---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9991								
	Response Ratio = 0.00000 + 0.45235 *A + 0.02740 *A^2								
10) C	1,1-Dichloroethene	0.565	0.508	0.561	0.618	0.605	0.638	0.582	8.08
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9987								
	Response Ratio = 0.00000 + 0.62417 *A								
11)	Freon 113	0.477	0.405	0.429	0.483	0.465	0.502	0.460	7.87
	---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9989								
	Response Ratio = 0.00000 + 0.42998 *A + 0.03438 *A^2								
12)	Carbon Disulfide	1.130	0.940	1.019	1.144	1.109	1.189	1.088	8.46
	---- Linear regr., Force(0,0) ---- Coefficient = 0.9979								
	Response Ratio = 0.00000 + 1.15731 *A								
13)	Iodomethane	0.828	0.702	0.749	0.814	0.808	0.848	0.792	6.94

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICC527
Lab FileID: I24622.D

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              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9989
                Response Ratio = 0.00000 + 0.83068 *A

14)     Methylene Chloride  0.647 0.460 0.498 0.538 0.520 0.529 0.532  11.85
              ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
                Response Ratio = 0.00000 + 0.51773 *A + 0.00519 *A^2

15)     Acetone             0.029 0.018 0.017 0.019 0.018 0.019 0.020  22.63
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9992
                Response Ratio = 0.00000 + 0.01880 *A

16)     Methyl acetate      0.038 0.033 0.034 0.036 0.036 0.038 0.036   6.21
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9990
                Response Ratio = 0.00000 + 0.03734 *A

17)     trans-1,2-Dichloroe 0.491 0.420 0.451 0.503 0.483 0.506 0.476   7.08
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9988
                Response Ratio = 0.00000 + 0.49771 *A

18)     Hexane              0.268 0.235 0.256 0.266 0.269 0.267 0.260   5.14
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9999
                Response Ratio = 0.00000 + 0.26740 *A

19)     Methyl Tert Butyl E 0.631 0.572 0.642 0.701 0.685 0.711 0.657   8.01
              ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
                Response Ratio = 0.00000 + 0.65685 *A + 0.02636 *A^2

20)     Di-isopropyl ether  1.135 0.956 1.104 1.205 1.191 1.210 1.134   8.54
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
                Response Ratio = 0.00000 + 1.20143 *A

21) P   1,1-Dichloroethane  0.550 0.500 0.557 0.608 0.594 0.600 0.568   7.19
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
                Response Ratio = 0.00000 + 0.59809 *A

22)     Acrylonitrile       0.104 0.076 0.073 0.071 0.075 0.075 0.079  15.39
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9994
                Response Ratio = 0.00000 + 0.07459 *A

23)     ETBE                0.815 0.727 0.832 0.933 0.912 0.965 0.864  10.27
              ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
                Response Ratio = 0.00000 + 0.84734 *A + 0.05733 *A^2

24)     Vinyl acetate       0.516 0.423 0.424 0.409 0.415 0.430 0.436   9.12
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9995
                Response Ratio = 0.00000 + 0.42182 *A

25)     cis-1,2-Dichloroeth 0.384 0.311 0.352 0.377 0.367 0.377 0.361   7.44
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9996
                Response Ratio = 0.00000 + 0.37328 *A

26)     2,2-Dichloropropane 0.430 0.383 0.433 0.473 0.454 0.468 0.440   7.51
              ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
                Response Ratio = 0.00000 + 0.44747 *A + 0.00963 *A^2

27)     Bromochloromethane  0.167 0.150 0.170 0.188 0.182 0.188 0.174   8.52
              ---- Linear regr., Force(0,0) ----  Coefficient =  0.9993
                Response Ratio = 0.00000 + 0.18585 *A

28)     Cyclohexane         0.507 0.505 0.587 0.658 0.637 0.670 0.594  12.40
```

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICC527
Lab FileID: I24622.D

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            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9988
              Response Ratio = 0.00000 + 0.65714 *A

29) C   Chloroform          0.616 0.526 0.585 0.644 0.622 0.637 0.605   7.25
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 0.63197 *A

30)     Tetrahydrofuran     0.079 0.048 0.056 0.057 0.055 0.059 0.059  18.08
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9987
              Response Ratio = 0.00000 + 0.05230 *A + 0.00312 *A^2

31) S   Dibromofluoromethan 0.278 0.302 0.315 0.291 0.312 0.278 0.296   5.39
32)     Carbon Tetrachlorid 0.418 0.397 0.446 0.484 0.473 0.498 0.453   8.75
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9989
              Response Ratio = 0.00000 + 0.48824 *A

33)     1,1,1-Trichloroetha 0.451 0.426 0.470 0.521 0.500 0.518 0.481   7.95
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9992
              Response Ratio = 0.00000 + 0.51151 *A

34)     2-Butanone          0.099 0.081 0.085 0.095 0.092 0.094 0.091   7.32
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
              Response Ratio = 0.00000 + 0.08975 *A + 0.00044 *A^2

35)     1,1-Dichloropropene 0.411 0.378 0.406 0.449 0.435 0.448 0.421   6.66
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9994
              Response Ratio = 0.00000 + 0.44336 *A

36)     Benzene             1.314 1.094 1.214 1.326 1.310 1.325 1.264   7.39
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 1.31809 *A

37)     TAME                0.660 0.586 0.683 0.755 0.748 0.792 0.704  10.73
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 0.68634 *A + 0.05169 *A^2

38) S   1,2-Dichloroethane- 0.248 0.268 0.280 0.252 0.274 0.238 0.260   6.19
39)     1,2-Dichloroethane  0.396 0.329 0.348 0.374 0.368 0.368 0.364   6.33
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 0.36802 *A

40)     Trichloroethene     0.340 0.294 0.324 0.354 0.359 0.369 0.340   8.11
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 0.33414 *A + 0.01748 *A^2

41)     Methylcyclohexane   0.490 0.475 0.541 0.613 0.614 0.639 0.562  12.42
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
              Response Ratio = 0.00000 + 0.56324 *A + 0.03807 *A^2

42)     Dibromomethane      0.170 0.158 0.178 0.198 0.194 0.193 0.182   8.74
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9996
              Response Ratio = 0.00000 + 0.19305 *A

43) C   1,2-Dichloropropane 0.351 0.293 0.321 0.356 0.350 0.355 0.338   7.48
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9996
              Response Ratio = 0.00000 + 0.35240 *A

44)     Bromodichloromethan 0.403 0.340 0.403 0.444 0.446 0.451 0.414  10.20
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 0.44733 *A
```

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICC527
Lab FileID: I24622.D

45) 2-Chloroethyl vinyl 0.136 0.128 0.153 0.173 0.178 0.182 0.158 14.53
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9996
Response Ratio = 0.00000 + 0.16212 *A + 0.00206 *A^2

46) cis-1,3-Dichloropro 0.436 0.418 0.485 0.539 0.546 0.554 0.496 11.94
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9997
Response Ratio = 0.00000 + 0.51255 *A + 0.02151 *A^2

47) I Chlorobenzene-d5 ----------ISTD----------
48) S Toluene-d8 1.203 1.304 1.281 1.143 1.242 1.080 1.209 7.06
49) C Toluene 1.704 1.513 1.587 1.682 1.665 1.703 1.642 4.68
---- Linear regr., Force(0,0) ---- Coefficient = 0.9997
Response Ratio = 0.00000 + 1.68715 *A

50) 2-Nitropropane 0.046 0.043 0.049 0.054 0.054 0.056 0.050 10.25
---- Linear regr., Force(0,0) ---- Coefficient = 0.9990
Response Ratio = 0.00000 + 0.05529 *A

51) 4-Methyl-2-pentanon 0.248 0.225 0.235 0.253 0.250 0.259 0.245 5.08
---- Linear regr., Force(0,0) ---- Coefficient = 0.9994
Response Ratio = 0.00000 + 0.25537 *A

52) trans-1,3-Dichlorop 0.473 0.397 0.466 0.495 0.504 0.521 0.476 9.22
---- Linear regr., Force(0,0) ---- Coefficient = 0.9993
Response Ratio = 0.00000 + 0.51231 *A

53) Tetrachloroethene 0.480 0.408 0.419 0.448 0.441 0.453 0.442 5.81
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9998
Response Ratio = 0.00000 + 0.42688 *A + 0.01288 *A^2

54) 1,1,2-Trichloroetha 0.299 0.234 0.249 0.263 0.255 0.258 0.260 8.35
---- Linear regr., Force(0,0) ---- Coefficient = 0.9998
Response Ratio = 0.00000 + 0.25756 *A

55) Dibromochloromethan 0.322 0.315 0.358 0.378 0.390 0.399 0.360 9.75
---- Linear regr., Force(0,0) ---- Coefficient = 0.9995
Response Ratio = 0.00000 + 0.39328 *A

56) 1,3-Dichloropropane 0.505 0.449 0.480 0.501 0.499 0.505 0.490 4.50
---- Linear regr., Force(0,0) ---- Coefficient = 0.9999
Response Ratio = 0.00000 + 0.50188 *A

57) 1,2-Dibromoethane 0.296 0.262 0.286 0.300 0.307 0.313 0.294 6.22
---- Linear regr., Force(0,0) ---- Coefficient = 0.9996
Response Ratio = 0.00000 + 0.30966 *A

58) 2-hexanone 0.171 0.141 0.163 0.176 0.176 0.179 0.168 8.39
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9998
Response Ratio = 0.00000 + 0.16877 *A + 0.00106 *A^2

59) 1-Chlorohexane 0.457 0.475 0.561 0.608 0.608 0.624 0.556 13.06
---- Linear regr., Force(0,0) ---- Coefficient = 0.9996
Response Ratio = 0.00000 + 0.61606 *A

60) C Ethylbenzene 2.004 1.748 1.846 1.994 2.052 2.095 1.957 6.77
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9999
Response Ratio = 0.00000 + 1.89782 *A + 0.10104 *A^2

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICC527
Lab FileID: I24622.D

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61) P   Chlorobenzene       1.248 1.062 1.089 1.157 1.181 1.204 1.157   6.09
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
            Response Ratio = 0.00000 + 1.11015 *A + 0.04760 *A^2

62)     1,1,1,2-Tetrachloro 0.388 0.354 0.393 0.418 0.416 0.434 0.400   7.08
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
            Response Ratio = 0.00000 + 0.39041 *A + 0.02140 *A^2

63)     m,p-Xylene          1.311 1.193 1.355 1.457 1.502 1.527 1.391   9.22
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
            Response Ratio = 0.00000 + 1.39350 *A + 0.03438 *A^2

64)     o-Xylene            1.284 1.166 1.284 1.396 1.405 1.462 1.333   8.10
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
            Response Ratio = 0.00000 + 1.29967 *A + 0.08050 *A^2

65)     Styrene             1.039 0.970 1.168 1.260 1.296 1.333 1.178  12.43
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
            Response Ratio = 0.00000 + 1.18710 *A + 0.07411 *A^2

66) P   Bromoform           0.224 0.192 0.207 0.231 0.240 0.252 0.224   9.70
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
            Response Ratio = 0.00000 + 0.21117 *A + 0.02041 *A^2

67)     Isopropylbenzene    1.586 1.458 1.684 1.856 1.846 1.925 1.726  10.51
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 1.71898 *A + 0.10196 *A^2


68) I   1,4-Dichlorobenzene-d ----------------ISTD---------------------
69) S   4-Bromofluorobenzen 0.860 0.908 0.895 0.796 0.888 0.776 0.854   6.46
70)     n-Propylbenzene     4.097 3.454 3.792 4.129 4.250 4.240 3.994   7.81
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
            Response Ratio = 0.00000 + 4.02128 *A + 0.11921 *A^2

71)     Bromobenzene        1.096 0.831 0.884 0.941 0.969 0.968 0.948   9.51
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 0.96352 *A

72) P   1,1,2,2-Tetrachloro 0.855 0.679 0.646 0.677 0.669 0.683 0.701  10.88
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 0.67743 *A

73)     1,3,5-Trimethylbenz 3.005 2.623 2.932 3.235 3.347 3.388 3.088   9.46
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 3.08599 *A + 0.15770 *A^2

74)     2-Chlorotoluene     2.886 2.353 2.485 2.764 2.848 2.881 2.703   8.44
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 2.63627 *A + 0.12784 *A^2

75)     trans-1,4-Dichloro- 0.136 0.145 0.150 0.173 0.176 0.181 0.160  11.70
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9990
            Response Ratio = 0.00000 + 0.17769 *A

76)     1,2,3-Trichloroprop 0.184 0.149 0.164 0.167 0.175 0.173 0.169   7.07
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 0.17274 *A

77)     Cyclohexanone       0.030 0.017 0.016 0.015 0.016 0.016 0.018  30.30
```

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          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 0.01509 *A + 0.00012 *A^2

78)     4-Chlorotoluene     2.464 2.030 2.211 2.375 2.462 2.464 2.334   7.65
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9996
            Response Ratio = 0.00000 + 2.44848 *A

79)     tert-Butylbenzene   1.510 1.238 1.410 1.541 1.540 1.562 1.467   8.46
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 1.47531 *A + 0.04424 *A^2

80)     1,2,4-Trimethylbenz 3.113 2.661 2.991 3.224 3.321 3.358 3.111   8.31
          ---- Quadratic regression ----  Coefficient =  0.9998
            Response Ratio = -0.04154 + 3.18769 *A + 0.09926 *A^2

81)     sec-Butylbenzene    3.713 3.270 3.617 3.959 3.980 4.020 3.760   7.69
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
            Response Ratio = 0.00000 + 3.80706 *A + 0.11054 *A^2

82)     4-Isopropyltoluene  2.993 2.596 2.934 3.230 3.272 3.315 3.057   8.95
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 3.08641 *A + 0.11850 *A^2

83)     1,3-Dichlorobenzene 2.037 1.532 1.637 1.746 1.779 1.810 1.757   9.74
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9996
            Response Ratio = 0.00000 + 1.79024 *A

84)     1,4-Dichlorobenzene 2.369 1.735 1.830 1.950 1.967 1.991 1.974  10.98
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
            Response Ratio = 0.00000 + 1.97566 *A

85)     n-Butylbenzene      1.870 1.573 1.789 2.019 2.033 2.086 1.895  10.19
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
            Response Ratio = 0.00000 + 1.88981 *A + 0.09954 *A^2

86)     Benzyl Chloride     0.215 0.177 0.231 0.262 0.278 0.285 0.241  17.16
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
            Response Ratio = 0.00000 + 0.24298 *A + 0.02174 *A^2

87)     1,2-Dichlorobenzene 1.817 1.438 1.527 1.616 1.639 1.630 1.611   7.89
          ---- Linear regr., Force(0,0) ----  Coefficient =  0.9998
            Response Ratio = 0.00000 + 1.62818 *A

88)     1,2-Dibromo-3-Chlor 0.112 0.078 0.076 0.084 0.079 0.076 0.084  16.74
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
            Response Ratio = 0.00000 + 0.08404 *A + -0.00380 *A^2

89)     Hexachlorobutadiene 0.884 0.533 0.609 0.654 0.610 0.571 0.644  19.40
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9993
            Response Ratio = 0.00000 + 0.68353 *A + -0.05525 *A^2

90)     1,2,4-Trichlorobenz 1.712 1.053 1.131 1.231 1.168 1.045 1.223  20.40
          ---- Quadratic regression ----  Coefficient =  0.9986
            Response Ratio = -0.02688 + 1.38947 *A + -0.16184 *A^2

91)     Naphthalene         2.829 1.441 1.631 1.804 1.674 1.473 1.809  28.60
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9979
            Response Ratio = 0.00000 + 1.97014 *A + -0.24158 *A^2

92)     1,2,3-Trichlorobenz 1.796 0.831 0.890 0.972 0.840 0.722 1.009  39.11
```

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICC527
Lab FileID: I24622.D

```
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9979
              Response Ratio = 0.00000 + 1.08012 *A + -0.17696 *A^2


93) I   Tert Butyl Alcohol-d1 ----------------ISTD--------------------
94)     acrolein            6.109 4.224 4.478 3.940 4.013 3.996 4.460  18.66
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9994
              Response Ratio = 0.00000 + 4.00721 *A

95)     Tert Butyl Alcohol  1.810 1.286 1.255 1.263 1.238 1.245 1.349  16.76
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9999
              Response Ratio = 0.00000 + 1.24494 *A

96)     tert Amyl alcohol   1.406 0.962 0.964 1.052 1.042 1.051 1.080  15.31
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 1.04672 *A

97)     1,4-Dioxane         0.291 0.125 0.138 0.144 0.142 0.137 0.163  38.73
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 0.14708 *A + -0.00119 *A^2

--------------------------------------------------------------------------------
(#) = Out of Range

          8260i102214.m        Thu Oct 23 08:55:56 2014
```

Initial Calibration Verification

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICV527
Lab FileID: I24626.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\2\DATA\102214\I24626.D Vial: 8
Acq On : 22 Oct 2014 12:44 pm Operator: darshnap
Sample : icv527-4 chem Inst : MSVOA16
Misc : MS28709,VI527,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\msdchem\2\METHODS\8260i102214.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Wed Oct 22 13:04:07 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	122	0.00	7.55
			Amount	Calc.	%Drift			
2		Dichlorodifluoromethane	40.000	37.739	5.7	118	0.00	2.71
3	P	Chloromethane	40.000	36.369	9.1	115	0.00	2.88
4	C	Vinyl Chloride	40.000	37.348	6.6	120	0.00	3.01
5		Bromomethane	40.000	38.939	2.7	124	0.00	3.41
6		Chloroethane	40.000	37.606	6.0	121	0.00	3.55
7		Trichlorofluoromethane	40.000	37.450	6.4	118	-0.03	3.71
8		Ethyl Ether	40.000	41.651	-4.1	124	0.00	4.00
9		1,2-Dichlorotrifluoroetha	40.000	41.554	-3.9	121	0.00	4.24
10	C	1,1-Dichloroethene	40.000	38.501	3.7	119	0.00	4.27
11		Freon 113	40.000	39.391	1.5	114	0.00	4.33
12		Carbon Disulfide	40.000	45.131	-12.8	139	0.00	4.33
13		Iodomethane	40.000	39.289	1.8	122	0.00	4.45
14		Methylene Chloride	40.000	39.975	0.1	118	0.00	4.89
15		Acetone	200.000	315.910	-58.0#	193	0.00	4.94
16		Methyl acetate	200.000	183.025	8.5	115	0.00	5.05
17		trans-1,2-Dichloroethene	40.000	37.888	5.3	114	0.00	5.06
18		Hexane	40.000	41.467	-3.7	127	0.00	5.11
19		Methyl Tert Butyl Ether	40.000	40.448	-1.1	119	0.00	5.17
20		Di-isopropyl ether	40.000	39.933	0.2	121	0.00	5.53
21	P	1,1-Dichloroethane	40.000	40.015	-0.0	120	0.00	5.71
22		Acrylonitrile	200.000	192.381	3.8	123	0.00	5.77
23		ETBE	40.000	40.256	-0.6	118	0.00	5.92
24		Vinyl acetate	200.000	236.949	-18.5	149	0.00	5.93
25		cis-1,2-Dichloroethene	40.000	38.831	2.9	117	0.00	6.28
26		2,2-Dichloropropane	40.000	41.404	-3.5	121	0.00	6.41
27		Bromochloromethane	40.000	39.023	2.4	118	0.00	6.49
28		Cyclohexane	40.000	36.819	8.0	112	0.00	6.50
29	C	Chloroform	40.000	39.104	2.2	117	0.00	6.54
30		Tetrahydrofuran	40.000	39.182	2.0	114	0.00	6.72
			AvgRF	CCRF	%Dev			
31	S	Dibromofluoromethane	0.296	0.284	4.1	119	0.00	6.73
			Amount	Calc.	%Drift			
32		Carbon Tetrachloride	40.000	38.503	3.7	118	0.00	6.71
33		1,1,1-Trichloroethane	40.000	40.326	-0.8	121	0.00	6.78
34		2-Butanone	200.000	250.061	-25.0#	148	0.00	6.85
35		1,1-Dichloropropene	40.000	40.922	-2.3	123	0.00	6.89
36		Benzene	40.000	39.381	1.5	119	0.00	7.15

Initial Calibration Verification

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICV527
Lab FileID: I24626.D

37		TAME	40.000	39.699	0.8	117	0.00	7.22
			AvgRF	CCRF	%Dev			
38	S	1,2-Dichloroethane-d4	0.260	0.248	4.6	120	0.00	7.28
			Amount	Calc.	%Drift			
39		1,2-Dichloroethane	40.000	41.486	-3.7	125	0.00	7.35
40		Trichloroethene	40.000	39.914	0.2	119	0.00	7.72
41		Methylcyclohexane	40.000	39.595	1.0	117	0.00	7.72
42		Dibromomethane	40.000	39.854	0.4	119	0.00	8.16
43	C	1,2-Dichloropropane	40.000	39.910	0.2	120	0.00	8.25
44		Bromodichloromethane	40.000	40.024	-0.1	123	0.00	8.30
45		2-Chloroethyl vinyl ether	200.000	183.285	8.4	110	0.00	8.83
46		cis-1,3-Dichloropropene	40.000	40.370	-0.9	121	0.00	8.92
			AvgRF	CCRF	%Dev			
47	I	Chlorobenzene-d5	1.000	1.000	0.0	118	0.00	10.66
48	S	Toluene-d8	1.209	1.153	4.6	119	0.00	9.10
			Amount	Calc.	%Drift			
49	C	Toluene	40.000	40.285	-0.7	120	0.00	9.15
50		2-Nitropropane	200.000	194.271	2.9	118	0.00	9.39
51		4-Methyl-2-pentanone	200.000	202.564	-1.3	121	0.00	9.50
52		trans-1,3-Dichloropropene	40.000	43.989	-10.0	135	0.00	9.55
53		Tetrachloroethene	40.000	41.837	-4.6	121	0.00	9.54
54		1,1,2-Trichloroethane	40.000	41.276	-3.2	120	0.00	9.72
55		Dibromochloromethane	40.000	41.416	-3.5	128	0.00	9.91
56		1,3-Dichloropropane	40.000	41.243	-3.1	122	0.00	10.00
57		1,2-Dibromoethane	40.000	41.060	-2.7	125	0.00	10.17
58		2-hexanone	200.000	251.393	-25.7#	147	0.00	10.33
59		1-Chlorohexane	40.000	37.838	5.4	113	0.00	10.61
60	C	Ethylbenzene	40.000	41.235	-3.1	121	0.00	10.67
61	P	Chlorobenzene	40.000	44.545	-11.4	131	0.00	10.67
62		1,1,1,2-Tetrachloroethane	40.000	42.612	-6.5	123	0.00	10.73
63		m,p-Xylene	80.000	85.266	-6.6	126	0.00	10.81
64		o-Xylene	40.000	45.205	-13.0	132	0.00	11.25
65		Styrene	40.000	41.858	-4.6	123	0.00	11.31
66	P	Bromoform	40.000	41.819	-4.5	122	0.00	11.36
67		Isopropylbenzene	40.000	45.027	-12.6	130	0.00	11.56
			AvgRF	CCRF	%Dev			
68	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	114	0.00	13.03
69	S	4-Bromofluorobenzene	0.854	0.832	2.6	119	0.00	11.88
			Amount	Calc.	%Drift			
70		n-Propylbenzene	40.000	45.040	-12.6	128	0.00	11.98
71		Bromobenzene	40.000	41.421	-3.6	121	0.00	12.00
72	P	1,1,2,2-Tetrachloroethane	40.000	44.109	-10.3	126	0.00	12.06
73		1,3,5-Trimethylbenzene	40.000	40.773	-1.9	115	0.00	12.17
74		2-Chlorotoluene	40.000	44.568	-11.4	126	0.00	12.17
75		trans-1,4-Dichloro-2-Bute	40.000	38.047	4.9	111	0.00	12.24
76		1,2,3-Trichloropropane	40.000	43.690	-9.2	129	0.00	12.22
77		Cyclohexanone	200.000	152.915	23.5#	88	0.00	12.28
78		4-Chlorotoluene	40.000	45.579	-13.9	134	0.00	12.34
79		tert-Butylbenzene	40.000	45.528	-13.8	127	0.00	12.51
80		1,2,4-Trimethylbenzene	40.000	41.793	-4.5	119	0.00	12.58
81		sec-Butylbenzene	40.000	45.820	-14.6	129	0.00	12.69
82		4-Isopropyltoluene	40.000	44.904	-12.3	126	0.00	12.83

Initial Calibration Verification

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI527-ICV527
Lab FileID: I24626.D

83	1,3-Dichlorobenzene	40.000	45.513	-13.8	133	0.00	12.95
84	1,4-Dichlorobenzene	40.000	41.528	-3.8	120	0.00	13.05
85	n-Butylbenzene	40.000	40.829	-2.1	113	0.00	13.27
86	Benzyl Chloride	40.000	40.755	-1.9	115	0.00	13.29
87	1,2-Dichlorobenzene	40.000	45.734	-14.3	131	0.00	13.48
88	1,2-Dibromo-3-Chloropropa	40.000	43.411	-8.5	119	0.00	14.23
89	Hexachlorobutadiene	40.000	43.141	-7.9	119	0.00	14.78
90	1,2,4-Trichlorobenzene	40.000	41.842	-4.6	118	0.00	14.83
91	Naphthalene	40.000	43.001	-7.5	119	0.00	15.12
92	1,2,3-Trichlorobenzene	40.000	43.609	-9.0	118	0.00	15.28

		AvgRF	CCRF	%Dev			
93 I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	115	-0.01	5.16

		Amount	Calc.	%Drift			
94	acrolein	200.000	155.323	22.3#	91	0.00	4.64
95	Tert Butyl Alcohol	400.000	427.506	-6.9	121	0.00	5.23
96	tert Amyl alcohol	400.000	476.265	-19.1	136	0.00	7.39
97	1,4-Dioxane	800.000	820.430	-2.6	117	0.00	8.49

(#) = Out of Range SPCC's out = 0 CCC's out = 0
I24622.D 8260i102214.m Thu Oct 23 08:55:41 2014

Continuing Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI538-CC527
Lab FileID: I24916.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\2\DATA\110114\I24916.D Vial: 1
Acq On : 1 Nov 2014 2:18 pm Operator: eileeng
Sample : cc527-4 Inst : MSVOA16
Misc : MS28810,VI538,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\msdchem\2\METHODS\8260i102214.m (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Wed Oct 22 13:04:07 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	87	0.00	7.55
			Amount	Calc.	%Drift			
2		Dichlorodifluoromethane	40.000	41.339	-3.3	93	0.00	2.71
3	P	Chloromethane	40.000	44.310	-10.8	100	0.00	2.88
4	C	Vinyl Chloride	40.000	44.374	-10.9	103	0.00	3.01
5		Bromomethane	40.000	50.632	-26.6#	115	-0.01	3.40
6		Chloroethane	40.000	48.562	-21.4#	112	-0.01	3.54
7		Trichlorofluoromethane	40.000	55.051	-37.6#	128	0.00	3.74
8		Ethyl Ether	40.000	48.605	-21.5#	105	0.00	4.00
9		1,2-Dichlorotrifluoroetha	40.000	46.087	-15.2	96	0.00	4.24
10	C	1,1-Dichloroethene	40.000	44.232	-10.6	98	0.00	4.27
11		Freon 113	40.000	43.456	-8.6	90	0.00	4.32
12		Carbon Disulfide	40.000	39.195	2.0	87	0.00	4.33
13		Iodomethane	40.000	40.103	-0.3	89	0.00	4.45
14		Methylene Chloride	40.000	40.727	-1.8	86	0.00	4.89
15		Acetone	200.000	201.817	-0.9	88	0.00	4.93
16		Methyl acetate	200.000	260.429	-30.2#	118	0.00	5.04
17		trans-1,2-Dichloroethene	40.000	39.661	0.8	86	0.00	5.06
18		Hexane	40.000	36.471	8.8	80	0.00	5.10
19		Methyl Tert Butyl Ether	40.000	44.236	-10.6	94	0.00	5.16
20		Di-isopropyl ether	40.000	38.092	4.8	83	0.00	5.53
21	P	1,1-Dichloroethane	40.000	40.188	-0.5	86	0.00	5.71
22		Acrylonitrile	200.000	210.421	-5.2	97	0.00	5.77
23		ETBE	40.000	41.707	-4.3	88	0.00	5.92
24		Vinyl acetate	200.000	154.814	22.6#	70	0.00	5.93
25		cis-1,2-Dichloroethene	40.000	39.455	1.4	85	0.00	6.27
26		2,2-Dichloropropane	40.000	43.640	-9.1	92	0.00	6.40
27		Bromochloromethane	40.000	41.069	-2.7	89	0.00	6.49
28		Cyclohexane	40.000	35.878	10.3	78	0.00	6.50
29	C	Chloroform	40.000	41.900	-4.7	90	0.00	6.54
30		Tetrahydrofuran	40.000	44.104	-10.3	93	0.00	6.72
			AvgRF	CCRF	%Dev			
31	S	Dibromofluoromethane	0.296	0.305	-3.0	92	0.00	6.73
			Amount	Calc.	%Drift			
32		Carbon Tetrachloride	40.000	44.385	-11.0	98	0.00	6.71
33		1,1,1-Trichloroethane	40.000	43.184	-8.0	93	-0.01	6.77
34		2-Butanone	200.000	223.330	-11.7	95	0.00	6.85
35		1,1-Dichloropropene	40.000	41.077	-2.7	89	0.00	6.89
36		Benzene	40.000	40.103	-0.3	87	0.00	7.14

Continuing Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VI538-CC527
Lab FileID: I24916.D

37		TAME	40.000	42.302	-5.8	89	0.00	7.22
			AvgRF	CCRF	%Dev			
38	S	1,2-Dichloroethane-d4	0.260	0.287	-10.4	100	0.00	7.28
			Amount	Calc.	%Drift			
39		1,2-Dichloroethane	40.000	45.869	-14.7	99	0.00	7.35
40		Trichloroethene	40.000	41.569	-3.9	89	0.00	7.72
41		Methylcyclohexane	40.000	38.037	4.9	80	0.00	7.72
42		Dibromomethane	40.000	43.223	-8.1	92	0.00	8.16
43	C	1,2-Dichloropropane	40.000	39.855	0.4	86	0.00	8.25
44		Bromodichloromethane	40.000	43.171	-7.9	95	0.00	8.30
45		2-Chloroethyl vinyl ether	200.000	205.841	-2.9	89	0.00	8.83
46		cis-1,3-Dichloropropene	40.000	41.707	-4.3	90	0.00	8.92
			AvgRF	CCRF	%Dev			
47	I	Chlorobenzene-d5	1.000	1.000	0.0	85	0.00	10.66
48	S	Toluene-d8	1.209	1.138	5.9	85	0.00	9.10
			Amount	Calc.	%Drift			
49	C	Toluene	40.000	40.044	-0.1	86	0.00	9.15
50		2-Nitropropane	200.000	251.357	-25.7#	110	0.00	9.39
51		4-Methyl-2-pentanone	200.000	225.752	-12.9	97	0.00	9.50
52		trans-1,3-Dichloropropene	40.000	43.453	-8.6	96	0.00	9.55
53		Tetrachloroethene	40.000	42.064	-5.2	88	0.00	9.54
54		1,1,2-Trichloroethane	40.000	43.322	-8.3	91	0.00	9.72
55		Dibromochloromethane	40.000	44.262	-10.7	98	0.00	9.91
56		1,3-Dichloropropane	40.000	43.371	-8.4	93	0.00	10.00
57		1,2-Dibromoethane	40.000	42.311	-5.8	93	0.00	10.17
58		2-hexanone	200.000	233.381	-16.7	98	0.00	10.33
59		1-Chlorohexane	40.000	40.908	-2.3	88	0.00	10.61
60	C	Ethylbenzene	40.000	43.394	-8.5	92	0.00	10.67
61	P	Chlorobenzene	40.000	42.644	-6.6	90	0.00	10.67
62		1,1,1,2-Tetrachloroethane	40.000	44.009	-10.0	92	0.00	10.73
63		m,p-Xylene	80.000	87.541	-9.4	93	0.00	10.81
64		o-Xylene	40.000	43.174	-7.9	90	0.00	11.25
65		Styrene	40.000	43.093	-7.7	91	0.00	11.31
66	P	Bromoform	40.000	48.798	-22.0#	104	0.00	11.36
67		Isopropylbenzene	40.000	43.286	-8.2	90	0.00	11.56
			AvgRF	CCRF	%Dev			
68	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	88	0.00	13.03
69	S	4-Bromofluorobenzene	0.854	0.776	9.1	86	0.00	11.88
			Amount	Calc.	%Drift			
70		n-Propylbenzene	40.000	41.359	-3.4	91	0.00	11.98
71		Bromobenzene	40.000	41.840	-4.6	95	0.00	12.00
72	P	1,1,2,2-Tetrachloroethane	40.000	44.904	-12.3	99	0.00	12.06
73		1,3,5-Trimethylbenzene	40.000	41.693	-4.2	92	0.00	12.17
74		2-Chlorotoluene	40.000	42.110	-5.3	92	0.00	12.17
75		trans-1,4-Dichloro-2-Bute	40.000	44.215	-10.5	101	0.00	12.24
76		1,2,3-Trichloropropane	40.000	44.445	-11.1	102	0.00	12.22
77		Cyclohexanone	200.000	258.777	-29.4#	118	0.00	12.28
78		4-Chlorotoluene	40.000	40.387	-1.0	92	0.00	12.34
79		tert-Butylbenzene	40.000	42.854	-7.1	93	0.00	12.51
80		1,2,4-Trimethylbenzene	40.000	41.699	-4.2	92	0.00	12.58
81		sec-Butylbenzene	40.000	41.368	-3.4	90	0.00	12.69
82		4-Isopropyltoluene	40.000	42.138	-5.3	92	0.00	12.83

Continuing Calibration Summary

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83	1,3-Dichlorobenzene	40.000	40.881	-2.2	93	0.00	12.95
84	1,4-Dichlorobenzene	40.000	41.533	-3.8	93	0.00	13.05
85	n-Butylbenzene	40.000	43.035	-7.6	93	0.00	13.27
86	Benzyl Chloride	40.000	48.508	-21.3#	108	0.00	13.29
87	1,2-Dichlorobenzene	40.000	42.720	-6.8	95	0.00	13.48
88	1,2-Dibromo-3-Chloropropa	40.000	51.709	-29.3#	110	0.00	14.23
89	Hexachlorobutadiene	40.000	46.049	-15.1	98	0.00	14.78
90	1,2,4-Trichlorobenzene	40.000	45.258	-13.1	99	0.00	14.83
91	Naphthalene	40.000	47.057	-17.6	100	0.00	15.12
92	1,2,3-Trichlorobenzene	40.000	46.552	-16.4	97	0.00	15.28

			AvgRF	CCRF	%Dev			
93	I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	102	0.00	5.16

		Amount	Calc.	%Drift			
94	acrolein	200.000	138.622	30.7#	72	0.00	4.63
95	Tert Butyl Alcohol	400.000	417.235	-4.3	105	0.00	5.23
96	tert Amyl alcohol	400.000	427.153	-6.8	109	0.00	7.39
97	1,4-Dioxane	800.000	887.282	-10.9	113	0.00	8.49

(#) = Out of Range SPCC's out = 0 CCC's out = 0
I24622.D 8260i102214.m Mon Nov 03 14:08:11 2014

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1144-ICC1144
Lab FileID: Z29635.D

Response Factor Report MSVOA15

Method : C:\msdchem\1\METHODS\826011014.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Nov 03 11:06:23 2014
Response via : Initial Calibration

Calibration Files
1 =z29632.D 2 =z29633.D 3 =z29634.D 4 =z29635.D
5 =z29636.D 6 =z29637.D

		Compound	1	2	3	4	5	6	Avg	%RSD
1)	I	Fluorobenzene	----------ISTD----------							
2)		Dichlorodifluoromet	0.741	0.614	0.611	0.584	0.566	0.550	0.611	11.20
		---- Quadratic regr., Force(0,0) ---- Coefficient = 1.0000								
		Response Ratio = 0.00000 + 0.61075 *A + -0.03084 *A^2								
3)	P	Chloromethane	1.162	0.899	0.939	0.871	0.876	0.859	0.934	12.31
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9997								
		Response Ratio = 0.00000 + 0.86716 *A								
4)	C	Vinyl Chloride	0.750	0.554	0.576	0.557	0.579	0.578	0.599	12.48
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9997								
		Response Ratio = 0.00000 + 0.57654 *A								
5)		Bromomethane	0.451	0.331	0.339	0.282	0.291	0.264	0.326	20.69
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9978								
		Response Ratio = 0.00000 + 0.32607 *A + -0.03034 *A^2								
6)		Chloroethane	0.378	0.268	0.274	0.246	0.231	0.217	0.269	21.34
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9997								
		Response Ratio = 0.00000 + 0.27029 *A + -0.02689 *A^2								
7)		Trichlorofluorometh	0.722	0.615	0.676	0.647	0.658	0.671	0.665	5.32
8)		Ethyl Ether	0.332	0.348	0.394	0.377	0.386	0.400	0.373	7.23
9)		1,2-Dichlorotrifluo	0.473	0.428	0.482	0.459	0.457	0.455	0.459	3.97
10)		Freon 113	0.415	0.404	0.436	0.429	0.419	0.421	0.421	2.65
11)	C	1,1-Dichloroethene	0.528	0.511	0.612	0.586	0.599	0.607	0.574	7.55
12)		Acetone	0.184	0.121	0.134	0.124	0.132	0.138	0.139	16.67
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9996								
		Response Ratio = 0.00000 + 0.11956 *A + 0.00184 *A^2								
13)		Iodomethane	0.667	0.632	0.754	0.725	0.760	0.783	0.720	8.20
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9998								
		Response Ratio = 0.00000 + 0.70403 *A + 0.03951 *A^2								
14)		Carbon Disulfide	0.962	0.936	1.095	1.052	1.051	1.055	1.025	6.03
15)		Methyl acetate	0.399	0.382	0.477	0.444	0.487	0.500	0.448	10.83
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9995								
		Response Ratio = 0.00000 + 0.43449 *A + 0.00664 *A^2								
16)		Methylene Chloride	0.824	0.739	0.832	0.785	0.792	0.795	0.795	4.17
17)		Methyl Tert Butyl E	0.862	0.901	1.067	1.019	1.070	1.087	1.001	9.60
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9995								
		Response Ratio = 0.00000 + 1.07498 *A								
18)		trans-1,2-Dichloroe	0.569	0.513	0.619	0.593	0.611	0.608	0.585	6.78
19)		Acrylonitrile	0.152	0.126	0.187	0.171	0.190	0.193	0.170	15.50

Initial Calibration Summary

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            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9990
              Response Ratio = 0.00000 + 0.17020 *A + 0.00233 *A^2

20)     Hexane              0.796 0.850 1.028 1.005 1.026 1.039 0.957  11.06
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 1.03141 *A

21)     Di-isopropyl ether  1.302 1.416 1.820 1.767 1.880 1.928 1.686  15.50
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 1.71464 *A + 0.10827 *A^2

22)     Vinyl acetate       0.483 0.587 0.822 0.806 0.870 0.886 0.742  22.43
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
              Response Ratio = 0.00000 + 0.78323 *A + 0.01057 *A^2

23) P   1,1-Dichloroethane  0.737 0.708 0.799 0.760 0.787 0.777 0.761   4.49
24)     ETBE                0.960 1.091 1.388 1.390 1.439 1.494 1.294  16.64
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
              Response Ratio = 0.00000 + 1.32128 *A + 0.08624 *A^2

25)     2-Butanone          0.048 0.162 0.228 0.214 0.239 0.238 0.188  39.43
            ---- Quadratic regression ----  Coefficient =  0.9990
              Response Ratio = -0.02387 + 0.22536 *A + 0.00162 *A^2

26)     2,2-Dichloropropane 0.459 0.434 0.500 0.470 0.480 0.475 0.470   4.72
27)     cis-1,2-Dichloroeth 0.369 0.372 0.475 0.446 0.465 0.459 0.431  11.09
28)     Bromochloromethane  0.219 0.229 0.267 0.249 0.257 0.256 0.246   7.50
29)     Tetrahydrofuran     0.124 0.100 0.131 0.131 0.137 0.138 0.127  11.11
30) C   Chloroform          0.653 0.699 0.761 0.725 0.746 0.725 0.718   5.29
31) S   Dibromofluoromethan 0.319 0.308 0.315 0.309 0.306 0.303 0.310   1.91
32)     1,1,1-Trichloroetha 0.496 0.520 0.593 0.566 0.569 0.571 0.553   6.59
33)     Cyclohexane         0.624 0.633 0.855 0.875 0.877 0.887 0.792  16.05
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9999
              Response Ratio = 0.00000 + 0.88208 *A

34)     Carbon Tetrachlorid 0.558 0.532 0.590 0.568 0.561 0.565 0.562   3.29
35)     1,1-Dichloropropene 0.331 0.397 0.484 0.464 0.483 0.480 0.440  14.24
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 0.47907 *A

36) S   1,2-Dichloroethane- 0.302 0.299 0.288 0.285 0.286 0.276 0.289   3.29
37)     TAME                0.659 0.747 1.013 1.011 1.071 1.103 0.934  19.72
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 0.96697 *A + 0.06894 *A^2

38)     Benzene             1.227 1.295 1.564 1.506 1.540 1.540 1.445  10.08
39)     1,2-Dichloroethane  0.521 0.527 0.562 0.524 0.547 0.549 0.538   3.08
40)     Trichloroethene     0.388 0.356 0.415 0.395 0.399 0.406 0.393   5.23
41)     Methylcyclohexane   0.477 0.520 0.692 0.698 0.688 0.701 0.629  16.26
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 0.69626 *A

42) C   1,2-Dichloropropane 0.382 0.364 0.456 0.433 0.445 0.463 0.424   9.71
43)     Dibromomethane      0.254 0.253 0.290 0.267 0.275 0.283 0.270   5.58
44)     Bromodichloromethan 0.444 0.452 0.542 0.513 0.531 0.535 0.503   8.68
45)     2-Chloroethyl vinyl 0.138 0.181 0.272 0.262 0.280 0.292 0.237  26.50
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 0.24865 *A + 0.00438 *A^2

46)     2-Nitropropane      0.075 0.097 0.125 0.115 0.123 0.127 0.110  18.40
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Initial Calibration Summary

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Sample: VZ1144-ICC1144
Lab FileID: Z29635.D

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            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 0.11305 *A + 0.00135 *A^2

47)     cis-1,3-Dichloropro 0.440 0.523 0.635 0.617 0.643 0.664 0.587  14.85
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
              Response Ratio = 0.00000 + 0.59578 *A + 0.03401 *A^2

48)     4-Methyl-2-pentanon 0.353 0.368 0.518 0.487 0.520 0.537 0.464  17.65
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
              Response Ratio = 0.00000 + 0.47221 *A + 0.00651 *A^2


49) I   Chlorobenzene-d5      ----------------ISTD--------------------
50) S   Toluene-d8          1.188 1.182 1.121 1.119 1.121 1.115 1.141   2.99
51) C   Toluene             1.845 1.744 1.948 1.872 1.924 1.937 1.878   4.09
52)     trans-1,3-Dichlorop 0.425 0.462 0.606 0.576 0.609 0.627 0.551  15.56
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 0.56073 *A + 0.03338 *A^2

53)     1,1,2-Trichloroetha 0.307 0.356 0.387 0.352 0.363 0.364 0.355   7.43
54)     Tetrachloroethene   0.410 0.429 0.515 0.488 0.491 0.500 0.472   8.95
55)     2-hexanone          0.251 0.250 0.383 0.363 0.402 0.410 0.343  21.40
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9993
              Response Ratio = 0.00000 + 0.35423 *A + 0.00579 *A^2

56)     1,3-Dichloropropane 0.570 0.559 0.677 0.627 0.654 0.667 0.626   8.05
57)     Dibromochloromethan 0.439 0.437 0.546 0.503 0.541 0.556 0.504  10.75
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 0.49418 *A + 0.03120 *A^2

58)     1,2-Dibromoethane   0.315 0.367 0.444 0.412 0.446 0.452 0.406  13.49
59)     1-Chlorohexane      0.381 0.445 0.633 0.625 0.639 0.656 0.563  21.00
            ---- Quadratic regression ----  Coefficient =  0.9998
              Response Ratio = -0.00818 + 0.62143 *A + 0.01879 *A^2

60) P   Chlorobenzene       1.238 1.169 1.338 1.271 1.294 1.307 1.270   4.69
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 1.27156 *A + 0.01728 *A^2

61) C   Ethylbenzene        1.889 1.915 2.256 2.130 2.184 2.215 2.098   7.52
62)     1,1,1,2-Tetrachloro 0.377 0.437 0.523 0.494 0.497 0.489 0.469  11.38
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 0.50861 *A + -0.00969 *A^2

63)     m,p-Xylene          1.111 1.260 1.620 1.555 1.596 1.624 1.461  15.05
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 1.53395 *A + 0.02228 *A^2

64)     o-Xylene            0.917 1.061 1.494 1.507 1.554 1.575 1.351  21.15
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 1.46699 *A + 0.05550 *A^2

65)     Styrene             0.721 0.890 1.355 1.343 1.414 1.445 1.195  25.81
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 1.29787 *A + 0.07483 *A^2

66) P   Bromoform           0.308 0.301 0.362 0.346 0.372 0.382 0.345   9.78
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 0.33703 *A + 0.02281 *A^2
```

Initial Calibration Summary

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Project: LC-39B, KSC, FL

Sample: VZ1144-ICC1144
Lab FileID: Z29635.D

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67) I   1,4-Dichlorobenzene-d ----------------ISTD--------------------
68)     Isopropylbenzene    2.131 2.470 3.374 3.428 3.466 3.731 3.100  20.66
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 3.11404 *A + 0.29984 *A^2

69)     Cyclohexanone       0.010 0.020 0.023 0.021 0.020 0.019 0.019  24.11
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9978
              Response Ratio = 0.00000 + 0.01989 *A

70) S   4-Bromofluorobenzen 0.796 0.749 0.735 0.743 0.758 0.822 0.767   4.48
71) P   1,1,2,2-Tetrachloro 1.319 1.051 1.153 1.036 1.043 1.089 1.115   9.77
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
              Response Ratio = 0.00000 + 1.02049 *A + 0.03086 *A^2

72)     trans-1,4-Dichloro- 0.247 0.242 0.322 0.309 0.334 0.367 0.303  16.44
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 0.27448 *A + 0.04571 *A^2

73)     n-Propylbenzene     3.426 3.440 4.224 4.128 4.260 4.592 4.012  11.83
74)     Bromobenzene        0.964 0.966 1.114 1.045 1.103 1.194 1.064   8.49
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
              Response Ratio = 0.00000 + 0.96291 *A + 0.11275 *A^2

75)     1,2,3-Trichloroprop 0.356 0.270 0.301 0.275 0.280 0.293 0.296  10.67
76)     1,3,5-Trimethylbenz 2.041 2.517 3.228 3.155 3.190 3.267 2.900  17.42
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 3.23193 *A

77)     2-Chlorotoluene     2.218 2.406 2.926 2.782 2.885 2.996 2.702  11.69
78)     4-Chlorotoluene     1.818 1.965 2.496 2.466 2.551 2.711 2.334  15.27
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 2.28980 *A + 0.20673 *A^2

79)     tert-Butylbenzene   1.008 1.156 1.582 1.542 1.542 1.574 1.400  17.97
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 1.56090 *A

80)     1,2,4-Trimethylbenz 1.853 2.552 3.367 3.213 3.234 3.292 2.919  20.54
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 3.26843 *A

81)     sec-Butylbenzene    2.517 3.072 4.041 3.932 3.896 3.901 3.560  17.43
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 3.94073 *A + -0.02185 *A^2

82)     4-Isopropyltoluene  1.776 2.297 3.354 3.225 3.192 3.174 2.836  22.71
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
              Response Ratio = 0.00000 + 3.26231 *A + -0.04512 *A^2

83)     1,3-Dichlorobenzene 1.454 1.578 1.933 1.838 1.882 1.896 1.763  11.23
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 1.83922 *A + 0.02859 *A^2

84)     1,4-Dichlorobenzene 2.207 1.860 2.182 2.050 2.103 2.124 2.088   5.98
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 2.05579 *A + 0.03361 *A^2

85)     Benzyl Chloride     0.312 0.309 0.447 0.413 0.435 0.423 0.390  16.05
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
```

Initial Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1144-ICC1144
Lab FileID: Z29635.D

```
              Response Ratio = 0.00000 + 0.43105 *A + -0.00311 *A^2

86)     n-Butylbenzene      0.587 0.651 0.918 0.930 0.932 0.917 0.823  19.33
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
              Response Ratio = 0.00000 + 0.93633 *A + -0.00848 *A^2

87)     1,2-Dichlorobenzene 1.656 1.554 1.938 1.766 1.725 1.636 1.713   7.75
88)     1,2-Dibromo-3-Chlor 0.160 0.123 0.147 0.118 0.090 0.076 0.119  27.09
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9945
              Response Ratio = 0.00000 + 0.14331 *A + -0.03449 *A^2

89)     1,2,4-Trichlorobenz 0.894 0.963 1.196 0.998 0.681 0.517 0.875  27.64
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9911
              Response Ratio = 0.00000 + 1.24964 *A + -0.37271 *A^2

90)     Hexachlorobutadiene 0.614 0.554 0.621 0.541 0.393 0.319 0.507  24.35
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9951
              Response Ratio = 0.00000 + 0.65371 *A + -0.17043 *A^2

91)     Naphthalene         2.442 2.054 2.794 2.132 1.367 0.987 1.963  34.30
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9809
              Response Ratio = 0.00000 + 2.77363 *A + -0.91147 *A^2

92)     1,2,3-Trichlorobenz 1.025 0.911 1.106 0.816 0.479 0.349 0.781  38.88
            ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9618
              Response Ratio = 0.00000 + 1.06160 *A + -0.36590 *A^2


93) I   Tert Butyl alcohol-d1 ----------------ISTD---------------------
94)     Acrolein            4.784 2.186 2.377 1.888 2.262 2.045 2.590  42.01
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9922
              Response Ratio = 0.00000 + 2.10102 *A

95)     Tert-Butyl Alcohol  1.951 1.633 1.586 1.487 1.572 1.562 1.632  10.02
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 1.55864 *A

96)     Tert amyl alcohol   0.960 1.024 1.242 1.211 1.285 1.289 1.169  12.08
            ---- Linear regr., Force(0,0) ----  Coefficient =  0.9995
              Response Ratio = 0.00000 + 1.27892 *A

97)     1,4-Dioxane               0.118 0.162 0.151 0.154 0.161 0.149  12.01
------------------------------------------------------------------------------
(#) = Out of Range

          826011014.M        Mon Nov 03 11:09:15 2014
```

Initial Calibration Verification

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1144-ICV1144
Lab FileID: Z29638.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\110114\z29638.D Vial: 8
Acq On : 1 Nov 2014 3:58 pm Operator: melissam
Sample : icv1144-4 Inst : MSVOA15
Misc : ms28798,vz1144,,,,, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\826011014.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Nov 03 11:06:23 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	124	0.00	7.74
			Amount	Calc.	%Drift			
2		Dichlorodifluoromethane	40.000	29.756	25.6#	94	0.00	2.64
3	P	Chloromethane	40.000	36.720	8.2	113	0.00	2.85
4	C	Vinyl Chloride	40.000	41.093	-2.7	132	0.00	2.99
5		Bromomethane	40.000	40.770	-1.9	135	0.00	3.41
6		Chloroethane	40.000	42.954	-7.4	134	0.00	3.57
			AvgRF	CCRF	%Dev			
7		Trichlorofluoromethane	0.665	0.633	4.8	121	0.00	3.80
8		Ethyl Ether	0.373	0.412	-10.5	136	0.00	4.09
9		1,2-Dichlorotrifluoroetha	0.459	0.496	-8.1	134	0.00	4.33
10		Freon 113	0.421	0.412	2.1	119	0.00	4.43
11	C	1,1-Dichloroethene	0.574	0.629	-9.6	133	0.00	4.37
			Amount	Calc.	%Drift			
12		Acetone	200.000	199.878	0.1	127	0.00	5.04
13		Iodomethane	40.000	41.249	-3.1	130	0.00	4.56
			AvgRF	CCRF	%Dev			
14		Carbon Disulfide	1.025	1.264	-23.3#	149	0.00	4.44
			Amount	Calc.	%Drift			
15		Methyl acetate	200.000	163.818	18.1	104	0.00	5.16
			AvgRF	CCRF	%Dev			
16		Methylene Chloride	0.795	0.797	-0.3	126	0.00	5.02
			Amount	Calc.	%Drift			
17		Methyl Tert Butyl Ether	40.000	40.329	-0.8	132	0.00	5.30
			AvgRF	CCRF	%Dev			
18		trans-1,2-Dichloroethene	0.585	0.602	-2.9	126	0.00	5.20
			Amount	Calc.	%Drift			
19		Acrylonitrile	200.000	203.337	-1.7	132	0.00	5.89
20		Hexane	40.000	40.681	-1.7	130	0.00	5.28
21		Di-isopropyl ether	40.000	42.175	-5.4	134	0.00	5.69
22		Vinyl acetate	200.000	297.156	-48.6#	194	0.00	6.08
			AvgRF	CCRF	%Dev			

Initial Calibration Verification

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1144-ICV1144
Lab FileID: Z29638.D

23	P	1,1-Dichloroethane	0.761	0.739	2.9	121	0.00	5.87
			Amount	Calc.	%Drift			
24		ETBE	40.000	42.660	-6.6	133	0.00	6.08
25		2-Butanone	200.000	203.683	-1.8	133	0.00	7.00
			AvgRF	CCRF	%Dev			
26		2,2-Dichloropropane	0.470	0.468	0.4	124	0.00	6.58
27		cis-1,2-Dichloroethene	0.431	0.443	-2.8	123	0.00	6.45
28		Bromochloromethane	0.246	0.259	-5.3	129	0.00	6.66
29		Tetrahydrofuran	0.127	0.138	-8.7	130	0.00	6.89
30	C	Chloroform	0.718	0.704	1.9	121	0.00	6.71
31	S	Dibromofluoromethane	0.310	0.310	0.0	124	0.00	6.90
32		1,1,1-Trichloroethane	0.553	0.558	-0.9	122	0.00	6.97
			Amount	Calc.	%Drift			
33		Cyclohexane	40.000	39.153	2.1	122	0.00	6.71
			AvgRF	CCRF	%Dev			
34		Carbon Tetrachloride	0.562	0.559	0.5	122	0.00	6.91
			Amount	Calc.	%Drift			
35		1,1-Dichloropropene	40.000	40.208	-0.5	129	0.00	7.08
			AvgRF	CCRF	%Dev			
36	S	1,2-Dichloroethane-d4	0.289	0.278	3.8	121	0.00	7.46
			Amount	Calc.	%Drift			
37		TAME	40.000	42.214	-5.5	133	0.00	7.41
			AvgRF	CCRF	%Dev			
38		Benzene	1.445	1.455	-0.7	120	0.00	7.33
39		1,2-Dichloroethane	0.538	0.529	1.7	125	0.00	7.52
40		Trichloroethene	0.393	0.395	-0.5	124	0.00	7.92
			Amount	Calc.	%Drift			
41		Methylcyclohexane	40.000	40.355	-0.9	125	0.00	7.94
			AvgRF	CCRF	%Dev			
42	C	1,2-Dichloropropane	0.424	0.435	-2.6	125	0.00	8.43
43		Dibromomethane	0.270	0.267	1.1	124	0.00	8.34
44		Bromodichloromethane	0.503	0.512	-1.8	124	0.00	8.47
			Amount	Calc.	%Drift			
45		2-Chloroethyl vinyl ether	200.000	121.997	39.0#	75	0.00	8.99
46		2-Nitropropane	200.000	202.081	-1.0	129	0.00	9.54
47		cis-1,3-Dichloropropene	40.000	38.448	3.9	120	0.00	9.10
48		4-Methyl-2-pentanone	200.000	201.015	-0.5	128	0.00	9.66
			AvgRF	CCRF	%Dev			
49	I	Chlorobenzene-d5	1.000	1.000	0.0	121	0.00	10.84
50	S	Toluene-d8	1.141	1.123	1.6	122	0.00	9.28
51	C	Toluene	1.878	1.843	1.9	120	0.00	9.34
			Amount	Calc.	%Drift			
52		trans-1,3-Dichloropropene	40.000	41.591	-4.0	129	0.00	9.72
			AvgRF	CCRF	%Dev			
53		1,1,2-Trichloroethane	0.355	0.354	0.3	122	0.00	9.89

Initial Calibration Verification

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1144-ICV1144
Lab FileID: Z29638.D

54		Tetrachloroethene	0.472	0.483	-2.3	120	0.00	9.74
			Amount	Calc.	%Drift			
55		2-hexanone	200.000	203.825	-1.9	129	0.00	10.48
			AvgRF	CCRF	%Dev			
56		1,3-Dichloropropane	0.626	0.639	-2.1	124	0.00	10.17
			Amount	Calc.	%Drift			
57		Dibromochloromethane	40.000	41.508	-3.8	130	0.00	10.09
			AvgRF	CCRF	%Dev			
58		1,2-Dibromoethane	0.406	0.427	-5.2	126	0.00	10.35
			Amount	Calc.	%Drift			
59		1-Chlorohexane	40.000	40.742	-1.9	124	0.00	10.79
60	P	Chlorobenzene	40.000	41.768	-4.4	128	0.00	10.86
			AvgRF	CCRF	%Dev			
61	C	Ethylbenzene	2.098	2.096	0.1	120	0.00	10.85
			Amount	Calc.	%Drift			
62		1,1,1,2-Tetrachloroethane	40.000	40.232	-0.6	124	0.00	10.91
63		m,p-Xylene	80.000	81.210	-1.5	124	0.00	10.99
64		o-Xylene	40.000	42.465	-6.2	130	0.00	11.43
65		Styrene	40.000	37.947	5.1	116	0.00	11.48
66	P	Bromoform	40.000	39.656	0.9	124	0.00	11.54
			AvgRF	CCRF	%Dev			
67	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	121	0.00	13.20
			Amount	Calc.	%Drift			
68		Isopropylbenzene	40.000	42.136	-5.3	126	0.00	11.74
69		Cyclohexanone	200.000	296.912	-48.5#	168	0.00	12.44
			AvgRF	CCRF	%Dev			
70	S	4-Bromofluorobenzene	0.767	0.741	3.4	121	0.00	12.05
			Amount	Calc.	%Drift			
71	P	1,1,2,2-Tetrachloroethane	40.000	37.307	6.7	114	0.00	12.22
72		trans-1,4-Dichloro-2-Bute	40.000	39.622	0.9	121	0.00	12.40
			AvgRF	CCRF	%Dev			
73		n-Propylbenzene	4.012	4.345	-8.3	128	0.00	12.16
			Amount	Calc.	%Drift			
74		Bromobenzene	40.000	39.070	2.3	119	0.00	12.18
			AvgRF	CCRF	%Dev			
75		1,2,3-Trichloropropane	0.296	0.268	9.5	118	0.00	12.38
			Amount	Calc.	%Drift			
76		1,3,5-Trimethylbenzene	40.000	37.146	7.1	116	0.00	12.34
			AvgRF	CCRF	%Dev			
77		2-Chlorotoluene	2.702	2.872	-6.3	125	0.00	12.35
			Amount	Calc.	%Drift			
78		4-Chlorotoluene	40.000	41.825	-4.6	127	0.00	12.52

Initial Calibration Verification

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1144-ICV1144
Lab FileID: Z29638.D

79	tert-Butylbenzene	40.000	40.633	-1.6	125	0.00	12.69
80	1,2,4-Trimethylbenzene	40.000	37.200	7.0	115	0.00	12.75
81	sec-Butylbenzene	40.000	41.247	-3.1	125	0.00	12.87
82	4-Isopropyltoluene	40.000	40.581	-1.5	123	0.00	13.00
83	1,3-Dichlorobenzene	40.000	41.235	-3.1	127	0.00	13.14
84	1,4-Dichlorobenzene	40.000	37.662	5.8	116	0.00	13.22
85	Benzyl Chloride	40.000	36.932	7.7	116	0.00	13.45
86	n-Butylbenzene	40.000	38.112	4.7	116	0.00	13.44
	----------	AvgRF	CCRF	%Dev	----------		
87	1,2-Dichlorobenzene	1.713	1.826	-6.6	125	0.00	13.64
	----------	Amount	Calc.	%Drift	----------		
88	1,2-Dibromo-3-Chloropropa	40.000	38.749	3.1	117	0.00	14.39
89	1,2,4-Trichlorobenzene	40.000	39.579	1.1	115	0.00	14.98
90	Hexachlorobutadiene	40.000	40.580	-1.4	117	0.00	14.94
91	Naphthalene	40.000	39.796	0.5	116	0.00	15.26
92	1,2,3-Trichlorobenzene	40.000	40.728	-1.8	116	0.00	15.43
	----------	AvgRF	CCRF	%Dev	----------		
93 I	Tert Butyl alcohol-d10	1.000	1.000	0.0	133	0.00	5.26
	----------	Amount	Calc.	%Drift	----------		
94	Acrolein	200.000	162.191	18.9	120	-0.01	4.72
95	Tert-Butyl Alcohol	400.000	420.576	-5.1	146	0.00	5.35
96	Tert amyl alcohol	400.000	413.599	-3.4	145	0.00	7.55
	----------	AvgRF	CCRF	%Dev	----------		
97	1,4-Dioxane	0.149	0.166	-11.4	146	0.00	8.66

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z29635.D 826011014.M Mon Nov 03 11:27:45 2014

Continuing Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1145-CC1144
Lab FileID: Z29642.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\110314\z29642.D Vial: 1
Acq On : 3 Nov 2014 8:10 am Operator: melissam
Sample : cc1144-4 Inst : MSVOA15
Misc : ms28789,vz1145,,,,, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\826011014.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Nov 03 11:06:23 2014
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF / Amount	CCRF / Calc.	%Dev / %Drift	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	113	0.00	7.74
		Amount / Calc. / %Drift						
2		Dichlorodifluoromethane	40.000	36.999	7.5	105	0.00	2.63
3	P	Chloromethane	40.000	43.035	-7.6	121	0.00	2.85
4	C	Vinyl Chloride	40.000	44.933	-12.3	131	0.00	3.00
5		Bromomethane	40.000	46.381	-16.0	138	0.00	3.41
6		Chloroethane	40.000	47.048	-17.6	132	0.00	3.57
		AvgRF / CCRF / %Dev						
7		Trichlorofluoromethane	0.665	0.653	1.8	114	0.00	3.80
8		Ethyl Ether	0.373	0.410	-9.9	123	0.00	4.08
9		1,2-Dichlorotrifluoroetha	0.459	0.485	-5.7	119	0.00	4.32
10		Freon 113	0.421	0.434	-3.1	114	-0.01	4.43
11	C	1,1-Dichloroethene	0.574	0.619	-7.8	119	0.00	4.37
		Amount / Calc. / %Drift						
12		Acetone	200.000	215.839	-7.9	125	0.00	5.04
13		Iodomethane	40.000	43.855	-9.6	126	0.00	4.56
		AvgRF / CCRF / %Dev						
14		Carbon Disulfide	1.025	1.078	-5.2	116	0.00	4.44
		Amount / Calc. / %Drift						
15		Methyl acetate	200.000	231.899	-15.9	137	0.00	5.16
		AvgRF / CCRF / %Dev						
16		Methylene Chloride	0.795	0.825	-3.8	119	0.00	5.01
		Amount / Calc. / %Drift						
17		Methyl Tert Butyl Ether	40.000	42.099	-5.2	125	0.00	5.29
		AvgRF / CCRF / %Dev						
18		trans-1,2-Dichloroethene	0.585	0.641	-9.6	122	0.00	5.20
		Amount / Calc. / %Drift						
19		Acrylonitrile	200.000	220.269	-10.1	131	0.00	5.89
20		Hexane	40.000	41.721	-4.3	121	0.00	5.28
21		Di-isopropyl ether	40.000	43.605	-9.0	126	0.00	5.68
22		Vinyl acetate	200.000	184.044	8.0	106	0.00	6.08
		AvgRF / CCRF / %Dev						

Continuing Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1145-CC1144
Lab FileID: Z29642.D

23	P	1,1-Dichloroethane	0.761	0.829	-8.9	123	0.00	5.86
			Amount	Calc.	%Drift			
24		ETBE	40.000	42.722	-6.8	121	0.00	6.08
25		2-Butanone	200.000	213.480	-6.7	127	0.00	6.99
			AvgRF	CCRF	%Dev			
26		2,2-Dichloropropane	0.470	0.523	-11.3	125	0.00	6.58
27		cis-1,2-Dichloroethene	0.431	0.486	-12.8	123	0.00	6.45
28		Bromochloromethane	0.246	0.274	-11.4	124	0.00	6.66
29		Tetrahydrofuran	0.127	0.144	-13.4	123	0.00	6.89
30	C	Chloroform	0.718	0.784	-9.2	122	0.00	6.71
31	S	Dibromofluoromethane	0.310	0.319	-2.9	116	0.00	6.90
32		1,1,1-Trichloroethane	0.553	0.597	-8.0	119	0.00	6.97
			Amount	Calc.	%Drift			
33		Cyclohexane	40.000	40.949	-2.4	116	0.00	6.71
			AvgRF	CCRF	%Dev			
34		Carbon Tetrachloride	0.562	0.598	-6.4	119	0.00	6.91
			Amount	Calc.	%Drift			
35		1,1-Dichloropropene	40.000	41.990	-5.0	122	0.00	7.08
			AvgRF	CCRF	%Dev			
36	S	1,2-Dichloroethane-d4	0.289	0.281	2.8	111	0.00	7.46
			Amount	Calc.	%Drift			
37		TAME	40.000	43.196	-8.0	124	0.00	7.41
			AvgRF	CCRF	%Dev			
38		Benzene	1.445	1.620	-12.1	121	0.00	7.33
39		1,2-Dichloroethane	0.538	0.570	-5.9	123	0.00	7.52
40		Trichloroethene	0.393	0.425	-8.1	121	0.00	7.92
			Amount	Calc.	%Drift			
41		Methylcyclohexane	40.000	40.959	-2.4	115	0.00	7.94
			AvgRF	CCRF	%Dev			
42	C	1,2-Dichloropropane	0.424	0.472	-11.3	123	0.00	8.43
43		Dibromomethane	0.270	0.286	-5.9	121	0.00	8.34
44		Bromodichloromethane	0.503	0.548	-8.9	120	0.00	8.47
			Amount	Calc.	%Drift			
45		2-Chloroethyl vinyl ether	200.000	208.909	-4.5	120	0.00	8.99
46		2-Nitropropane	200.000	212.274	-6.1	123	0.00	9.54
47		cis-1,3-Dichloropropene	40.000	42.496	-6.2	121	0.00	9.09
48		4-Methyl-2-pentanone	200.000	218.893	-9.4	127	0.00	9.66
			AvgRF	CCRF	%Dev			
49	I	Chlorobenzene-d5	1.000	1.000	0.0	125	0.00	10.84
50	S	Toluene-d8	1.141	1.050	8.0	117	0.00	9.28
51	C	Toluene	1.878	1.817	3.2	121	0.00	9.34
			Amount	Calc.	%Drift			
52		trans-1,3-Dichloropropene	40.000	38.191	4.5	121	0.00	9.72
			AvgRF	CCRF	%Dev			
53		1,1,2-Trichloroethane	0.355	0.342	3.7	122	0.00	9.89

Continuing Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1145-CC1144
Lab FileID: Z29642.D

54		Tetrachloroethene	0.472	0.463	1.9	118	0.00	9.74
			Amount	Calc.	%Drift			
55		2-hexanone	200.000	193.964	3.0	126	0.00	10.48
			AvgRF	CCRF	%Dev			
56		1,3-Dichloropropane	0.626	0.623	0.5	124	0.00	10.17
			Amount	Calc.	%Drift			
57		Dibromochloromethane	40.000	38.528	3.7	124	0.00	10.08
			AvgRF	CCRF	%Dev			
58		1,2-Dibromoethane	0.406	0.409	-0.7	124	0.00	10.34
			Amount	Calc.	%Drift			
59		1-Chlorohexane	40.000	38.595	3.5	121	0.00	10.79
60	P	Chlorobenzene	40.000	37.593	6.0	119	0.00	10.86
			AvgRF	CCRF	%Dev			
61	C	Ethylbenzene	2.098	2.030	3.2	119	0.00	10.85
			Amount	Calc.	%Drift			
62		1,1,1,2-Tetrachloroethane	40.000	38.034	4.9	121	0.00	10.91
63		m,p-Xylene	80.000	75.533	5.6	119	0.00	10.99
64		o-Xylene	40.000	38.644	3.4	121	0.00	11.43
65		Styrene	40.000	37.860	5.4	119	0.00	11.48
66	P	Bromoform	40.000	39.391	1.5	126	0.00	11.54
			AvgRF	CCRF	%Dev			
67	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	128	0.00	13.20
			Amount	Calc.	%Drift			
68		Isopropylbenzene	40.000	38.318	4.2	120	0.00	11.74
69		Cyclohexanone	200.000	184.654	7.7	110	0.00	12.44
			AvgRF	CCRF	%Dev			
70	S	4-Bromofluorobenzene	0.767	0.751	2.1	129	0.00	12.05
			Amount	Calc.	%Drift			
71	P	1,1,2,2-Tetrachloroethane	40.000	37.047	7.4	119	0.00	12.22
72		trans-1,4-Dichloro-2-Bute	40.000	37.257	6.9	119	0.00	12.39
			AvgRF	CCRF	%Dev			
73		n-Propylbenzene	4.012	3.790	5.5	118	0.00	12.16
			Amount	Calc.	%Drift			
74		Bromobenzene	40.000	37.953	5.1	122	0.00	12.18
			AvgRF	CCRF	%Dev			
75		1,2,3-Trichloropropane	0.296	0.257	13.2	120	0.00	12.38
			Amount	Calc.	%Drift			
76		1,3,5-Trimethylbenzene	40.000	36.411	9.0	119	0.00	12.34
			AvgRF	CCRF	%Dev			
77		2-Chlorotoluene	2.702	2.555	5.4	118	0.00	12.34
			Amount	Calc.	%Drift			
78		4-Chlorotoluene	40.000	37.532	6.2	119	0.00	12.52

Continuing Calibration Summary

Job Number: FA19407
Account: GSYNFLTI Geosyntec Consultants
Project: LC-39B, KSC, FL

Sample: VZ1145-CC1144
Lab FileID: Z29642.D

79	tert-Butylbenzene	40.000	36.656	8.4	119	0.00	12.69
80	1,2,4-Trimethylbenzene	40.000	36.531	8.7	119	0.00	12.75
81	sec-Butylbenzene	40.000	36.499	8.8	117	0.00	12.87
82	4-Isopropyltoluene	40.000	36.743	8.1	118	0.00	13.00
83	1,3-Dichlorobenzene	40.000	36.795	8.0	119	0.00	13.14
84	1,4-Dichlorobenzene	40.000	36.532	8.7	119	0.00	13.22
85	Benzyl Chloride	40.000	39.583	1.0	131	0.00	13.45
86	n-Butylbenzene	40.000	37.009	7.5	118	0.00	13.44
	----------	AvgRF	CCRF	%Dev	----------		
87	1,2-Dichlorobenzene	1.713	1.663	2.9	121	0.00	13.64
	----------	Amount	Calc.	%Drift	----------		
88	1,2-Dibromo-3-Chloropropa	40.000	37.065	7.3	119	0.00	14.38
89	1,2,4-Trichlorobenzene	40.000	37.699	5.8	117	0.00	14.98
90	Hexachlorobutadiene	40.000	36.467	8.8	114	0.00	14.94
91	Naphthalene	40.000	35.422	11.4	113	0.00	15.26
92	1,2,3-Trichlorobenzene	40.000	33.307	16.7	107	0.00	15.43
	----------	AvgRF	CCRF	%Dev	----------		
93 I	Tert Butyl alcohol-d10	1.000	1.000	0.0	136	0.00	5.26
	----------	Amount	Calc.	%Drift	----------		
94	Acrolein	200.000	170.134	14.9	129	-0.01	4.72
95	Tert-Butyl Alcohol	400.000	367.539	8.1	131	-0.01	5.33
96	Tert amyl alcohol	400.000	369.555	7.6	133	0.00	7.55
	----------	AvgRF	CCRF	%Dev	----------		
97	1,4-Dioxane	0.149	0.149	0.0	134	-0.01	8.65

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z29635.D 826011014.M Tue Nov 04 08:22:24 2014

APPENDIX C

RIS COMPLETION TICKETS

DATA CHECKER

Completion Ticket

On 11/24/2014 at 3:33 PM the following files were submitted to TtNUS

Completion_GSTTI_39B_20141124.txt

Lithology_GSTTI_39B_20141124.txt

Location_GSTTI_39B_20141124.txt

Project_GSTTI_39B_20141124.txt

Result_GSTTI_39B_20141124.txt

Sample_GSTTI_39B_20141124.txt

Water_GSTTI_39B_20141124.txt

The following comment was provided with this submission:
OCT 2014 PM LTM

If you need to identify this session at a later date you may use the Ticket Key:

Repository20141124_3669113_kedd_GSTTI

You may print this page by clicking on the "Print This Page" button

Thank you for using the Data Checker, to upload more files click the "Upload Files" link in the menu.

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APPENDIX D

O&M FORMS

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 1/10/14	Time: 1505

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.4 V; 87%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.5 V; 94%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.2	Extraction Well #2	0.5	Extraction Well #1	17,971	Extraction Well #2	7,488

Hour meter - number of hours that pumps have been running	12,061	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (250 hours)

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 1/24/14	Time: 1455

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	No	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 13.8 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 13.9 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	generator/compressor malfunctioning

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	0.8	Extraction Well #2	0.8	Extraction Well #1	24,127	Extraction Well #2	10,053

Hour meter - number of hours that pumps have been running	12,396	

Task that need to be completed during the next scheduled visit

Generator will not work, outlet indicator light blinking - indicating short circuit in appliance. Ground prong on compressor's plug is broken, may be causing short circuit signal. Need to repair compressor plug. Wells screens not cleaned.

Comments

Both pumps operating, but no suction observed from inlets. Pumps move water when manually operated using check valve on inlet. When manually operation with check valve stopped, pump stops pumping water even though still primed. No leaks in plumbing, electrical wiring fine.

Pumps have reached end of useful life. Replaced both pumps. No spare pumps remain in the trailer.

After replacing pumps, water pumped immediately at recorded flows with check valve connected to inlets, ensuring no problem with plumbing or electrical wiring.

Estimated volume produced based on the hour meter reading (335 hours) and previous flow rates

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 02/07/14	Time: 1400

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.3 V; 74%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.4 V; 82%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.0	Extraction Well #2	0.9	Extraction Well #1	15,756	Extraction Well #2	14,180

Hour meter - number of hours that pumps have been running	12,658	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (263 hours)

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 02/28/14	Time: 1430

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 13.6 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 13.7V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi.

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.0	Extraction Well #2	1.0	Extraction Well #1	29,220	Extraction Well #2	29,220

Hour meter - number of hours that pumps have been running	13,145	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (487 hours)

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: D. Sizemore	Date: 03/12/14	Time: 1400

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 13.7 V; 100%
Inspect wiring and connection	Monthly	No	Battery 2: 13.2 V; 100%
Inspect piping and connections for leaks	Monthly	No	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	Yes	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.0	Extraction Well #2	1.0	Extraction Well #1	16,602	Extraction Well #2	16,602

Hour meter - number of hours that pumps have been running	13,422	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (277 hours)

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 03/26/14	Time: 1540

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 13.2 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 13.5 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.1	Extraction Well #2	0.7	Extraction Well #1	21,450	Extraction Well #2	13,650

Hour meter - number of hours that pumps have been running	13,747	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (325 hours)

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 04/11/14	Time: 1515

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	No	pumps running, no suction
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.9 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.9 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	0.2	Extraction Well #2	0.6	Extraction Well #1	23,753	Extraction Well #2	15,116

Hour meter - number of hours that pumps have been running	14,107	

Task that need to be completed during the next scheduled visit

Comments

Pumps running, but no suction observed at inlet. Checked wiring and checked for leaks. Check and cleaned impellers; still no suction. Flow only observed when tubing manually moved up and down with check valve attached to tubing in extraction well. Once manual movement of tubing stopped, pump did not produce flow. Pumps have reached end of useful life.

Replaced both pumps with previously used pumps that were completely disassembled, cleaned thoroughly, and reassembled.

Replacement pumps (used) produced very low flows. Pumps need to be replaced.

Estimated volume produced based on the hour meter reading (360 hours) and flows recorded on previous O&M event (03/26/14).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 04/25/14	Time: 1410

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	No	pumps running, no suction
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.7 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.7 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	broken tee connection
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	Yes	cleared around sediment blocks
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.4	Extraction Well #2	1.0	Extraction Well #1	4,014	Extraction Well #2	12,042

Hour meter - number of hours that pumps have been running	14,441

Task that need to be completed during the next scheduled visit

Comments

Existing pumps were used pumps that were disassembled and cleaned that did not perform well when reinstalled last O&M (04/11/14).

Both pumps replaced with new pumps. Installed SHURflo In-line strainer (50-mesh stainless steel screen, model# 15-085-00 - 255-313), as suggested by manufacturer.

Restart system.

No spare pumps remain in trailer - will order additional backup pumps.

Tee connection broken on EW-1. Bypassed. Will replace next O&M event.

Estimated volume produced based on the hour meter reading (335 hours) and flows recorded on previous O&M event (04/11/14).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 05/09/14	Time: 1345

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.6 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.7 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	Yes	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.4	Extraction Well #2	1.0	Extraction Well #1	26,040	Extraction Well #2	18,600

Hour meter - number of hours that pumps have been running	14,751	

Task that need to be completed during the next scheduled visit

Comments

Replaced broken tee in EW-1 piping that was by-passed during previous O&M event.

Replaced brittle tee in EW-2 piping.

Estimated volume produced based on the hour meter reading (310 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: D. Sizemore	Date: 5/23/14	Time: 1345

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	No suction on EW-1
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.7 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.8 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	Yes	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	Yes	10X each at ~80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.5	Extraction Well #2	1.5	Extraction Well #1	27,009	Extraction Well #2	27,009

Hour meter - number of hours that pumps have been running	15,052	

Task that need to be completed during the next scheduled visit

Comments

No suction observed from EW-1 upon arrival. Manually primed pump and flow resumed.

Estimated volume produced based on the hour meter reading (300 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 06/06/14	Time: 1350

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	No suction observed from EW-2
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.8 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.9 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	broken/cracked Tee in EW-2 line
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.1	Extraction Well #2	0.4	Extraction Well #1	21,417	Extraction Well #2	7,788

Hour meter - number of hours that pumps have been running	15,376

Task that need to be completed during the next scheduled visit

Comments

Broken tee in EW-2 line replaced. Crack in line may be reason for no/low suction.

Manually primed pump and flow resumed.

Pump for EW-2 exhibiting low flows. Will monitor and evaluate replacement next O&M

Estimated volume produced based on the hour meter reading (325 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 6/20/14	Time: 1025

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	No suction from EW-2
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.6 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.7 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	No accumulation observed.
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi.

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.0	Extraction Well #2	0.2	Extraction Well #1	19,794	Extraction Well #2	3,959

Hour meter - number of hours that pumps have been running	15,706	

Task that need to be completed during the next scheduled visit

Comments

No suction observed from EW-2. Manually primed pump.

Pump for EW-2 will be replaced with new pump next O&M event.

Estimated volume produced based on the hour meter reading (330 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 7/7/14	Time: 0910

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.2 V; 76%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.2 V; 75%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.0	Extraction Well #2	0.8	Extraction Well #1	24,372	Extraction Well #2	4,874

Hour meter - number of hours that pumps have been running	16,112	

Task that need to be completed during the next scheduled visit

Comments

Pump EW-2 still exhibiting low flows: ~0.2 gpm. Pump nearing end of useful life. Replace EW-2 pump and resume flow.

One new replacement pump remains in trailer.

Estimated volume produced calculated based on flow rate from previous O&M event (0.2 gpm).

Estimated volume produced based on the hour meter reading (406 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 7/18/14	Time: 1140

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.8 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 13.0 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	Yes	cleared vegetation around sediment blocks and trailer
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	0.8	Extraction Well #2	1.0	Extraction Well #1	12,672	Extraction Well #2	15,840

Hour meter - number of hours that pumps have been running	16,378	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (264 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 08/01/14	Time: 1415

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.6 V; 98%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.4 V; 92%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	0.9	Extraction Well #2	1.4	Extraction Well #1	14,396	Extraction Well #2	22,394

Hour meter - number of hours that pumps have been running	16,644

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (267 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 08/18/14	Time: 1210

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.3 V; 76%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.5 V; 90%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed; SB3 under standing water
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	Yes	cleared vegetation around sediment blocks
Clean injection and extraction well screens	Monthly	Yes	10X each at ~80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.0	Extraction Well #2	1.4	Extraction Well #1	18,738	Extraction Well #2	26,233

Hour meter - number of hours that pumps have been running	16,957	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (312 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 08/29/14	Time: 1415

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	no suction observed from EW-1
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 13.2 V; 100%
Inspect wiring and connection	Monthly	Yes	Battery 2: 13.2 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	Yes	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.4	Extraction Well #2	0.4	Extraction Well #1	13,680	Extraction Well #2	5,472

Hour meter - number of hours that pumps have been running	17,185

Task that need to be completed during the next scheduled visit

Comments

No suction observed from EW-1. Checked wiring and cleaned impellers on pump - still no suction. Pump for EW-1 has reached the end of it's useful life.

Replaced pump for EW-1. Restarted system and collected readings.

Low flow observed in EW-2, may indicate pump is nearing end of useful life. If low flows persist for EW-2, will replace pump next O&M event.

No spare pumps remain in trailer.

Estimated volume produced for EW-1 calculated based on flow rate from previous O&M event (1.0 gpm).

Estimated volume produced based on the hour meter reading (228 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett, B. Coppenger	Date: 9/12/14	Time: 1015

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 90%; 12.4 V
Inspect wiring and connection	Monthly	Yes	Battery 2: 90%; 12.4 V
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	Yes	cleared vegetation around trailer and sediment blocks
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.3	Extraction Well #2	1.9	Extraction Well #1	10,140	Extraction Well #2	4,363

Hour meter - number of hours that pumps have been running	17,366	

Task that need to be completed during the next scheduled visit

Comments

Sediment Block 3 under standing water.

Extraction Well 1 piping destroyed by mowers (9/8/14). System shutdown for repair.

Piping run for EW-1 replaced. Caution tape wrapped around exposed secondary containment piping and around EW-1. System restarted.

No suction observed from pump EW-2. Checked wiring and piping - still no suction. Pump has reached end of useful life. Pump replaced.

System restarted and collected readings.

2 spare pumps remain in trailer.

Estimated volume produced for EW-1 calculated based on 130 hours of operation (estimated hours operated before piping was damaged based on discussion with SC Jones [damaged on 8 Sept 2014]).

Estimated volume produced for EW-2 calculated based on flow observed during previous O&M event (0.4 gpm).

Estimated volume produced for EW-2 based on the hour meter reading (182 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 09/26/14	Time: 1300

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.3 V; 80%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.4 V; 90%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.5	Extraction Well #2	1.5	Extraction Well #1	16,308	Extraction Well #2	16,308

Hour meter - number of hours that pumps have been running	17,548	

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (181 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 10/10/14	Time: 1000

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.2 V; 61%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.2 V; 61%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	cleared vegetation around sediment blocks
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.3	Extraction Well #2	1.5	Extraction Well #1	14,953	Extraction Well #2	17,253

Hour meter - number of hours that pumps have been running	17,739

Task that need to be completed during the next scheduled visit

Comments

sediment block 3 under standing water

Estimated volume produced based on the hour meter reading (192 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: J. Bartlett	Date: 10/24/14	Time: 1130

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.6 V; 96%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.6 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.3	Extraction Well #2	1.4	Extraction Well #1	14,976	Extraction Well #2	16,128

Hour meter - number of hours that pumps have been running	17,931

Task that need to be completed during the next scheduled visit

Comments

Estimated volume produced based on the hour meter reading (192 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: D. Sizemore	Date: 11/7/14	Time: 1000

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.7 V; 97%
Inspect wiring and connection	Monthly	yes	Battery 2: 12.7 V; 99%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	Yes	
Clean solar panels	As Needed	Yes	
Clean flow regulators	Monthly	Yes	
Clear Vegetation around piping, trailer and wells	As Needed	Yes	cleared around sediment blocks
Clean injection and extraction well screens	Monthly	Yes	10x each @ 80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.5	Extraction Well #2	1.5	Extraction Well #1	15,750	Extraction Well #2	21,933

Hour meter - number of hours that pumps have been running	18,175	

Task that need to be completed during the next scheduled visit

Comments

Extraction well 1 (EW-1) piping destroyed by land clearing activities (11/3/14). Piping replaced for EW-1 during O&M event (11/7/14).

Estimated volume produced for EW-1 calculated based on 175 hours of operation (estimated hours operated before piping was damaged).

Estimated volume produced based on the hour meter reading (244 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: Ben Coppenger	Date: 11/21/14	Time: 1500

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	no suction observed from EW-2
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.2 V; 66%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.5 V; 92%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	No	
Clean pump impellers	Bi-weekly	Yes	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	1.0	Extraction Well #2	0.6	Extraction Well #1	12,918	Extraction Well #2	19,377

Hour meter - number of hours that pumps have been running	18,390	

Task that need to be completed during the next scheduled visit

Re-check pump batteries to see if batteries are going bad.

Monitor flow rates to see if decrease in flow rates might correspond to batteries going bad.

Comments

No suction from pump for extraction well (EW-2) observed. Troubleshot pump - checked wiring, piping - still no suction. Pump manually primed with water - still no suction from pump. Pump has reached end of useful life. Replaced pump EW-2.

Estimated volume produced for EW-2 calculated using flow observed from previous O&M event (1.5 gpm).

1 spare pump remains in trailer.

Estimated volume produced based on the hour meter reading (215 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: B. Coppenger	Date: 12/5/14	Time: 1345

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	no suction observed from EW-2
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.0 V; 39%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.5 V; 94%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	Yes	no accumulation observed
Clean pump impellers	Bi-weekly	Yes	
Clean solar panels	As Needed	Yes	
Clean flow regulators	Monthly	Yes	
Clear Vegetation around piping, trailer and wells	As Needed	Yes	
Clean injection and extraction well screens	Monthly	Yes	10X each at 80 psi

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	0.8	Extraction Well #2	0.6	Extraction Well #1	6,456	Extraction Well #2	4,842

Hour meter - number of hours that pumps have been running	18,525

Task that need to be completed during the next scheduled visit

Pump for extraction well #1 (EW-1) operational, but may need replacement next O&M event due to low observed flow. Recheck batteries to see if voltage has increased or if they need replacement.

Comments

Pump for extraction well #2 (EW-2) operational upon arrival, but no suction observed. Checked piping, wiring, and manually primed pump - still no water being pumped. Replaced EW-2 pump with the last remaining spare pump and restarted system. Water pumping through EW-2 after replacement.

EW-1 is operational, but flow is than observed flow from prior O&M events. EW-1 pump may need to be replaced next O&M event.

Need to order more spare pumps.

Estimated volume produced based on the hour meter reading (135 hours).

Geosyntec consultants

Launch Complex 39B O&M

Launch Complex 39B, SWMU #9
Kennedy Space Center, Florida

Technician: B. Coppenger	Date: 12/19/2014	Time: 1025

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no)	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Battery charge remaining	Weekly	See note	Battery 1: 12.01 V; 39%
Inspect wiring and connection	Monthly	Yes	Battery 2: 12.92 V; 100%
Inspect piping and connections for leaks	Monthly	Yes	
Inspect sediment blocks (inside pad)	Monthly	NA	
Clean pump impellers	Bi-weekly	No	
Clean solar panels	As Needed	No	
Clean flow regulators	Monthly	No	
Clear Vegetation around piping, trailer and wells	As Needed	No	
Clean injection and extraction well screens	Monthly	No	

Flow Rates (gpm)				Estimated Volume Produced (gallons)			
Extraction Well #1	0.2	Extraction Well #2	0.2	Extraction Well #1	7,109	Extraction Well #2	1,777

Hour meter - number of hours that pumps have been running	18,673

Task that need to be completed during the next scheduled visit

Comments

1025-system operation upon arrival. Low flow and observed with EW1 pump-not running at full capacity. Replaced with new pump. Very little flow observed in both pumps/wells still. Checked tubing-EW1 tubing inside the trailer rotting. Replaced rotted tubing with new tubing. Still have low flow in EW1. Checked batteries EW1 and EW2. EW2 battery 100% - has power but little flow still observed. Battery 1 39% but getting more flow than Battery 2. Checked wiring and connections - all seem relatively good. Still little flow. EW2 tubing had check valve on extraction end - EW1 extraction well had no check valve. Switched the check valve from EW2 extraction well to EW1 extraction well to see if flow would improve on EW1. Very little improvement - still low flow. EW2 tubing needs new check valve and EW1 also if possible. Check valve seems to be somewhat faulty. Recommend complete overhaul on system and 100% new tubing and wiring. Only one new replacement pump remains in trailer.

Need to try to replace wiring for Battery 1, if not completely replace Battery 1. This is the second O&M that Battery 1 had approximately 39%.

Battery 2 recharged to 100%.

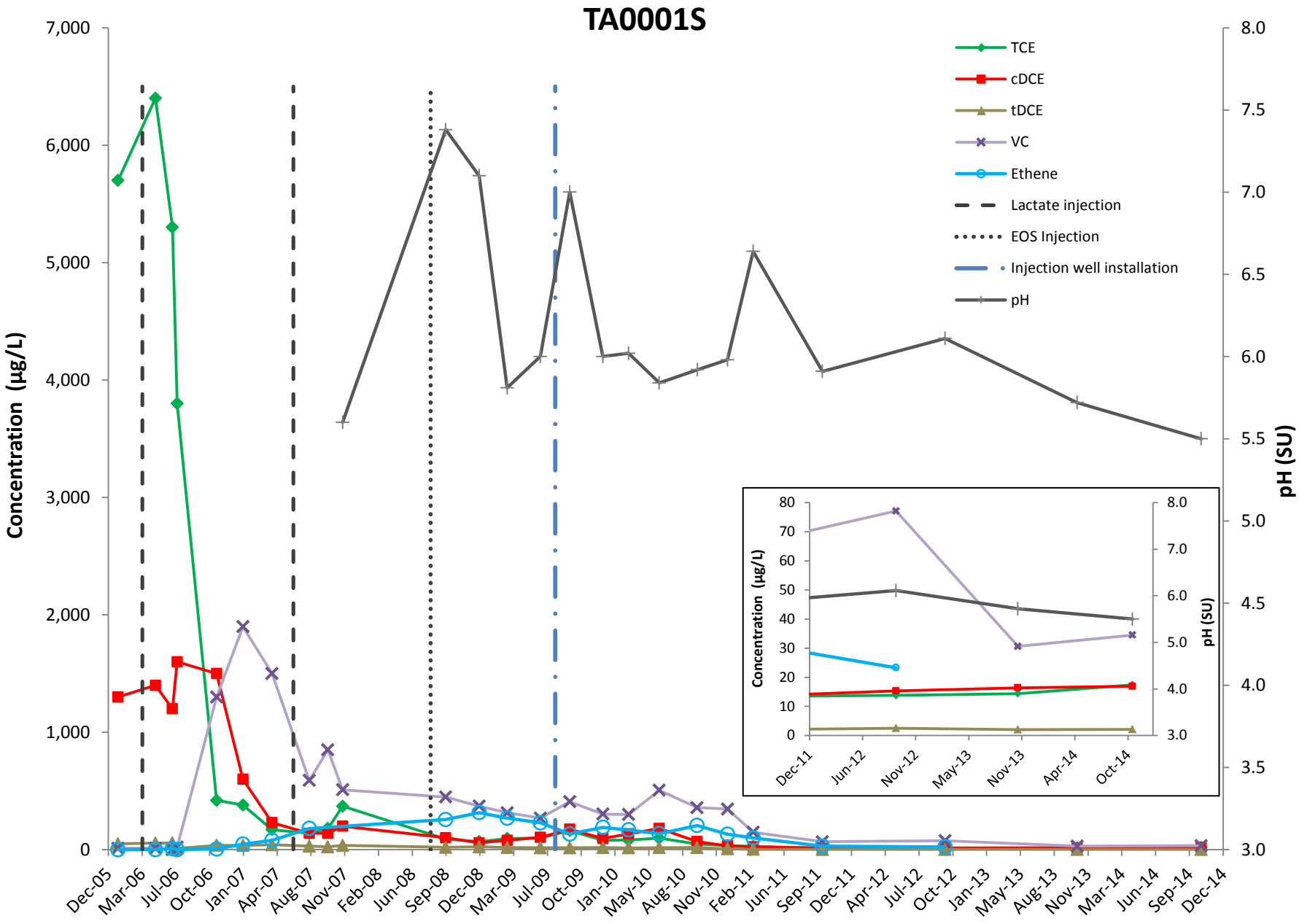
1150-left site

Estimated volume produced based on the hour meter reading (148 hours).

Geosyntec consultants

APPENDIX E

TREND GRAPHS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tDCE
VC
Ethene
Lactate injection
EOS Injection
Injection well installation
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6,000
5,000
4,000
3,000
2,000
1,000
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
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Sep-08
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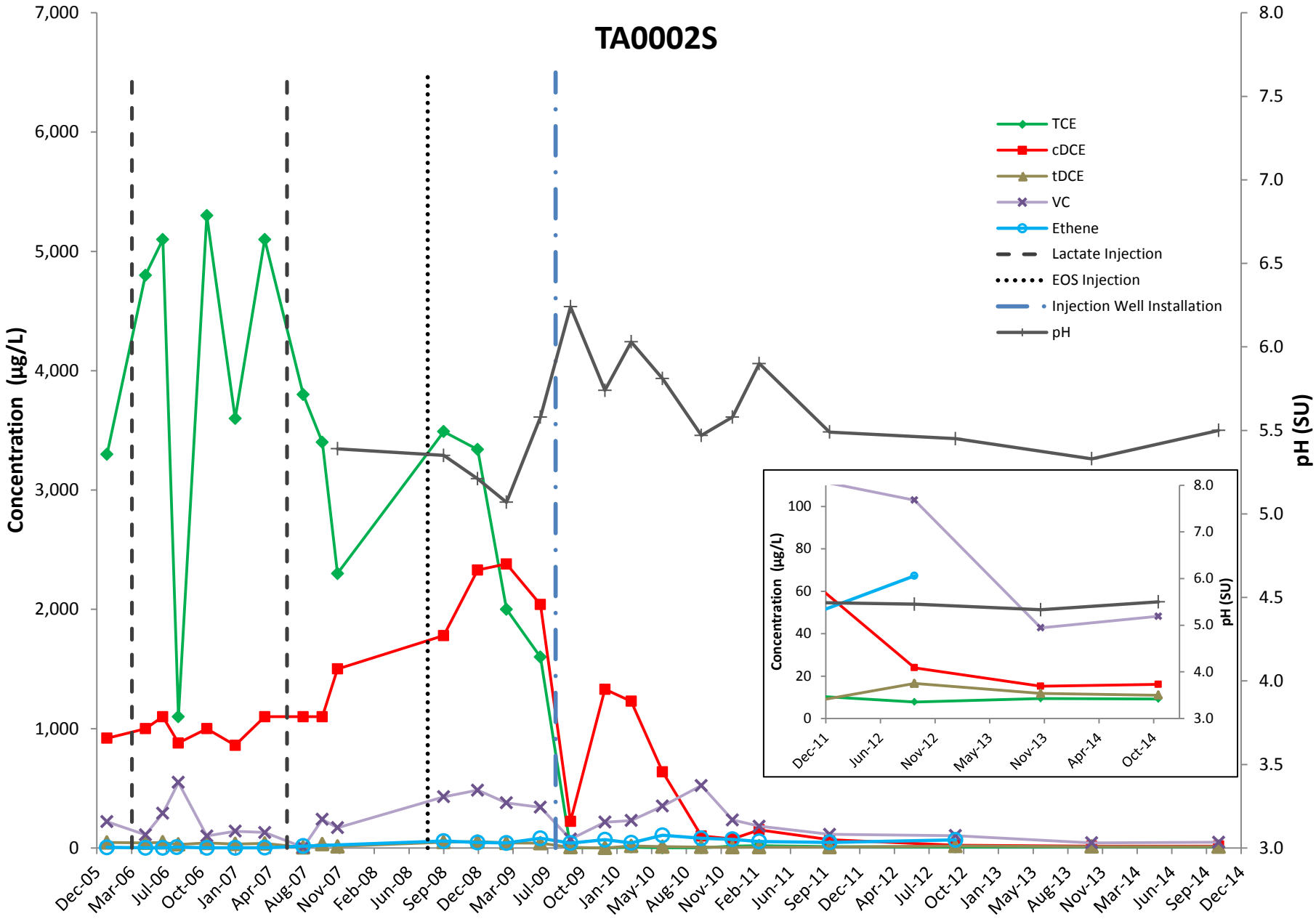
Oct-14


TA0002S
Concentration (µg/L)
pH (SU)
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
Jun-08
Sep-08
Dec-08
Mar-09
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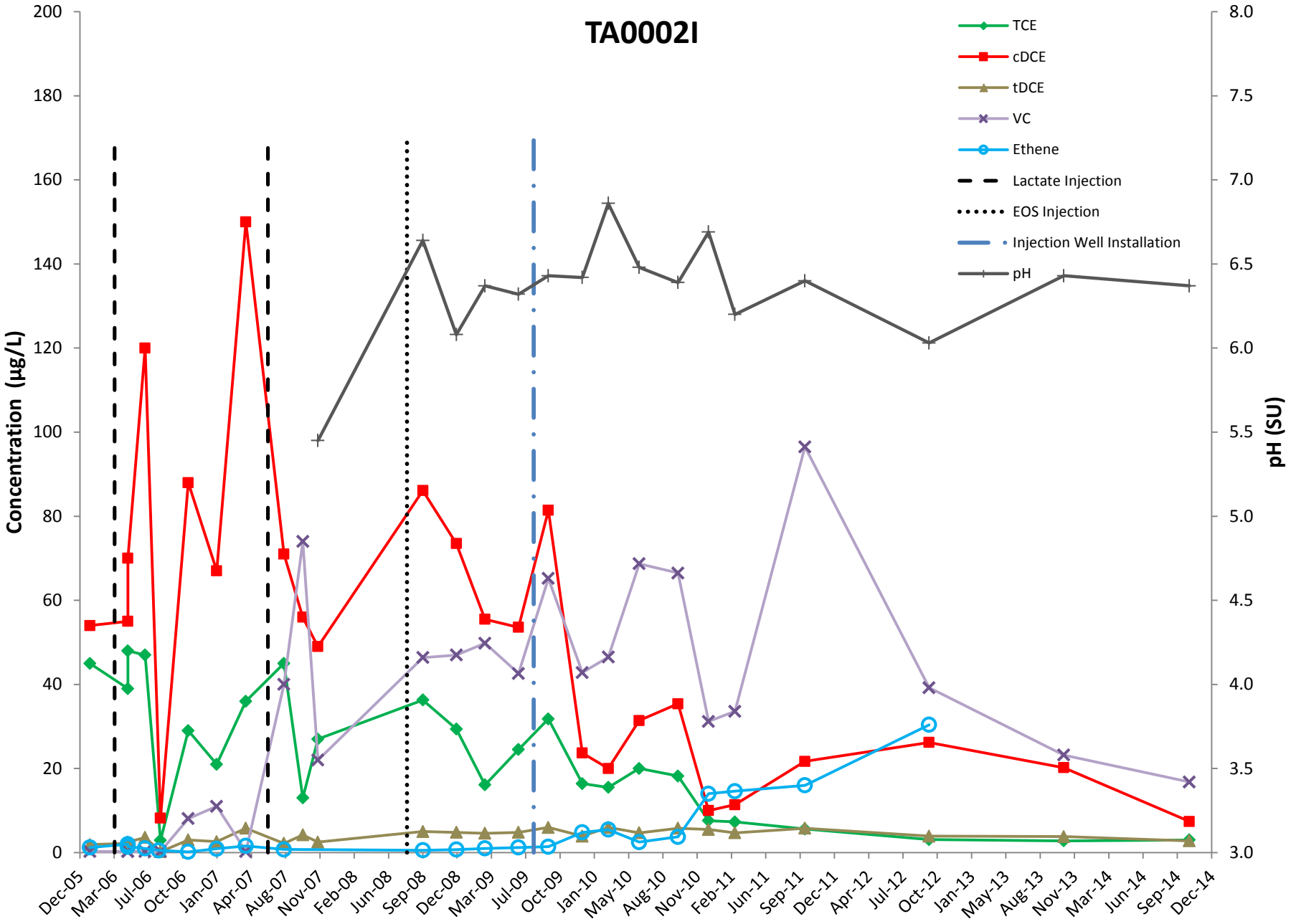
Jan-10
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
Dec-11
Apr-12
Jul-12
Oct-12
Jan-13
May-13
Aug-13
Nov-13
Mar-14
Jun-14
Sep-14
Dec-14
Concentration (µg/L)
pH (SU)
100
80
60
40
20
0
8.0
7.0
6.0
5.0
4.0
3.0
Dec-11
Jun-12
Nov-12
May-13
Nov-13
Apr-14
Oct-14


TA0002I
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
200
180
160
140
120
100
80
60
40
20
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
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Jan-07
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Sep-08
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Sep-11
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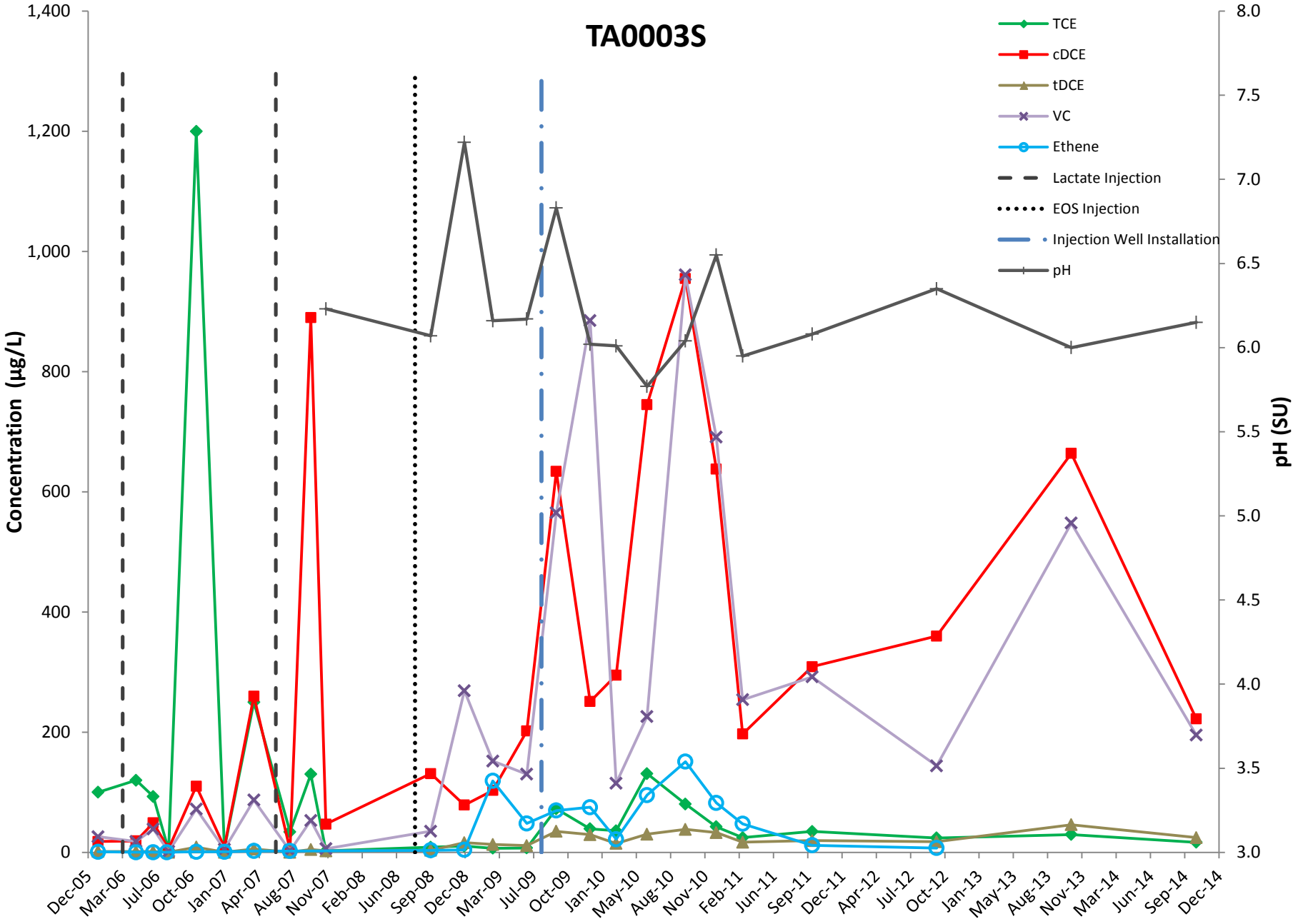
TA0003S
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
1,400
1,200
1,000
800
600
400
200
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
Jun-08
Sep-08
Dec-08
Mar-09
Jul-09
Oct-09
Jan-10
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
Dec-11
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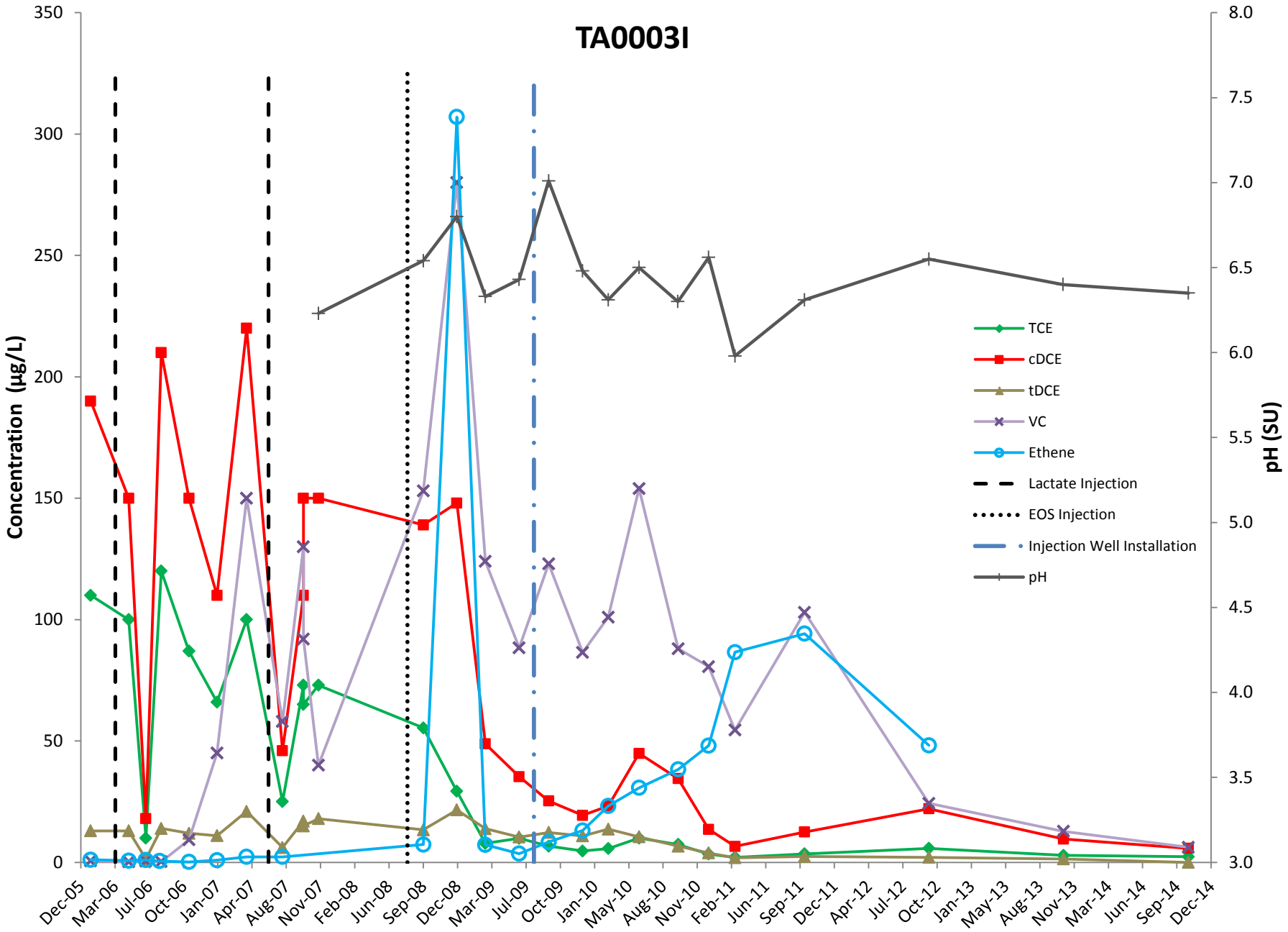
May-13
Aug-13
Nov-13
Mar-14
Jun-14
Sep-14
Dec-14


TA0003I
Concentration (µg/L)
pH (SU)
350
300
250
200
150
100
50
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
Jun-08
Sep-08
Dec-08
Mar-09
Jul-09
Oct-09
Jan-10
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
Dec-11
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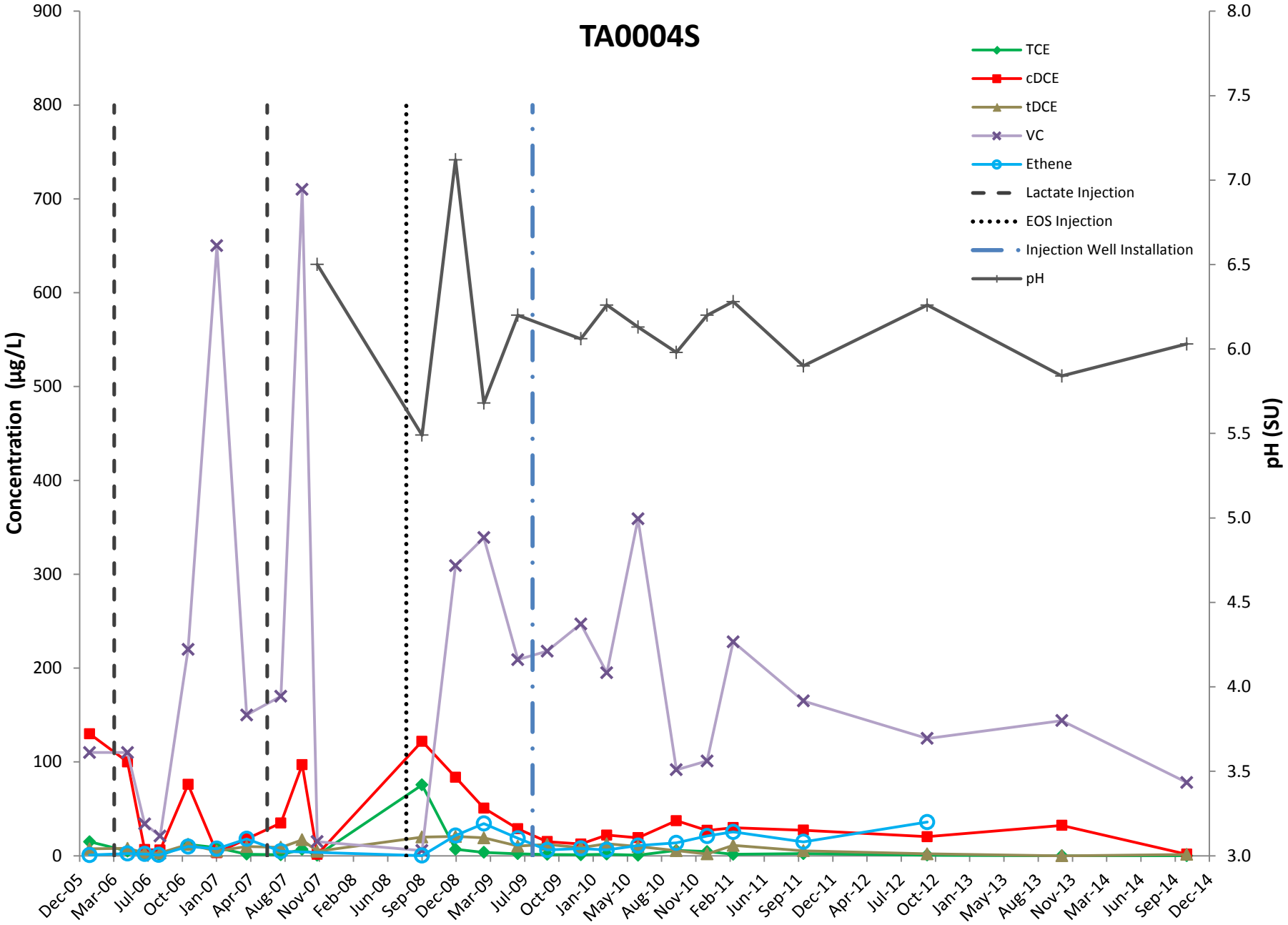
Jan-13
May-13
Aug-13
Nov-13
Mar-14
Jun-14
Sep-14
Dec-14


TA0004S
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
900
800
700
600
500
400
300
200
100
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
Jun-08
Sep-08
Dec-08
Mar-09
Jul-09
Oct-09
Jan-10
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
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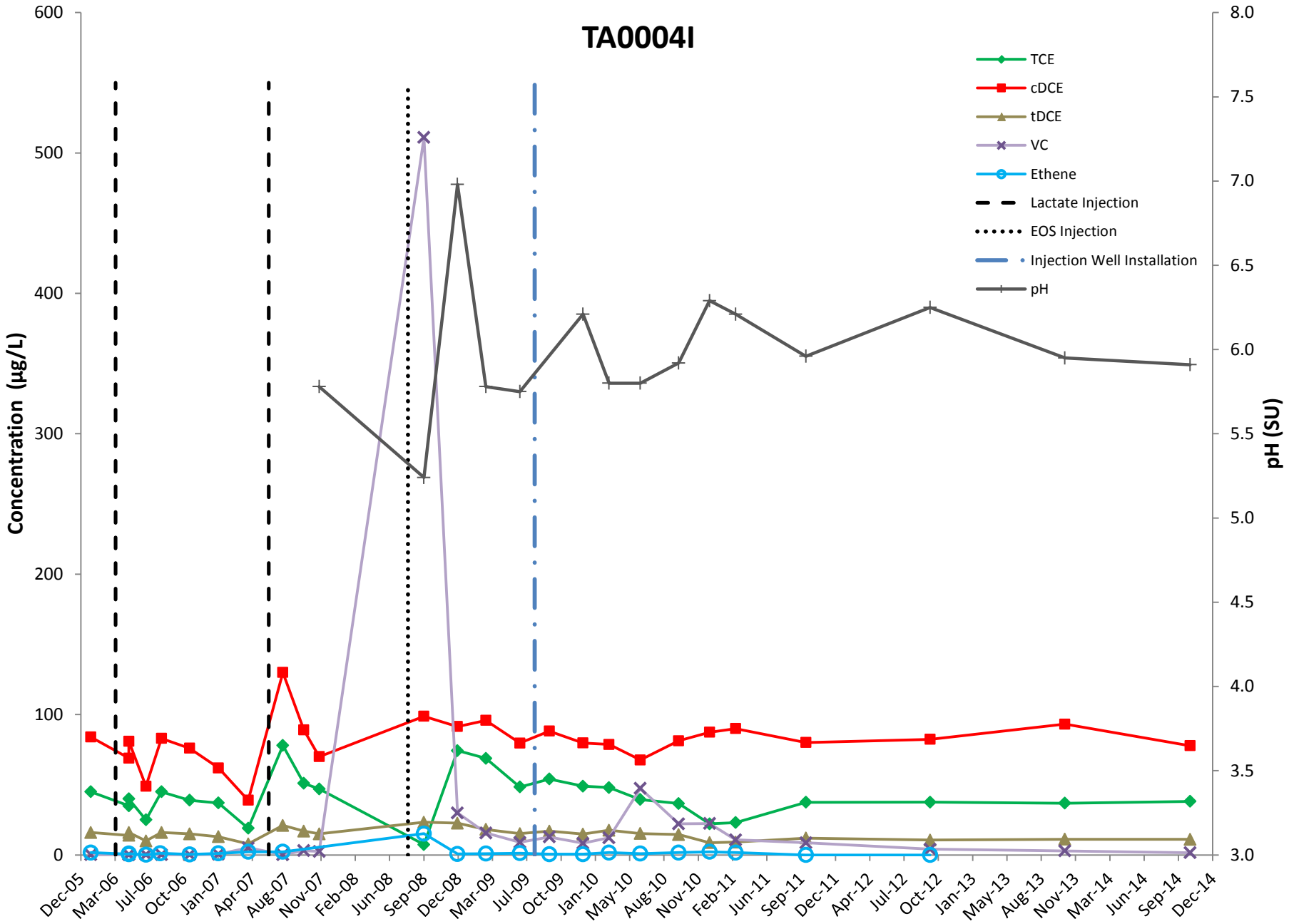
Jun-14
Sep-14
Dec-14


TA0004I
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
600
500
400
300
200
100
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
Jun-08
Sep-08
Dec-08
Mar-09
Jul-09
Oct-09
Jan-10
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
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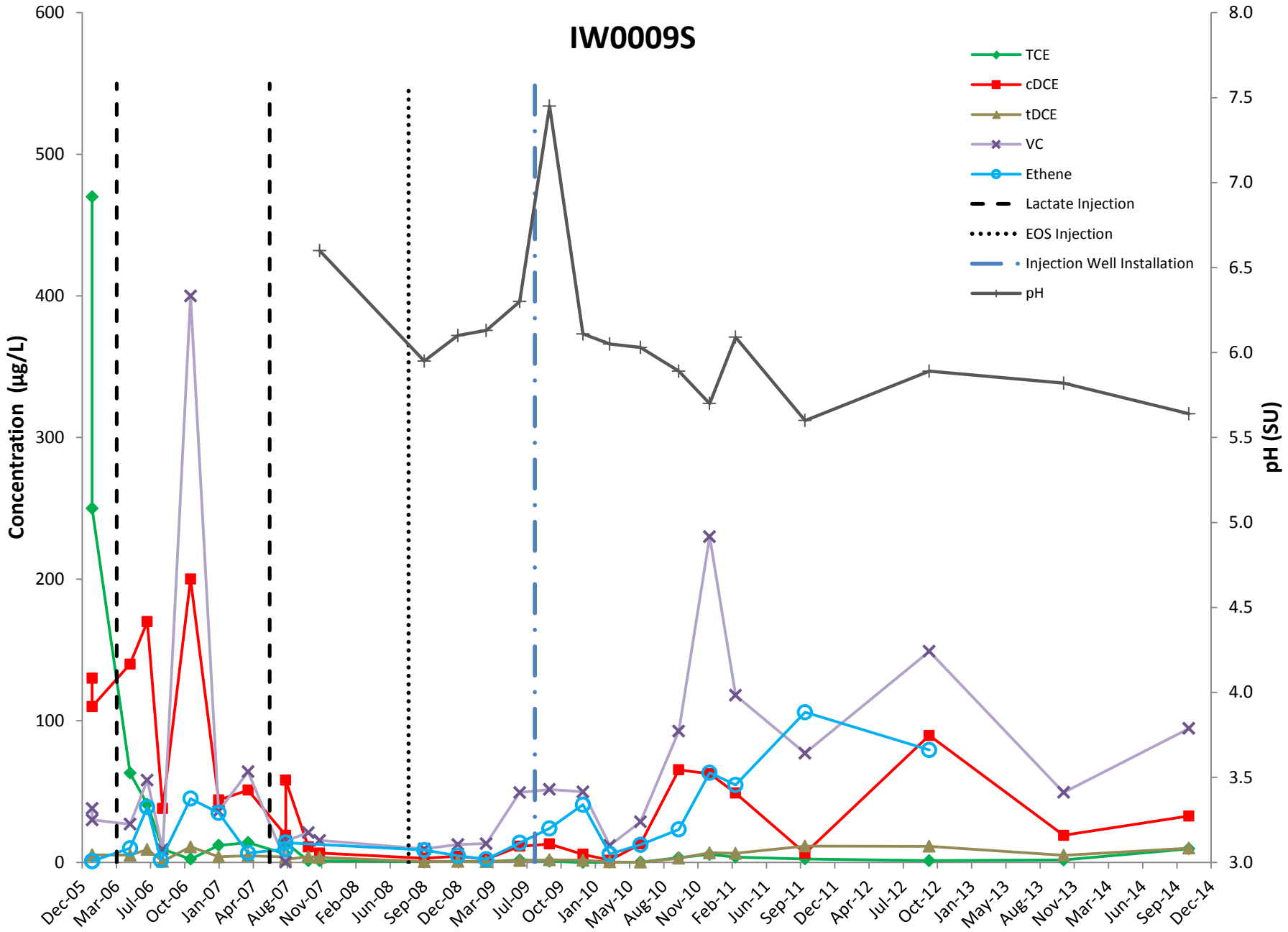
Aug-13
Nov-13
Mar-14
Jun-14
Sep-14
Dec-14


IW0009S
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
600
500
400
300
200
100
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
Jun-08
Sep-08
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Mar-09
Jul-09
Oct-09
Jan-10
May-10
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Feb-11
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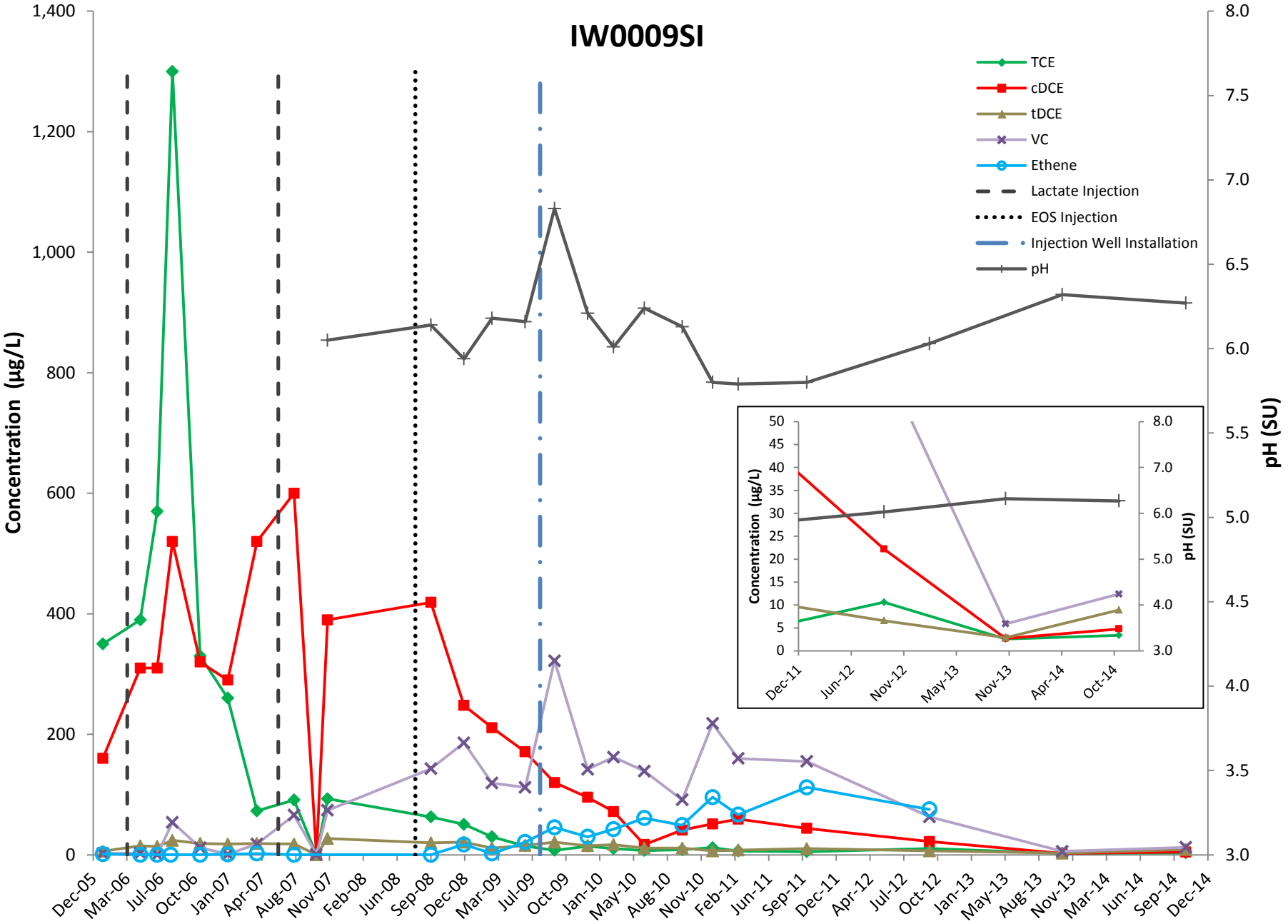
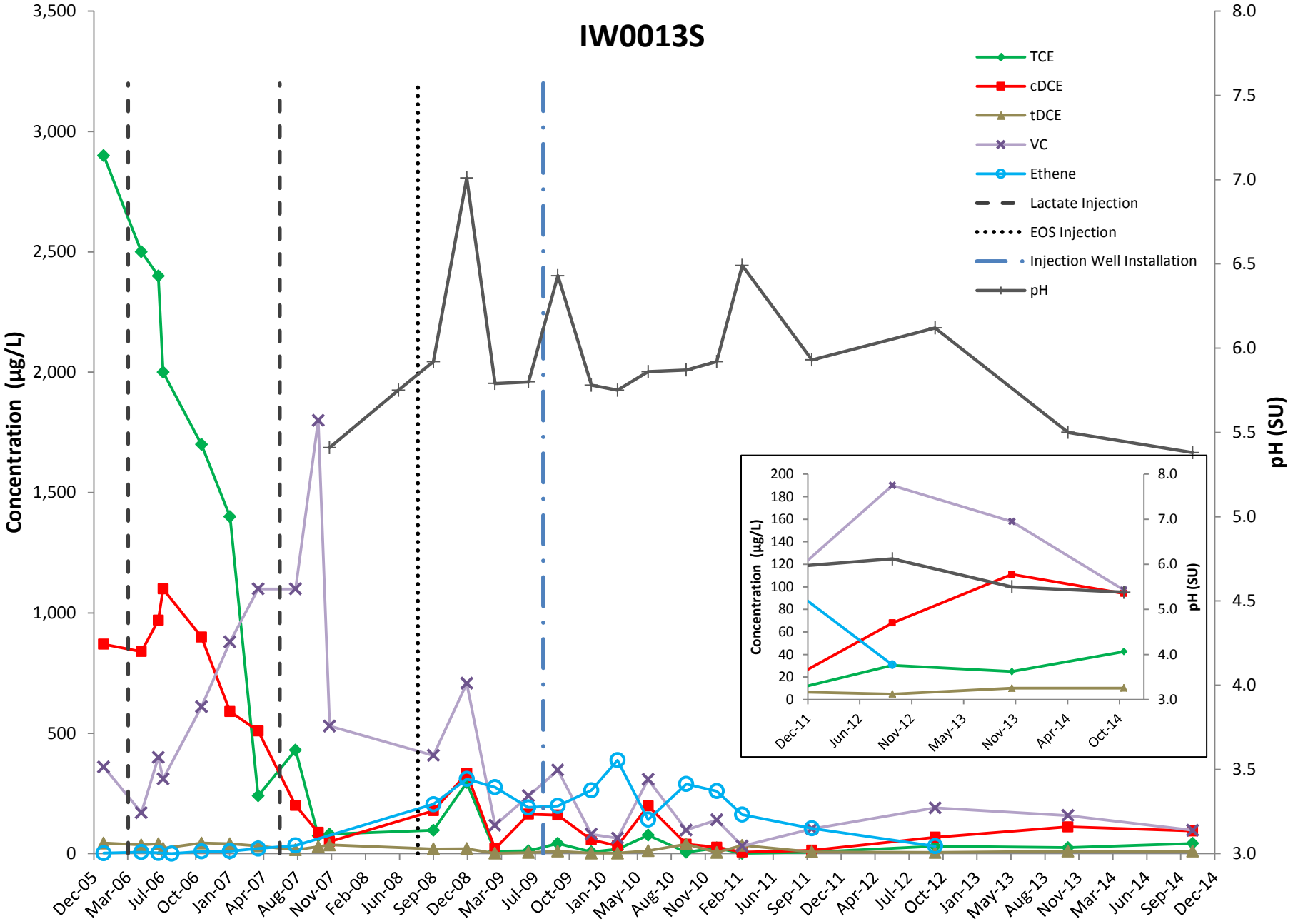
Jun-14
Sep-14
Dec-14


IW0009SI
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
1,400
1,200
1,000
800
600
400
200
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
Dec-05
Mar-06
Jul-06
Oct-06
Jan-07
Apr-07
Aug-07
Nov-07
Feb-08
Jun-08
Sep-08
Dec-08
Mar-09
Jul-09
Oct-09
Jan-10
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
Dec-11
Apr-12
Jul-12
Oct-12
Jan-13
May-13
Aug-13
Nov-13
Mar-14
Jun-14
Sep-14
Dec-14
Concentration (µg/L)
pH (SU)
50
45
40
35
30
25
20
15
10
5
0
8.0
7.0
6.0
5.0
4.0
3.0
Dec-11
Jun-12
Nov-12
May-13
Nov-13
Apr-14
Oct-14


IW0013S
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
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Dec-05
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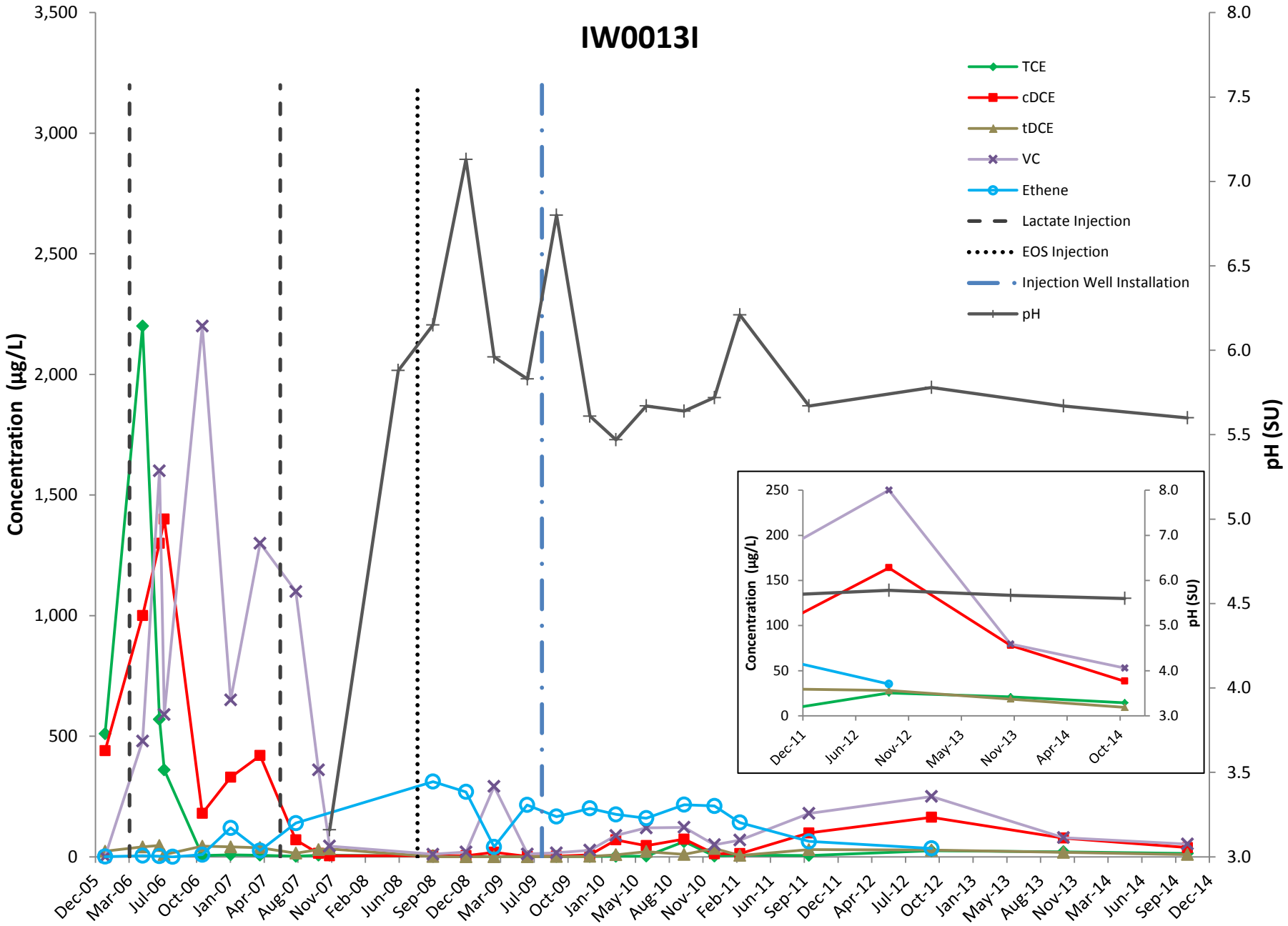
Dec-11
Apr-12
Jul-12
Oct-12
Jan-13
May-13
Aug-13
Nov-13
Mar-14
Jun-14
Sep-14
Dec-14
Concentration (µg/L)
pH (SU)
200
180
160
140
120
100
80
60
40
20
0
8.0
7.0
6.0
5.0
4.0
3.0
Dec-11
Jun-12
Nov-12
May-13
Nov-13
Apr-14
Oct-14


IW0013I
TCE
cDCE
tDCE
VC
Ethene
Lactate Injection
EOS Injection
Injection Well Installation
pH
Concentration (µg/L)
pH (SU)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
8.0
7.5
7.0
6.5
6.0
5.5
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Dec-05
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Dec-11
Apr-12
Jul-12
Oct-12
Jan-13
May-13
Aug-13
Nov-13
Mar-14
Jun-14
Sep-14
Dec-14
250
200
150
100
50
0
Dec-11
Jun-12
Nov-12
May-13
Nov-13
Apr-14
Oct-14

APPENDIX F

MEETING MINUTES

Meeting Minutes Report

Attendees:

(Geosyntec) Jim Langenbach, (FDEP) John Armstrong, (Geosyntec) Rebecca C. Daprato, (NASA) Mike Deliz, (Geosyntec) Melissa Hensley, (IHA) Tim Mrdjenovich, (NASA) John Matthews, (NASA) Rosaly Santos-Ebaugh, (Geosyntec) Lane Dorman, (Tetra Tech) Mark Speranza, (Jacobs Engineering) Guy Fazzio, (NASA) Harry Plaza, (NASA) Dinh Vo, (Tetra Tech) Mark Jonnet, (IHA) Michele Cielukowski, (NASA) Anne Chrest, (Tetra Tech) Chris Hook, (IHA) Amanda Beatty, (IHA) Dan Sciarini, (Geosyntec) Emily Lawson, (FECC) Gordon Kirkland, (Tetra Tech) Jennifer Buel, (Geosyntec) Michael Burcham, (CORE Engineering and Construction) Harlan Faircloth, (Geosyntec) Crystal Towns, (Geosyntec) Whitney Morrison

April 2015 Team Meeting

Meeting Date From: 4/23/2015 To: 4/24/2015

Meeting ID: 1504

Location Description: Kennedy Space Center-FL

Meeting Type: Full Partnering Team Meeting

Meeting Topic:	**Minutes**		
Minute: 1504-M1	**Site:**	**Goal:**	**Discussion:**
Presenter: TEAM, TEAM	CENTERWIDE		Team consensus reached that January 2015 revision 1 meeting minutes are final.
Decision:1	Team consensus reached that January 2015 revision 1 meeting minutes are final.		

Meeting Topic:	**Vehicle Assembly Building Re-Assessment Area (VABRA)**		
Minute: 1504-M2	**Site:**	**Goal:**	**Discussion:**
Presenter: Daprato, Rebecca C.	VAB AREA RE-ASSESSMENT	Present Step 1A and 1B Engineering Evaluation (EE) for Hot Spots 3 and 4	This is a Ground Systems Development & Operations project to evaluate absence/presence of affected soil (around electrical equipment only) and groundwater. The VABRA study area occupies approximately 112 acres. During the August 2013 team meeting, soil sampling results and path forward were presented. Team consensus was reached for no further action (NFA) in 14 areas. Soil was delineation completed in three areas and additional soil sampling was needed for delineation in two areas. During the August 2013 team meeting, groundwater sampling results and path forward were presented. Hot Spot 3 (Western Mobile Launch Platform [MLP] Hot Spot) was identified as a new hot spot. Team consensus reached to install a monitoring well to confirm presence of polycyclic aromatic hydrocarbons (PAH) exceedances (Hot Spot 4). Team consensus was reached to install monitoring wells in Hot Spot 3 to characterize area of affected groundwater and evaluate chlorinated volatile organic compound (CVOC) concentrations at depth. Team consensus was reached to install monitoring wells to confirm extent of dissolved-phased constituents in Hot Spot 3. Hot Spots 1 and 2 were identified during MLP/VAB assessment activities. Hot Spot 2 is currently being addressed through an air sparge interim measure (IM). Hot Spots 3 and 4 were identified during VABRA activities.

Presenter: Hook, Chris	LC-39A (SWMU 008) - 21ST CENTURY	Present Step 4 EE, construction completion.	quarterly and annual performance monitoring with the addition of adding 39A-21ST-MW0020I to the quarterly sampling plan.
Decision:31	Team consensus reached to continue IM operations conduct routine OM&M, perform quarterly and annual performance monitoring with the addition of adding 39A-21ST-MW0020I to the quarterly sampling plan.		

Meeting Topic:	**LC39B Lox Area (SWMU 009)**		
Minute: 1504-M8	**Site:**	**Goal:**	**Discussion:**
Presenter: Daprato, Rebecca C.	LC-39B, J7-0337 (SWMU 009)	Present results from the 2014 MNA sampling, 2014 performance monitoring, summary of O&M activities, and obtain team consensus on recommendations.	Annual MNA sampling was conducted in October 2014. Two monitoring wells were sampled that are outside the current assessment area (IW0012 cluster). Samples collected from the wells were analyzed for CVOCs and one the sample from monitoring well IW0012Swas analyzed for total and dissolved aluminum. Monitoring well 39B-LOX-IW0012 cluster is outside the assessment area and the monitoring wells are considered point of compliance wells. Since initiation of MNA sampling (January 2006) the TCE, cDCE, and VC concentrations have been less than detection limits in this well. The results suggest that CVOC plume is not expanding. Sample concentrations of aluminum in 39B-LOX-IW0012S (total 3,920 µg/L and dissolved 3,840 µg/L) are above upper range of KSC background (280 µg/L). Aluminum concentrations increased after decreasing since September 2011. This sampling event utilized EPA Method 6020A instead of EPA Method 6010C since EPA Method 6010C can bias aluminum concentrations high when chloride concentrations are high (39B-LOX-IW0012S generally has 20% salinity due to its location). The aluminum concentrations measured at 39B-LOX-IW0012S were within range of historic observations at this location. Two mowing/clearing events damaged/destroyed injection wells in September 2009 and November 2014. Clearing event in November 2014 left mulch layer across site (up to 2 feet; buried injection wells). Not practical, or potentially possible, to locate destroyed injection wells at site. Injection wells will not be used again. Annual performance monitoring conducted in October 2014. Maximum concentrations detected: TCE 42.6 µg/L at IW13S (below site-wide clean up criteria, but not well-specific criteria [PQL]), cDCE 222 µg/L at TA03S (below clean-up criteria), and VC 195 µg/L at TA03S. VC is the only constituent above clean-up criteria. Recirculation system operated approximately 81% of time (not designed to operate 24 hours per day) and recirculated 780,000 gallons of groundwater (January through December 2014). No sediment

Presenter: Daprato, Rebecca C.	LC-39B, J7-0337 (SWMU 009)	Present results from the 2014 MNA sampling, 2014 performance monitoring, summary of O&M activities, and obtain team consensus on recommendations.	accumulation was observed behind sediment blocks in 2014. Team consensus reached to consider destroyed injection wells as abandoned and plan to abandon remaining wells (wells that are not damaged) in future. Team consensus reached to discontinue the operation of the recirculation system and performance monitoring. The area will be included in the Engineering Evaluation Process with the supplemental assessment data being presented at the June 2015 meeting. Team consensus reached to continue MNA sampling as follows: 39B-LOX-IW0012S and 12I analyzed for CVOCs and 39B-LOX-IW0012S analyzed for aluminum (conduct metal analysis method via EPA Method 6020A [mass spec]).
Decision:32	Team consensus reached to consider destroyed injection wells as abandoned and plan to abandon remaining wells (wells that are not damaged) in future.		
Decision:33	Team consensus reached to discontinue the operation of the recirculation system and performance monitoring. The area will be included in the Engineering Evaluation Process with the supplemental assessment data being presented at the June 2015 meeting.		
Decision:34	Team consensus reached to continue MNA sampling as follows: 39B-LOX-IW0012S and 12I analyzed for CVOCs and 39B-LOX-IW0012S analyzed for aluminum (conduct metal analysis method via EPA Method 6020A [mass spec]).		

Meeting Topic:	**Hydrocarbon Burn Facility (SWMU 007)**		
Minute: 1504-M9	**Site:**	**Goal:**	**Discussion:**
Presenter: Hook, Chris	HYDROCARBON BURN FACILITY, L7-0888 (SWMU 007)	Present Step 2 EE and obtain team consensus on path forward.	The Step 1A EE was presented to KSCRT in January 2015. Groundwater is medium of concern. TCE, cDCE, VC, and benzene are the constituents of concern. Team consensus was achieved at the January 2015 meeting that the VOC plume Low Concentration Plume (LCP)/High Concentration Plume (HCP)/Hot Spot (HS) were delineated. Step 1B EE technologies retained were air sparging, ARD with bioaugmentation, and MNA. Hot Spot only and high concentration/Hot Spot were to be evaluated for air sparging and ARD alternative. MNA would evaluate Hot Spot/HCP/LCP. Alternative G1 Air Sparging of Hot Spot: this will target the Hot Spot plume reducing concentrations to less than NADC with transition to MNA in 1.5 years. Technology is limited due to air distribution in the heterogeneous lithology. Site management would continue as a result of the persisting LCP/HCP. Some of the advantages to choosing this option: effective technology at well-defined sites, large reduction in concentration within a short timeframe, technology is well developed, lowest lifecycle cost per pound of active alternatives, and the capital cost can be reduced using existing AS systems. Some disadvantages are that the technology is energy intensive, potential preferential