



UNC  
ENVIRONMENT,  
HEALTH & SAFETY

The University of North Carolina at Chapel Hill  
Department of Environment, Health & Safety  
1120 Estes Drive Ext., CB# 1650  
Chapel Hill, North Carolina 27599-1650

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*Via Electronic Mail*

June 25, 2015

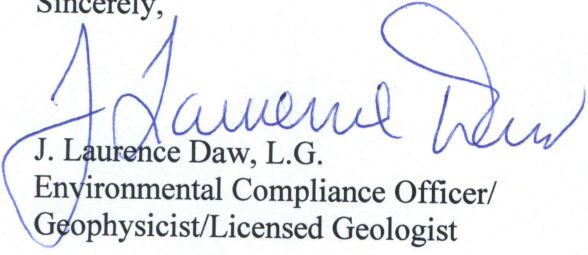
Kim T. Caulk  
NC DENR Division of Waste Management  
Inactive Hazardous Sites Branch, REC Program  
401 Oberlin Road Suite 150  
Raleigh, NC 27605

Subject: Remedial Action Progress Report - January 2014 through December 2014  
UNC/Airport Road Waste Disposal Area, Chapel Hill, North Carolina  
Site ID No. NCD 980 557 623

Dear Mr. Caulk:

Please find attached the Remedial Action Progress Report - January 2014 through December 2014 for the subject site. ARCADIS G&M of North Carolina, Inc., the Registered Environmental Consultant for the site, prepared the report. Please contact me at (919) 962-6666 if I can be of further assistance. Thank you.

Sincerely,

  
J. Laurence Daw, L.G.  
Environmental Compliance Officer/  
Geophysicist/Licensed Geologist

Attachment

Cc: Mary Beth Koza  
Alan Pinnix  
Roger Stancil



## **Remedial Action Progress Report — January 2014 through December 2014**

UNC Chapel Hill  
Airport Road Waste Disposal Area  
Chapel Hill, North Carolina  
NCD 980 557 623

June 2015

ARCADIS



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J. Alan Pinnix, L.G., RSM  
Principal Scientist/Project Manager

Remedial Action Progress  
Report — January 2014  
through December 2014

UNC Chapel Hill  
Airport Road Waste Disposal  
Area, Chapel Hill, North  
Carolina

Prepared for:  
The University of North Carolina at  
Chapel Hill

Prepared by:  
ARCADIS G&M of North Carolina, Inc.  
801 Corporate Center Drive,  
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North Carolina 27607  
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Our Ref.:  
NC000239.0019

Date:  
June 2015

IHSB SITE NAME The UNC Airport Road Waste Disposal Area

DATE & NAME OF DOCUMENT 2014 Remedial Action Progress Report

TYPE OF SUBMITTAL (circle all that apply): Report, Work plan, Work Phase Comp. Statement, Schedule Change

**REMEDIATING PARTY DOCUMENT CERTIFICATION STATEMENT (.0306(B)(2))**

"I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Mary Beth Koza

Name of Remediating Party

Mary Beth Koza  
Signature of Remediating Party

6-18-2015  
Date

**NOTARIZATION**

North Carolina (Enter State)

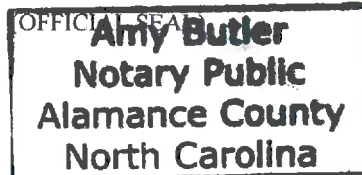
Alamance COUNTY

I, Amy Butler, a Notary Public of said County and State, do hereby certify that Mary Beth Koza did personally appear and sign before me this day, produced proper identification in the form of a NC Drivers License, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 18th day of June, 2015.

Amy Butler  
Notary Public (signature)

My commission expires: May 28, 2017



IHSB SITE NAME The UNC Airport Road Waste Disposal Area

DATE & NAME OF DOCUMENT 2014 Remedial Action Progress Report

TYPE OF SUBMITTAL (circle all that apply): Report Work plan, Work Phase Comp. Statement, Schedule Change

**REGISTERED SITE MANAGER CERTIFICATION OF SIGNATURES**

As the Registered Environmental Consultant for the Site for which this filing is made, I certify that the signatures included herewith are genuine and authentic original handwritten signatures and/or true, accurate, and complete copies of the genuine and authentic original handwritten signatures of the persons who purport to sign for this filing. I further certify that I have collected through reliable means the originals and/or copies of said signatures from the persons authorized to sign for this filing who, in fact, signed the originals thereof. Those persons and I understand and agree that any copies of signatures have the same legally binding effect as original handwritten signatures, and I certify that any person for whom I am submitting a copy of their signature has provided me with their express consent to submit said copy. Additionally, I certify that I am authorized to attest to the genuineness and authenticity of the signatures, both originals and any copies, being submitted herewith and that by signing below, I do in fact attest to the genuineness and authenticity of all the signatures, both originals and copies, being submitted for this filing.

J. Alan Pinnix

Name of Registered Site Manager

JAP  
Signature of Registered Site Manager

6/23/2015  
Date

**REGISTERED SITE MANAGER DOCUMENT CERTIFICATION STATEMENT (.0306(b)(1))**

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act N.C.G.S. 130A-310, et seq, and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

J. Alan Pinnix

Name of Registered Site Manager

JAP  
Signature of Registered Site Manager

6/23/2015  
Date

**NOTARIZATION**

North Carolina (Enter State)

Wake COUNTY

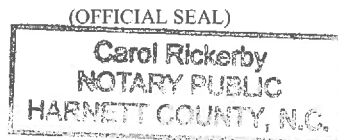
Harnett

I, Carol Rickerby, a Notary Public of ~~said~~ Harnett County and State, do hereby certify that J. Alan Pinnix did personally appear and sign before me this day, produced proper identification in the form of NCDL 895951, was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certifications is true and accurate, and he or she then signed these Certifications in my presence.

WITNESS my hand and official seal this 23 day of June, 2015.

Carol Rickerby  
Notary Public (signature)

My commission expires: 11/30/2019



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## 1. Introduction

ARCADIS G&M of North Carolina, Inc. (ARCADIS) prepared this report on behalf of the University of North Carolina at Chapel Hill (UNC) to document remedial action progress and performance of the groundwater remediation system at the UNC Airport Road Waste Disposal Area (the site). The site is located near the intersection of Municipal Drive and Animal Shelter Road and is shown on **Figure 1**.

This site is being remediated under the Registered Environmental Consultant (REC) Program. As required by the REC program implementation guidance, this report is the eleventh Remedial Action Progress Report submitted since certification of the Groundwater Remediation System Construction Completion Report on October 25, 2006. As four consecutive quarterly reports were submitted in 2007, REC program guidelines allows for submittal of a single annual report detailing all groundwater remedial activities over the past year. This report is the seventh annual report and covers the reporting period of January 2014 through December 2014.

This report discusses the operation and maintenance (O&M) of the groundwater remediation system for the period, along with results of the required groundwater effluent sampling and air discharge sampling. The selected remedial option for the site consists of groundwater extraction using electric submersible pumps and dual phase (groundwater/soil vapor) recovery utilizing vacuum-enhanced recovery (VER). Treated groundwater is discharged to the Orange Water and Sewer Authority (OWASA) sewer system under OWASA discharge permit #010. The groundwater remediation system became fully operational on October 5, 2006.

This report also contains the results of the October 2014 annual groundwater and surface water monitoring event. The samples were collected from 24 monitor wells, 4 vapor extraction and recovery wells, 6 recovery wells, and 4 surface water sample locations to evaluate overall effectiveness of the groundwater remediation efforts.

## 2. Groundwater Remediation System

The groundwater remediation system was installed at the site in the summer of 2006, and the system became fully operational on October 5, 2006. The groundwater remediation system consists of four vapor extraction and recovery (VER) wells (designated VER-1 through VER-4), three shallow recovery wells (designated as SRW-1 through SRW-3) and three deep recovery wells (designated as DRW-1 through DRW-3) as shown on **Figure 2**. Groundwater from the VER wells and shallow recovery wells is pumped into a settling tank, followed by bag filtration. This flow then joins groundwater pumped from the deep recovery wells and the combined flow enters the air stripper. Following treatment by the air stripper, the water is pumped to OWASA Manhole 47C4001 where it is discharged into the OWASA sewer system.

### 2.1 Treatment System Operation and Maintenance

The groundwater remediation system is inspected by ARCADIS personnel on a monthly basis. System operational information recorded during the site checks includes readings from the various pressure and flow gauges located on the bag filter, influent flow meters, air stripper, VER system, effluent pump, and effluent totalizer. Minor adjustments are made to keep the system operating as efficiently as possible. Maintenance activities include changing of the cloth bag filter. Monthly O&M activities include collecting readings from the various flow meters and pressure gauges at each well head, as well as cleaning of the air stripper and removal of accumulated sediment from the settling tank.

A record of system O&M activities conducted from January 2014 through December 2014 is included in **Table 1**. The information presented on **Table 1** includes descriptions of the activities and the dates on which the activities were performed.

The groundwater remediation system and recovery wells were generally operational between January 2014 and December 2014. Given the large reduction in concentration of constituents seen in the VER and adjacent wells since groundwater remediation commenced and the high maintenance requirements of the VER system, the VER system was operated only periodically throughout the year. If this trend reverses at any point in the future, the VER system will be brought back online on a full time basis.

Based on the totalizer reading recorded at the treatment system on January 7, 2015, approximately 47,926,985 gallons of impacted groundwater have been extracted from

the site and treated and discharged since the system was first activated on October 5, 2006.

## 2.2 Treatment System Sampling

Treatment system sampling consists of collection of groundwater effluent samples to monitor the quality of water entering the OWASA system and also collection of air discharge samples from the air stripper. The following sections describe the sampling in greater detail.

### 2.2.1 Monthly OWASA Discharge Permit Sampling

Following start up of the groundwater remediation system, monthly collection of treated groundwater samples was performed as per the requirements of the OWASA discharge permit #010, which became effective on June 1, 2006. The permit requires monthly discharge sampling and monthly reporting for the first year of system operation followed by monthly sampling and quarterly reporting for subsequent years. The first year of operation was completed as of October 2007 and as such the reporting frequency was adjusted to quarterly. Monthly effluent sampling will continue for the duration of the permit.

The treatment system effluent samples were analyzed for volatile organic compounds (VOCs) and arsenic, chromium, copper, lead, zinc and mercury. Samples designated for analysis of VOCs, arsenic, chromium, copper, lead, and zinc were submitted to TestAmerica in Savannah, Georgia for analysis. Samples designated for analysis of mercury were submitted to TestAmerica in Pensacola, Florida for analysis.

System effluent samples were collected on January 10, 2014, February 7, 2014, March 23, 2014, April 24, 2014, May 22, 2014, June 27, 2014, July 23, 2014, August 28, 2014, September 25, 2014, October 17, 2014, November 24, 2014, and December 11, 2014, for reporting to OWASA.

The analytical results from all effluent monitoring events (**Table 2**) indicate the groundwater treatment system is effectively treating the extracted groundwater. In 2014, all parameters were in compliance with OWASA discharge limits for the respective monitoring period.

Quarterly discharge monitoring reports (DMR) were generated for the January to March 2014 monitoring period, April to June 2014 monitoring period, July to

September 2014 monitoring period and October to December 2014 monitoring period. Copies of the DMRs are included in **Appendix A**. The laboratory analytical reports associated with the groundwater treatment system effluent samples are included in **Appendix B**.

#### 2.2.2 Air Discharge Effluent Sampling

In addition to the OWASA effluent sampling, air discharge samples were collected from the air stripper on March 28, 2014 and August 28, 2014. No VER samples were collected during 2014 as the VER system was only operated periodically. Should the VER portion of the remedial system be used more than several days a month in the future, air sampling will resume.

Air samples collected in the field remained in the custody of an ARCADIS employee until hand delivered to the laboratory. Air sample analytical services were provided by Research Triangle Park Laboratories. All air samples were analyzed for VOCs by EPA Method TO-15.

The analytical results from the air discharge sampling events associated with the air stripper are presented in **Table 3**. The analytical data were converted to daily mass flow in pounds per day using the raw data and the air flow information collected during each monitoring event. The converted data indicates a total average of 0.01 pounds per day of volatile organics for the air stripper for the period of January 2014 through December 2014. Extrapolated for a year, this average would be 3.7 pounds per year or approximately 0.002 tons. This volume remains well below the 5 tons per year required for an air quality permit.

Monitoring of air quality from the air stripper will continue on a semi-annual basis as per the monitoring schedule contained in the Construction Completion Report: Groundwater Remediation System dated October 2006.

Copies of the air quality laboratory reports are included in **Appendix C**. In the event the VER system is restarted air sampling will be resumed for this portion of the remedial system as well.

### 3. Annual Groundwater and Surface Water Sampling Event

The results of the field measurements collected from the site monitor wells are presented in this section along with the analytical results for the October 2014 groundwater and surface water sampling event. The locations of the site monitor wells, recovery wells, and surface water sample points are shown on **Figure 2**. The construction details for site monitor wells and recovery wells are listed on **Table 4**.

#### 3.1 Groundwater Flow Direction

Water-level measurements from top of casing were collected from the site wells on October 13, 2014, to determine the groundwater flow direction at the site. The water-level measurements were converted to water-level elevations using existing monitor well top of casing elevation data. The depth-to-water measurements and the converted water-level elevations for the October 2014 gauging event are listed on **Table 5**.

The water-level elevations in the shallow monitor wells ranged from 446.69 feet above mean sea level (ft msl) in downgradient well MW-25 to 477.17 ft msl in upgradient well MW-3, located near the source area. In the bedrock aquifer, water-level elevations ranged from 378.34 ft msl in downgradient monitor well MW-35 to 474.94 in monitor well MW-28 which is located upgradient of the source area.

The water-level elevations in the monitor wells adjacent to, or near, recovery wells are most directly affected by the active pumping of the recovery wells. Since the activation of the recovery wells in October 2006, water-level elevations in site monitor wells located near the recovery wells have decreased slightly to significantly depending on the proximity of the monitor well relative to the recovery wells. Historical depth-to-water measurements and groundwater elevation data for the site monitor wells are presented in **Table 6**.

Water-level contour maps for the October 2014 sampling event were prepared for the surficial and bedrock aquifers using the water-level elevation data from the wells (**Figures 3 and 4**, respectively). Based on the information presented on **Figures 3 and 4**, the overall groundwater flow direction in the surficial and bedrock aquifers is generally towards the north and northeast. In comparing the groundwater flow map created with the October 2014 water-level elevation data to the numerous historic potentiometric surface maps that have been created for the site, it is apparent that the groundwater recovery system has altered the groundwater flow pattern at the site. Based on the October 2014 water level data, the capture zone created by the

groundwater extraction wells extends from the source area north/northwest to the SRW series of recovery wells and northeast toward deep recovery wells DRW-2 and DRW-3.

### 3.2 Groundwater Parameters

The field groundwater parameters for temperature, pH, specific conductance, dissolved oxygen and oxidation reduction potential were measured for samples collected from monitor wells during the October 2014 sampling event. The last set of temperature, pH, and specific conductance measurements that were recorded prior to sampling the monitor wells are presented in **Table 7**. The temperature, pH, and specific conductance ranges for the monitoring wells were as follows: 14.80 to 19.31 (degrees Celsius), 5.00 to 8.09 (standard units), and 97 to 2,327 ( $\mu\text{mhos}$ ), respectively. The temperature, pH, and specific conductance measurements collected during the October 2014 sampling event are consistent with the measurements collected during previous monitor well sampling events.

### 3.3 Groundwater Sample Analytical Results

Groundwater samples were collected from 24 monitor wells, 4 vapor extraction and recovery wells, and 6 recovery wells during the October 2014 groundwater sampling event. The analytical results for the October 2014 groundwater sampling event are summarized in **Table 8**. A copy of the laboratory analytical data report associated with this sampling event is included in **Appendix B**.

Based on the laboratory data report for the October 2014 sampling event, benzene, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, diethyl ether, MTBE, trichloroethene, and vinyl chloride were reported at concentrations above North Carolina Groundwater Standards. The highest concentrations of these compounds were seen in VER-2 located downgradient of the source area, with decreasing concentrations further downgradient.

The one exception was MTBE which was detected in bedrock well MW-36 and shallow well MW-4, which are located approximately 1,000 feet lateral gradient of the waste disposal area and within approximately 100 feet of Martin Luther King, Jr. Boulevard (formerly Airport Road). Based on the fact that MTBE has only recently been detected at the site, and that the timeframe for use of MTBE began in the 1980s (well after burial activities were suspended at the waste disposal area), it appears that the detection of MTBE in well MW-36 is likely related to an offsite unrelated release of gasoline on or near Martin Luther King Jr. Boulevard.

Contaminant isoconcentration contour maps for benzene, chloroform, methylene chloride, and diethyl ether are presented for the shallow unconsolidated aquifer in **Figures 5, 6, 7, and 8**, respectively. Isoconcentration contour maps for benzene, chloroform, and diethyl ether are presented for the bedrock aquifer in **Figures 9, 10, and 11**, respectively. The maps were created using the data from the October 2014 sampling event, and historical data was also considered in the placement of the contours. Isoconcentration contour cross section maps for benzene and diethyl ether have been prepared and are included as **Figures 12 and 13**, respectively. Historical groundwater analytical data for site monitor wells are presented in **Table 9**.

Overall the groundwater analytical data from the October 2014 groundwater sampling event indicates that the existing monitor well network has defined the extent of impacted groundwater at the site.

### 3.4 Historical Groundwater Analytical Trends

The groundwater analytical data obtained during the October 2014 sampling event indicate localized decreases in specific VOC concentrations since activation of the groundwater remediation system. VOC concentration reductions have been observed primarily in shallow monitor wells MW-1, MW-2, MW-6 and MW-12, and bedrock monitor wells MW-11, MW-15 and MW-31. Monitor wells MW-1 and MW-2 are located in close proximity to the VER wells, downgradient of the source area, while monitor well MW-12 is located between SRW-2 and SRW-3. Monitor wells MW-11 and MW-15 are adjacent to DRW-2 and DRW-1 respectively. The general decrease in VOC concentrations, especially in monitor wells located in the vicinity of recovery wells, suggests the groundwater remediation system is effectively reducing groundwater contaminant concentrations at the site. The analytical results for these wells will be further evaluated during future monitoring events to determine if these trends continue.

### 3.5 Surface Water Analytical Results

Surface water samples were collected from historic sample locations SW-3, SW-4, SW-5, and SW-6 and analyzed for VOCs during the October 2014 monitoring event. Surface water sample locations are shown on **Figure 2** and tabulated analytical results are displayed on **Table 10**. Analytical results indicate that no VOCs were detected above laboratory reporting limits in any of the surface water samples collected.

## 4. Summary

This section provides a summary of the groundwater remediation system O&M activities and system sampling activities conducted for the performance monitoring period of January 2014 through December 2014. This section also provides a summary of the analytical results for the groundwater and surface water sampling event conducted at the site in October 2014. The data collected during the performance monitoring period documented in this report indicate that the groundwater remediation system is effectively extracting and treating impacted groundwater, and that the impacted groundwater plume at the site is adequately defined by the existing monitor well network.

### 4.1 Groundwater Remediation System O&M

The groundwater remediation system is inspected by ARCADIS personnel on a regular basis. System operational information recorded during the site checks includes readings from the various pressure and flow gauges located on the bag filter, influent flow meters, air stripper, effluent pump, and effluent totalizer. Minor adjustments are made to keep the system operating as efficiently as possible. Regular maintenance activities include changing of the cloth bag filter. Monthly O&M activities include collecting readings from the various flow meters and pressure gauges at each well head, as well as cleaning of the air stripper and effluent transfer pump. As previously indicated, the VER portion of the system is being operated on a periodic basis.

Based on the totalizer reading at the treatment system on January 7, 2015, approximately 47,926,985 gallons of impacted groundwater have been pumped from the site recovery wells and treated and discharged since the system was activated on October 5, 2006.

### 4.2 Groundwater Remediation System Monthly OWASA Sampling

The sampling of the effluent entering the OWASA system was conducted on a monthly basis. The analytical data from the monthly sampling events indicate the groundwater treatment system is sufficiently removing the constituents of concern from the discharge. In 2014, all parameters were in compliance with the OWASA discharge limits.



#### 4.3 Air Discharge Effluent Sampling

The air discharge sampling performed on the effluent discharge of the air stripper during the operational period indicated that on average, 0.01 pounds per day of VOCs are being generated from the groundwater remediation system. This value extrapolated over a period of a year indicates the total VOC discharge will be approximately 0.002 tons which is well below the 5 tons per year limit for an air discharge permit.

#### 4.4 Groundwater Sampling

Water-level measurements were collected from site monitor wells and recovery wells during the October 2014 monitor well sampling event. The depth-to-water measurements and the converted water-level elevation data for the shallow and bedrock monitor wells indicate that groundwater is flowing north and northeast across the site.

The groundwater flow pattern derived using the water level elevation data indicates that the groundwater recovery system has altered groundwater flow at the site in comparison to previous static water-level elevation measurement events. The groundwater extraction system has created a capture zone that extends from the VER wells north/northwest to the SRW series of recovery wells and northeast toward deep recovery wells DRW-2 and DRW-3. The current capture zone overlaps well with the existing footprint of impacted groundwater.

Groundwater samples were collected from 24 monitor wells, 4 vapor extraction and recovery wells, and 6 recovery wells during the October 2014 annual sampling event and the samples were analyzed for VOCs. The analytical results from the October 2014 groundwater sampling event indicate that benzene, chlorobenzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, diethyl ether, MTBE, trichloroethene, and vinyl chloride were reported at concentrations above North Carolina Groundwater Standards. The concentrations of some of these constituents have been reduced at specific well locations during 2014.

#### 4.5 Surface Water Sampling

Analytical results indicate that no VOCs were detected above laboratory reporting limits in any of the surface water samples collected in 2014. This is similar to historic surface water monitoring results.

#### 4.6 Conclusions

The data generated for the UNC Airport Road Waste Disposal Area during 2014 continues to indicate that the extent of impacted groundwater is well understood, and that the impacted groundwater plume is contained onsite. Furthermore, the active groundwater remediation system appears to be effective at containing and recovering the impacted groundwater and reduced contaminant concentrations have been observed at several monitor well locations. Operation of the groundwater remediation system will continue through 2015 with the next Remedial Action Progress Report being submitted in mid-2016.



Table 1. Groundwater Remediation System Sampling and Operation and Maintenance Record January 2014 through December 2014, UNC Airport Road Waste Disposal Area, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Date	Personnel On-Site	Maintenance Activity/Comments	System Status	Samples Collected	System Totalizer Reading (gallons)	Gallons Pumped During Period (gallons)	OWASA Totalizer Reading	Average Daily Flow for Period (gallons)	Period Start	Period End
1/10/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	5,213,590	5,213,590	5,298,219	125	1/0/1900	1/10/2014
2/7/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	5,584,510	370,920	NR	13,247	1/10/2014	2/7/2014
2/17/2014	<b>SAEDACCO</b>	On-site to perform monthly O&M activities.	Running	None	NR		NR	NA	--	--
3/23/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	6,167,750	583,240	6,267,500	13,255	2/7/2014	3/23/2014
3/27/2014	D. Twamley	On-site to collect semiannual vapor sample. <b>Air stripper stack pressure reading 265 CFM.</b>	Running	Air Stripper VOCs ( <b>TO-15</b> )	6,230,500	62,750	6,331,570	15,688	3/23/2014	3/27/2014
4/24/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	6,639,980	409,480	6747370	14,624	3/27/2014	4/24/2014
5/16/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	6,942,777	302,797	7054160	13,764	4/24/2014	5/16/2014
6/27/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	7,479,044	536,267	7596955	12,768	5/16/2014	6/27/2014
7/23/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	7,741,719	262,675	7863420	10,103	6/27/2014	7/23/2014
7/25/2014	<b>SAEDACCO</b>	On-site to perform monthly O&M activities.	Running	None	NR		NR	NA	--	--
8/28/2014	D. Twamley, J. Fino	On-site to collect semiannual vapor sample. <b>Air stripper stack pressure reading 155 CFM.</b>	Running	Effluent (VOCs, RCRA Metals and Hg); Air Stripper VOCs ( <b>TO-15</b> )	8,121,090	379,371	8247580	10,538	7/23/2014	8/28/2014
9/8/2014	<b>SAEDACCO</b>	On-site to perform monthly O&M activities.	Running	None	NR		NR	NA	--	--
9/9/2014	<b>SAEDACCO</b>	Completed monthly O&M activities.	Running	None	NR		NR	NA	--	--
9/25/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	8,445,328	324,238	8575894	11,580	8/28/2014	9/25/2014
10/16/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	8,674,081	228,753	8808700	10,893	9/25/2014	10/16/2014
11/24/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	9,090,335	416,254	9229405	10,673	10/16/2014	11/24/2014
12/11/2014	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	9,272,100	181,765	9413390	10,692	11/24/2014	12/11/2014
1/7/2015	D. Twamley	On-site to collect monthly effluent samples.	Running	Effluent (VOCs, RCRA Metals and Hg)	9,523,150	251,050	9667840	9,298	12/11/2014	1/7/2015

Table 2. Summary of Groundwater Treatment System Effluent Sample Results, UNC Airport Road Waste Disposal Area, The University of North Carolina at Chapel Hill, North Carolina.

Parameter	OWASA Maximum Allowable Discharge Concentration	Groundwater Treatment System Effluent Samples					
		1/10/2014	2/7/2014	3/23/2014	4/24/2014	5/22/2014	6/27/2014
<b>Benzene (µg/L)</b>	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>Chloroform (µg/L)</b>	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>1,2-Dichloroethane (µg/L)</b>	71	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>Methylene Chloride (µg/L)</b>	930	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
<b>1,1,2,2-Tetrachloroethane (µg/L)</b>	30	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>Arsenic (µg/L)</b>	16	< 20	< 20	< 20	< 20	< 20	< 20
<b>Chromium (µg/L)</b>	50	< 10	< 10	< 10	< 10	< 10	< 10
<b>Copper (µg/L)</b>	60	< 20	< 20	< 20	< 20	< 20	< 20
<b>Lead (µg/L)</b>	49	< 10	< 10	< 10	< 10	< 10	< 10
<b>Zinc (µg/L)</b>	535	< 20	< 20	< 20	< 20	< 20	< 20
<b>Mercury (ng/L)</b>	50	< 0.50	1.2	0.52	< 0.50	1.2	0.65

µg/L Micrograms per liter

ng/L Nanograms per liter

Table 2. Summary of Groundwater Treatment System Effluent Sample Results, UNC Airport Road Waste Disposal Area, The University of North Carolina at Chapel Hill, North Carolina.

Parameter	OWASA Maximum Allowable Discharge Concentration	Groundwater Treatment System Effluent Samples					
		7/23/2014	8/28/2014	9/25/2014	10/17/2014	11/24/2014	12/11/2014
<b>Benzene (µg/L)</b>	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>Chloroform (µg/L)</b>	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>1,2-Dichloroethane (µg/L)</b>	71	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>Methylene Chloride (µg/L)</b>	930	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
<b>1,1,2,2-Tetrachloroethane (µg/L)</b>	30	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>Arsenic (µg/L)</b>	16	< 20	< 20	< 20	< 20	< 20	< 20
<b>Chromium (µg/L)</b>	50	< 10	< 10	< 10	< 10	< 10	< 10
<b>Copper (µg/L)</b>	60	< 20	< 20	20	< 20	< 20	< 20
<b>Lead (µg/L)</b>	49	< 10	< 10	< 10	< 10	< 10	< 10
<b>Zinc (µg/L)</b>	535	44	< 20	83	< 20	22	100
<b>Mercury (ng/L)</b>	50	0.93	< 0.50	< 0.50	< 0.50	0.99	0.75

µg/L Micrograms per liter

ng/L Nanograms per liter

Table 3. Summary of Air Stripper Discharge Sample Results, UNC Airport Road Waste Disposal Area, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Sample ID.:	Air Stripper Discharge	Air Stripper Discharge				
Date Sampled:	3/28/2014	8/28/2014				
Air Stripper Discharge Pipe (6 inch diameter)						
Vapor Flow Rate (cfm)	265	155				
Vapor Temperature (degrees celcius)	35	35				
Vapor Flow Rate (m3/day)	11448	6696				
Discharge Velocity (ft/sec)	5.62	3.29				
Volatiles Organics (ppbv)	Air Concentration ppbv	Converted Concentration mg/m3	Daily Mass Flow Rate lbs/day	Air Concentration ppbv	Converted Concentration mg/m3	Daily Mass Flow Rate lbs/day
<i>(USEPA Method TO-15 GC/MS)</i>						
Dichlorodifluoromethane (Freon 12)	120.91					
1,2-Chloro-1,1,2,2-Tetrafluoroethane	170.92					
Chloromethane	50.49	4.22	0.01	0.00	5.04	0.01
Vinyl chloride	62.50					
1,3-Butadiene	54.09					
Bromomethane	94.94					
Chloroethane	64.51				166.39	0.44
Trichloromonofluoromethane	137.37					
1,1-Dichloroethene	96.94					
1,1,2-Trichloro-1,2,2-trifluoroethane	187.38					
Ethanol	46.07	13.19	0.02	0.00		
Carbon Disulfide	76.14					
Isopropyl alcohol	60.10	2.30	0.01	0.00	12.84	0.03
Methylene Chloride	84.93	1.93	0.01	0.00		
Acetone	58.08	29.96	0.07	0.00	19.16	0.05
t-1,2-dichloroethene	96.94					
Hexane	86.18	2.18	0.01	0.00	4.23	0.01
Methyl-t-butyl ether (MTBE)	88.15					
1,1-Dichloroethane	98.96					
Vinyl acetate	86.09					
cis-1,2-dichloroethene	96.94					
Cyclohexane	84.18	1.51	0.01	0.00	2.53	0.01
Chloroform	119.38					
Ethyl Acetate	88.10	2.34	0.01	0.00		
Tetrahydrofuran	72.11	28.29	0.08	0.00	1.93	0.01
1,1,1-Trichloroethane	133.40					
Carbon Tetrachloride	153.82					
2-Butanone	72.11				3.42	0.01
Heptane	100.2	25.70	0.11	0.00	3.70	0.02
Benzene	78.11	13.78	0.04	0.00	1.39	0.00
1,2-Dichloroethane	98.96	8.95	0.04	0.00	12.68	0.05
Trichloroethylene	131.39				1.70	0.01
1,2-Dichloropropane	112.99					
Bromodichloromethane	163.83					
1,4-Dioxane	88.11				1.18	0.00
Cis-1,3-Dichloropropene	110.97					
Toluene	92.14	1.96	0.01	0.00	3.53	0.01
4-Methyl-2-pentanone (MIBK)	100.16					
t-1,2-dichloropropene	110.97					
Tetrachloroethylene	165.83					
1,1,2-Trichloroethane	133.40					
Dibromochloromethane	208.28					
1,2-Dibromoethane	187.86					
2-Hexanone	100.16					
Ethylbenzene	106.17					
Chlorobenzene	112.56	1.19	0.01	0.00	2.68	0.01
m/p-Xylene	106.17				3.55	0.02
o-Xylene	106.17				1.14	0.00
Styrene	104.15					
Tribromomethane	252.73					
1,1,2,2-Tetrachloroethane	167.85					
1-Ethyl-4-Methylbenzene	120.19					
1,3,5-Trimethylbenzene	120.19					
1,2,4-Trimethylbenzene	120.19					
1,3-Dichlorobenzene	147.01	5.31	0.03	0.00	13.46	0.08
1,4-Dichlorobenzene	147.01	5.64	0.03	0.00	13.97	0.08
Benzyl Chloride	126.59					
1,2-Dichlorobenzene	147.01					
1,1,2,3,4,4-hexachloro-1,2-butadiene	260.76					
1,2,4-Trichlorobenzene	181.45					
Total lbs/day			0.01		0.01	

Calculated values

\*Conversion from ppbv to mg/m3:  $mg/m^3 = (ppbv/1000)*(MW)/24.45$

mg/m<sup>3</sup> milligrams per cubic meter

lbs/day pounds per day

cfm

m<sup>3</sup>/day

ft/sec

ppbv

cubic feet per minute

cubic meters per day

feet per second

parts per billion by volume

Table 4. Summary of Monitor Well and Recovery Well Construction Details, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Monitor Well Identification	Date of Installation	Measuring Point Elevation (Top of Casing) (ft msl)	Depth of Surface Casing (ft bls)	Total Drilled Depth (ft bls)	Screened Interval (ft bls)
MW-1	INA	483.11	NA	28.3	INA
MW-2	INA	484.30	NA	29	INA
MW-3	INA	483.34	NA	20	INA
MW-4	INA	472.18	NA	24.6	INA
MW-5	INA	454.62	NA	15	INA
MW-6	4/11/1995	472.55	NA	22	12.0-22.0
* MW-7	4/21/1995	475.01	22	48	38.0-48.0
* MW-9	4/21/1995	476.25	NA	43.5	20.0-35.0
* MW-11	4/18/1995	472.78	NA	36	26.0-36.0
MW-12	4/13/1995	464.21	NA	22	12.0-22.0
* MW-13	4/19/1995	467.60	NA	23	13.0-23.0
* MW-14	8/11/1995	481.67	29	175	165.0-175.0
* MW-15	7/20/1995	465.04	40	60.5	50.0-60.0
* MW-16	7/21/1995	467.14	16	82	22.0-42.0
* MW-17	7/24/1995	478.99	26	71	60.0-70.0
MW-18	7/19/1995	467.96	NA	16	5.0-15.0
MW-19	7/19/1995	473.90	NA	10	5.0-10.0
MW-20	7/27/1995	475.03	NA	25	14.0-24.0
* MW-21	7/21/1995	463.28	NA	22	11.0-21.0
MW-22	7/26/1995	460.78	NA	10	5.0-10.0
* MW-23	8/17/1995	458.92	17	89	78.0-88.0
* MW-24	1/19/1996	465.32	105	200	175.0-195.0
MW-25	1/23/1996	458.74	NA	15	5.0-15.0
* MW-26	2/5/1996	458.79	20	180	75.0-95.0
* MW-28	1/15/1996	480.40	NA	46	36.0-46.0
* MW-29	11/14/1996	480.73	55	170	160.0-170.0
* MW-30	11/12/1996	468.57	NA	40	25.0-40.0
* MW-31	11/13/1996	468.45	50	90	75.0-90.0
* MW-32	11/12/1996	462.06	NA	43	28.0-43.0
* MW-33	11/13/1996	461.46	50	85	70.0-85.0
* MW-34	7/6/2004	464.65	NA	85	70.0-85.0
* MW-35	7/6/2004	452.45	NA	75	60.0-75.0
* MW-36	7/7/2004	466.90	NA	84	69.0-84.0
* MW-37	7/6/2004	460.29	100	125	115.0-125.0
MW-38	9/10/2010	484.85	NA	20	10.0-20.0
MW-39	9/10/2010	478.20	NA	20	10.0-20.0
SRW-1	4/4/2006	460.98	NA	25	10.0-25.0
SRW-2	4/13/2006	464.20	NA	35	20.0-35.0
SRW-3	4/4/2006	462.76	NA	35	20.0-35.0
* DRW-1	4/2/1998	466.11	20	80	Open Borehole
* DRW-2	4/7/2006	461.90	20	80	Open Borehole
* DRW-3	4/7/2006	459.20	20	150	Open Borehole
VER-1	4/4/2006	483.08	NA	25	5.0-25.0
VER-2	3/26/1998	482.20	NA	25	5.0-25.0
VER-3	4/4/2006	480.11	NA	25	5.0-25.0
VER-4	4/4/2006	478.83	NA	25	5.0-25.0

\* Bedrock wells - This designation indicates that the entire screened interval or open borehole interval is in bedrock

ft msl Feet above mean sea level.

NA Not Applicable.

ft bls Feet below land surface.

INA Information not available.

Note: Monitor Wells MW-8, MW-10, and MW-27 were not installed.



Table 5. Water Level Elevations in Monitor Wells and Recovery Wells, October 13, 2014, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Monitor Well Identification	Measuring Point Elevation (ft msl)	Depth to Water (ft toc)	Groundwater Elevation (ft msl)
MW-1	483.11	16.20	466.91
MW-2	484.30	18.65	465.65
MW-3	483.34	6.17	477.17
MW-4	472.18	17.85	454.33
MW-5	454.62	Dry	--
MW-6	472.55	16.47	456.08
*MW-7	475.01	23.44	451.57
*MW-9	476.25	13.03	463.22
*MW-11	472.78	35.98	436.80
MW-12	464.21	15.98	448.23
*MW-13	467.60	13.05	454.55
*MW-14	481.67	27.72	453.95
*MW-15	465.04	24.80	440.24
*MW-16	467.14	7.21	459.93
*MW-17	478.99	16.24	462.75
MW-18	467.96	4.78	463.18
MW-19	473.90	4.91	468.99
MW-20	475.03	24.28	450.75
*MW-21	463.28	12.93	450.35
MW-22	460.78	6.26	454.52
*MW-23	458.92	13.25	445.67
*MW-24	465.32	11.24	454.08
MW-25	458.74	12.05	446.69
*MW-26	458.79	40.69	418.10
*MW-28	480.4	5.46	474.94
*MW-29	480.73	13.14	467.59
*MW-30	468.57	32.82	435.75
*MW-31	468.45	52.73	415.72
*MW-32	462.06	23.33	438.73
*MW-33	461.46	36.14	425.32
*MW-34	464.65	25.41	439.24
*MW-35	452.45	74.11	378.34
*MW-36	466.90	21.81	445.09
*MW-37	460.29	27.79	432.50
MW-38	484.85	17.06	467.79
MW-39	478.20	4.03	474.17
VER-1	483.08	15.00	468.08
VER-2	482.20	14.16	468.04
VER-3	480.11	12.01	468.10
VER-4	478.83	4.28	474.55
SRW-1	460.98	NM	--
SRW-2	464.20	NM	--
SRW-3	462.76	22.74	440.02
*DRW-1	466.11	23.51	442.60
*DRW-2	461.90	45.60	416.30
*DRW-3	459.20	NM	--

ft toc Feet below top of casing.

ft msl Feet above mean sea level.

\* Bedrock Wells - This designation indicates that the entire screened interval or open borehole interval is in bedrock.

Dry Well dry at time of gauging

NA Not available.

NM Not measured.

Table 6. Historical Groundwater Elevation Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Date Measured:		7/19/04		11/2/10		11/14/11		12/18/12		11/4/13		10/13/14	
Monitor Well ID	TOC (ft msl)	Depth to WL (ft toc)	GW Elevation (ft msl)	Depth to WL (ft toc)	GW Elevation (ft msl)	Depth to WL (ft toc)	GW Elevation (ft msl)	Depth to WL (ft toc)	GW Elevation (ft msl)	Depth to WL (ft toc)	GW Elevation (ft msl)	Depth to WL (ft toc)	GW Elevation (ft msl)
MW-1	483.11	12.40	470.71	16.40	466.71	17.92	465.19	14.43	468.68	15.03	468.08	16.20	466.91
MW-2	484.30	13.60	470.70	18.71	465.59	20.44	463.86	17.14	467.16	17.3	467.00	18.65	465.65
MW-3	483.34	5.30	478.04	4.53	478.81	5.32	478.02	5.68	477.66	5.95	477.39	6.17	477.17
MW-4	472.18	14.75	457.43	19.08	453.10	20.89	451.29	18.04	454.14	16.43	455.75	17.85	454.33
MW-5	454.62	4.75	449.87	5.18	449.44	9.70	444.92	7.42	447.20	7.88	446.74	Dry	--
MW-6	472.55	9.70	462.85	18.35	454.20	14.42	458.13	15.71	456.84	14.73	457.82	16.47	456.08
*MW-7	475.01	9.10	465.91	23.33	451.68	16.07	458.94	25.82	449.19	22.97	452.04	23.44	451.57
*MW-9	476.25	8.90	467.35	15.58	460.67	15.54	460.71	12.83	463.42	11.71	464.54	13.03	463.22
*MW-11	472.78	19.57	453.21	34.40	438.38	37.50	435.28	35.00	437.78	35.13	437.65	35.98	436.80
MW-12	464.21	6.77	457.44	14.02	450.19	10.77	453.44	12.24	451.97	16.09	448.12	15.98	448.23
*MW-13	467.60	6.98	460.62	15.52	452.08	12.94	454.66	10.68	456.92	13.14	454.46	13.05	454.55
*MW-14	481.67	16.17	465.5	27.26	454.41	23.22	458.45	29.03	452.64	27.11	454.56	27.72	453.95
*MW-15	465.04	1.77	463.27	22.95	442.09	11.06	453.98	31.58	433.46	25.94	439.10	24.80	440.24
*MW-16	467.14	6.42	460.72	5.85	461.29	5.98	461.16	6.28	460.86	6.85	460.29	7.21	459.93
*MW-17	478.99	10.97	468.02	16.22	462.77	15.07	463.92	16.79	462.20	15.8	463.19	16.24	462.75
MW-18	467.96	4.54	463.42	4.13	463.83	4.39	463.57	4.74	463.22	4.52	463.44	4.78	463.18
MW-19	473.90	NM	NM	4.21	469.69	5.08	468.82	3.83	470.07	4.17	469.73	4.91	468.99
MW-20	475.03	18.58	456.45	Dry	--	Dry	--	Dry	--	20.05	454.98	24.28	450.75
*MW-21	463.28	5.52	457.76	12.21	451.07	11.23	452.05	10.75	452.53	10.46	452.82	12.93	450.35
MW-22	460.78	4.44	456.34	4.71	456.07	4.27	456.51	4.21	456.57	5.32	455.46	6.26	454.52
*MW-23	458.92	3.09	455.83	11.56	447.36	10.45	448.47	10.55	448.37	10.62	448.30	13.25	445.67
*MW-24	465.32	2.20	463.12	17.53	447.79	11.86	453.46	10.43	454.89	9.64	455.68	11.24	454.08
MW-25	458.74	6.60	452.14	11.33	447.41	12.17	446.57	9.41	449.33	9.69	449.05	12.05	446.69
*MW-26	458.79	6.45	452.34	26.60	432.19	33.02	425.77	28.61	430.18	31.83	426.96	40.69	418.10
*MW-28	480.40	7.18	473.22	6.83	473.57	6.05	474.35	5.65	474.75	5.23	475.17	5.46	474.94
*MW-29	480.73	10.60	470.13	14.46	466.27	14.46	466.27	13.24	467.49	12.09	468.64	13.14	467.59
*MW-30	468.57	17.70	450.87	32.54	436.03	33.50	435.07	31.72	436.85	32.16	436.41	32.82	435.75
*MW-31	468.45	17.00	451.45	33.06	435.39	45.46	422.99	36.35	432.10	41.95	426.50	52.73	415.72
*MW-32	462.06	17.07	444.99	23.34	438.72	26.65	435.41	19.98	442.08	19.85	442.21	23.33	438.73
*MW-33	461.46	15.00	446.46	27.07	434.39	32.08	429.38	25.79	435.67	33.96	427.50	36.14	425.32
*MW-34	464.65	21.54	443.11	24.63	440.02	27.07	437.58	22.73	441.92	22.64	442.01	25.41	439.24
*MW-35	452.45	64.18	388.27	68.60	383.85	70.98	381.47	72.27	380.18	72.94	379.51	74.11	378.34
*MW-36	466.90	27.31	439.59	20.99	445.91	21.67	445.23	20.41	446.49	20.63	446.27	21.81	445.09
*MW-37	460.29	13.98	446.31	22.19	438.10	25.69	434.60	22.13	438.16	23.43	436.86	27.79	432.50
MW-38	484.85	--	--	16.16	468.69	17.37	467.48	16.08	468.77	15.83	469.02	17.06	467.79
MW-39	478.20	--	--	3.86	474.34	3.43	474.77	2.05	476.15	3.12	475.08	4.03	474.17
VER-1	483.08	--	--	14.39	468.69	23.38	459.70	13.75	469.33	13.62	469.46	15.00	468.08
VER-2	482.20	--	--	21.15	461.05	18.45	463.75	12.29	469.91	12.78	469.42	14.16	468.04
VER-3	480.11	--	--	23.53	456.58	22.05	458.06	11.96	468.15	17.13	462.98	12.01	468.10
VER-4	478.83	--	--	4.11	474.72	7.19	471.64	4.44	474.39	4.93	473.90	4.28	474.55
SRW-1	460.98	--	--	Dry	--	2.30	458.68	11.55	449.43	NM	--	NM	--
SRW-2	464.20	--	--	26.43	437.77	25.99	438.21	26.90	437.30	Dry	--	Dry	--
SRW-3	462.76	--	--	22.52	440.24	7.11	455.65	21.91	440.85	23.28	439.48	22.74	440.02
*DRW-1	466.11	--	--	19.53	446.58	9.73	456.38	30.41	435.70	24.66	441.45	23.51	442.60
*DRW-2	461.90	--	--	46.43	415.47	31.74	430.16	44.29	417.61	42.81	419.09	45.60	416.30
*DRW-3	459.20	--	--	34.54	424.66	NM	--	51.40	407.80	NM	--	NM	--

- TOC Top of Casing
- WL Water Level
- GW Groundwater
- NM Not measured.
- ft toc Feet below top of casing.
- ft msl Feet above mean sea level.
- \* Bedrock Wells - This designation indicates that the entire screened interval or open borehole interval is in bedrock.
- Dry Well dry at time of gauging

Table 7. Groundwater Sampling Data for Samples Collected from Monitor Wells and Recovery Wells in October 2014, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Well No.	Date Sampled	Gallons per Well Volume	Gallons Purged	Temperature (Degrees Celsius)	pH (Standard Units)	Specific Conductance (µmhos/cm)	Dissolved Oxygen (mg/L)	ORP mV	Turbidity (NTU)	Sampling Method
MW-1	10/14/2014	1.9	2.5	17.35	6.39	2,327	2.51	81.7	757	Bailer
MW-2	10/14/2014	1.7	5.1	16.72	6.44	1,680	1.26	31.1	217	Bailer
MW-3	10/14/2014	2.2	6.6	19.19	6.29	690	1.97	120.1	425	Bailer
MW-4	10/15/2014	1.0	2.0	15.38	5.00	312	2.23	209.9	872	Bailer
MW-5	NS	NM	NM	NM	NM	NM	NM	NM	NM	NS
MW-6	10/14/2014	0.9	2.7	17.20	5.40	161	0.78	155.1	50.6	Peristaltic Pump
MW-7	10/16/2014	4.0	8.0	16.54	6.81	691	0.69	82.1	5.23	Grundfos Pump
MW-9	10/14/2014	3.5	10.5	16.07	6.21	441	3.38	128.6	184	Bailer
MW-11	10/13/2014	0.5	1.5	15.47	5.80	258	1.31	152.0	340	Bailer
MW-12	10/15/2014	2.6	7.8	16.85	5.66	164	4.11	204.4	119	Bailer
MW-14	10/16/2014	23.5	70.5	17.13	7.15	648	0.14	-35	2.78	Grundfos Pump
MW-15	10/16/2014	5.6	16.8	15.60	6.42	872	0.52	65.8	2.23	Grundfos Pump
MW-16	10/16/2014	5.6	16.8	16.29	6.78	692	0.38	-11.9	3.82	Grundfos Pump
MW-17	10/15/2014	8.6	25.8	16.30	6.27	2,267	0.43	126.8	5.58	Grundfos Pump
MW-22	10/15/2014	0.6	1.8	18.46	6.53	1,240	1.23	-4.0	76.7	Bailer
MW-23	10/13/2014	12.0	36.0	15.38	7.11	310	0.17	47.1	8.01	Grundfos Pump
MW-25	10/13/2014	1.0	3.0	17.21	5.29	97	1.51	157.6	257	Bailer
MW-26	10/13/2014	8.7	17.2	17.68	7.28	443	2.73	115.5	50.9	Grundfos Pump
MW-28	10/15/2014	6.5	13.0	19.31	6.62	344	0.78	2.8	48.0	Grundfos Pump
MW-30	10/14/2014	1.1	2.2	14.80	8.09	377	2.68	148.0	25.5	Bailer
MW-31	10/14/2014	6.0	18.0	15.60	6.34	304	0.23	13.3	1.91	Grundfos Pump
MW-32	10/14/2014	3.1	9.3	15.21	6.24	318	1.93	145.5	239	Bailer
MW-33	10/14/2014	7.8	24.0	16.79	7.27	356	0.19	-179.2	0	Grundfos Pump
MW-35	10/14/2014	0.1	0.4	15.16	7.34	990	3.61	145.8	>1000	Bailer
MW-36	10/15/2014	10.0	10.0	15.38	6.38	413	5.83	213.0	459	Grundfos Pump
SRW-1	10/16/2014	NA	NA	18.58	6.67	1,095	2.79	26.0	9.34	Sample Port
SRW-2	10/16/2014	NA	NA	19.02	7.1	839.0	2.4	85.9	2.41	Sample Port
SRW-3	10/16/2014	NA	NA	18.41	6.78	339	2.37	128.1	5.89	Sample Port
DRW-1	10/16/2014	NA	NA	17.45	6.37	849	1.95	108.7	32.5	Sample Port
DRW-2	10/16/2014	NA	NA	16.62	7.06	460	1.59	128.8	2.78	Sample Port
DRW-3	10/16/2014	NA	NA	17.38	6.86	523	4.47	109.8	7.23	Sample Port
VER-1	10/16/2014	NA	NA	17.12	6.64	1,311	0.78	-21.5	9.13	Peristaltic Pump
VER-2	10/16/2014	NA	NA	18.16	6.50	1,583	2.71	51.5	19.3	Sample Port
VER-3	10/16/2014	NA	NA	16.43	6.60	266	3.56	126.9	33.1	Sample Port
VER-4	10/16/2014	NA	NA	18.75	5.82	146	3.12	158.9	13.6	Peristaltic Pump

Notes:

- µmhos/cm      micromhos per centimeter
- mV            millivolts
- NM            Not measured
- NA            Not applicable as active recovery well
- NS            Not sampled - well dry

Table 8. Summary of Analytical Results for Groundwater Samples Collected in October 2014, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-1	MW-2	MW-3	MW-4	MW-6	MW-7	MW-9	MW-11	MW-12	MW-14	Dup-1 (MW-14)	MW-15
		10/14/2014	10/14/2014	10/14/2014	10/15/2014	10/14/2014	10/16/2014	10/14/2014	10/13/2014	10/15/2014	10/16/2014	10/16/2014	10/16/2014
Volatile Organics (USEPA Method 8260) µg/L	NCAC 2L GW Standard												
Acetone		500 U	250 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U	50 U	50 U	100 U
Benzene	1	50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	14	13	10 U
Bromoform		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Bromomethane		250 U	25 U	5 U	5 U	5 U	250 U	5 U	5 U	5 U	25 U	25 U	50 U
Carbon disulfide		100 U	50 U	2 U	2 U	2 U	100 U	2 U	2 U	2 U	10 U	10 U	20 U
Carbon tetrachloride		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Chlorobenzene	50	50 U	69	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	12
Chlorodibromomethane		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Chloroethane		250 U	130 U	5 U	5 U	5 U	250 U	5 U	5 U	5 U	25 U	25 U	50 U
Chloroform	70	50 U	25 U	1 U	1 U	1.7	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Chloromethane		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
1,1-Dichloroethane	6	50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
1,2-Dichloroethane	0.4	50 U	250	1 U	1 U	1 U	50 U	1 U	1 U	1 U	13	10	35
1,1-Dichloroethene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
cis-1,2-Dichloroethene	70	50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
1,2-Dichloropropane		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
cis-1,3-Dichloropropene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Dichlorobromomethane		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Diethyl ether	3100*	2800	3000	10 U	10 U	110	4500	8.5	15	5 U	470	480	1100
Ethylbenzene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
2-Hexanone		500 U	250 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U	50 U	50 U	100 U
Methylene Chloride		250 U	130 U	5 U	5 U	5 U	250 U	5 U	5 U	5 U	25 U	25 U	50 U
4-Methyl-2-pentanone (MIBK)		500 U	250 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U	50 U	50 U	100 U
Methyl tert-butyl ether	20	500 U	250 U	10 U	80	10 U	500 U	10 U	10 U	10 U	50 U	50 U	100 U
2-Butanone (MEK)		500 U	250 U	10 U	10 U	10 U	500 U	10 U	10 U	10 U	50 U	50 U	100 U
Styrene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Tetrachloroethene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
1,1,2,2-Tetrachloroethane		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Toluene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
trans-1,2-Dichloroethene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
trans-1,3-Dichloropropene		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
1,1,1-Trichloroethane		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
1,1,2-Trichloroethane		50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Trichloroethene	3	50 U	29	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Vinyl chloride	0.03	50 U	25 U	1 U	1 U	1 U	50 U	1 U	1 U	1 U	5 U	5 U	10 U
Xylenes, Total		100 U	50 U	2 U	2 U	2 U	100 U	2 U	2 U	2 U	10 U	10 U	20 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
 ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

NA Not analyzed.

Table 8. Summary of Analytical Results for Groundwater Samples Collected in October 2014, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-16 10/15/2014	MW-17 10/15/2014	MW-22 10/15/2014	MW-23 10/13/2014	MW-25 10/13/2014	MW-26 10/14/2014	MW-28 10/15/2014	MW-30 10/14/2014	MW-31 10/14/2014	MW-32 10/14/2014	MW-33 10/14/2014	MW-35 10/14/2014	MW-36 10/15/2014
Volatile Organics (USEPA Method 8260) µg/L	NCAC 2L GW Standard													
Acetone		10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 U	10 U	10 U	10 U	10 U	50 U
Benzene	1	1 U	1.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Bromoform		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Bromomethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	25 U
Carbon disulfide		2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	10 U
Carbon tetrachloride		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Chlorobenzene	50	1 U	3.5	4.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Chlorodibromomethane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Chloroethane		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	25 U
Chloroform	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Chloromethane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1-Dichloroethane	6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
1,2-Dichloroethane	0.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1-Dichloroethene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
cis-1,2-Dichloroethene	70	1 U	4.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
1,2-Dichloropropane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
cis-1,3-Dichloropropene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Dichlorobromomethane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Diethyl ether	3100*	10 U	47	5 U	5 U	5 U	5 U	5 U	5 U	8	5 U	5 U	5 U	25 U
Ethylbenzene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U
Methylene Chloride		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	25 U
4-Methyl-2-pentanone (MIBK)		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U
Methyl tert-butyl ether	20	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	450
2-Butanone (MEK)		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U
Styrene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Tetrachloroethene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1,2,2-Tetrachloroethane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Toluene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
trans-1,2-Dichloroethene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
trans-1,3-Dichloropropene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1,1-Trichloroethane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
1,1,2-Trichloroethane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Trichloroethene	3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Vinyl chloride	0.03	1 U	3.8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U
Xylenes, Total		2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	10 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
 ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

NA Not analyzed.

Table 8. Summary of Analytical Results for Groundwater Samples Collected in October 2014, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	VER-1 10/16/2014	VER-2 10/16/2014	VER-3 10/16/2014	VER-4 10/16/2014	SRW-1 10/16/2014	SRW-2 10/16/2014	SRW-3 10/16/2014	DRW-1 10/16/2014	DRW-2 10/16/2014	DRW-3 10/16/2014
Volatile Organics (USEPA Method 8260) µg/L	NCAC 2L GW Standard										
Acetone		50 U	500 U	20 U	10 U	10 U	20 U	25 U	250 U	10 U	10 U
Benzene	1	5 U	<b>240</b>	<b>2.7</b>	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Bromoform		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Bromomethane		25 U	250 U	10 U	5 U	5 U	10 U	5 U	130 U	5 U	5 U
Carbon disulfide		10 U	100 U	4 U	2 U	2 U	4 U	2 U	50 U	2 U	2 U
Carbon tetrachloride		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Chlorobenzene	50	<b>83</b>	50 U	2 U	1 U	<b>6.2</b>	<b>5.3</b>	1 U	25 U	1 U	1 U
Chlorodibromomethane		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Chloroethane		25 U	250 U	10 U	5 U	5 U	10 U	5 U	130 U	5 U	5 U
Chloroform	70	5 U	<b>140</b>	<b>2.2</b>	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Chloromethane		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
1,1-Dichloroethane	6	<b>10</b>	50 U	<b>4.1</b>	1 U	1 U	2 U	1 U	25 U	1 U	1 U
1,2-Dichloroethane	0.4	<b>69</b>	<b>230</b>	<b>5.1</b>	1 U	1 U	<b>11</b>	1 U	25 U	1 U	1 U
1,1-Dichloroethene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
cis-1,2-Dichloroethene	70	5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
1,2-Dichloropropane		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
cis-1,3-Dichloropropene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Dichlorobromomethane		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Diethyl ether	3100*	<b>950</b>	<b>6100</b>	<b>360</b>	10 U	<b>17</b>	<b>250</b>	<b>8.4</b>	<b>1500</b>	<b>16</b>	5 U
Ethylbenzene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
2-Hexanone		50 U	500 U	20 U	10 U	10 U	20 U	10 U	250 U	10 U	10 U
Methylene Chloride		25 U	250 U	10 U	5 U	5 U	10 U	5 U	130 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)		50 U	500 U	20 U	10 U	10 U	20 U	10 U	250 U	10 U	10 U
Methyl tert-butyl ether	20	50 U	500 U	20 U	10 U	10 U	20 U	10 U	250 U	10 U	10 U
2-Butanone (MEK)		50 U	500 U	20 U	10 U	10 U	20 U	10 U	250 U	10 U	10 U
Styrene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Tetrachloroethene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
1,1,2,2-Tetrachloroethane		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Toluene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
trans-1,2-Dichloroethene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
trans-1,3-Dichloropropene		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
1,1,1-Trichloroethane		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
1,1,2-Trichloroethane		5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Trichloroethene	3	<b>16</b>	<b>98</b>	2 U	1 U	1 U	<b>3.5</b>	1 U	25 U	1 U	1 U
Vinyl chloride	0.03	5 U	50 U	2 U	1 U	1 U	2 U	1 U	25 U	1 U	1 U
Xylenes, Total		10 U	100 U	4 U	2 U	2 U	4 U	2 U	50 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
 ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

**Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.**

NA Not analyzed.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-1 05/15/98	MW-1 11/15/00	MW-1 10/31/02	MW-1 07/22/04	MW-1 01/11/07	MW-1 04/18/07	MW-1 07/11/07	MW-1 10/03/07	MW-1 10/22/08	MW-1 11/05/09	MW-1 11/4/10	MW-1 11/16/11	MW-1 12/18/12	MW-1 11/6/13	MW-1 10/14/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	50 U	5,000 U	160,000	260,000	20,000	50,000 U	10,000 U	5,000 U	25,000 U	25,000 U	2,500 U	5,000 U	2,500 U	1300 U	500 U
Benzene	1	69,000	142,000	32,000	100,000	27,000 D	26,000	19,000	31,000	25,000	14,000	1,000	450	100 U	50 U	50 U
Chlorobenzene	50	24	450	440	1,000 U	330	2,000 U	400 U	560	1,000 U	1,000 U	100 U	200 U	100 U	50 U	50 U
Chloroform	70	90,000	273,000	89,000	190,000	55,000 D	49,000	37,000	51,000 D	28,000	28,000	3400	200 U	110	50 U	50 U
1,4-Dichlorobenzene	6	NA	200 U	41	NA	100 U	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	NA	NA	NA	NA
1,1-Dichloroethane	6	5.2	200 U	42	1,000 U	100 U	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	200 U	100 U	50 U	50 U
1,2-Dichloroethane	0.4	50,000 U	6,700	3,800	9,900	100 U	2,000 U	1,800	200 U	1,000 U	1,400	360	300	100 U	50 U	50 U
Cis-1,2-Dichloroethene	70	9	200 U	64	1,000 U	100 U	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	200 U	100 U	50 U	50 U
Trans-1,2-Dichloroethene	100	NA	200 U	20	NA	100 U	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	200 U	NA	50 U	50 U
Diethyl ether	3,100*	220,000	430,000	160,000	290,000	85,000 D	110,000	40,000	53,000 D	39,000	44,000	5,200	4,600	5,200	2,900	2,800
Ethylbenzene	600	50,000 U	640	920	3,100	2,600	2,000 U	1,100	1,700	1,000 U	1,000 U	100 U	200 U	100 U	50 U	50 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	10,000 U	1,000 U	1,000 U	NA	1000 U	500 U	500 U
Methylene chloride	5	66,000	222,000	71,000	140,000	36,000 D	41,000	29,000	27,000	18,000	19,000	500 U	1,000 U	500 U	250 U	250 U
1,1,2,2-Tetrachloroethane	0.2	5 U	200 U	2,600	8,000	4,300	3,600	3,300	3,400	1,000 U	1,000 U	390	200 U	100 U	50 U	50 U
Tetrachloroethene	0.7	50,000 U	200 U	42	1,000 U	140	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	200 U	100 U	50 U	50 U
Toluene	600	50,000 U	5,530	250	1,000 U	100 U	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	200 U	100 U	50 U	50 U
Trichloroethene	3	5 U	4,960	1,600	14,000	5,300	3,700	2,900	3,200	1,200	1,000 U	140	200 U	100 U	50 U	50 U
Trichlorofluoromethane	2000	NA	200 U	35	NA	100 U	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	NA	NA	NA	NA
Vinyl chloride	0.03	11	200 U	3	1,000 U	100 U	2,000 U	400 U	200 U	1,000 U	1,000 U	100 U	200 U	100 U	50 U	50 U
Xylenes, Total	500	50,000 U	1,890	2,140	2,300	1,700	4,000 U	1,100	2,400	2,000 U	2,000 U	200 U	400 U	200 U	100 U	100 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-2 05/15/98	MW-2 11/14/00	MW-2 10/31/02	MW-2 07/21/04	MW-2 01/11/07	MW-2 04/18/07	MW-2 07/11/07	MW-2 10/03/07	MW-2 10/22/08	MW-2 11/04/09	MW-2 11/4/10	MW-2 11/16/11	MW-2 12/18/12	MW-2 11/06/13	MW-2 10/14/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	25,000 U	5,000 U	30,000	50,000 U	39,000	50,000 U	98,000	60,000	25,000 U	25,000 U	5,000 U	1,300 U	1,300 U	630 U	250 U
Benzene	1	8,500	12,800	13,000	25,000	27,000 D	23,000	28,000	32,000	16,000	15,000	5900	450	50 U	25 U	25 U
Chlorobenzene	50	2,500 U	200 U	150	2,000 U	380	2,000 U	1,000 U	630	1,000 U	1,000 U	220	110	73	66	69
Chloroform	70	46,000	102,000	85,000	130,000	120,000 D	94,000	110,000	110,000 D	47,000	49,000	800	50 U	50 U	25 U	25 U
1,4-Dichlorobenzene	6	NA	200 U	2 U	NA	100 U	2,000 U	1,000 U	500 U	1,000 U	1,000 U	200 U	NA	50 U	NA	NA
1,1-Dichloroethane	6	2,500 U	200 U	23	2,000 U	100 U	2,000 U	1,000 U	500 U	1,000 U	1,000 U	200 U	50 U	50 U	25 U	25 U
1,2-Dichloroethane	0.4	2,500 U	4,140	4,400	2,000 U	4,900	4,700	4,300	5,700	1,000 U	2,700	970	340	200	190	250
Cis-1,2-Dichloroethene	70	2,500 U	200 U	8	4,000 U	100 U	2,000 U	1,000 U	500 U	1,000 U	1,000 U	200 U	50 U	50 U	25 U	25 U
Trans-1,2-Dichloroethene	100	NA	200 U	4	NA	100 U	2,000 U	1,000 U	500 U	1,000 U	1,000 U	200 U	50 U	NA	50 U	50 U
Diethyl ether	3,100*	55,000	82,000	65,000	130,000	96,000 D	130,000	72,000	64,000 D	42,000	54,000	13000	4,500	3,200	1500	3000
Ethylbenzene	600	2,500 U	200 U	320	2,000 U	2,400	2,000 U	2,400	3,400	1,100	1,000 U	340	50 U	50 U	25 U	25 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	10,000 U	10,000 U	2,000 U	NA	500 U	250 U	250 U
Methylene chloride	5	26,000	48,700	35,000	58,000	48,000 D	52,000	55,000	39,000	19,000	37,000	1,000 U	250 U	250 U	130 U	130 U
1,1,2,2-Tetrachloroethane	0.2	2,500 U	200 U	63	2,000 U	190	2,000 U	1,000 U	500 U	1,000 U	1,000 U	200 U	50 U	50 U	25 U	25 U
Tetrachloroethene	0.7	2,500 U	--	4	2,000 U	100 U	2,000 U	1,000 U	500 U	1,000 U	1,000 U	200 U	50 U	50 U	25 U	25 U
Toluene	600	2,500 U	650	510	2,000 U	2,600	2,000 U	4,800	6,400	1,000 U	1,000 U	200 U	50 U	50 U	25 U	25 U
Trichloroethene	3	2,500 U	177	170	2,000 U	490	2,000 U	1,000 U	630	1,000 U	1,000 U	200 U	50 U	50 U	25 U	29
Trichlorofluoromethane	2,000	NA	6,830 J	7,400	NA	100 U	2,000 U	1,000 U	500 U	1,900	1,000 U	200 U	NA	NA	NA	NA
Vinyl chloride	0.03	5,000 U	200 U	3	2,000 U	100 U	2,000 U	1,000 U	500 U	1,000 U	1,000 U	200 U	50 U	50 U	25 U	25 U
Xylenes, Total	500	2,500 U	470	290	4,000 U	12,000	54,000	13,000	18,000	3,900	2,200	920	100 U	100 U	50 U	50 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.



Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-3 05/15/98	MW-3 11/14/00	MW-3 10/31/02	MW-3 07/21/04	MW-3 01/11/07	MW-3 04/18/07	MW-3 07/11/07	MW-3 10/03/07	MW-3 10/22/08	MW-3 11/04/09	MW-3 11/4/10	MW-3 11/16/11	MW-3 12/18/12	MW-3 11/05/13	MW-3 10/14/14
	NCAC 2L GW Standard															
<u>Volatile Organics</u> (USEPA Method 8260) ug/L																
Acetone	6,000	50 U	2 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	8.7	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	NA	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	10	2 U	2 U	16 U	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	600	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5 U	2 U	2 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-4 10/31/02	MW-4 07/20/04	MW-4 10/01/07	MW-4 10/20/08	MW-4 11/03/09	MW-4 11/2/2010	MW-4 11/14/2011	MW-4 12/19/12	MW-4 11/05/13	MW-4 10/15/14
	NCAC 2L GW Standard										
<u>Volatile Organics</u> (USEPA Method 8260) ug/L											
Acetone	6,000	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	2 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	2 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	2 U	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	600	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	80
Methylene chloride	5	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	2 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-5 11/14/00	MW-5 10/30/02	MW-5 07/20/04	MW-5 11/03/09	MW-5 11/2/10	MW-5 11/14/11	MW-5 12/19/12	MW-5 11/05/13	
	NCAC 2L GW Standard									
<u>Volatile Organics</u> (USEPA Method 8260) ug/L										
Acetone	6,000	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	
Benzene	1	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Chlorobenzene	50	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Chloroform	70	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
1,4-Dichlorobenzene	6	2 U	2 U	NA	1 U	1 U	NA	1 U	NA	
1,1-Dichloroethane	6	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
1,2-Dichloroethane	0.4	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Cis-1,2-Dichloroethene	70	2 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	
Trans-1,2-Dichloroethene	100	2 U	2 U	NA	1 U	1 U	1 U	NA	1 U	
Diethyl ether	3,100*	2 U	2 U	<b>3.4</b>	10 U	10 U	10 U	10 U	10 U	
Ethylbenzene	600	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Methyl tert-butyl ether	20	NA	NA	NA	10 U	10 U	NA	10 U	10 U	
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
1,1,2,2-Tetrachloroethane	0.2	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Tetrachloroethene	0.7	--	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Toluene	600	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Trichloroethene	3	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Trichlorofluoromethane	2000	2 U	2 U	NA	1 U	1 U	NA	NA	NA	
Vinyl chloride	0.03	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-6 05/14/98	MW-6 11/14/00	MW-6 10/31/02	MW-6 07/21/04	MW-6 02/06/07	MW-6 04/18/07	MW-6 07/12/07	MW-6 10/02/07	MW-6 10/21/08	MW-6 11/04/09	MW-6 11/3/10	MW-6 11/15/11	MW-6 12/20/12	MW-6 11/7/13	MW-6 10/14/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	5,000 U	50 U	50 U	1,200 U	500 U	2,500 U	2,500 U	130 U	1,200 U	25 U	1,300 U	250 U	130 U	50 U	10 U
Benzene	1	500	834	440	910	920	690	960	790	170	200	50 U	10 U	5 U	2 U	1 U
Chlorobenzene	50	500 U	2.1	2	50 U	20 U	100 U	100 U	5 U	50 U	1	50 U	10 U	5 U	2 U	1 U
Chloroform	70	1,100	963	140	470	510	370	250	20	50 U	39	50 U	10 U	5 U	4.5	1.7
1,4-Dichlorobenzene	6	NA	2 U	2 U	50 U	20 U	100 U	100 U	5 U	50 U	1 U	50 U	NA	5 U	NA	NA
1,1-Dichloroethane	6	500 U	2 U	2 U	50 U	20 U	100 U	100 U	5 U	50 U	1 U	50 U	10 U	5 U	2 U	1 U
1,2-Dichloroethane	0.4	500 U	21.5	16	50 U	42	100 U	100 U	5 U	50 U	18	50 U	10 U	5 U	2 U	1 U
Cis-1,2-Dichloroethene	70	500 U	2 U	2 U	200 U <sup>1</sup>	20 U	100 U	100 U	13	50 U	1.8	50 U	10 U	5 U	2 U	1 U
Trans-1,2-Dichloroethene	100	NA	4	5	NA	20 U	100 U	100 U	12	50 U	3.3	50 U	10 U	5 U	2 U	1 U
Diethyl ether	3,100*	7,500	4,450	5,400	12,000	10,000 D	20,000 D	8,400	20,000 D	2,700	4,700 D	2,400	550	150	72	110
Ethylbenzene	600	500 U	2 U	2 U	390	20 U	100 U	100 U	5 U	50 U	1 U	50 U	10 U	5 U	2 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	500 U	10 U	500 U	NA	10 U	10 U	10 U
Methylene chloride	5	800	655	88	50 U	490	500 U	500 U	25 U	250 U	25	250 U	50 U	25 U	10 U	10 U
1,1,2,2-Tetrachloroethane	0.2	500 U	2 U	2 U	50 U	20 U	100 U	100 U	5 U	50 U	1 U	50 U	10 U	5 U	2 U	1 U
Tetrachloroethene	0.7	500 U	2 U	2 U	50 U	20 U	100 U	100 U	5 U	50 U	1 U	50 U	10 U	5 U	2 U	1 U
Toluene	600	500 U	2 U	2 U	50 U	20 U	100 U	100 U	5 U	50 U	1 U	50 U	10 U	5 U	2 U	1 U
Trichloroethene	3	500 U	10.7	13	28 J	25	100 U	100 U	18	50 U	6.5	50 U	10 U	5 U	2 U	1 U
Trichlorofluoromethane	2,000	NA	2.9 J	4	50 U	20 U	100 U	100 U	5 U	50 U	1.3	50 U	NA	NA	NA	NA
Vinyl chloride	0.03	1,000 U	2 U	2 U	50 U	20 U	100 U	100 U	5 U	50 U	1 U	50 U	10 U	5 U	2 U	1 U
Xylenes, Total	500	500 U	2 U	2 U	100 U	40 U	200 U	200 U	10 U	100 U	2 U	100 U	20 U	10 U	4 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-7 05/14/98	MW-7 11/16/00	MW-7 10/29/02	MW-7 07/21/04	MW-7 01/11/07	MW-7 04/18/07	MW-7 07/12/07	MW-7 10/02/07	MW-7 10/21/08	MW-7 11/04/09	MW-7 11/3/10	MW-7 11/15/11	MW-7 12/20/12	MW-7 11/07/13	MW-7 10/16/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	50 U	50 U	50 U	5 U	250 U	6,300 U	2,500 U	25 U	1,200 U	2,500 U	1,300 U	1,300 U	1,300 U	250 U	500 U
Benzene	1	5 U	140	4	2.7 U	10 U	250 U	100 U	2.5	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Chlorobenzene	50	5 U	15.1	5	8.3	14	250 U	100 U	5.6	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Chloroform	70	16	2.7 U	2 U	6.9 U	10 U	250 U	100 U	1.2	50 U	100 U	50 U	50 U	50 U	10 U	50 U
1,4-Dichlorobenzene	6	NA	2.9	2 U	1 U	10 U	250 U	100 U	1 U	50 U	100 U	50 U	NA	50 U	NA	50 U
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	10 U	250 U	100 U	1 U	50 U	100 U	50 U	50 U	50 U	10 U	50 U
1,2-Dichloroethane	0.4	15	59.6	33	49	52	250 U	100 U	38	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Cis-1,2-Dichloroethene	70	5 U	4.1	2	2.0 U <sup>1</sup>	10 U	250 U	100 U	7.9	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Trans-1,2-Dichloroethene	100	NA	2 U	2 U	NA	10 U	250 U	100 U	12	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Diethyl ether	3,100*	64	2,480	930	2,300	3,400 D	19,000	8,200	10,000 D	3,300	4,300	3,300	4,400	2,400	430	4,500
Ethylbenzene	600	5 U	2 U	2 U	5 U	10 U	250 U	100 U	1 U	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	500 U	1,000 U	500 U	NA	500 U	100 U	500 U
Methylene chloride	5	5 U	5 U	5 U	1 U	50 U	1,300 U	500 U	5 U	250 U	500 U	250 U	250 U	250 U	50 U	250 U
1,1,2,2-Tetrachloroethane	0.2	5 U	5 U	2 U	1 U	10 U	250 U	100 U	1 U	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Tetrachloroethene	0.7	5 U	--	2 U	1 U	10 U	250 U	100 U	1 U	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Toluene	600	5 U	2.1	2 U	1 U	10 U	250 U	100 U	1 U	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Trichloroethene	3	5 U	8.2	2	4.2	10 U	250 U	100 U	18	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	1 U	10 U	250 U	100 U	1 U	50 U	100 U	50 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	6.9	4	5.5	10 U	250 U	100 U	5.9	50 U	100 U	50 U	50 U	50 U	10 U	50 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	20 U	500 U	200 U	2 U	100 U	200 U	100 U	100 U	100 U	20 U	100 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-9 05/14/98	MW-9 11/14/00	MW-9 10/31/02	MW-9 07/22/04	MW-9 10/03/07	MW-9 10/21/08	MW-9 11/04/09	MW-9 11/03/10	MW-9 11/16/11	MW-9 12/20/12	MW-9 11/07/13	MW-9 10/14/14
	NCAC 2L GW Standard												
<u>Volatile Organics</u> (USEPA Method 8260) ug/L													
Acetone	6,000	50 U	50 U	50 U	25 U	25 U	50 U	25 U	25 U	25 U	250 U	25 U	10 U
Benzene	1	5 U	3.4 U	50	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Chlorobenzene	50	5 U	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Chloroform	70	5.1	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	1 U	1 U	2 U	1 U	1 U	NA	NA	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	2.4	5	1.2	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	2.0 U <sup>1</sup>	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	NA	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Diethyl ether	3,100*	120	160	720	140	110 D	110	95 D	65	210	400	37	8.5
Ethylbenzene	600	5 U	2 U	2 U	5 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	20 U	10 U	10 U	NA	100 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	1 U	5 U	10 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Tetrachloroethene	0.7	5 U	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Trichloroethene	3	5 U	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	1 U	1 U	2 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	10 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	2 U	4 U	2 U	2 U	2 U	20 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-11 05/13/98	MW-11 11/14/00	MW-11 10/31/02	MW-11 07/22/04	MW-11 01/11/07	MW-11 04/17/07	MW-11 07/12/07	MW-11 10/03/07	MW-11 10/21/08	MW-11 11/02/09	MW-11 11/05/10	MW-11 11/15/11	MW-11 12/19/12	MW-11 11/04/13	MW-11 10/13/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	50 U	50 U	50 U	1,200 U	130 U	630 U	250 U	25 U	250 U	25 U	25 U	25 U	50 U	25 U	10 U
Benzene	1	5 U	2.5 U	6	50 U	5 U	25 U	10 U	1 U	10 U	1 U	1 U	1 U	2 U	1 U	1 U
Chlorobenzene	50	5 U	7.4	8	50 U	5 U	25 U	10 U	2.8	10 U	1.5	1 U	1 U	2 U	1 U	1 U
Chloroform	70	20	8.6 U	12	50 U	5.1	25 U	10 U	4.8	10 U	1.9	1 U	1 U	2 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	50 U	5 U	25 U	10 U	1 U	10 U	1 U	1 U	NA	2 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	50 U	5 U	25 U	10 U	1 U	10 U	1 U	1 U	1 U	2 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	47.7	50	56	26	25 U	10	17	10 U	8.3	3.0	1 U	2 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	3.2	2	100 U	5 U	25 U	10 U	1.1	10 U	1 U	1 U	1 U	2 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	NA	5 U	25 U	10 U	1 U	10 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	1,400	1,790	1,600	3,100	1,300 D	1,100	420	610 D	340	290 D	100	10 U	98	42	15
Ethylbenzene	600	50 U	2 U	2 U	250 U	5 U	25 U	10 U	1 U	10 U	1 U	1 U	10 U	2 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	20 U	10 U	10 U
Methylene chloride	5	5 U	5 U	6	50 U	25 U	130 U	50 U	5 U	50 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	50 U	5 U	25 U	10 U	1 U	10 U	1 U	1 U	1 U	2 U	1 U	1 U
Tetrachloroethene	0.7	50 U	--	2 U	50 U	5 U	25 U	10 U	1 U	10 U	1 U	1 U	1 U	2 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	50 U	5 U	25 U	10 U	1 U	10 U	1 U	1 U	1 U	2 U	1 U	1 U
Trichloroethene	3	6.5	8.4	8	50 U	5 U	25 U	10 U	4.0	10 U	1.9	1 U	1 U	2 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	5.4	7	50 U	5 U	25 U	10 U	1 U	10 U	1.3	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	12	8	13	50 U	5 U	25 U	10 U	2.2	10 U	1.4	1 U	1 U	2 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	100 U	10 U	50 U	20 U	2 U	20 U	2 U	2 U	2 U	4 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-12 05/14/98	MW-12 11/15/00	MW-12 10/29/02	MW-12 12/18/03	MW-12 07/21/04	MW-12 01/11/07	MW-12 04/18/07	MW-12 07/11/07	MW-12 10/02/07	MW-12 10/21/08	MW-12 11/03/09	MW-12 11/04/10	MW-12 11/15/11	MW-12 01/23/13	MW-12 11/06/13	MW-12 10/15/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard																
Acetone	6,000	5,000 U	50 U	50 U	1,200 U	500 U	130 U	130 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	1,300	2,020	290 J	350	470	5 U	5 U	1 U	1.5	1 U	1 U	1 U	1.5	1 U	1 U	1 U
Chlorobenzene	50	500 U	23.4	17	50 U	23	5 U	5 U	1 U	1 U	1 U	1 U	7.6	1 U	1 U	1 U	1 U
Chloroform	70	10,000	8,050	32	50 U	21	5 U	5 U	1 U	3.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	3.1	2	NA	20 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	500 U	2 U	4	50 U	20 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	500 U	585	330 J	50 U	360	19	5 U	3.6	14	1.6	1 U	1 U	68	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	500 U	5.6	4	100 U	40 U <sup>1</sup>	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1.3	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	500 U	2 U	2 U	100 U	NA	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1.6	NA	1 U	1 U
Diethyl ether	3,100*	13,000	13,900	11,000	8,800	13,000	720 D	300	150	360 D	94	10 U	10 U	3,200	10 U	10 U	5 U
Ethylbenzene	600	500 U	2 U	2 U	50 U	100 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5,700	4,160	5 U	250 U	20 U	25 U	25 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	500 U	2 U	2 U	50 U	20 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	500 U	2 U	2 U	50 U	20 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	500 U	2	2 U	50 U	20 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	500 U	43	30	25 J	35	5 U	5 U	3.1	4.4	1 U	1 U	1 U	9.3	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	550	20	NA	20 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	1,000 U	2 U	4	50 U	20 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	500 U	2 U	2 U	100 U	40 U	10 U	10 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.



Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-13 05/14/98	MW-13 11/14/00	MW-13 10/30/02	MW-13 07/21/04	MW-13 01/10/07	MW-13 04/17/07	MW-13 07/12/07
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard							
Acetone	6,000	2,500 U	50 U	50 U	120 U	25 U	130 U	500 U
Benzene	1	250 U	18.1 U	32	22	16	6.8	20 U
Chlorobenzene	50	250 U	15.6	4	8.2	1 U	5 U	20 U
Chloroform	70	250 U	23.8 U	8	5 U	1.9	5 U	20 U
1,4-Dichlorobenzene	6	NA	2.4	2 U	5 U	1 U	5 U	20 U
1,1-Dichloroethane	6	250 U	2.7	2 U	5 U	1 U	5 U	20 U
1,2-Dichloroethane	0.4	250 U	211	42	96	3.2	5 U	20 U
Cis-1,2-Dichloroethene	70	250 U	5	2 U	10 U <sup>1</sup>	1 U	5 U	20 U
Trans-1,2-Dichloroethene	100	250 U	2 U	2 U	NA	1 U	5 U	20 U
Diethyl ether	3,100*	3,300	5,840	1,900	4,200	330 D	450	990
Ethylbenzene	600	250 U	2 U	2 U	25 U	1 U	5 U	20 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5	250 U	5 U	5 U	5 U	5 U	25 U	100 U
1,1,2,2-Tetrachloroethane	0.2	250 U	2 U	2 U	5 U	1 U	5 U	20 U
Tetrachloroethene	0.7	250 U	--	2 U	5 U	1 U	5 U	20 U
Toluene	600	250 U	2 U	2 U	5 U	1 U	5 U	20 U
Trichloroethene	3	250 U	28	5	5 U	1.1	5 U	20 U
Trichlorofluoromethane	2,000	NA	8.2		5 U	1 U	5 U	20 U
Vinyl chloride	0.03	500 U	5.8	2	5 U	1 U	5 U	20 U
Xylenes, Total	500	250 U	2 U	2 U	10 U	2 U	10 U	40 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-14 05/14/98	MW-14 11/15/00	MW-14 10/29/02	MW-14 07/21/04	MW-14 01/11/07	MW-14 04/18/07	MW-14 07/11/07	MW-14 10/03/07	MW-14 10/22/08	MW-14 11/05/09	MW-14 11/05/10	MW-14 11/15/11	MW-14 01/23/13	MW-14 11/07/13	MW-14 10/16/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	50 U	50 U	50 U	170	130 U	2,500 U	1,300 U	1,300 U	500 U	500 U	500 U	500 U	500 U	130 U	50 U
Benzene	1	280	3.8 U	180	190	190	230	260	210	59	54	36	38	20	16	14
Chlorobenzene	50	50 U	2 U	2	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Chloroform	70	56	2 U	97	53	46	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	NA	20 U	NA	NA
1,1-Dichloroethane	6	50 U	2 U	2 U	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
1,2-Dichloroethane	0.4	63	4.7	47	50	42	100 U	50 U	50 U	20 U	27	20 U	20	20 U	8.5	13
Cis-1,2-Dichloroethene	70	50 U	2 U	2 U	40 U <sup>1</sup>	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Trans-1,2-Dichloroethene	100	50 U	2 U	2 U	NA	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	NA	5 U	5 U
Diethyl ether	3,100*	1,800	51 U	1,900	1,800	3,100	5,400	2,500	1,800	800	880	650	1,400	590	380	470
Ethylbenzene	600	50 U	2 U	2 U	25 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	200 U	200 U	200 U	NA	200 U	50 U	50 U
Methylene chloride	5	50 U	5 U	6	5 U	25 U	500 U	250 U	250 U	100 U	100 U	100 U	100 U	100 U	25 U	25 U
1,1,2,2-Tetrachloroethane	0.2	50 U	2 U	2 U	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Tetrachloroethene	0.7	50 U	2 U	2 U	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Toluene	600	50 U	2 U	2 U	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Trichloroethene	3	50 U	2 U	10	10	9.3	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Trichlorofluoromethane	2,000	NA	2 U	10	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	NA	NA	NA	NA
Vinyl chloride	0.03	100 U	2 U	2	5 U	5 U	100 U	50 U	50 U	20 U	20 U	20 U	20 U	20 U	5 U	5 U
Xylenes, Total	500	50 U	2 U	3	10 U	10 U	200 U	100 U	100 U	40 U	40 U	40 U	40 U	40 U	10 U	10 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-15 05/14/98	MW-15 11/15/00	MW-15 10/29/02	MW-15 12/18/03	MW-15 07/21/04	MW-15 01/11/07	MW-15 04/18/07	MW-15 07/11/07	MW-15 10/02/07	MW-15 10/21/08	MW-15 11/05/09	MW-15 11/04/10	MW-15 11/15/11	MW-15 01/23/13	MW-15 11/06/13	MW-15 10/16/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard																
Acetone	6,000	5,000 U	50 U	50 U	1,200 U	1,600	250 U	5,000 U	2,500 U	25 U	2,500 U	2,500 U	2,500 U	2,500 U	500 U	250 U	100 U
Benzene	1	1,900	355	990	540	930	10 U	200 U	150	130	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Chlorobenzene	50	500 U	5.3	18	17 J	50 U	10 U	200 U	100 U	15	100 U	100 U	100 U	100 U	20 U	10 U	12
Chloroform	70	10,000	606	1,000	220	180	10 U	200 U	100 U	1.6	100 U	100 U	100 U	100 U	20 U	10 U	10 U
1,4-Dichlorobenzene	6	NA	2 U	2	NA	50 U	10 U	200 U	100 U	1 U	100 U	100 U	100 U	NA	20 U	NA	NA
1,1-Dichloroethane	6	500 U	2 U	4	50 U	50 U	10 U	200 U	100 U	1.7	100 U	100 U	100 U	100 U	20 U	10 U	10 U
1,2-Dichloroethane	0.4	500 U	130	320 J	250	380	190	200 U	110	120	100 U	150	100 U	160	34	16	35
Cis-1,2-Dichloroethene	70	500 U	2 U	5	100 U	100 U <sup>1</sup>	10 U	200 U	100 U	2.8	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Trans-1,2-Dichloroethene	100	500 U	2 U	2 U	100 U	NA	10 U	200 U	100 U	3.2	100 U	100 U	100 U	100 U	NA	10 U	10 U
Diethyl ether	3,100*	13,000	2,670	11,000	8,500	14,000	9,800 D	10,000	5,300	4,700 D	4,200	4,400	3,000	4,400	890	440	1100
Ethylbenzene	600	500 U	2 U	2 U	50 U	250 U	10 U	200 U	100 U	1 U	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,000 U	1,000 U	1,000 U	NA	200 U	100 U	100 U
Methylene chloride	5	5,700	197	240	77 J	50 U	50 U	1,000 U	500 U	5 U	100 U	500 U	500 U	500 U	100 U	50 U	50 U
1,1,2,2-Tetrachloroethane	0.2	500 U	2 U	2 U	50 U	50 U	10 U	200 U	100 U	1 U	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Tetrachloroethene	0.7	500 U	--	2 U	50 U	50 U	10 U	200 U	100 U	1 U	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Toluene	600	500 U	2 U	2 U	50 U	50 U	10 U	200 U	100 U	1 U	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Trichloroethene	3	500 U	9.5	35	24 J	50 U	24	200 U	100 U	15	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Trichlorofluoromethane	2,000	NA	68.9	94	NA	50 U	10 U	200 U	100 U	1 U	100 U	100 U	100 U	NA	NA	NA	NA
Vinyl chloride	0.03	1,000 U	2 U	4	50 U	50 U	10 U	200 U	100 U	2.7	100 U	100 U	100 U	100 U	20 U	10 U	10 U
Xylenes, Total	500	500 U	2 U	2 U	100 U	100 U	20 U	400 U	200 U	2 U	200 U	200 U	200 U	200 U	40 U	20 U	20 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-16 05/14/98	MW-16 11/15/00	MW-16 10/29/02	MW-16 07/22/04	MW-16 10/02/07	MW-16 10/21/08	MW-16 11/05/09	MW-16 11/05/10	MW-16 11/16/11	MW-16 01/23/13	MW-16 11/06/13	MW-16 10/15/14
	NCAC 2L GW Standard												
<u>Volatile Organics</u> (USEPA Method 8260) ug/L													
Acetone	6,000	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	7.7	2 U	3.0	3.5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	2 U	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

█ Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-17 11/14/00	MW-17 10/29/02	MW-17 07/20/04	MW-17 10/02/07	MW-17 10/22/08	MW-17 11/02/09	MW-17 11/05/10	MW-17 11/16/11	MW-17 12/20/12	MW-17 11/06/13	MW-17 10/15/14	MW-18 11/14/00	MW-18 10/31/02	MW-18 07/20/04
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard														
Acetone	6,000	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U	50 U	50 U	25 U
Benzene	1	2 U	2 U	1 U	1 U	1.2	1.3	2.0	2.0	1.6	1.2	1.6	2 U	2 U	1 U
Chlorobenzene	50	2 U	2 U	1 U	1 U	1.3	1.7	2.0	2.7	2.7	3.2	3.5	3.5	3	4.4
Chloroform	70	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
1,4-Dichlorobenzene	6	2 U	2 U	1 U	1 U	2.6	3.3	3.0	NA	5	NA	NA	2 U	2 U	NA
1,1-Dichloroethane	6	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
1,2-Dichloroethane	0.4	2 U	2 U	1 U	1 U	7.3	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
Cis-1,2-Dichloroethene	70	2.9	27	22 <sup>1</sup>	8.8	7.3	5.9	6.0	6.3	5.5	5.8	4.7	2 U	2 U	2 U
Trans-1,2-Dichloroethene	100	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	2 U	2 U	NA
Diethyl ether	3,100*	2 U	77	110	39	43	37	46	50	42	57	47	34 U	2 U	49
Ethylbenzene	600	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U	NA	NA	NA
Methylene chloride	5	5 U	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
Tetrachloroethene	0.7	--	2 U	1 U	1.3	1.3	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
Toluene	600	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
Trichloroethene	3	2 U	2 U	1.3	2.5	2.0	1.5	1.0	1.2	1 U	1 U	1 U	2 U	2 U	1 U
Trichlorofluoromethane	2,000	2 U	2 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	2 U	2 U	NA
Vinyl chloride	0.03	2 U	15	20	5.1	5.7	4.6	7.0	6.0	4.6	4.2	3.8	2 U	2 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-19 07/25/95	MW-20 07/20/04	MW-21 05/13/98	MW-21 11/14/00	MW-21 10/30/02	MW-21 07/19/04	MW-21 11/05/09
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard							
Acetone	6,000	<b>16 J</b>	25 U	50 U	50 U	50 U	25 U	25 U
Benzene	1	5 U	1 U	5 U	2 U	2 U	1 U	1 U
Chlorobenzene	50	5 U	1 U	5 U	2 U	2 U	1 U	1 U
Chloroform	70	<b>12</b>	1 U	5 U	2 U	2 U	1 U	1 U
1,4-Dichlorobenzene	6	10 U	NA	NA	2 U	2 U	NA	1 U
1,1-Dichloroethane	6	5 U	1 U	5 U	2 U	2 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	1 U	5 U	2 U	2 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	5 U	2 U	2 U	2 U	1 U
Trans-1,2-Dichloroethene	100	5 U	NA	5 U	2 U	2 U	NA	1 U
Diethyl ether	3,100*	10 U	2 U	5 U	2 U	2 U	2 U	10 U
Ethylbenzene	600	5 U	1 U	5 U	2 U	2 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	1 U	5 U	2 U	2 U	1 U	1 U
Tetrachloroethene	0.7	5 U	1 U	5 U	--	2 U	1 U	1 U
Toluene	600	5 U	1 U	5 U	2 U	2 U	1 U	1 U
Trichloroethene	3	5 U	1 U	5 U	2 U	2 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	NA	NA	2 U	2 U	NA	1 U
Vinyl chloride	0.03	10 U	1 U	10 U	2 U	2 U	1 U	1 U
Xylenes, Total	500	10 U	2 U	5 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).


 Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-22 05/14/98	MW-22 11/15/00	MW-22 10/29/02	MW-22 07/21/04	MW-22 10/02/07	MW-22 10/21/08	MW-22 11/03/09	MW-22 11/04/10	MW-22 11/16/11	MW-22 01/23/13	MW-22 11/06/13	MW-22 10/15/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard												
Acetone	6,000	50 U	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	160	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	13	12.1	10	5 U	3.3	11	4.6	3.4	6.6	1.6	10	4.2
Chloroform	70	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	3.5	3	5 U	1 U	2.8	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	18.3	2	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	2,600	620	130	5 U	26	12	10 U	10 U	12	10 U	10 U	5 U
Ethylbenzene	600	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	8.9	2.2	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	5 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	10 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-23 05/13/98	MW-23 10/30/02	MW-23 07/20/04	MW-23 10/01/07	MW-23 10/20/08	MW-23 11/02/09	MW-23 11/05/10	MW-23 11/15/11	MW-23 12/20/12	MW-23 11/05/13	MW-23 10/13/14
	NCAC 2L GW Standard											
<u>Volatile Organics</u> (USEPA Method 8260) ug/L												
Acetone	6,000	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	5 U	2 U	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	5 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	2 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.



Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-24 12/19/03	MW-24 07/22/04	MW-24 11/03/09	MW-25 05/13/98	MW-25 11/14/00	MW-25 10/30/02	MW-25 07/21/04	MW-25 01/10/07	MW-25 04/17/07	MW-25 07/12/07	MW-25 11/02/09	MW-25 11/03/10	MW-25 11/15/11	MW-25 12/20/12	MW-25 11/04/13	MW-25 10/13/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard																
Acetone	6,000	25 U	25 U	25 U	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	1 U	1.1	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	1 U	1 U	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	1 U	1 U	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	1 U	1 U	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	1 U	1 U	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2 U	1 U	1 U	5 U	2 U	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	2 U	1 U	1 U	5 U	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	4.8	6	10 U	5 U	43 U	2 U	45	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	1 U	1 U	1 U	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	10 U	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	1 U	1 U	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	1 U	1 U	1 U	5 U	--	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	1 U	1 U	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	1 U	1 U	1 U	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	1 U	1 U	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	1 U	1 U	1 U	10 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

█ Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-26 05/13/98	MW-26 11/15/00	MW-26 10/30/02	MW-26 07/22/04	MW-26 01/10/07	MW-26 04/17/07	MW-26 07/12/07	MW-26 10/02/07	MW-26 10/23/08	MW-26 11/02/09	MW-26 11/03/10	MW-26 11/15/11	MW-26 12/20/12	MW-26 11/04/13	MW-26 10/14/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U
Diethyl ether	3,100*	5.2	2 U	2 U	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	5 U	2 U	2 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1.1	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-28 11/16/00	MW-28 10/31/02	MW-28 10/02/07	MW-28 10/22/08	MW-28 11/04/09	MW-28 11/04/10	MW-28 11/16/11	MW-28 12/19/12	MW-28 11/06/13	MW-28 10/15/14	MW-29 11/15/00	MW-29 10/31/02	MW-29 07/21/04	MW-29 11/04/09
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard														
Acetone	6,000	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U	25 U	50 U	25 U	25 U
Benzene	1	2 U	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Chlorobenzene	50	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Chloroform	70	2 U	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2	1 U	1 U
1,4-Dichlorobenzene	6	2 U	2 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA	1 U	2 U	1 U	1 U
1,1-Dichloroethane	6	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
1,2-Dichloroethane	0.4	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	1 U
Trans-1,2-Dichloroethene	100	2 U	2 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U	2 U	NA	1 U
Diethyl ether	3,100*	2 U	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U	1 U	2 U	2 U	10 U
Ethylbenzene	600	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U	NA	NA	NA	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Tetrachloroethene	0.7	--	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--	2 U	1 U	1 U
Toluene	600	2 U	2 U	1 U	1 U	1 U	1 U	250 D	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Trichloroethene	3	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Trichlorofluoromethane	2,000	2 U	2 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA	1 U	2 U	1 U	1 U
Vinyl chloride	0.03	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	1 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-30 11/14/00	MW-30 10/30/02	MW-30 07/20/04	MW-30 01/10/07	MW-30 04/17/07	MW-30 07/11/07	MW-30 10/01/07	MW-30 10/20/08	MW-30 11/03/09	MW-30 11/02/10	MW-30 11/14/11	MW-30 12/20/12	MW-30 11/04/13	MW-30 10/14/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard														
Acetone	6,000	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2 U	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	2 U	2	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	--	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	--	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-31 05/13/98	MW-31 11/14/00	MW-31 10/30/02	MW-31 07/20/04	MW-31 01/10/07	MW-31 04/17/07	MW-31 07/11/07	MW-31 10/01/07	MW-31 10/20/08	MW-31 11/03/09	MW-31 11/02/10	MW-31 11/14/11	MW-31 12/20/12	MW-31 11/04/13	MW-31 10/14/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
Acetone	6,000	250 U	50 U	50 U	25 U	25 U	250 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	25 U	2 U	2 U	1.3	1 U	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	25 U	2 U	3	4.1	2.4	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	25 U	2 U	3	2.1	2.5	10 U	2 U	1.4	1.2	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	1 U	1 U	10 U	2 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	25 U	2 U	2 U	1 U	1 U	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	25 U	8.4	19	25	14	10 U	4.5	3.7	1.6	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	25 U	2 U	2 U	2.0 U <sup>1</sup>	1.0	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	25 U	2 U	2 U	NA	1 U	10 U	2 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	480	215	770	2,000	640 D	400	160	120 D	39	14	10	21	10 U	10 U	8
Ethylbenzene	600	25 U	2 U	2 U	5 U	1 U	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	25 U	5 U	5 U	1 U	5 U	50 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	25 U	2 U	2 U	1 U	1 U	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	25 U	2 U	2 U	1 U	1 U	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	25 U	2 U	2 U	1 U	1 U	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	25 U	2 U	4	5.0	3.0	10 U	2 U	1.3	1.3	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	1 U	1 U	10 U	2 U	1 U	1.5	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	50 U	2 U	5	5.4	2.4	10 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	25 U	2 U	2 U	2 U	2 U	20 U	4 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-32 05/13/98	MW-32 11/13/00	MW-32 10/30/02	MW-32 12/19/03	MW-32 07/20/04	MW-32 01/10/07	MW-32 04/17/07	MW-32 07/11/07	MW-32 10/01/07	MW-32 10/20/08	MW-32 11/04/09	MW-32 11/02/10	MW-32 11/14/11	MW-32 12/19/12	MW-32 11/04/13	MW-32 10/14/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard																
Acetone	6,000	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	5 U	2 U	15	2 U	2 U	2.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	5 U	2 U	2 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5 U	--	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).


 Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-33 05/13/98	MW-33 11/13/00	MW-33 10/30/02	MW-33 12/19/03	MW-33 07/20/04	MW-33 01/10/07	MW-33 04/17/07	MW-33 07/11/07	MW-33 10/01/07	MW-33 10/20/08	MW-33 11/04/09	MW-33 11/02/10	MW-33 11/14/11	MW-33 12/19/12	MW-33 11/04/13	MW-33 10/14/14
	NCAC 2L GW Standard																
<u>Volatile Organics</u> (USEPA Method 8260) ug/L																	
Acetone	6,000	50 U	50 U	50 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5 U	2 U	2 U	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5 U	2 U	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	5 U	2 U	<b>13</b>	<b>18</b>	<b>30</b>	<b>28</b>	<b>16</b>	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	5 U	2 U	2 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	5 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	2 U	2 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	10 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	5 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).


 Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID:	MW-34	MW-35	MW-35	MW-35	MW-35	MW-35	MW-35	MW-35	MW-35	MW-35
	Date Sampled:	07/20/04	07/20/04	10/01/07	10/21/08	11/04/09	11/02/10	11/16/11	12/19/12	11/05/13	10/14/14
	NCAC 2L GW Standard										
<u>Volatile Organics</u> (USEPA Method 8260) ug/L											
Acetone	6,000	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2 U	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	NA	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	2 U	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U
Ethylbenzene	600	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	NA	10 U	10 U	10 U	NA	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).


 Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.



Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-36 07/20/04	MW-36 10/01/07	MW-36 10/20/08	MW-36 11/03/09	MW-36 11/02/10	MW-36 11/14/11	MW-36 12/20/12	MW-36 11/05/13	MW-36 10/15/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard									
Acetone	6,000	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	10 U
Benzene	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	1 U	1 U	1 U	1 U	1 U	NA	1 U	NA	NA
1,1-Dichloroethane	6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2.0 U <sup>1</sup>	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	NA	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Diethyl ether	3,100*	2 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	600	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	45	120	61	NA	30	49	450
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	NA
Vinyl chloride	0.03	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	MW-37	MW-38	MW-38	MW-38	MW-38	MW-39	MW-39	MW-39	MW-39
		07/20/04	09/30/10	10/04/10	10/08/10	10/18/10	09/30/10	10/04/10	10/08/10	10/18/10
	NCAC 2L GW Standard									
<u>Volatile Organics</u> (USEPA Method 8260) ug/L										
Acetone	6,000	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1.5	2.1	1 U	1 U	1 U	1 U	1 U
Chloroform	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	1 U	14	8.7	21	22	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Diethyl ether	3,100*	2 U	220 E	140 E	390 E	49	10 U	10 U	10 U	10 U
Ethylbenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	0.03	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID:	VER-1	VER-1	VER-1	VER-1	VER-1	VER-1	VER-1	VER-2	VER-2	VER-2	VER-2	VER-2	VER-2	VER-2	
	Date Sampled:	05/05/06	10/22/08	11/03/09	11/05/10	11/15/11	12/18/12	11/06/13	05/05/06	10/22/08	11/03/09	11/05/10	11/15/11	12/18/12	11/04/13	
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard															
	Acetone	6,000	12,000 U	1,200 U	25 U	630 U	630 U	500 U	130 U	50,000 U	50,000 U	2,500 U	25,000 U	13,000 U	5,000 U	2500 U
	Benzene	1	7,600	4,800	1 U	460	25 U	20 U	5 U	19,000	18,000	750	14,000	7,800	2,300	330
	Chlorobenzene	50	1,200 U	50 U	1 U	54	28	69	38	5,000 U	2,000 U	100 U	1,000 U	500 U	200 U	100 U
	Chloroform	70	30,000	180	2	25 U	25 U	20 U	5 U	95,000	41,000	3,700	21,000	3,900	1,200	230
	1,4-Dichlorobenzene	6	NA	50 U	1 U	25 U	NA	20 U	NA	NA	2,000 U	100 U	1,000 U	NA	200 U	NA
	1,1-Dichloroethane	6	1,200 U	50 U	1 U	25 U	25 U	20 U	5 U	5,000 U	2,000 U	100 U	1,000 U	500 U	200 U	100 U
	1,2-Dichloroethane	0.4	1,200 U	50 U	1 U	150	94	82	47	5,000 U	2,000 U	250	1,700	960	430	260
	Cis-1,2-Dichloroethene	70	1,200 U	50 U	1 U	25 U	25 U	20 U	5 U	5,000 U	2,000 U	100 U	1,000 U	500 U	200 U	100 U
	Trans-1,2-Dichloroethene	100	1,200 U	50 U	1 U	25 U	25 U	NA	5 U	5,000 U	2,000 U	100 U	1,000 U	500 U	NA	100 U
	Diethyl ether	3,100*	29,000	1,800	10 U	2,400	1,300	1,200	400	110,000	77,000	3,500	43,000	23,000	13,000	5000
	Ethylbenzene	600	1,200 U	50 U	1 U	35	25 U	20 U	5 U	5,000 U	2,000 U	100 U	1,000 U	500 U	200 U	100 U
	Methyl tert-butyl ether	20	NA	500 U	10 U	250 U	NA	200 U	50 U	NA	20,000 U	1,000 U	10,000 U	NA	2000 U	1000 U
	Methylene chloride	5	15,000	250 U	5 U	130 U	130 U	100 U	25 U	57,000	27,000	1,500	12,000	2,700	1,000 U	500 U
	1,1,2,2-Tetrachloroethane	0.2	1,200 U	50 U	1 U	25 U	25 U	20 U	5 U	5,000 U	2,000 U	110	1,000 U	500 U	200 U	100 U
	Tetrachloroethene	0.7	1,200 U	50 U	1 U	25 U	25 U	20 U	5 U	5,000 U	2,000 U	100 U	1,000 U	500 U	200 U	100 U
	Toluene	600	1,200 U	50 U	1 U	25 U	25 U	20 U	5 U	5,000 U	2,000 U	100 U	1,000 U	500 U	200 U	100 U
	Trichloroethene	3	1,200 U	50 U	1 U	25 U	25 U	20 U	5.5	5,000 U	2,000 U	190	1,000 U	500 U	210	110
	Trichlorofluoromethane	2,000	NA	50 U	1 U	25 U	NA	NA	NA	NA	2,000 U	100 U	1,000 U	NA	NA	NA
	Vinyl chloride	0.03	1,200 U	50 U	1 U	25 U	25 U	20 U	5 U	5,000 U	2,000 U	100 U	1,000 U	500 U	200 U	100 U
Xylenes, Total	500	2,500 U	100 U	2 U	50 U	50 U	40 U	10 U	10,000 U	4,000 U	200 U	2,000 U	1,000 U	400 U	200 U	

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	VER-3	VER-3	VER-3	VER-3	VER-3	VER-3	VER-3	VER-4	VER-4	VER-4	VER-4	VER-4	VER-4	VER-4
		05/05/06	10/22/08	11/03/09	11/05/10	11/15/11	12/18/12	11/04/13	05/04/06	10/22/08	11/03/09	11/05/10	11/15/11	12/18/12	11/06/13
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard														
Acetone	6,000	20,000 U	25,000 U	6,200 U	6,300 U	1,300 U	1,300 U	630 U	10 U	500 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	8,600	5,500	310	510	130	50 U	25 U	1 U	59	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	4,800	11,000	250 U	250	100	50 U	25 U	5.5	46	1.8	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	1,000 U	250 U	250 U	NA	50 U	NA	NA	20 U	1 U	1 U	NA	1 U	NA
1,1-Dichloroethane	6	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	2,000 U	1,000 U	250 U	250 U	50 U	NA	25 U	1 U	20 U	1 U	1 U	1 U	NA	1 U
Diethyl ether	3,100*	68,000	40,000	13,000	10,000	3,200	5,600	1200	15	850	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	600	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	10,000 U	2,500 U	2,500 U	NA	500 U	250 U	NA	200 U	10 U	10 U	NA	10 U	10 U
Methylene chloride	5	5,500	13,000	1,500	1,300 U	250 U	250 U	130 U	1 U	100 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	1,000 U	250 U	250 U	NA	NA	NA	NA	20 U	1 U	1 U	NA	NA	NA
Vinyl chloride	0.03	2,000 U	1,000 U	250 U	250 U	50 U	50 U	25 U	1 U	20 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	4,000 U	2,000 U	500 U	500 U	100 U	100 U	50 U	2	40 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID:	SRW-1	SRW-1	SRW-1	SRW-1	SRW-1	SRW-1	SRW-1	SRW-2	SRW-2	SRW-2	SRW-2	SRW-2	SRW-2	SRW-2
	Date Sampled:	05/04/06	10/02/07	10/22/08	11/03/09	11/03/10	01/23/13	11/07/13	05/04/06	10/02/07	10/22/08	11/03/09	11/03/10	11/14/11	11/07/13
	NCAC 2L GW Standard														
<u>Volatile Organics</u> (USEPA Method 8260) ug/L															
Acetone	6,000	670 U	25 U	25 U	25 U	25 U	25 U	25 U	2,900 U	25 U	1,200 U	250 U	500 U	1,300 U	50 U
Benzene	1	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	<b>2.8</b>	50 U	10 U	20 U	50 U	2 U
Chlorobenzene	50	67 U	<b>11</b>	<b>9.1</b>	<b>6.5</b>	<b>6.5</b>	<b>6.2</b>	<b>15</b>	290 U	<b>11</b>	50 U	10 U	20 U	50 U	<b>6.2</b>
Chloroform	70	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	<b>2.1</b>	50 U	10 U	20 U	50 U	2 U
1,4-Dichlorobenzene	6	NA	NA	<b>3</b>	<b>2</b>	<b>1.5</b>	<b>1.9</b>	NA	NA	NA	50 U	10 U	20 U	NA	NA
1,1-Dichloroethane	6	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	<b>1.2</b>	50 U	10 U	20 U	50 U	2 U
1,2-Dichloroethane	0.4	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	<b>75</b>	<b>55</b>	<b>55</b>	<b>45</b>	<b>110</b>	<b>13</b>
Cis-1,2-Dichloroethene	70	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	<b>1.6</b>	50 U	10 U	20 U	50 U	2 U
Trans-1,2-Dichloroethene	100	67 U	1 U	1 U	1 U	1 U	NA	1 U	290 U	1 U	50 U	10 U	20 U	50 U	2 U
Diethyl ether	3,100*	<b>1,900</b>	<b>74</b>	<b>53</b>	<b>31</b>	<b>50</b>	<b>27</b>	<b>26</b>	<b>8,200</b>	<b>2,400</b>	<b>1,800</b>	<b>1,600</b>	<b>1,000</b>	<b>4,000</b>	170 U
Ethylbenzene	600	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	1 U	50 U	10 U	20 U	50 U	2 U
Methyl tert-butyl ether	20	NA	NA	10 U	10 U	10 U	10 U	10 U	NA	NA	500 U	100 U	200 U	NA	20 U
Methylene chloride	5	67 U	5 U	5 U	5 U	5 U	5 U	5 U	290 U	5 U	250 U	50 U	100 U	250 U	10 U
1,1,2,2-Tetrachloroethane	0.2	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	1 U	50 U	10 U	20 U	50 U	2 U
Tetrachloroethene	0.7	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	1 U	50 U	10 U	20 U	50 U	2 U
Toluene	600	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	1 U	50 U	10 U	20 U	50 U	2 U
Trichloroethene	3	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	<b>8.4</b>	50 U	10 U	20 U	50 U	<b>5.1</b>
Trichlorofluoromethane	2,000	NA	NA	1 U	1 U	1 U	NA	NA	NA	NA	50 U	10 U	20 U	NA	NA
Vinyl chloride	0.03	67 U	1 U	1 U	1 U	1 U	1 U	1 U	290 U	<b>1.1</b>	50 U	10 U	20 U	50 U	2 U
Xylenes, Total	500	130 U	2 U	2 U	2 U	2 U	2 U	2 U	590 U	2 U	100 U	20 U	40 U	100 U	4 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	SRW-3 05/03/06	SRW-3 10/02/07	SRW-3 10/22/08	SRW-3 11/03/09	SRW-3 11/03/10	SRW-3 11/14/11	SRW-3 01/23/13	SRW-3 11/07/13	DRW-1 05/03/06	DRW-1 10/02/07	DRW-1 10/22/08	DRW-1 11/03/09	DRW-1 11/03/10	DRW-1 11/14/11	DRW-1 01/23/13	DRW-1 11/07/13
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard																
Acetone	6,000	2,000 U	25 U	1,200 U	250 U	250 U	1,300 U	25 U	25 U	3,800 U	25 U	500 U	1,200 U	2,500 U	25 U	1300 U	630 U
Benzene	1	200 U	11	50 U	10 U	10 U	50 U	1 U	1 U	380 U	160	20 U	50 U	100 U	1 U	50 U	25 U
Chlorobenzene	50	200 U	9	50 U	10 U	10 U	50 U	1.4	1 U	380 U	15	20 U	50 U	100 U	1.6	50 U	25 U
Chloroform	70	200 U	1.5	50 U	10 U	10 U	50 U	1.3	1 U	380 U	1.4	20 U	50 U	100 U	1 U	50 U	25 U
1,4-Dichlorobenzene	6	NA	NA	50 U	10 U	10 U	NA	1 U	1 U	NA	NA	20 U	50 U	100 U	NA	50 U	NA
1,1-Dichloroethane	6	200 U	1 U	50 U	10 U	10 U	50 U	1 U	1 U	380 U	1.6	20 U	50 U	100 U	1 U	50 U	25 U
1,2-Dichloroethane	0.4	200 U	63	50 U	13	10 U	110	1 U	1.2	380 U	120	20 U	120	100 U	1 U	50 U	44
Cis-1,2-Dichloroethene	70	200 U	3.9	50 U	10 U	10 U	50 U	1 U	1 U	380 U	3.3	20 U	50 U	100 U	1 U	50 U	25 U
Trans-1,2-Dichloroethene	100	200 U	4.9	50 U	10 U	10 U	50 U	NA	1 U	380 U	4	20 U	50 U	100 U	1 U	NA	25 U
Diethyl ether	3,100*	6,200	4,900	2,100	860	440	3,500	10 U	53	11,000	6,900	610	3,800	3,900	16	2,000	1200
Ethylbenzene	600	200 U	1 U	50 U	10 U	10 U	50 U	1 U	1 U	380 U	1 U	20 U	50 U	100 U	1 U	50 U	25 U
Methyl tert-butyl ether	20	NA	NA	500 U	100 U	100 U	NA	10 U	10 U	NA	NA	200 U	500 U	1,000 U	NA	500 U	250 U
Methylene chloride	5	200 U	5 U	250 U	50 U	50 U	250 U	5 U	5 U	380 U	5 U	20 U	250 U	500 U	5 U	250 U	130 U
1,1,2,2-Tetrachloroethane	0.2	200 U	1 U	50 U	10 U	10 U	50 U	1 U	1 U	380 U	1 U	20 U	50 U	100 U	1 U	50 U	25 U
Tetrachloroethene	0.7	200 U	1 U	50 U	10 U	10 U	50 U	1 U	1 U	380 U	1 U	20 U	50 U	100 U	1 U	50 U	25 U
Toluene	600	200 U	1 U	50 U	10 U	10 U	50 U	1 U	1 U	380 U	1 U	20 U	50 U	100 U	1 U	50 U	25 U
Trichloroethene	3	200 U	13	50 U	10 U	10 U	50 U	1 U	1 U	380 U	17	20 U	50 U	100 U	1	50 U	25 U
Trichlorofluoromethane	2,000	NA	NA	50 U	10 U	10 U	NA	NA	NA	NA	NA	20 U	50 U	100 U	NA	NA	NA
Vinyl chloride	0.03	200 U	3.6	50 U	10 U	10 U	50 U	1 U	1 U	380 U	3.5	20 U	50 U	100 U	1 U	50 U	25 U
Xylenes, Total	500	400 U	2 U	100 U	20 U	20 U	100 U	2 U	2 U	770 U	2 U	40 U	100 U	200 U	2 U	100 U	50 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.

Table 9. Historical Groundwater Analytical Data, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Constituent	Sample ID: Date Sampled:	DRW-2 05/03/06	DRW-2 10/02/07	DRW-2 10/22/08	DRW-2 11/03/09	DRW-2 11/03/10	DRW-2 11/14/11	DRW-2 01/23/13	DRW-2 11/07/13	DRW-3 05/03/06	DRW-3 10/02/07	DRW-3 10/22/08	DRW-3 11/03/09	DRW-3 11/03/10	DRW-3 11/14/11	DRW-3 01/23/13	DRW-3 11/07/13
<u>Volatile Organics</u> (USEPA Method 8260) ug/L	NCAC 2L GW Standard																
Acetone	6,000	59 U	25 U	50 U	25 U	25 U	25 U	25 U	25 U	29 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Benzene	1	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	5.9 U	<b>1.3</b>	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	6	NA	NA	2 U	1 U	1 U	NA	1 U	NA	NA	NA	1 U	1 U	1 U	NA	1 U	NA
1,1-Dichloroethane	6	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	0.4	5.9 U	<b>9.3</b>	<b>3.2</b>	<b>1.7</b>	1 U	1 U	<b>1</b>	1 U	2.9 U	<b>1</b>	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	70	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	100	5.9 U	1 U	2 U	1 U	1 U	1 U	NA	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	NA	1 U
Diethyl ether	3,100*	<b>200</b>	<b>470</b>	<b>87</b>	<b>59</b>	<b>40</b>	<b>57</b>	<b>34</b>	<b>14</b>	<b>98</b>	<b>37</b>	10 U	<b>18</b>	10 U	10 U	10 U	10 U
Ethylbenzene	600	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl tert-butyl ether	20	NA	NA	20 U	10 U	10 U	NA	10 U	10 U	NA	NA	10 U	10 U	10 U	NA	10 U	10 U
Methylene chloride	5	5.9 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	2.9 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.2	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	0.7	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	600	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	3	5.9 U	<b>1.5</b>	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	2,000	NA	NA	2 U	1 U	1 U	NA	NA	NA	NA	NA	1 U	1 U	1 U	NA	NA	NA
Vinyl chloride	0.03	5.9 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2.9 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	500	12 U	2 U	4 U	2 U	2 U	2 U	2 U	2 U	5.7 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

NCAC 2L North Carolina Administrative Code 2L Groundwater Standard  
ug/L Micrograms per liter.

U Constituent was not detected above the reporting limit.

D Constituent concentration was quantitated using a secondary dilution.

NA Not analyzed.

\* USEPA Risk-Based Concentration (RBC) for tap water (no NCAC 2L Groundwater Standard exists).

**Indicates that the reported concentration exceeds the NCAC 2L Groundwater Standard or RBC.**

Table 10. Summary of Analytical Results for Surface Water Samples Collected in October 2014, UNC Airport Road Waste Disposal Area, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

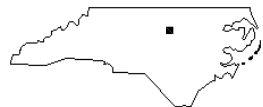
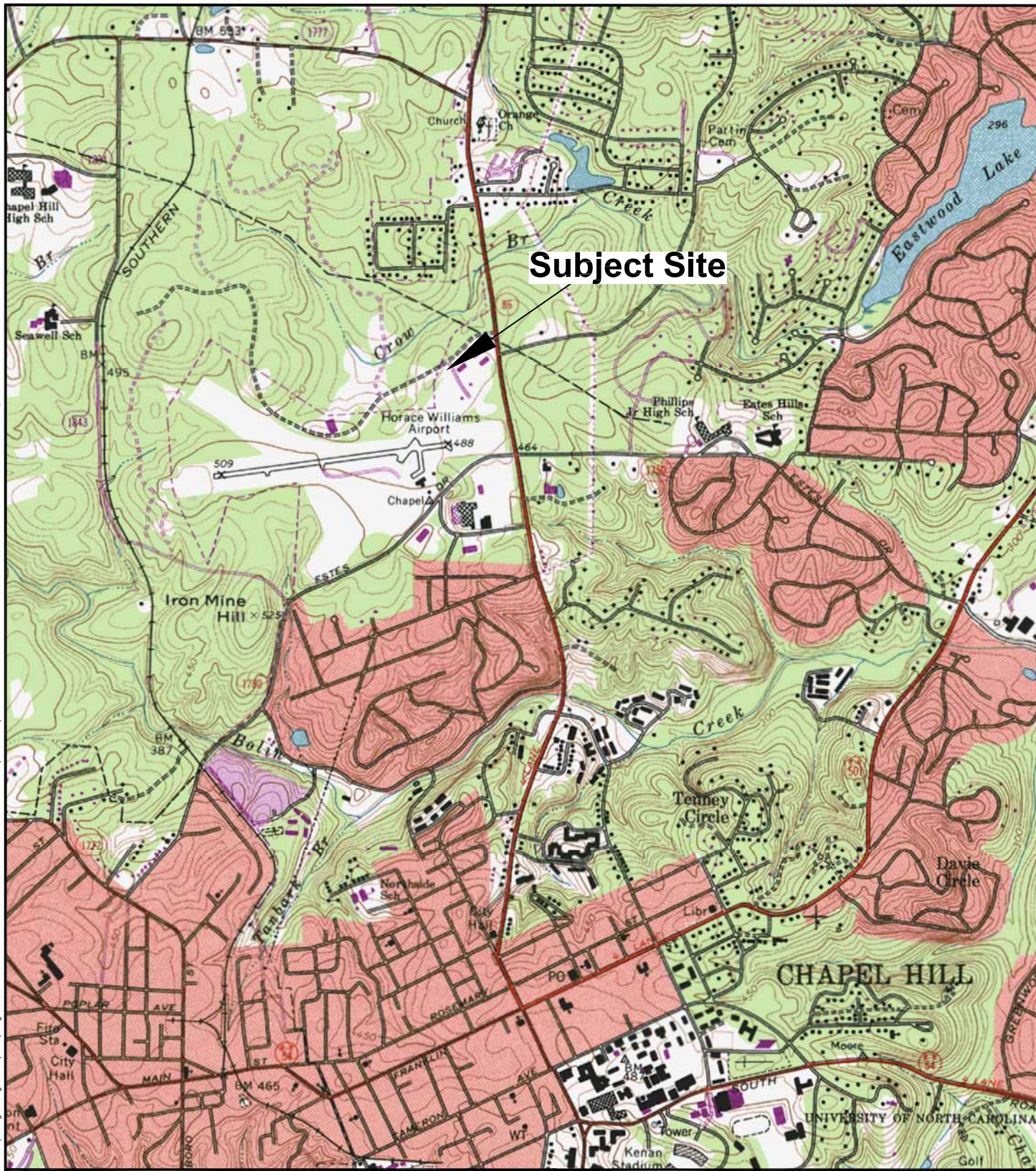
Constituent	Sample ID: Date Sampled:	SW-3 10/13/14	SW-4 10/13/14	SW-5 10/13/14	SW-6 10/13/14
<u>Volatile Organics</u> (USEPA Method 8260) ug/L		ND	ND	ND	ND

ug/L      Micrograms per liter.  
 ND      Constituent was not detected above the reporting limit.

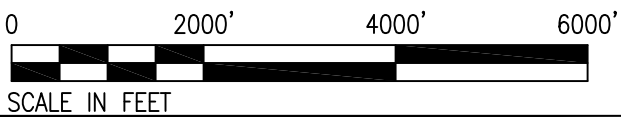


Figures

CITY: Raleigh, NC DWGROUP: ENV DB: LD: PIC: PM: TM: LVR:  
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CONTOUR INTERVAL 10-FOOT DATUM IS MEAN SEA LEVEL  
 SOURCE: TOPOGRAPHY TAKEN FROM USGS 7.5 MINUTE QUADRANGLE  
 CHAPEL HILL 1967 (PHOTOREVISED 1988), NC MAP



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
 THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
 CHAPEL HILL, NORTH CAROLINA

**SITE LOCATION**

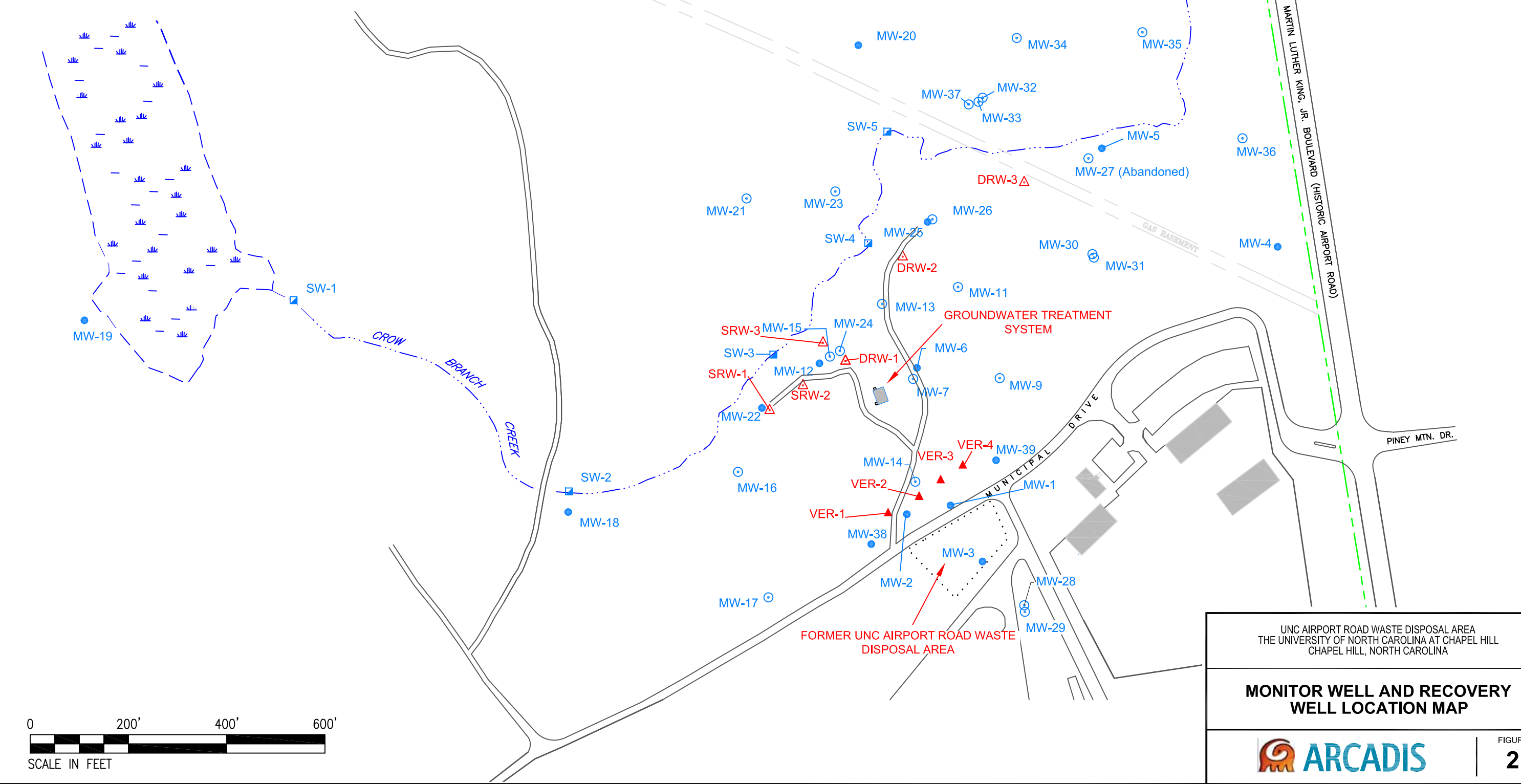


FIGURE  
**1**










CITY: Augusta, GA; DWG GROUP: ENV; DR: A. Warren; LD: PIC: PK: TM: LYR: G:\EN\UN\UNC Airport Road\00238.0019\2014 Remedial System Report\Figures\Figure 2\_Site Layout.dwg; LAYOUT: Figure 2\_Site Layout.dwg; ACADVER: 18.1S (LMS TECH); PAGESETUP: --; PLOTSTYLETABLE: --; PLOTSTYLETUP: --; PLOTTED: 2/19/2015 10:02 PM; BY: PINNIX, ALAN

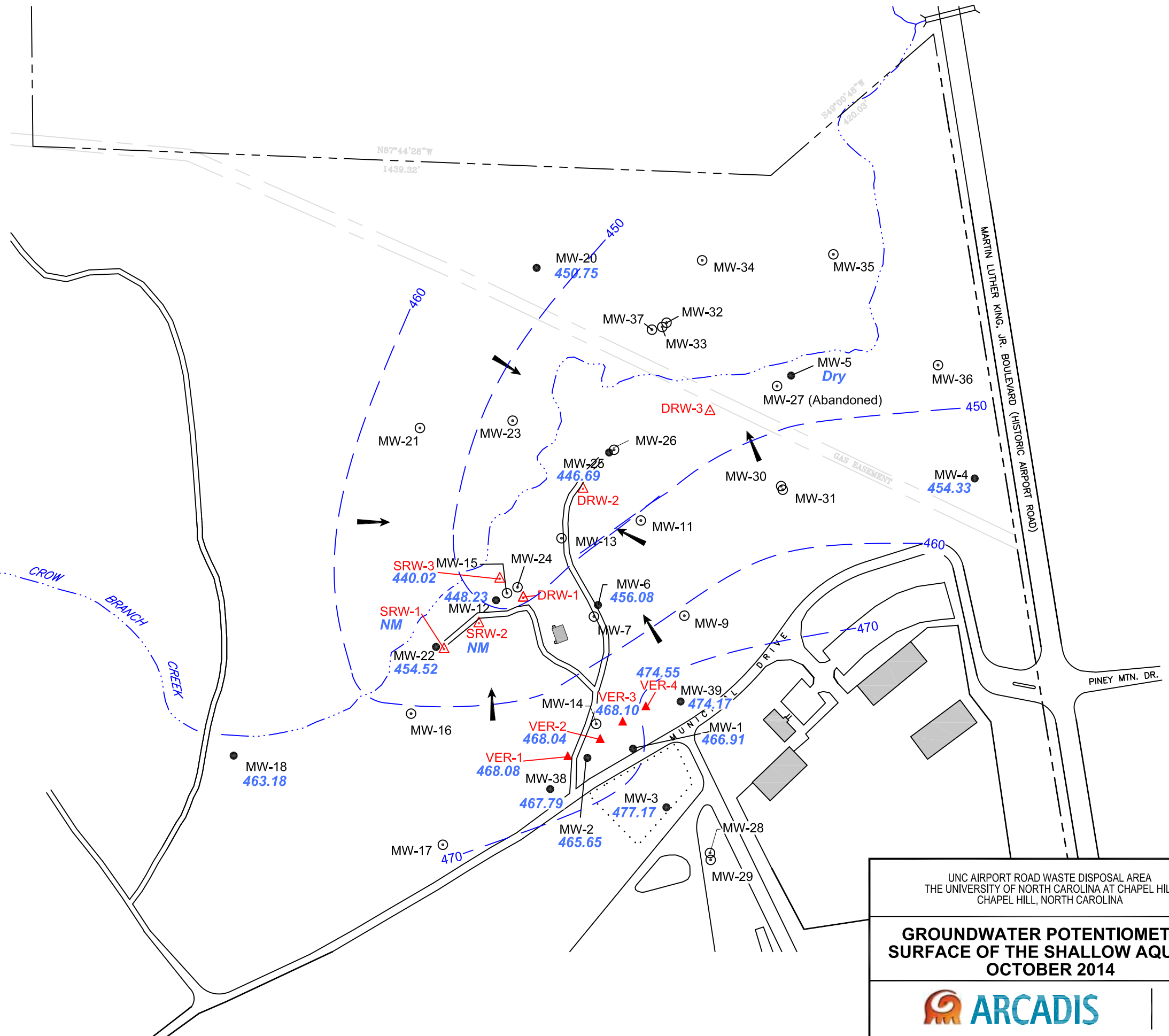
**LEGEND**

- BUILDING/STRUCTURE
- PROPERTY LINE
- FORMER BURIAL AREA
- SHALLOW MONITOR WELL
- DEEP MONITOR WELL
- RECOVERY WELL
- VACUUM ENHANCED RECOVERY TEST WELL
- SURFACE WATER LOCATION



**LEGEND**

-  BUILDING/STRUCTURE
-  PROPERTY LINE
-  FORMER BURIAL AREA
-  SHALLOW MONITOR WELL
-  DEEP MONITOR WELL
-  RECOVERY WELL
-  VACUUM ENHANCED RECOVERY WELL
-  SURFACE WATER LOCATION
- 452.14 WATER LEVEL ELEVATION (ft msl)
- 454 POTENTIOMETRIC CONTOUR
-  GROUNDWATER FLOW DIRECTION



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
CHAPEL HILL, NORTH CAROLINA

**GROUNDWATER POTENTIOMETRIC SURFACE OF THE SHALLOW AQUIFER  
OCTOBER 2014**


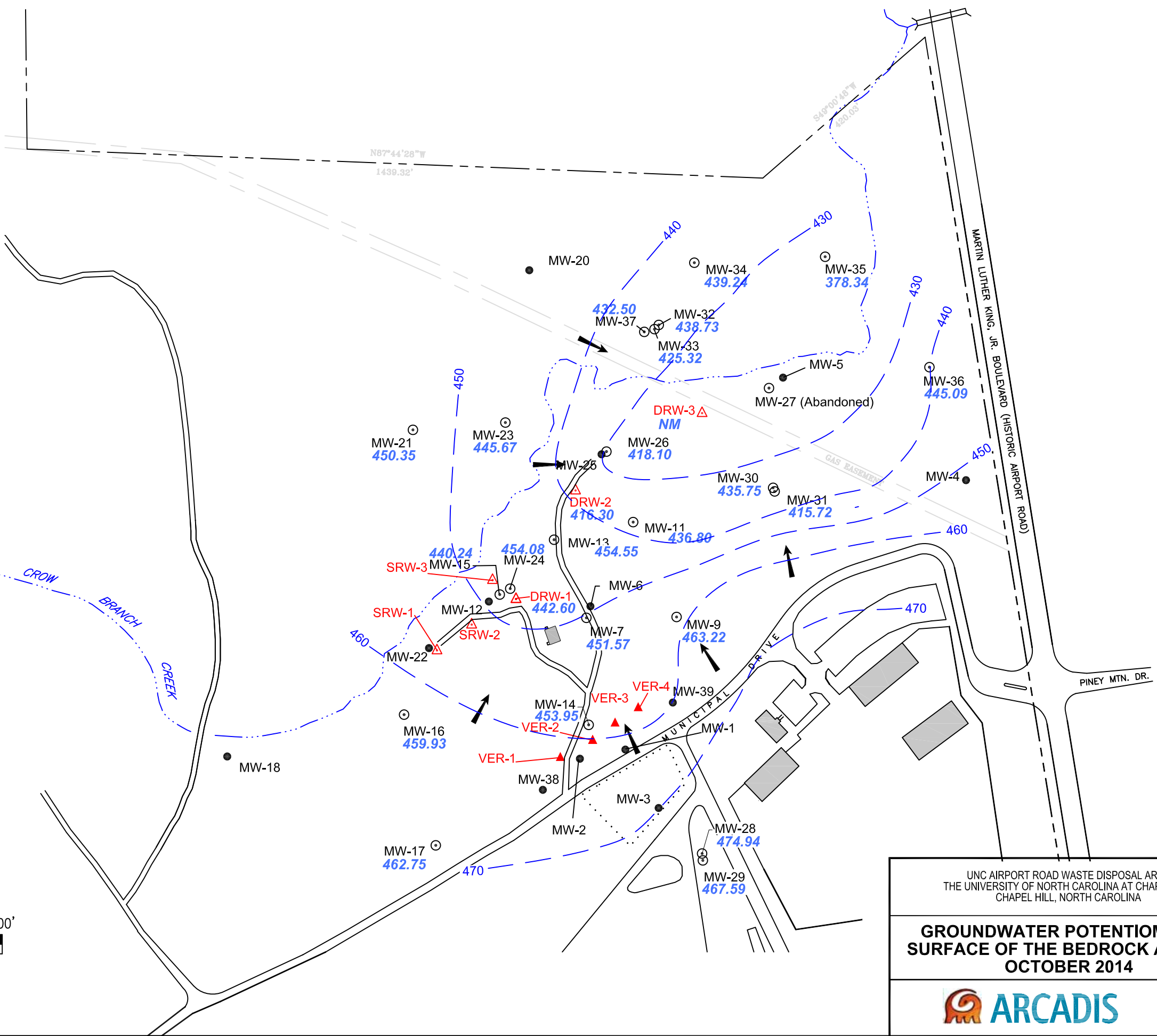


FIGURE **3**

**LEGEND**

- BUILDING/STRUCTURE
- PROPERTY LINE
- FORMER BURIAL AREA
- SHALLOW MONITOR WELL
- DEEP MONITOR WELL
- RECOVERY WELL
- VACUUM ENHANCED RECOVERY WELL
- SURFACE WATER LOCATION
- 452.14 WATER LEVEL ELEVATION (ft msl)
- 454 POTENTIOMETRIC CONTOUR
- GROUNDWATER FLOW DIRECTION



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
CHAPEL HILL, NORTH CAROLINA

**GROUNDWATER POTENTIOMETRIC  
SURFACE OF THE BEDROCK AQUIFER  
OCTOBER 2014**










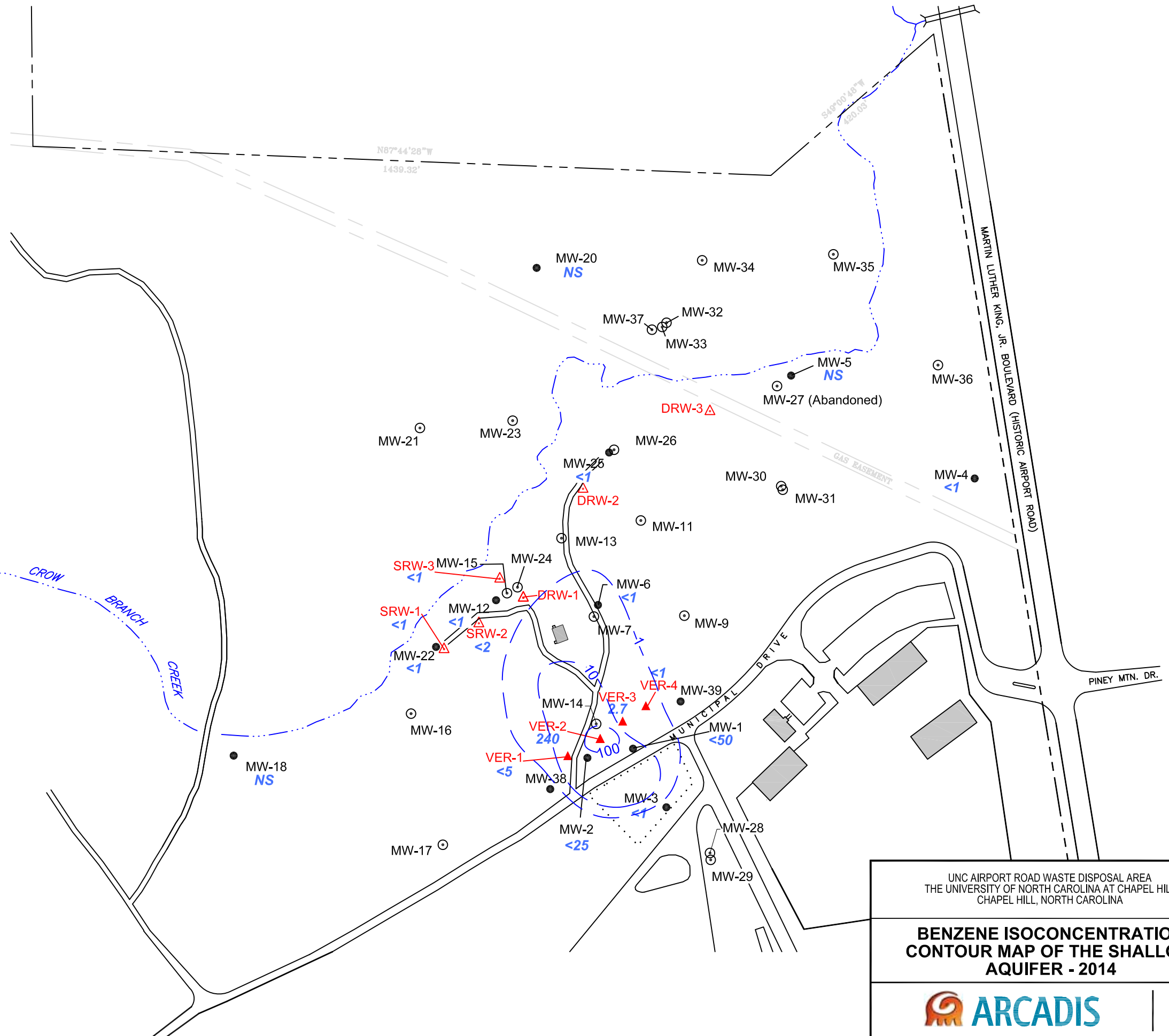


FIGURE  
**4**

**LEGEND**

-  BUILDING/STRUCTURE
-  PROPERTY LINE
-  FORMER BURIAL AREA
-  SHALLOW MONITOR WELL
-  DEEP MONITOR WELL
-  RECOVERY WELL
-  VACUUM ENHANCED RECOVERY WELL
-  SURFACE WATER LOCATION
- 920 BENZENE CONCENTRATION ( $\mu\text{g/L}$ )
- 100 — ISOCENTRATION CONTOUR ( $\mu\text{g/L}$ )
- NS NOT SAMPLED

NCAC 2L STANDARD FOR BENZENE IS  $1 \mu\text{g/L}$



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
 THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
 CHAPEL HILL, NORTH CAROLINA

**BENZENE ISOCONCENTRATION  
 CONTOUR MAP OF THE SHALLOW  
 AQUIFER - 2014**


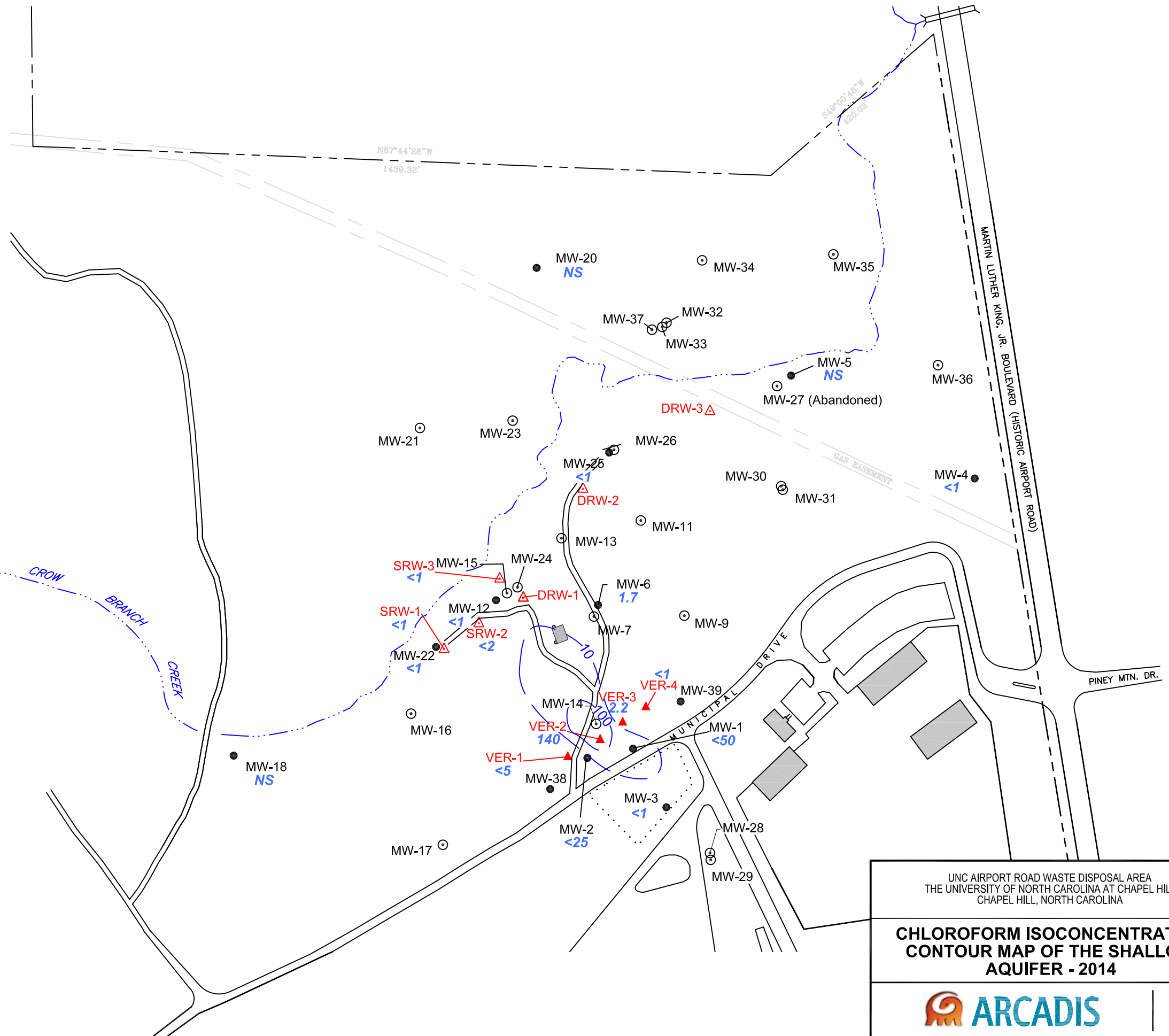
 **ARCADIS**

FIGURE **5**

**LEGEND**

- BUILDING/STRUCTURE
- PROPERTY LINE
- FORMER BURIAL AREA
- SHALLOW MONITOR WELL
- DEEP MONITOR WELL
- RECOVERY WELL
- VACUUM ENHANCED RECOVERY WELL
- SURFACE WATER LOCATION
- 920 CHLOROFORM CONCENTRATION ( $\mu\text{g/L}$ )
- 100 ISOCOCONCENTRATION CONTOUR ( $\mu\text{g/L}$ )
- NS NOT SAMPLED

NCAC 2L STANDARD FOR CHLOROFORM IS 70  $\mu\text{g/L}$











UNC AIRPORT ROAD WASTE DISPOSAL AREA  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
CHAPEL HILL, NORTH CAROLINA

**CHLOROFORM ISOCOCONCENTRATION  
CONTOUR MAP OF THE SHALLOW  
AQUIFER - 2014**

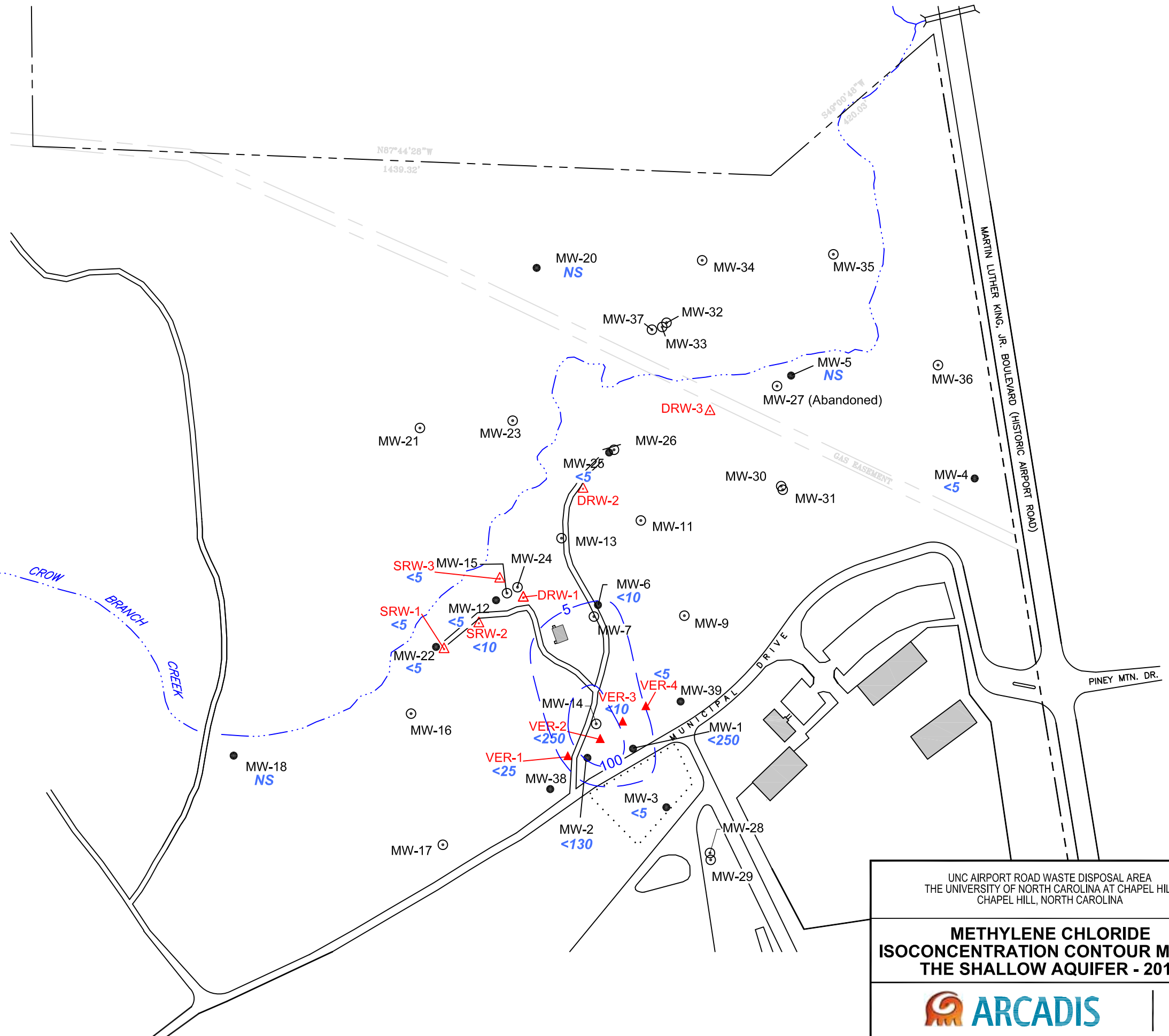
**ARCADIS**

FIGURE  
**6**

**LEGEND**

-  BUILDING/STRUCTURE
-  PROPERTY LINE
-  FORMER BURIAL AREA
-  SHALLOW MONITOR WELL
-  DEEP MONITOR WELL
-  RECOVERY WELL
-  VACUUM ENHANCED RECOVERY WELL
-  SURFACE WATER LOCATION
- 920 METHYLENE CHLORIDE CONCENTRATION ( $\mu\text{g/L}$ )
- 100 — ISOCENTRATION CONTOUR ( $\mu\text{g/L}$ )
- NS NOT SAMPLED

NCAC 2L STANDARD FOR METHYLENE CHLORIDE IS 5  $\mu\text{g/L}$



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
 THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
 CHAPEL HILL, NORTH CAROLINA

**METHYLENE CHLORIDE  
 ISOCONCENTRATION CONTOUR MAP OF  
 THE SHALLOW AQUIFER - 2014**










 **ARCADIS**

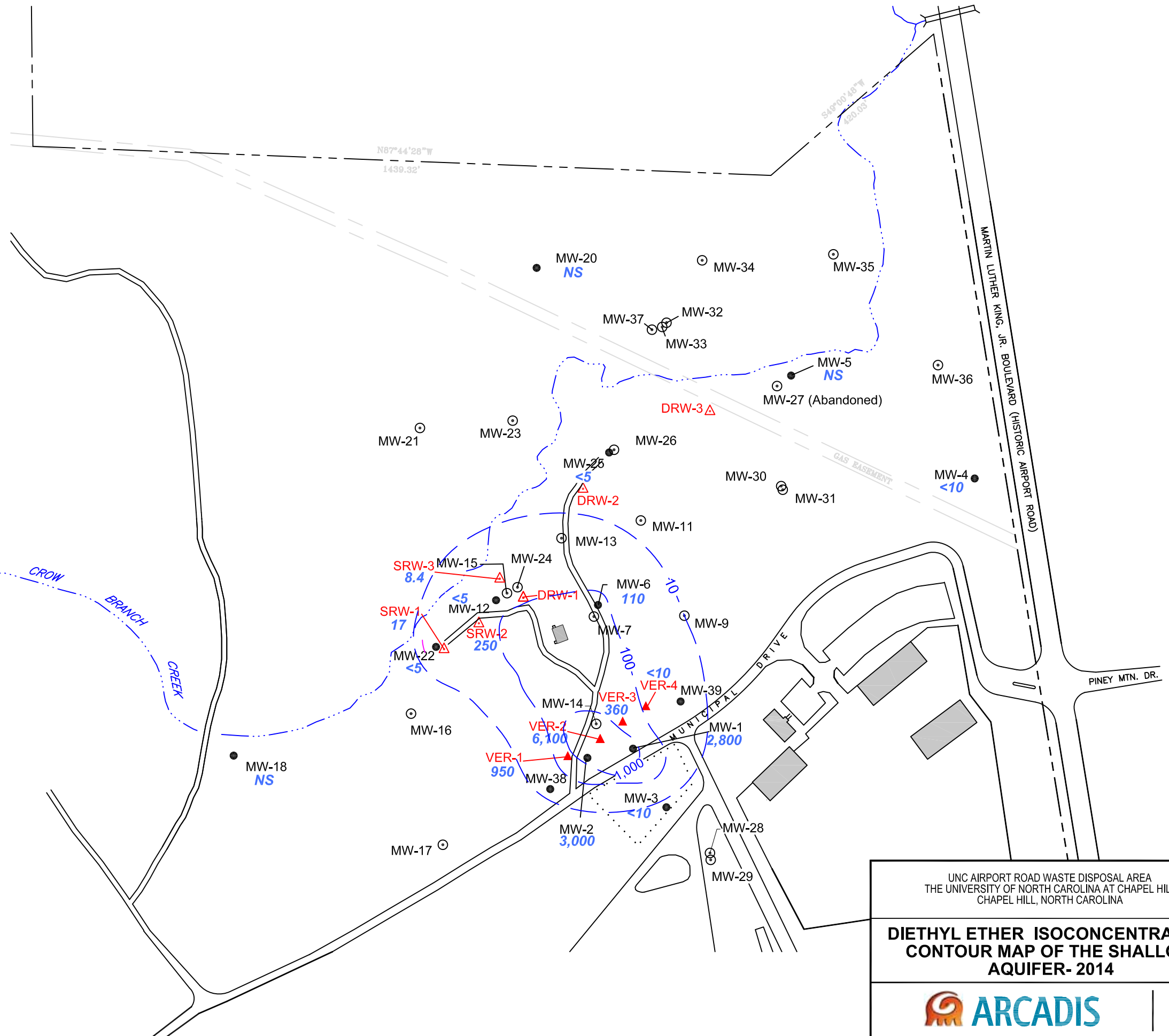
FIGURE  
**7**



**LEGEND**

-  BUILDING/STRUCTURE
-  PROPERTY LINE
-  FORMER BURIAL AREA
-  SHALLOW MONITOR WELL
-  DEEP MONITOR WELL
-  RECOVERY WELL
-  VACUUM ENHANCED RECOVERY WELL
-  SURFACE WATER LOCATION
- 920 DIETHYL ETHER CONCENTRATION ( $\mu\text{g/L}$ )
- 100 ISOCENTRATION CONTOUR ( $\mu\text{g/L}$ )
- NS NOT SAMPLED

USEPA RISK BASED TAP WATER CONCENTRATION FOR DIETHYL ETHER IS 3,100  $\mu\text{g/L}$



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
 THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
 CHAPEL HILL, NORTH CAROLINA

**DIETHYL ETHER ISOCONCENTRATION  
 CONTOUR MAP OF THE SHALLOW  
 AQUIFER- 2014**










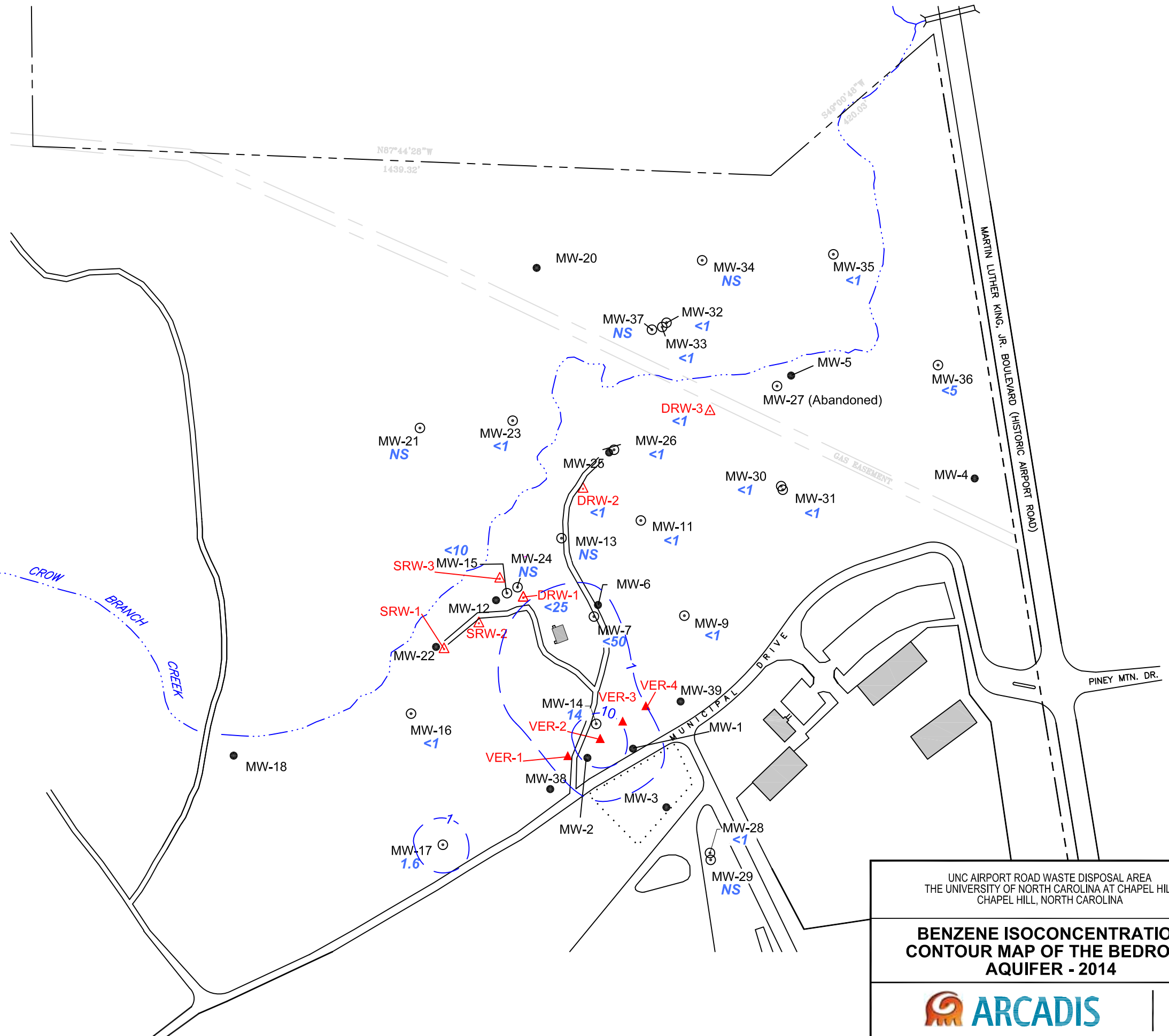
 **ARCADIS**

FIGURE **8**

**LEGEND**

-  BUILDING/STRUCTURE
-  PROPERTY LINE
-  FORMER BURIAL AREA
-  SHALLOW MONITOR WELL
-  DEEP MONITOR WELL
-  RECOVERY WELL
-  VACUUM ENHANCED RECOVERY WELL
-  SURFACE WATER LOCATION
- 920 BENZENE CONCENTRATION ( $\mu\text{g/L}$ )
- 100 — ISOCENTRATION CONTOUR ( $\mu\text{g/L}$ )
- NS NOT SAMPLED
- NCAC 2L STANDARD FOR BENZENE IS  $1 \mu\text{g/L}$



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
 THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
 CHAPEL HILL, NORTH CAROLINA

**BENZENE ISOCONCENTRATION  
 CONTOUR MAP OF THE BEDROCK  
 AQUIFER - 2014**










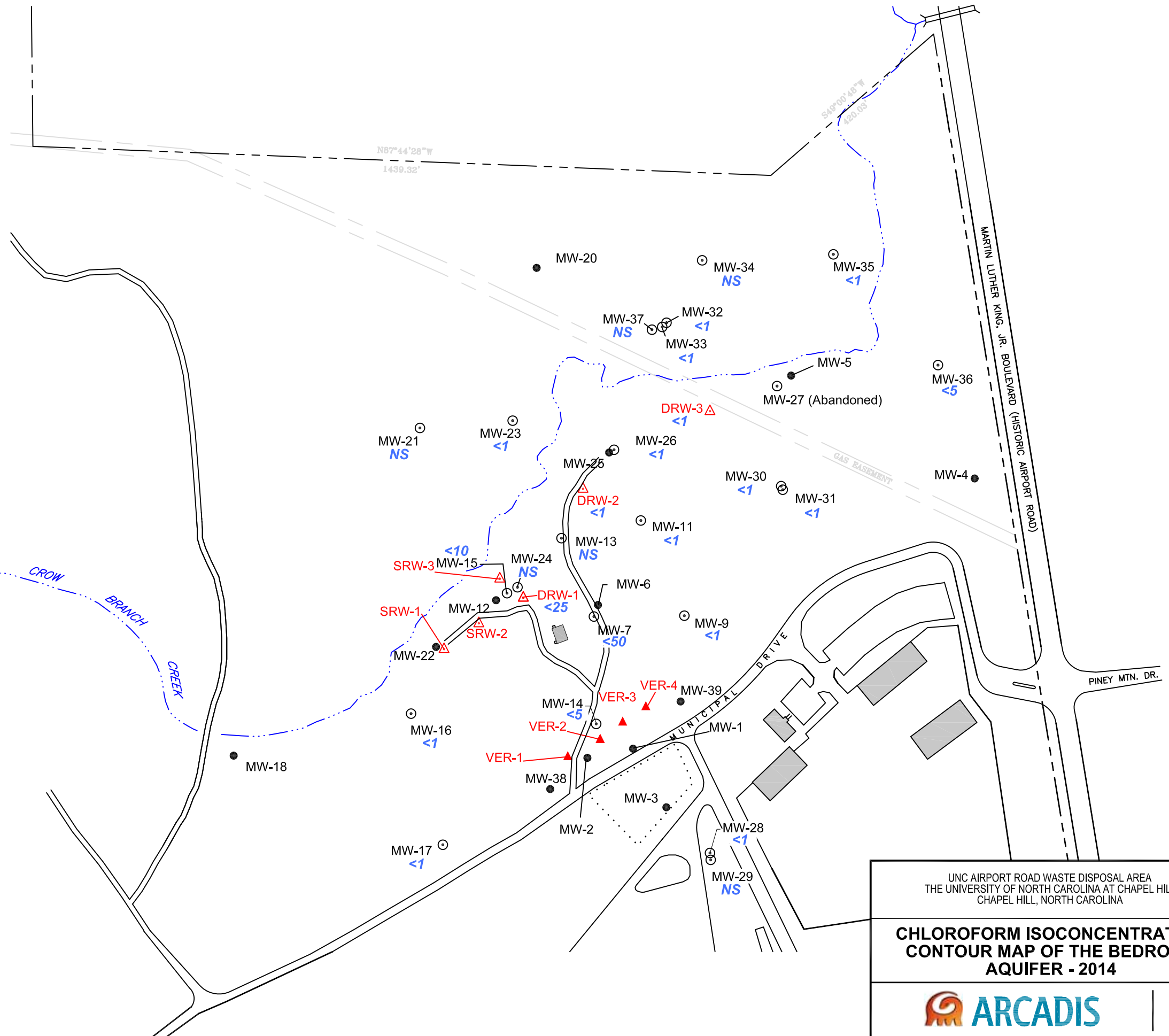
 **ARCADIS**

FIGURE **9**

**LEGEND**

-  BUILDING/STRUCTURE
-  PROPERTY LINE
-  FORMER BURIAL AREA
-  SHALLOW MONITOR WELL
-  DEEP MONITOR WELL
-  RECOVERY WELL
-  VACUUM ENHANCED RECOVERY WELL
-  SURFACE WATER LOCATION
- 920 CHLOROFORM CONCENTRATION ( $\mu\text{g/L}$ )
- 100 ISOCOCONCENTRATION CONTOUR ( $\mu\text{g/L}$ )
- NS NOT SAMPLED

NCAC 2L STANDARD FOR CHLOROFORM IS 70  $\mu\text{g/L}$



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
 THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
 CHAPEL HILL, NORTH CAROLINA

**CHLOROFORM ISOCONCENTRATION  
 CONTOUR MAP OF THE BEDROCK  
 AQUIFER - 2014**


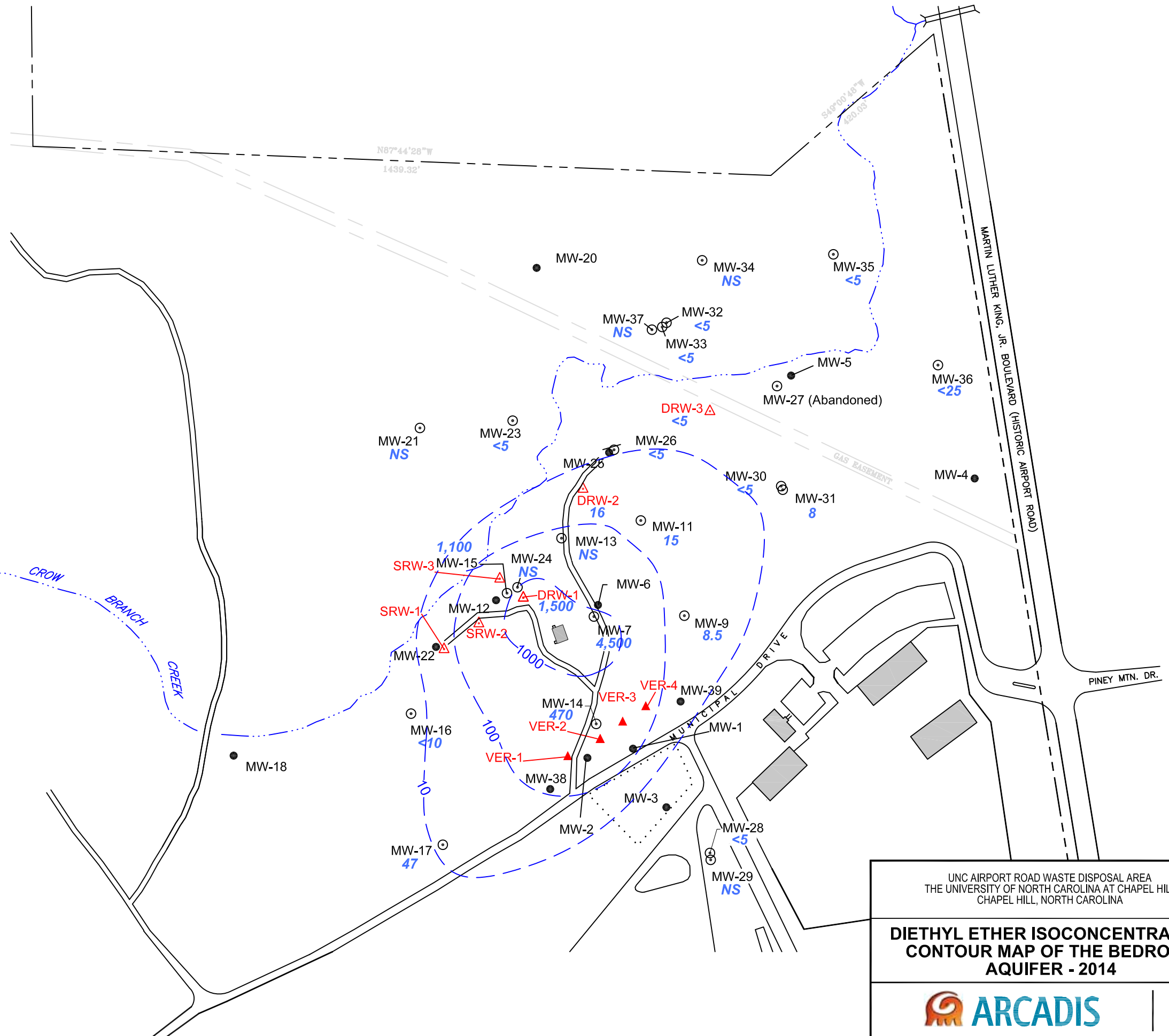
 **ARCADIS**

FIGURE **10**

**LEGEND**

- BUILDING/STRUCTURE
- PROPERTY LINE
- FORMER BURIAL AREA
- SHALLOW MONITOR WELL
- DEEP MONITOR WELL
- RECOVERY WELL
- VACUUM ENHANCED RECOVERY WELL
- SURFACE WATER LOCATION
- 920 DIETHYL ETHER CONCENTRATION ( $\mu\text{g/L}$ )
- 100 ISOCOCONCENTRATION CONTOUR ( $\mu\text{g/L}$ )
- NS NOT SAMPLED

USEPA RISK BASED TAP WATER CONCENTRATION FOR DIETHYL ETHER IS 3,100  $\mu\text{g/L}$



UNC AIRPORT ROAD WASTE DISPOSAL AREA  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
CHAPEL HILL, NORTH CAROLINA

**DIETHYL ETHER ISOCONCENTRATION  
CONTOUR MAP OF THE BEDROCK  
AQUIFER - 2014**

**ARCADIS**

FIGURE  
**11**



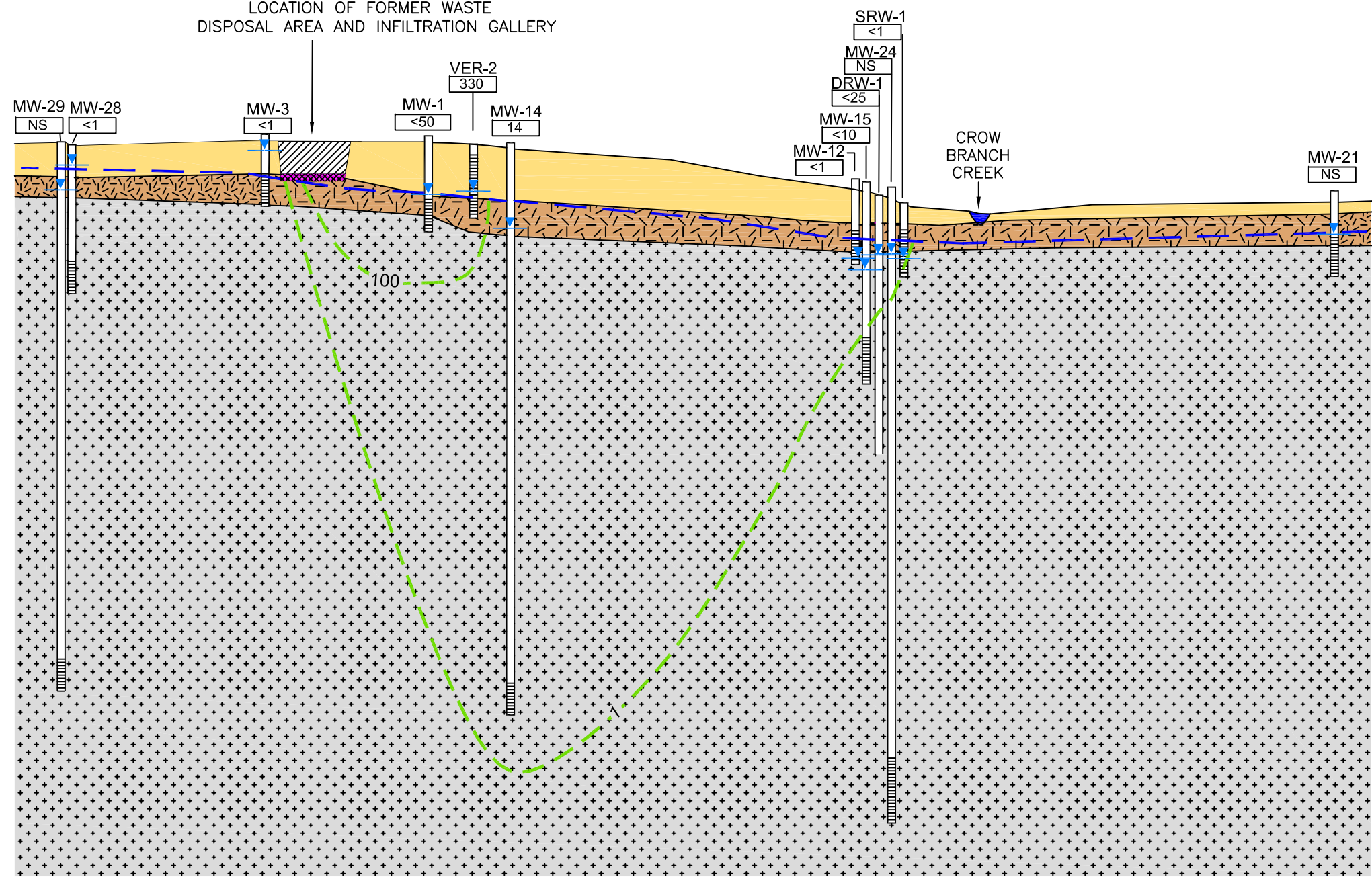
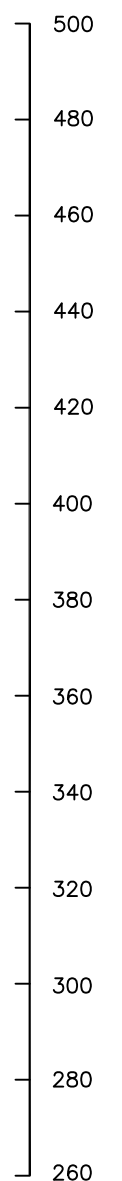
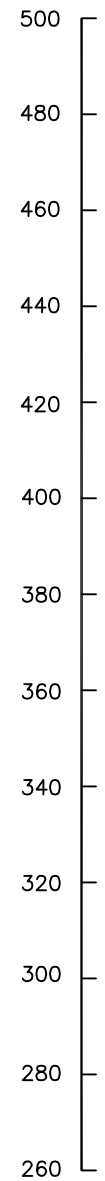
SOUTH

NORTH

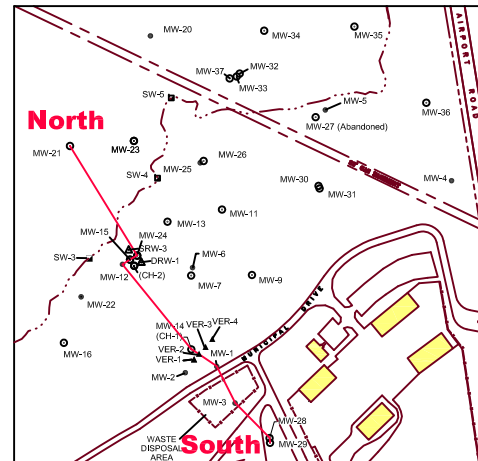
LOCATION OF FORMER WASTE DISPOSAL AREA AND INFILTRATION GALLERY

ELEVATION (FT.MSL)

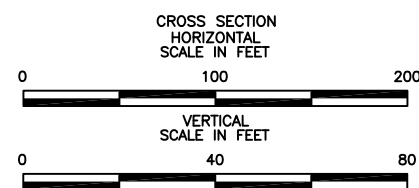
ELEVATION (FT.MSL)



**Cross Section Location**



Not to Scale



LEGEND

- SOIL: SILTY CLAY AND SANDY CLAY
- WEATHERED ROCK/ SAPROLITE
- COMPETENT ROCK (GRANODIORITE)
- BACKFILL
- INFILTRATION GALLERY
- WATER TABLE (SHALLOW AQUIFER)
- POTENTIOMETRIC SURFACE (BEDROCK AQUIFER)
- 190 BENZENE CONCENTRATION (µg/L)
- 100 BENZENE ISOCONCENTRATION (µg/L)
- SCREENED INTERVAL
- OPEN BOREHOLE

UNC AIRPORT ROAD WASTE DISPOSAL AREA  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
CHAPEL HILL, NORTH CAROLINA

**BENZENE ISOCONCENTRATION CROSS SECTION - 2014**

FIGURE  
**12**

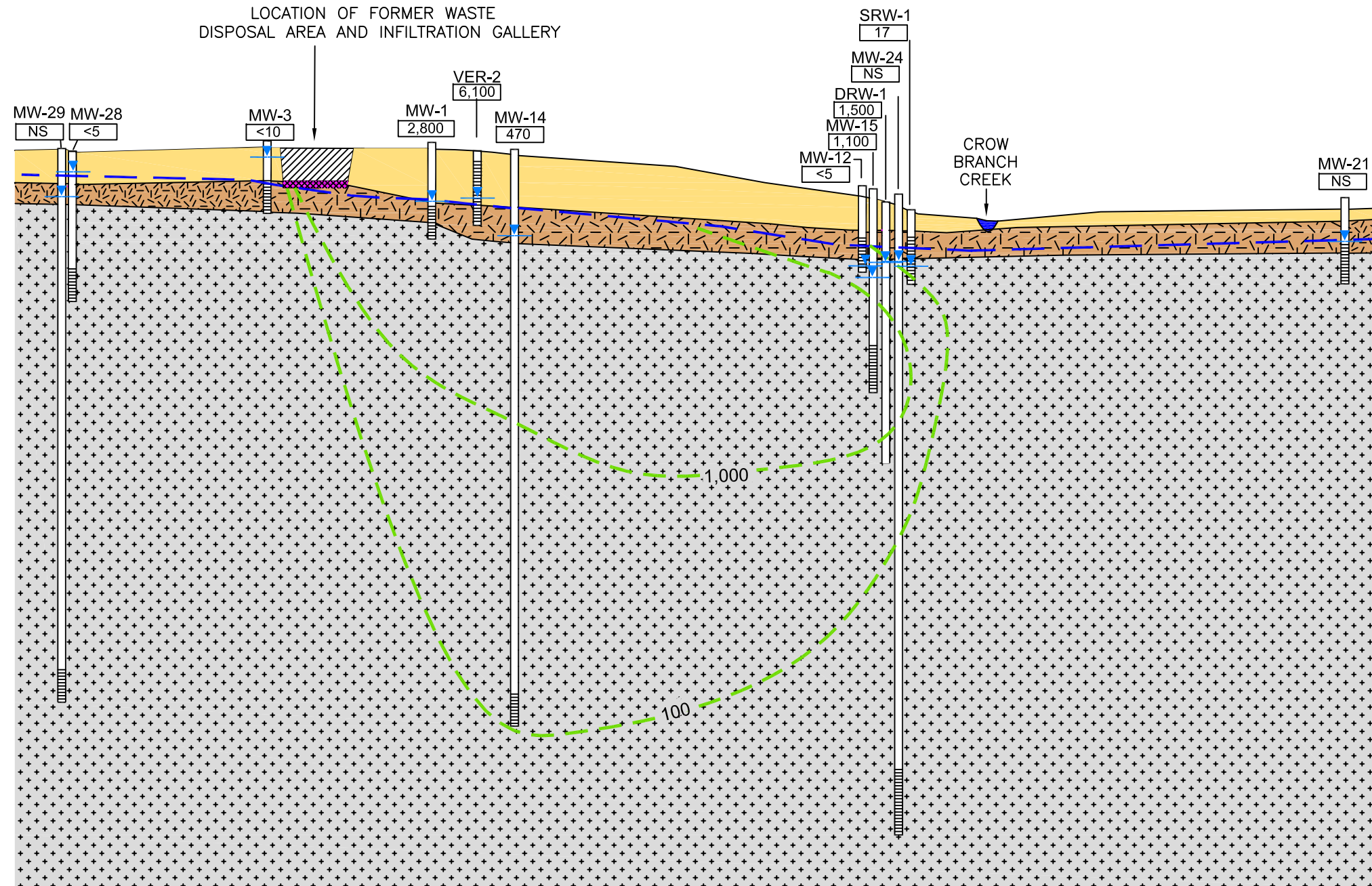
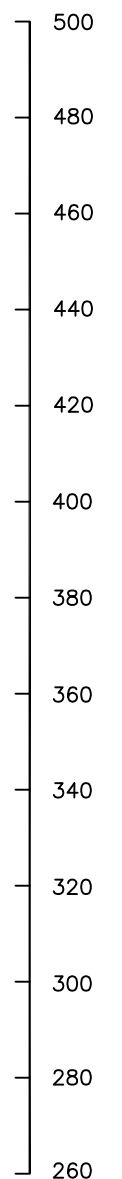
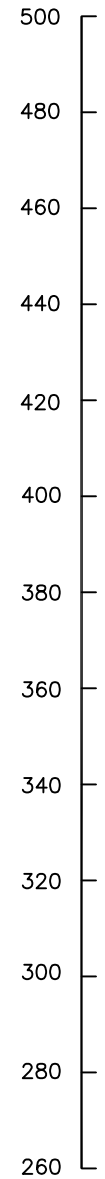
SOUTH

NORTH

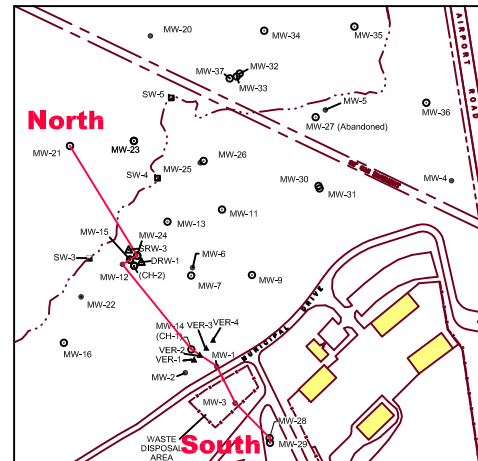
LOCATION OF FORMER WASTE DISPOSAL AREA AND INFILTRATION GALLERY

ELEVATION (FT.MSL)

ELEVATION (FT.MSL)



**Cross Section Location**

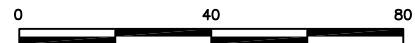


Not to Scale

CROSS SECTION HORIZONTAL SCALE IN FEET



VERTICAL SCALE IN FEET



LEGEND

- SOIL: SILTY CLAY AND SANDY CLAY
- BACKFILL
- 190 DIETHYL ETHER CONCENTRATION ( $\mu\text{g/L}$ )
- WEATHERED ROCK/SAPROLITE
- INFILTRATION GALLERY
- 100 DIETHYL ETHER ISCONCENTRATION ( $\mu\text{g/L}$ )
- COMPETENT ROCK (GRANODIORITE)
- WATER TABLE (SHALLOW AQUIFER)
- POTENTIOMETRIC SURFACE (BEDROCK AQUIFER)
- SCREENED INTERVAL
- OPEN BOREHOLE

UNC AIRPORT ROAD WASTE DISPOSAL AREA  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
CHAPEL HILL, NORTH CAROLINA

**DIETHYL ETHER ISCONCENTRATION  
CROSS SECTION - 2014**



ARCADIS

**Appendix A**

Discharge Monitoring Reports



Infrastructure · Water · Environment · Buildings

Mr. J. Laurence Daw  
Geophysicist/Licensed Geologist  
The University of North Carolina at Chapel Hill  
Department of Environment, Health & Safety  
1120 Estes Drive Extension  
Campus Box 1650  
Chapel Hill, NC 27599-1650

Subject:

Monthly Monitoring Report (January 2014 to March 2014)  
OWASA Permit Number 0010  
The University of North Carolina at Chapel Hill, Airport Road Waste Disposal Area,  
Chapel Hill, North Carolina

Dear Mr. Daw:

ARCADIS has prepared the January 2014 to March 2014 monitoring report for the Airport Road Waste Disposal Area located in Chapel Hill, North Carolina. This report is prepared in accordance with permit requirements for the discharge of treated groundwater at the above referenced site. As shown on the attached report (Table 1), the discharge did not exceed any maximum daily concentrations for the samples collected on January 10, 2014, February 7, 2014 or March 23, 2014.

The average daily flow rate was below the permitted average daily maximum during the period. Please feel free to contact me at (919) 854-1282 if you have any questions regarding this work.

Sincerely,

ARCADIS G&M of North Carolina, Inc.

A handwritten signature in black ink, appearing to read "J. Alan Pinnix".

J. Alan Pinnix, L.G.  
Principal Scientist

ARCADIS G&M of North Carolina,  
Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh,  
North Carolina 27607-5073  
Tel 919 854 1282  
Fax 919 854 5448  
[www.arcadis-us.com](http://www.arcadis-us.com)

ENVIRONMENTAL

Date:  
17 April 2014

Contact:  
Alan Pinnix

Phone:  
919 415 2300

E-mail:  
[alan.pinnix@arcadis-us.com](mailto:alan.pinnix@arcadis-us.com)



**Table 1. Groundwater Discharge Monitoring Report for January-March 2014**

The University of North Carolina at Chapel Hill  
 Department of Environment, Health & Safety  
 1120 Estes Drive Extension, CB #1650  
 Chapel Hill, North Carolina 27599-1650

OWASA Permit Number 0010

UNC Airport Road Waste Disposal Area  
 Chapel Hill, North Carolina

Discharge to Manhole # 47C4001

Parameter	Maximum Allowable Daily Value	Date		
		1/10/2014	2/7/2014	3/23/2014
Average Flow (gallons per day)	43,200	5,869*	13,247**	13,255***
Temperature (degrees Celsius)	NA	NM	NM	NM
pH (Standard Units)	NA	NM	NM	NM
Benzene (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
Chloroform (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane (micrograms per liter)	71	< 1.0	< 1.0	< 1.0
Methylene Chloride (micrograms per liter)	930	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane (micrograms per liter)	30	< 1.0	< 1.0	< 1.0
Arsenic (micrograms per liter)	16	< 20	< 20	< 20
Chromium (micrograms per liter)	50	< 10	< 10	< 10
Copper (micrograms per liter)	60	< 20	< 20	< 20
Lead (micrograms per liter)	49	< 10	< 10	< 10
Zinc (micrograms per liter)	535	< 20	< 20	< 20
Mercury (nanograms per liter)	50	< 0.50	1.2	0.52

NOTE : Discharge initiated on 10/05/2006

< 1.0 Not detected above reporting limit.

NA Not applicable to the permit conditions.

NM Not Measured

\* Flow reading based upon data collected between 12/21/2013 and 1/10/2014.

\*\* Flow reading based upon data collected between 1/11/2014 and 2/7/2014.

\*\*\* Flow reading based upon data collected between 2/8/2014 and 3/23/2014.

I hereby certify that I have examined and am familiar with the information submitted in this document and that the information is true, accurate and complete.

I am aware that there are significant penalties for submitting false information.

4/17/2014

Date



Signature of Official



Mr. J. Laurence Daw  
Geophysicist/Licensed Geologist  
The University of North Carolina at Chapel Hill  
Department of Environment, Health & Safety  
1120 Estes Drive Extension  
Campus Box 1650  
Chapel Hill, NC 27599-1650

Subject:  
Monthly Monitoring Report (April 2014 to June 2014)  
OWASA Permit Number 0010  
The University of North Carolina at Chapel Hill, Airport Road Waste Disposal Area,  
Chapel Hill, North Carolina

Dear Mr. Daw:

ARCADIS has prepared the April 2014 to June 2014 monitoring report for the Airport Road Waste Disposal Area located in Chapel Hill, North Carolina. This report is prepared in accordance with permit requirements for the discharge of treated groundwater at the above referenced site. As shown on the attached report (Table 1), the discharge did not exceed any maximum daily concentrations for the samples collected on April 24, 2014, May 22, 2014 or June 27, 2014.

The average daily flow rate was below the permitted average daily maximum during the period. Please feel free to contact me at (919) 854-1282 if you have any questions regarding this work.

Sincerely,

ARCADIS G&M of North Carolina, Inc.

J. Alan Pinnix, L.G.  
Principal Scientist

ARCADIS G&M of North Carolina,  
Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh,  
North Carolina 27607-5073  
Tel 919 854 1282  
Fax 919 854 5448  
[www.arcadis-us.com](http://www.arcadis-us.com)

ENVIRONMENTAL

Date:  
24 July 2014

Contact:  
Alan Pinnix

Phone:  
919 415 2300

E-mail:  
[alan.pinnix@arcadis-us.com](mailto:alan.pinnix@arcadis-us.com)

**Table 1. Groundwater Discharge Monitoring Report for April-June 2014**

The University of North Carolina at Chapel Hill  
 Department of Environment, Health & Safety  
 1120 Estes Drive Extension, CB #1650  
 Chapel Hill, North Carolina 27599-1650

OWASA Permit Number 0010

UNC Airport Road Waste Disposal Area  
 Chapel Hill, North Carolina

Discharge to Manhole # 47C4001

Parameter	Maximum Allowable Daily Value			
		4/24/2014	5/22/2014	6/27/2014
Date		4/24/2014	5/22/2014	6/27/2014
Average Flow (gallons per day)	43,200	14,264*	13,764**	12,768***
Temperature (degrees Celsius)	NA	NM	NM	NM
pH (Standard Units)	NA	NM	NM	NM
Benzene (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
Chloroform (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane (micrograms per liter)	71	< 1.0	< 1.0	< 1.0
Methylene Chloride (micrograms per liter)	930	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane (micrograms per liter)	30	< 1.0	< 1.0	< 1.0
Arsenic (micrograms per liter)	16	< 20	< 20	< 20
Chromium (micrograms per liter)	50	< 10	< 10	< 10
Copper (micrograms per liter)	60	< 20	< 20	< 20
Lead (micrograms per liter)	49	< 10	< 10	< 10
Zinc (micrograms per liter)	535	< 20	< 20	< 20
Mercury (nanograms per liter)	50	< 0.50	1.2	0.65

NOTE : Discharge initiated on 10/05/2006

< 1.0 Not detected above reporting limit.

NA Not applicable to the permit conditions.

NM Not Measured

\* Flow reading based upon data collected between 3/24/2013 and 4/24/2014.

\*\* Flow reading based upon data collected between 4/25/2014 and 5/22/2014.

\*\*\* Flow reading based upon data collected between 5/23/2014 and 6/27/2014.

I hereby certify that I have examined and am familiar with the information submitted in this document and that the information is true, accurate and complete.

I am aware that there are significant penalties for submitting false information.

6/24/2014

Date

  
 Signature of Official



Mr. J. Laurence Daw  
Geophysicist/Licensed Geologist  
The University of North Carolina at Chapel Hill  
Department of Environment, Health & Safety  
1120 Estes Drive Extension  
Campus Box 1650  
Chapel Hill, NC 27599-1650

Subject:

Monthly Monitoring Report (July 2014 to September 2014)  
OWASA Permit Number 0010  
The University of North Carolina at Chapel Hill, Airport Road Waste Disposal Area,  
Chapel Hill, North Carolina

Dear Mr. Daw:

ARCADIS has prepared the July 2014 to September 2014 monitoring report for the Airport Road Waste Disposal Area located in Chapel Hill, North Carolina. This report is prepared in accordance with permit requirements for the discharge of treated groundwater at the above referenced site. As shown on the attached report (Table 1), the discharge did not exceed any maximum daily concentrations for the samples collected on July 23, 2014, August 28, 2014 or September 25, 2014.

The average daily flow rate was below the permitted average daily maximum during the period. Please feel free to contact me at (919) 854-1282 if you have any questions regarding this work.

Sincerely,

ARCADIS G&M of North Carolina, Inc.

J. Alan Pinnix, L.G.  
Principal Scientist

ARCADIS G&M of North Carolina,  
Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh,  
North Carolina 27607-5073  
Tel 919 854 1282  
Fax 919 854 5448  
[www.arcadis-us.com](http://www.arcadis-us.com)

ENVIRONMENTAL

Date:  
October 30, 2014

Contact:  
Alan Pinnix

Phone:  
919 415 2300

E-mail:  
[alan.pinnix@arcadis-us.com](mailto:alan.pinnix@arcadis-us.com)

**Table 1. Groundwater Discharge Monitoring Report for July-September 2014**

The University of North Carolina at Chapel Hill  
 Department of Environment, Health & Safety  
 1120 Estes Drive Extension, CB #1650  
 Chapel Hill, North Carolina 27599-1650

OWASA Permit Number 0010

UNC Airport Road Waste Disposal Area  
 Chapel Hill, North Carolina

Discharge to Manhole # 47C4001

Parameter	Maximum Allowable Daily Value			
		7/23/2014	8/28/2014	9/25/2014
Date		7/23/2014	8/28/2014	9/25/2014
Average Flow (gallons per day)	43,200	10,103*	10,538**	11,580***
Temperature (degrees Celsius)	NA	NM	NM	NM
pH (Standard Units)	NA	NM	NM	NM
Benzene (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
Chloroform (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane (micrograms per liter)	71	< 1.0	< 1.0	< 1.0
Methylene Chloride (micrograms per liter)	930	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane (micrograms per liter)	30	< 1.0	< 1.0	< 1.0
Arsenic (micrograms per liter)	16	< 20	< 20	< 20
Chromium (micrograms per liter)	50	< 10	< 10	< 10
Copper (micrograms per liter)	60	< 20	< 20	20
Lead (micrograms per liter)	49	< 10	< 10	< 10
Zinc (micrograms per liter)	535	44	< 20	83
Mercury (nanograms per liter)	50	0.93	< 0.50	< 0.50

NOTE : Discharge initiated on 10/05/2006

< 1.0 Not detected above reporting limit.

NA Not applicable to the permit conditions.

NM Not Measured

\* Flow reading based upon data collected between 6/28/2014 and 7/23/2014.

\*\* Flow reading based upon data collected between 7/24/2014 and 8/28/2014.

\*\*\* Flow reading based upon data collected between 8/29/2014 and 9/25/2014.

I hereby certify that I have examined and am familiar with the information submitted in this document and that the information is true, accurate and complete.

I am aware that there are significant penalties for submitting false information.

10/30/2014  
 Date

  
 Signature of Official

Mr. J. Laurence Daw  
Geophysicist/Licensed Geologist  
The University of North Carolina at Chapel Hill  
Department of Environment, Health & Safety  
1120 Estes Drive Extension  
Campus Box 1650  
Chapel Hill, NC 27599-1650

Subject:

Monthly Monitoring Report (October 2014 to December 2014)  
OWASA Permit Number 0010  
The University of North Carolina at Chapel Hill, Airport Road Waste Disposal Area,  
Chapel Hill, North Carolina

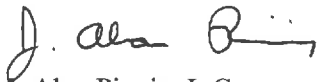
Dear Mr. Daw:

ARCADIS has prepared the October 2014 to December 2014 monitoring report for the Airport Road Waste Disposal Area located in Chapel Hill, North Carolina. This report is prepared in accordance with permit requirements for the discharge of treated groundwater at the above referenced site. As shown on the attached report (Table 1), the discharge did not exceed any maximum daily concentrations for the samples collected on October 17, 2014, November 24, 2014 or December 11, 2014.

The average daily flow rate was below the permitted average daily maximum during the period. Please feel free to contact me at (919) 854-1282 if you have any questions regarding this work.

Sincerely,

ARCADIS G&M of North Carolina, Inc.



J. Alan Pinnix, L.G.  
Principal Scientist

ARCADIS G&M of North Carolina,  
Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh,  
North Carolina 27607-5073  
Tel 919 854 1282  
Fax 919 854 5448  
[www.arcadis-us.com](http://www.arcadis-us.com)

ENVIRONMENTAL

Date:

January 14, 2015

Contact:

Alan Pinnix

Phone:

919 415 2300

E-mail:

[alan.pinnix@arcadis-us.com](mailto:alan.pinnix@arcadis-us.com)

**Table 1. Groundwater Discharge Monitoring Report for October-December 2014**

The University of North Carolina at Chapel Hill  
 Department of Environment, Health & Safety  
 1120 Estes Drive Extension, CB #1650  
 Chapel Hill, North Carolina 27599-1650

OWASA Permit Number 0010

UNC Airport Road Waste Disposal Area  
 Chapel Hill, North Carolina

Discharge to Manhole # 47C4001

Parameter	Maximum Allowable Daily Value	Date		
		10/17/2014	11/24/2014	12/11/2014
Average Flow (gallons per day)	43,200	10,893*	10,673**	10,692***
Temperature (degrees Celsius)	NA	NM	NM	NM
pH (Standard Units)	NA	NM	NM	NM
Benzene (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
Chloroform (micrograms per liter)	100	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane (micrograms per liter)	71	< 1.0	< 1.0	< 1.0
Methylene Chloride (micrograms per liter)	930	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane (micrograms per liter)	30	< 1.0	< 1.0	< 1.0
Arsenic (micrograms per liter)	16	< 20	< 20	< 20
Chromium (micrograms per liter)	50	< 10	< 10	< 10
Copper (micrograms per liter)	60	< 20	< 20	< 20
Lead (micrograms per liter)	49	< 10	< 10	< 10
Zinc (micrograms per liter)	535	< 20	22	100
Mercury (nanograms per liter)	50	< 0.50	0.99	0.75

NOTE : Discharge initiated on 10/05/2006

< 1.0 Not detected above reporting limit.

NA Not applicable to the permit conditions.

NM Not Measured

\* Flow reading based upon data collected between 9/26/2014 and 10/16/2014.

\*\* Flow reading based upon data collected between 10/17/2014 and 11/24/2014.

\*\*\* Flow reading based upon data collected between 11/25/2014 and 12/11/2014.

I hereby certify that I have examined and am familiar with the information submitted in this document and that the information is true, accurate and complete.

I am aware that there are significant penalties for submitting false information.

1/15/2015  
Date

  
Signature of Official

ARCADIS

**Appendix B**

Laboratory Analytical Data Reports  
for Groundwater Samples



# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-97743-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
1/20/2014 1:39:44 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

**Job ID: 680-97743-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-97743-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

### **RECEIPT**

The samples were received on 01/11/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.8 C.

### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Sample Effluent (680-97743-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 01/13/2014.

No difficulties were encountered during the volatiles analysis.

All quality control parameters were within the acceptance limits.

### **METALS (ICP)**

Sample Effluent (680-97743-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 01/13/2014 and analyzed on 01/14/2014.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-97743-1	Effluent	Water	01/10/14 10:45	01/11/14 08:57

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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- 12
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- 14

# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-97743-1**

No Detections.

- 1
- 2
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This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-97743-1**

**Date Collected: 01/10/14 10:45**

**Matrix: Water**

**Date Received: 01/11/14 08:57**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			01/13/14 20:25	1
Benzene	1.0	U	1.0		ug/L			01/13/14 20:25	1
Bromoform	1.0	U	1.0		ug/L			01/13/14 20:25	1
Bromomethane	5.0	U	5.0		ug/L			01/13/14 20:25	1
Carbon disulfide	2.0	U	2.0		ug/L			01/13/14 20:25	1
Carbon tetrachloride	1.0	U	1.0		ug/L			01/13/14 20:25	1
Chlorobenzene	1.0	U	1.0		ug/L			01/13/14 20:25	1
Chlorodibromomethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
Chloroethane	5.0	U	5.0		ug/L			01/13/14 20:25	1
Chloroform	1.0	U	1.0		ug/L			01/13/14 20:25	1
Chloromethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			01/13/14 20:25	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			01/13/14 20:25	1
Dichlorobromomethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			01/13/14 20:25	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			01/13/14 20:25	1
Diethyl ether	10	U	10		ug/L			01/13/14 20:25	1
Ethylbenzene	1.0	U	1.0		ug/L			01/13/14 20:25	1
2-Hexanone	10	U	10		ug/L			01/13/14 20:25	1
Methylene Chloride	5.0	U	5.0		ug/L			01/13/14 20:25	1
2-Butanone (MEK)	10	U	10		ug/L			01/13/14 20:25	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			01/13/14 20:25	1
Styrene	1.0	U	1.0		ug/L			01/13/14 20:25	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
Tetrachloroethene	1.0	U	1.0		ug/L			01/13/14 20:25	1
Toluene	1.0	U	1.0		ug/L			01/13/14 20:25	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			01/13/14 20:25	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			01/13/14 20:25	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			01/13/14 20:25	1
Trichloroethene	1.0	U	1.0		ug/L			01/13/14 20:25	1
Vinyl chloride	1.0	U	1.0		ug/L			01/13/14 20:25	1
Xylenes, Total	2.0	U	2.0		ug/L			01/13/14 20:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	91		70 - 130		01/13/14 20:25	1
Dibromofluoromethane	103		70 - 130		01/13/14 20:25	1
Toluene-d8 (Surr)	89		70 - 130		01/13/14 20:25	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		01/13/14 10:49	01/14/14 19:22	1
Chromium	10	U	10		ug/L		01/13/14 10:49	01/14/14 19:22	1
Copper	20	U	20		ug/L		01/13/14 10:49	01/14/14 19:22	1
Lead	10	U	10		ug/L		01/13/14 10:49	01/14/14 19:22	1
Zinc	20	U	20		ug/L		01/13/14 10:49	01/14/14 19:22	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (70-130)	DBFM (70-130)	TOL (70-130)
680-97743-1	Effluent	91	103	89
LCS 680-311201/5	Lab Control Sample	101	108	101
LCSD 680-311201/7	Lab Control Sample Dup	88	101	89
MB 680-311201/10	Method Blank	91	107	97

### Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-311201/10**

**Matrix: Water**

**Analysis Batch: 311201**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			01/13/14 14:00	1
Benzene	1.0	U	1.0		ug/L			01/13/14 14:00	1
Bromoform	1.0	U	1.0		ug/L			01/13/14 14:00	1
Bromomethane	5.0	U	5.0		ug/L			01/13/14 14:00	1
Carbon disulfide	2.0	U	2.0		ug/L			01/13/14 14:00	1
Carbon tetrachloride	1.0	U	1.0		ug/L			01/13/14 14:00	1
Chlorobenzene	1.0	U	1.0		ug/L			01/13/14 14:00	1
Chlorodibromomethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
Chloroethane	5.0	U	5.0		ug/L			01/13/14 14:00	1
Chloroform	1.0	U	1.0		ug/L			01/13/14 14:00	1
Chloromethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			01/13/14 14:00	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			01/13/14 14:00	1
Dichlorobromomethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			01/13/14 14:00	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			01/13/14 14:00	1
Diethyl ether	10	U	10		ug/L			01/13/14 14:00	1
Ethylbenzene	1.0	U	1.0		ug/L			01/13/14 14:00	1
2-Hexanone	10	U	10		ug/L			01/13/14 14:00	1
Methylene Chloride	5.0	U	5.0		ug/L			01/13/14 14:00	1
2-Butanone (MEK)	10	U	10		ug/L			01/13/14 14:00	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			01/13/14 14:00	1
Styrene	1.0	U	1.0		ug/L			01/13/14 14:00	1
1,1,1,2-Tetrachloroethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
Tetrachloroethene	1.0	U	1.0		ug/L			01/13/14 14:00	1
Toluene	1.0	U	1.0		ug/L			01/13/14 14:00	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			01/13/14 14:00	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			01/13/14 14:00	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			01/13/14 14:00	1
Trichloroethene	1.0	U	1.0		ug/L			01/13/14 14:00	1
Vinyl chloride	1.0	U	1.0		ug/L			01/13/14 14:00	1
Xylenes, Total	2.0	U	2.0		ug/L			01/13/14 14:00	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	91		70 - 130		01/13/14 14:00	1
Dibromofluoromethane	107		70 - 130		01/13/14 14:00	1
Toluene-d8 (Surr)	97		70 - 130		01/13/14 14:00	1

**Lab Sample ID: LCS 680-311201/5**

**Matrix: Water**

**Analysis Batch: 311201**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	100	60.5		ug/L		61	39 - 162
Benzene	50.0	49.2		ug/L		98	74 - 123

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-311201/5**

**Matrix: Water**

**Analysis Batch: 311201**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	50.0	59.2		ug/L		118	60 - 134
Bromomethane	50.0	40.4		ug/L		81	10 - 171
Carbon disulfide	50.0	57.2		ug/L		114	63 - 142
Carbon tetrachloride	50.0	49.8		ug/L		100	70 - 131
Chlorobenzene	50.0	51.1		ug/L		102	79 - 120
Chlorodibromomethane	50.0	54.3		ug/L		109	63 - 134
Chloroethane	50.0	54.2		ug/L		108	47 - 148
Chloroform	50.0	49.7		ug/L		99	76 - 128
Chloromethane	50.0	60.0		ug/L		120	47 - 151
cis-1,2-Dichloroethene	50.0	48.9		ug/L		98	78 - 127
cis-1,3-Dichloropropene	50.0	49.1		ug/L		98	73 - 128
Dichlorobromomethane	50.0	50.1		ug/L		100	72 - 129
1,1-Dichloroethane	50.0	48.0		ug/L		96	69 - 132
1,2-Dichloroethane	50.0	48.6		ug/L		97	75 - 120
1,1-Dichloroethene	50.0	51.1		ug/L		102	73 - 134
1,2-Dichloropropane	50.0	42.9		ug/L		86	71 - 126
Diethyl ether	50.0	39.6		ug/L		79	40 - 160
Ethylbenzene	50.0	51.2		ug/L		102	78 - 125
2-Hexanone	100	88.2		ug/L		88	52 - 149
Methylene Chloride	50.0	49.0		ug/L		98	79 - 124
2-Butanone (MEK)	100	81.8		ug/L		82	55 - 142
4-Methyl-2-pentanone (MIBK)	100	105		ug/L		105	51 - 143
Styrene	50.0	52.7		ug/L		105	75 - 129
1,1,1,2-Tetrachloroethane	50.0	53.1		ug/L		106	71 - 127
Tetrachloroethene	50.0	49.9		ug/L		100	77 - 128
Toluene	50.0	50.4		ug/L		101	77 - 125
trans-1,2-Dichloroethene	50.0	50.5		ug/L		101	78 - 130
trans-1,3-Dichloropropene	50.0	45.3		ug/L		91	72 - 127
1,1,1-Trichloroethane	50.0	49.5		ug/L		99	76 - 126
1,1,2-Trichloroethane	50.0	51.4		ug/L		103	69 - 127
Trichloroethene	50.0	50.5		ug/L		101	80 - 120
Vinyl chloride	50.0	60.6		ug/L		121	58 - 141
Xylenes, Total	150	155		ug/L		104	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	101		70 - 130
Dibromofluoromethane	108		70 - 130
Toluene-d8 (Surr)	101		70 - 130

**Lab Sample ID: LCSD 680-311201/7**

**Matrix: Water**

**Analysis Batch: 311201**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Acetone	100	57.9		ug/L		58	39 - 162	5	50
Benzene	50.0	41.8		ug/L		84	74 - 123	16	30
Bromoform	50.0	55.8		ug/L		112	60 - 134	6	30
Bromomethane	50.0	38.6		ug/L		77	10 - 171	4	50

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-311201/7

Matrix: Water

Analysis Batch: 311201

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon disulfide	50.0	51.9		ug/L		104	63 - 142	10	30
Carbon tetrachloride	50.0	42.1		ug/L		84	70 - 131	17	30
Chlorobenzene	50.0	46.7		ug/L		93	79 - 120	9	30
Chlorodibromomethane	50.0	53.1		ug/L		106	63 - 134	2	50
Chloroethane	50.0	51.4		ug/L		103	47 - 148	5	40
Chloroform	50.0	46.3		ug/L		93	76 - 128	7	30
Chloromethane	50.0	56.1		ug/L		112	47 - 151	7	30
cis-1,2-Dichloroethene	50.0	45.8		ug/L		92	78 - 127	6	30
cis-1,3-Dichloropropene	50.0	42.9		ug/L		86	73 - 128	13	30
Dichlorobromomethane	50.0	46.4		ug/L		93	72 - 129	8	30
1,1-Dichloroethane	50.0	44.2		ug/L		88	69 - 132	8	30
1,2-Dichloroethane	50.0	46.8		ug/L		94	75 - 120	4	30
1,1-Dichloroethene	50.0	46.9		ug/L		94	73 - 134	9	30
1,2-Dichloropropane	50.0	38.3		ug/L		77	71 - 126	12	30
Diethyl ether	50.0	39.7		ug/L		79	40 - 160	0	50
Ethylbenzene	50.0	45.5		ug/L		91	78 - 125	12	30
2-Hexanone	100	79.3		ug/L		79	52 - 149	11	30
Methylene Chloride	50.0	46.3		ug/L		93	79 - 124	6	30
2-Butanone (MEK)	100	77.4		ug/L		77	55 - 142	6	30
4-Methyl-2-pentanone (MIBK)	100	96.0		ug/L		96	51 - 143	9	30
Styrene	50.0	48.7		ug/L		97	75 - 129	8	30
1,1,2,2-Tetrachloroethane	50.0	48.4		ug/L		97	71 - 127	9	30
Tetrachloroethene	50.0	45.2		ug/L		90	77 - 128	10	30
Toluene	50.0	44.2		ug/L		88	77 - 125	13	30
trans-1,2-Dichloroethene	50.0	47.4		ug/L		95	78 - 130	6	30
trans-1,3-Dichloropropene	50.0	41.8		ug/L		84	72 - 127	8	50
1,1,1-Trichloroethane	50.0	42.2		ug/L		84	76 - 126	16	30
1,1,2-Trichloroethane	50.0	46.7		ug/L		93	69 - 127	10	30
Trichloroethene	50.0	43.3		ug/L		87	80 - 120	15	30
Vinyl chloride	50.0	54.4		ug/L		109	58 - 141	11	30
Xylenes, Total	150	137		ug/L		92	80 - 124	12	30

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	88		70 - 130
Dibromofluoromethane	101		70 - 130
Toluene-d8 (Surr)	89		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-311234/1-A

Matrix: Water

Analysis Batch: 311551

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 311234

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		01/13/14 10:49	01/14/14 18:32	1
Chromium	10	U	10		ug/L		01/13/14 10:49	01/14/14 18:32	1
Copper	20	U	20		ug/L		01/13/14 10:49	01/14/14 18:32	1
Lead	10	U	10		ug/L		01/13/14 10:49	01/14/14 18:32	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 680-311234/1-A  
Matrix: Water  
Analysis Batch: 311551

Client Sample ID: Method Blank  
Prep Type: Total Recoverable  
Prep Batch: 311234

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	20	U	20		ug/L		01/13/14 10:49	01/14/14 18:32	1

Lab Sample ID: LCS 680-311234/2-A  
Matrix: Water  
Analysis Batch: 311551

Client Sample ID: Lab Control Sample  
Prep Type: Total Recoverable  
Prep Batch: 311234

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	96.4		ug/L		96	75 - 125
Chromium	100	99.6		ug/L		100	75 - 125
Copper	100	99.3		ug/L		99	75 - 125
Lead	50.0	49.2		ug/L		98	75 - 125
Zinc	100	98.8		ug/L		99	75 - 125

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## GC/MS VOA

### Analysis Batch: 311201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-97743-1	Effluent	Total/NA	Water	8260B	
LCS 680-311201/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-311201/7	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-311201/10	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 311234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-97743-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-311234/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-311234/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 311551

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-97743-1	Effluent	Total Recoverable	Water	6010C	311234
LCS 680-311234/2-A	Lab Control Sample	Total Recoverable	Water	6010C	311234
MB 680-311234/1-A	Method Blank	Total Recoverable	Water	6010C	311234

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-97743-1**

**Date Collected: 01/10/14 10:45**

**Matrix: Water**

**Date Received: 01/11/14 08:57**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	311201	01/13/14 20:25	JD1	TAL SAV
Total Recoverable	Prep	3005A			311234	01/13/14 10:49	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	311551	01/14/14 19:22	BCB	TAL SAV

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-97743-1

**Login Number: 97743**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Banda, Christy S**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-97743-1

## Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISO/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-14
Arkansas DEQ	State Program	6	88-0692	02-01-14 *
California	NELAP	9	3217CA	07-31-14
Colorado	State Program	8	N/A	12-31-14
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-14
GA Dept. of Agriculture	State Program	4	N/A	06-30-14
Georgia	State Program	4	N/A	06-30-14
Georgia	State Program	4	803	06-30-14
Guam	State Program	9	09-005r	04-17-14
Hawaii	State Program	9	N/A	06-30-14
Illinois	NELAP	5	200022	11-30-14
Indiana	State Program	5	N/A	06-30-14
Iowa	State Program	7	353	07-01-15
Kentucky (DW)	State Program	4	90084	12-31-14
Kentucky (UST)	State Program	4	18	06-30-14
Louisiana	NELAP	6	LA100015	12-31-14
Maine	State Program	1	GA00006	08-16-14
Maryland	State Program	3	250	12-31-14
Massachusetts	State Program	1	M-GA006	06-30-14
Michigan	State Program	5	9925	06-30-14
Mississippi	State Program	4	N/A	06-30-14
Montana	State Program	8	CERT0081	01-01-15
Nebraska	State Program	7	TestAmerica-Savannah	06-30-14
New Jersey	NELAP	2	GA769	06-30-14
New Mexico	State Program	6	N/A	06-30-14
New York	NELAP	2	10842	03-31-14
North Carolina DENR	State Program	4	269	12-31-14
North Carolina DHHS	State Program	4	13701	07-31-14
Oklahoma	State Program	6	9984	08-31-14
Pennsylvania	NELAP	3	68-00474	06-30-14
Puerto Rico	State Program	2	GA00006	01-01-14 *
South Carolina	State Program	4	98001	06-30-14
Tennessee	State Program	4	TN02961	06-30-14
Texas	NELAP	6	T104704185-08-TX	11-30-14
USDA	Federal		SAV 3-04	04-07-14
Virginia	NELAP	3	460161	06-14-14
Washington	State Program	10	C1794	06-10-14
West Virginia DEP	State Program	3	94	06-30-14
West Virginia DHHR	State Program	3	9950C	12-31-13 *
Wisconsin	State Program	5	999819810	08-31-14
Wyoming	State Program	8	8TMS-L	06-30-14

\* Expired certification is currently pending renewal and is considered valid.

TestAmerica Savannah

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-85251-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
1/16/2014 9:21:31 AM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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results through  
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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

---

**Job ID: 400-85251-1**

---

**Laboratory: TestAmerica Pensacola**

---

**Narrative**

**Job Narrative**  
**400-85251-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 1/11/2014 11:31 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.8° C.

**Metals**

Method 1631E: The following samples were diluted to bring the concentration of target analytes within the calibration range: (400-85347-1 MS), (400-85347-1 MSD), 001 Outfall Composite (400-85347-1). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

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# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-85251-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-85251-1	EFFLUENT	Water	01/10/14 10:45	01/11/14 11:31

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-85251-1**

**Date Collected: 01/10/14 10:45**

**Matrix: Water**

**Date Received: 01/11/14 11:31**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		01/13/14 12:15	01/15/14 10:53	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

## Metals

### Prep Batch: 204545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-85251-1	EFFLUENT	Total/NA	Water	1631E	
400-85347-A-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-85347-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-204545/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-204545/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-204545/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 204634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-85251-1	EFFLUENT	Total/NA	Water	1631E	204545
400-85347-A-1-B MS	Matrix Spike	Total/NA	Water	1631E	204545
400-85347-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	204545
LCS 400-204545/2-A	Lab Control Sample	Total/NA	Water	1631E	204545
LCSD 400-204545/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	204545
MB 400-204545/1-A	Method Blank	Total/NA	Water	1631E	204545

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-204545/1-A**  
**Matrix: Water**  
**Analysis Batch: 204634**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 204545**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		01/14/14 16:30	01/15/14 08:37	1

**Lab Sample ID: LCS 400-204545/2-A**  
**Matrix: Water**  
**Analysis Batch: 204634**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 204545**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.49		ng/L		90	79 - 121

**Lab Sample ID: LCSD 400-204545/3-A**  
**Matrix: Water**  
**Analysis Batch: 204634**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 204545**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.49		ng/L		90	79 - 121	0	20

**Lab Sample ID: 400-85347-A-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 204634**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 204545**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2200		1000	3220		ng/L		106	71 - 125

**Lab Sample ID: 400-85347-A-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 204634**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 204545**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	2200		1000	3160		ng/L		100	71 - 125	2	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-85251-1**

**Date Collected: 01/10/14 10:45**

**Matrix: Water**

**Date Received: 01/11/14 11:31**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			204545	01/13/14 12:15	VLC	TAL PEN
Total/NA	Analysis	1631E		1	204634	01/15/14 10:53	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-14
Arkansas DEQ	State Program	6	88-0689	09-01-14
Florida	NELAP	4	E81010	06-30-14
Georgia	State Program	4	N/A	06-30-14
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14
Louisiana	NELAP	6	30976	06-30-14
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-14
Michigan	State Program	5	9912	05-04-14
New Jersey	NELAP	2	FL006	06-30-14
North Carolina DENR	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14
Pennsylvania	NELAP	3	68-00467	01-31-14
Rhode Island	State Program	1	LAO00307	12-31-13 *
South Carolina	State Program	4	96026	06-30-13 *
Tennessee	State Program	4	TN02907	06-30-14
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-14
West Virginia DEP	State Program	3	136	06-30-14

\* Expired certification is currently pending renewal and is considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-85251-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





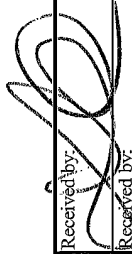
**Pensacola**  
3355 McLemore Drive

Pensacola, FL 32514  
phone 850.474.1001 fax 850.474.4789

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

**Chain of Custody Record**

<b>Client Contact</b> ARCADIS 801 Corporate Center Drive, Suite 300 Raleigh, NC 27607 919-854-1282 919-854-5448 Project Name: UNC - Airport Road Site: Chapel Hill, NC P O # NC000239.0019.0001B		<b>Project Manager:</b> Alan Pinnix <b>Tel/Fax:</b> 919-854-1282 <b>Analysis Turnaround Time</b> Calendar (C) or Work Days (W) TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		<b>Site Contact:</b> Alan Pinnix <b>Lab Contact:</b> Marty Edwards <b>Date:</b> 1/10/14 <b>Carrier:</b> Fed Ex		<b>COC No.:</b> 1 of 1 COCs <b>Job No.:</b> <b>SDG No.:</b> <b>Sample Specific Notes:</b>	
<b>Sample Identification</b> Effluent		<b>Sample Date:</b> 1/10/2014 <b>Sample Time:</b> 1045 <b>Sample Type:</b> Grab <b>Matrix:</b> W <b># of Cont.:</b> 3		<b>Filtered Sample:</b> Mercury, low level (Method 1631E)		 400-85251 COC	
<b>Preservation Used:</b> 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other		<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		<b>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</b>	
<b>Relinquished by:</b> 		<b>Company:</b> ARCADIS <b>Date/Time:</b> 1-10-14/1700		<b>Received by:</b> 		<b>Company:</b> HALEN <b>Date/Time:</b> FHY 1131	
<b>Relinquished by:</b>		<b>Company:</b>		<b>Received by:</b>		<b>Company:</b>	
<b>Relinquished by:</b>		<b>Company:</b>		<b>Received by:</b>		<b>Company:</b>	

4-80 CIP-5



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-85251-1

**Login Number: 85251**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Crawford, Lauren E**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.8°C IR-5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-98451-1  
Client Project/Site: UNC Airport Road - Chapel Hill, NC

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
2/19/2014 4:49:20 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

**Job ID: 680-98451-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road - Chapel Hill, NC**

**Report Number: 680-98451-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 02/08/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.8 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample Effluent (680-98451-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 02/18/2014.

No difficulties were encountered during the volatiles analysis.

All quality control parameters were within the acceptance limits.

### METALS (ICP)

Sample Effluent (680-98451-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 02/10/2014 and analyzed on 02/11/2014.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-98451-1	Effluent	Water	02/07/14 11:40	02/08/14 10:21

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



## Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

### Qualifiers

#### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

#### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-98451-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diethyl ether	35		10		ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

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- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

# Client Sample Results

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-98451-1**

**Date Collected: 02/07/14 11:40**

**Matrix: Water**

**Date Received: 02/08/14 10:21**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			02/18/14 17:30	1
Benzene	1.0	U	1.0		ug/L			02/18/14 17:30	1
Bromoform	1.0	U	1.0		ug/L			02/18/14 17:30	1
Bromomethane	5.0	U	5.0		ug/L			02/18/14 17:30	1
Carbon disulfide	2.0	U	2.0		ug/L			02/18/14 17:30	1
Carbon tetrachloride	1.0	U	1.0		ug/L			02/18/14 17:30	1
Chlorobenzene	1.0	U	1.0		ug/L			02/18/14 17:30	1
Chlorodibromomethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
Chloroethane	5.0	U	5.0		ug/L			02/18/14 17:30	1
Chloroform	1.0	U	1.0		ug/L			02/18/14 17:30	1
Chloromethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			02/18/14 17:30	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			02/18/14 17:30	1
Dichlorobromomethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			02/18/14 17:30	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			02/18/14 17:30	1
<b>Diethyl ether</b>	<b>35</b>		10		ug/L			02/18/14 17:30	1
Ethylbenzene	1.0	U	1.0		ug/L			02/18/14 17:30	1
2-Hexanone	10	U	10		ug/L			02/18/14 17:30	1
Methylene Chloride	5.0	U	5.0		ug/L			02/18/14 17:30	1
2-Butanone (MEK)	10	U	10		ug/L			02/18/14 17:30	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			02/18/14 17:30	1
Styrene	1.0	U	1.0		ug/L			02/18/14 17:30	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
Tetrachloroethene	1.0	U	1.0		ug/L			02/18/14 17:30	1
Toluene	1.0	U	1.0		ug/L			02/18/14 17:30	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			02/18/14 17:30	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			02/18/14 17:30	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			02/18/14 17:30	1
Trichloroethene	1.0	U	1.0		ug/L			02/18/14 17:30	1
Vinyl chloride	1.0	U	1.0		ug/L			02/18/14 17:30	1
Xylenes, Total	2.0	U	2.0		ug/L			02/18/14 17:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	106		70 - 130		02/18/14 17:30	1
Dibromofluoromethane	115		70 - 130		02/18/14 17:30	1
Toluene-d8 (Surr)	112		70 - 130		02/18/14 17:30	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		02/10/14 09:44	02/11/14 17:07	1
Chromium	10	U	10		ug/L		02/10/14 09:44	02/11/14 17:07	1
Copper	20	U	20		ug/L		02/10/14 09:44	02/11/14 17:07	1
Lead	10	U	10		ug/L		02/10/14 09:44	02/11/14 17:07	1
Zinc	20	U	20		ug/L		02/10/14 09:44	02/11/14 17:07	1

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# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (70-130)	DBFM (70-130)	TOL (70-130)
680-98451-1	Effluent	106	115	112
LCS 680-316011/4	Lab Control Sample	103	114	110
LCSD 680-316011/5	Lab Control Sample Dup	106	110	110
MB 680-316011/8	Method Blank	106	116	111

### Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-316011/8**

**Matrix: Water**

**Analysis Batch: 316011**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			02/18/14 12:32	1
Benzene	1.0	U	1.0		ug/L			02/18/14 12:32	1
Bromoform	1.0	U	1.0		ug/L			02/18/14 12:32	1
Bromomethane	5.0	U	5.0		ug/L			02/18/14 12:32	1
Carbon disulfide	2.0	U	2.0		ug/L			02/18/14 12:32	1
Carbon tetrachloride	1.0	U	1.0		ug/L			02/18/14 12:32	1
Chlorobenzene	1.0	U	1.0		ug/L			02/18/14 12:32	1
Chlorodibromomethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
Chloroethane	5.0	U	5.0		ug/L			02/18/14 12:32	1
Chloroform	1.0	U	1.0		ug/L			02/18/14 12:32	1
Chloromethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			02/18/14 12:32	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			02/18/14 12:32	1
Dichlorobromomethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			02/18/14 12:32	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			02/18/14 12:32	1
Diethyl ether	10	U	10		ug/L			02/18/14 12:32	1
Ethylbenzene	1.0	U	1.0		ug/L			02/18/14 12:32	1
2-Hexanone	10	U	10		ug/L			02/18/14 12:32	1
Methylene Chloride	5.0	U	5.0		ug/L			02/18/14 12:32	1
2-Butanone (MEK)	10	U	10		ug/L			02/18/14 12:32	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			02/18/14 12:32	1
Styrene	1.0	U	1.0		ug/L			02/18/14 12:32	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
Tetrachloroethene	1.0	U	1.0		ug/L			02/18/14 12:32	1
Toluene	1.0	U	1.0		ug/L			02/18/14 12:32	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			02/18/14 12:32	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			02/18/14 12:32	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			02/18/14 12:32	1
Trichloroethene	1.0	U	1.0		ug/L			02/18/14 12:32	1
Vinyl chloride	1.0	U	1.0		ug/L			02/18/14 12:32	1
Xylenes, Total	2.0	U	2.0		ug/L			02/18/14 12:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	106		70 - 130		02/18/14 12:32	1
Dibromofluoromethane	116		70 - 130		02/18/14 12:32	1
Toluene-d8 (Surr)	111		70 - 130		02/18/14 12:32	1

**Lab Sample ID: LCS 680-316011/4**

**Matrix: Water**

**Analysis Batch: 316011**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	100	101		ug/L		101	39 - 162
Benzene	50.0	53.4		ug/L		107	74 - 123

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# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-316011/4**

**Matrix: Water**

**Analysis Batch: 316011**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	50.0	61.8		ug/L		124	60 - 134
Bromomethane	50.0	40.9		ug/L		82	10 - 171
Carbon disulfide	50.0	47.5		ug/L		95	63 - 142
Carbon tetrachloride	50.0	62.6		ug/L		125	70 - 131
Chlorobenzene	50.0	53.7		ug/L		107	79 - 120
Chlorodibromomethane	50.0	59.1		ug/L		118	63 - 134
Chloroethane	50.0	47.5		ug/L		95	47 - 148
Chloroform	50.0	53.6		ug/L		107	76 - 128
Chloromethane	50.0	55.7		ug/L		111	47 - 151
cis-1,2-Dichloroethene	50.0	54.1		ug/L		108	78 - 127
cis-1,3-Dichloropropene	50.0	46.1		ug/L		92	73 - 128
Dichlorobromomethane	50.0	48.7		ug/L		97	72 - 129
1,1-Dichloroethane	50.0	54.1		ug/L		108	69 - 132
1,2-Dichloroethane	50.0	51.6		ug/L		103	75 - 120
1,1-Dichloroethene	50.0	49.1		ug/L		98	73 - 134
1,2-Dichloropropane	50.0	53.7		ug/L		107	71 - 126
Diethyl ether	50.0	45.2		ug/L		90	40 - 160
Ethylbenzene	50.0	54.5		ug/L		109	78 - 125
2-Hexanone	100	105		ug/L		105	52 - 149
Methylene Chloride	50.0	54.0		ug/L		108	79 - 124
2-Butanone (MEK)	100	99.8		ug/L		100	55 - 142
4-Methyl-2-pentanone (MIBK)	100	103		ug/L		103	51 - 143
Styrene	50.0	53.0		ug/L		106	75 - 129
1,1,1,2-Tetrachloroethane	50.0	53.0		ug/L		106	71 - 127
Tetrachloroethene	50.0	56.3		ug/L		113	77 - 128
Toluene	50.0	53.1		ug/L		106	77 - 125
trans-1,2-Dichloroethene	50.0	55.2		ug/L		110	78 - 130
trans-1,3-Dichloropropene	50.0	53.6		ug/L		107	72 - 127
1,1,1-Trichloroethane	50.0	49.8		ug/L		100	76 - 126
1,1,2-Trichloroethane	50.0	53.3		ug/L		107	69 - 127
Trichloroethene	50.0	48.8		ug/L		98	80 - 120
Vinyl chloride	50.0	54.9		ug/L		110	58 - 141
Xylenes, Total	150	160		ug/L		107	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	103		70 - 130
Dibromofluoromethane	114		70 - 130
Toluene-d8 (Surr)	110		70 - 130

**Lab Sample ID: LCSD 680-316011/5**

**Matrix: Water**

**Analysis Batch: 316011**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Acetone	100	98.9		ug/L		99	39 - 162	2	50
Benzene	50.0	53.1		ug/L		106	74 - 123	1	30
Bromoform	50.0	60.5		ug/L		121	60 - 134	2	30
Bromomethane	50.0	38.9		ug/L		78	10 - 171	5	50

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# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-316011/5

Matrix: Water

Analysis Batch: 316011

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	RPD Limit
Carbon disulfide	50.0	43.1		ug/L		86	63 - 142	10	30	
Carbon tetrachloride	50.0	57.1		ug/L		114	70 - 131	9	30	
Chlorobenzene	50.0	53.7		ug/L		107	79 - 120	0	30	
Chlorodibromomethane	50.0	58.9		ug/L		118	63 - 134	0	50	
Chloroethane	50.0	46.1		ug/L		92	47 - 148	3	40	
Chloroform	50.0	50.8		ug/L		102	76 - 128	5	30	
Chloromethane	50.0	48.5		ug/L		97	47 - 151	14	30	
cis-1,2-Dichloroethene	50.0	51.7		ug/L		103	78 - 127	5	30	
cis-1,3-Dichloropropene	50.0	45.6		ug/L		91	73 - 128	1	30	
Dichlorobromomethane	50.0	47.4		ug/L		95	72 - 129	3	30	
1,1-Dichloroethane	50.0	50.0		ug/L		100	69 - 132	8	30	
1,2-Dichloroethane	50.0	50.8		ug/L		102	75 - 120	2	30	
1,1-Dichloroethene	50.0	43.6		ug/L		87	73 - 134	12	30	
1,2-Dichloropropane	50.0	52.9		ug/L		106	71 - 126	2	30	
Diethyl ether	50.0	44.4		ug/L		89	40 - 160	2	50	
Ethylbenzene	50.0	53.7		ug/L		107	78 - 125	2	30	
2-Hexanone	100	107		ug/L		107	52 - 149	2	30	
Methylene Chloride	50.0	54.1		ug/L		108	79 - 124	0	30	
2-Butanone (MEK)	100	111		ug/L		111	55 - 142	11	30	
4-Methyl-2-pentanone (MIBK)	100	109		ug/L		109	51 - 143	6	30	
Styrene	50.0	53.2		ug/L		106	75 - 129	0	30	
1,1,2,2-Tetrachloroethane	50.0	51.8		ug/L		104	71 - 127	2	30	
Tetrachloroethene	50.0	51.8		ug/L		104	77 - 128	8	30	
Toluene	50.0	53.3		ug/L		107	77 - 125	0	30	
trans-1,2-Dichloroethene	50.0	51.7		ug/L		103	78 - 130	7	30	
trans-1,3-Dichloropropene	50.0	56.5		ug/L		113	72 - 127	5	50	
1,1,1-Trichloroethane	50.0	45.1		ug/L		90	76 - 126	10	30	
1,1,2-Trichloroethane	50.0	57.4		ug/L		115	69 - 127	7	30	
Trichloroethene	50.0	46.2		ug/L		92	80 - 120	5	30	
Vinyl chloride	50.0	50.5		ug/L		101	58 - 141	8	30	
Xylenes, Total	150	164		ug/L		109	80 - 124	2	30	

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	106		70 - 130
Dibromofluoromethane	110		70 - 130
Toluene-d8 (Surr)	110		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-314841/1-A

Matrix: Water

Analysis Batch: 315187

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 314841

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		02/10/14 09:44	02/11/14 15:46	1
Chromium	10	U	10		ug/L		02/10/14 09:44	02/11/14 15:46	1
Copper	20	U	20		ug/L		02/10/14 09:44	02/11/14 15:46	1
Lead	10	U	10		ug/L		02/10/14 09:44	02/11/14 15:46	1

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# QC Sample Results

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 680-314841/1-A**  
**Matrix: Water**  
**Analysis Batch: 315187**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 314841**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	20	U	20		ug/L		02/10/14 09:44	02/11/14 15:46	1

**Lab Sample ID: LCS 680-314841/2-A**  
**Matrix: Water**  
**Analysis Batch: 315187**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 314841**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	103		ug/L		103	75 - 125
Chromium	100	104		ug/L		104	75 - 125
Copper	100	102		ug/L		102	75 - 125
Lead	50.0	50.4		ug/L		101	75 - 125
Zinc	100	101		ug/L		101	75 - 125

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

## GC/MS VOA

### Analysis Batch: 316011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-98451-1	Effluent	Total/NA	Water	8260B	
LCS 680-316011/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-316011/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-316011/8	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 314841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-98451-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-314841/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-314841/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 315187

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-98451-1	Effluent	Total Recoverable	Water	6010C	314841
LCS 680-314841/2-A	Lab Control Sample	Total Recoverable	Water	6010C	314841
MB 680-314841/1-A	Method Blank	Total Recoverable	Water	6010C	314841

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road - Chapel Hill, NC

TestAmerica Job ID: 680-98451-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-98451-1**

**Date Collected: 02/07/14 11:40**

**Matrix: Water**

**Date Received: 02/08/14 10:21**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	316011	02/18/14 17:30	MMT	TAL SAV
Total Recoverable	Prep	3005A			314841	02/10/14 09:44	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	315187	02/11/14 17:07	BCB	TAL SAV

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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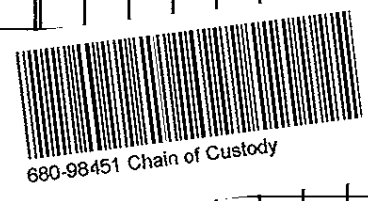
**Savannah**  
5102 LaRoche Avenue  
Savannah, GA 31404  
phone 912.354.7858 fax 912.352.0165

### Chain of Custody Record

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

<b>Client Contact</b>		<b>Project Manager: Alan Pinnix</b>		<b>Site Contact: Alan Pinnix</b>		<b>Date: 2/7/14</b>	
ARCADIS		Tel/Fax: 919-854-1282		Lab Contact: Jerry Lanier		Carrier: Fed Ex	
801 Corporate Center Drive, Suite 300		Analysis Turnaround Time		PP Metals (Method 6010)*		Job No.	
Raleigh, NC 27607		Calendar (C) or Work Days (W)		VOCS (Method 8260B)		SDG No.	
919-854-1282		TAT if different from Below		Filtered Sample		Sample Specific Notes:	
919-854-5448		<input checked="" type="checkbox"/> 2 weeks		Sample Date		*Report: As, Cr, Cu, Pb, and Zn only.	
Project Name: UNC - Airport Road		<input type="checkbox"/> 1 week		Sample Time			
Site: Chapel Hill, NC		<input type="checkbox"/> 2 days		Sample Type			
P O # NC000239.0019.0001B		<input type="checkbox"/> 1 day		Matrix			
Sample Identification		Sample Date		Sample Time			
Effluent		2/7/2014		1140			
				Grab			
				W			
				4			
				N			
				3			
				1			
				2			
				4			



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other \_\_\_\_\_  
 Possible Hazard Identification  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Disposal By Lab  Archive For \_\_\_\_\_ Months  
 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Relinquished by: <i>Alan Pinnix</i>	Company: ARCADIS	Received by: <i>Jerry Lanier</i>	Company: <i>TR 88V</i>	Date/Time: 2-7-14/1700	Date/Time: 02/08/14 1021
Relinquished by:	Company:	Received by:	Company:	Date/Time:	Date/Time:
Relinquished by:	Company:	Received by:	Company:	Date/Time:	Date/Time:

0.9°C  
680-98451



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-98451-1

Login Number: 98451

List Source: TestAmerica Savannah

List Number: 1

Creator: Conner, Keaton

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 680-98451-1

Project/Site: UNC Airport Road - Chapel Hill, NC

## Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-15
A2LA	ISO/IEC 17025		399.01	02-28-15
Alabama	State Program	4	41450	06-30-14
Arkansas DEQ	State Program	6	88-0692	01-31-15
California	NELAP	9	3217CA	07-31-14
Colorado	State Program	8	N/A	12-31-14
Connecticut	State Program	1	PH-0161	03-31-15
Florida	NELAP	4	E87052	06-30-14
GA Dept. of Agriculture	State Program	4	N/A	06-30-14
Georgia	State Program	4	N/A	06-30-14
Georgia	State Program	4	803	06-30-14
Guam	State Program	9	09-005r	04-17-14
Hawaii	State Program	9	N/A	06-30-14
Illinois	NELAP	5	200022	11-30-14
Indiana	State Program	5	N/A	06-30-14
Iowa	State Program	7	353	07-01-15
Kentucky (DW)	State Program	4	90084	12-31-14
Kentucky (UST)	State Program	4	18	06-30-14
Louisiana	NELAP	6	LA100015	12-31-14
Maine	State Program	1	GA00006	08-16-14
Maryland	State Program	3	250	12-31-14
Massachusetts	State Program	1	M-GA006	06-30-14
Michigan	State Program	5	9925	06-30-14
Mississippi	State Program	4	N/A	06-30-14
Montana	State Program	8	CERT0081	01-01-15
Nebraska	State Program	7	TestAmerica-Savannah	06-30-14
New Jersey	NELAP	2	GA769	06-30-14
New Mexico	State Program	6	N/A	06-30-14
New York	NELAP	2	10842	03-31-14
North Carolina DENR	State Program	4	269	12-31-14
North Carolina DHHS	State Program	4	13701	07-31-14
Oklahoma	State Program	6	9984	08-31-14
Pennsylvania	NELAP	3	68-00474	06-30-14
Puerto Rico	State Program	2	GA00006	01-01-14 *
South Carolina	State Program	4	98001	06-30-14
Tennessee	State Program	4	TN02961	06-30-14
Texas	NELAP	6	T104704185-08-TX	11-30-14
USDA	Federal		SAV 3-04	04-07-14
Virginia	NELAP	3	460161	06-14-14
Washington	State Program	10	C1794	06-10-14
West Virginia DEP	State Program	3	94	06-30-14
West Virginia DHHR	State Program	3	9950C	12-31-13 *
Wisconsin	State Program	5	999819810	08-31-14
Wyoming	State Program	8	8TMS-L	06-30-14

\* Expired certification is currently pending renewal and is considered valid.

TestAmerica Savannah

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-86315-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
2/13/2014 10:00:47 AM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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results through  
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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

---

**Job ID: 400-86315-1**

---

**Laboratory: TestAmerica Pensacola**

---

**Narrative**

**Job Narrative**  
**400-86315-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 2/8/2014 10:14 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° C.

**Metals**

Method 1631E: The following samples were diluted to bring the concentration of target analytes within the calibration range: (400-86381-1 MS), (400-86381-1 MSD). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

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# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-86315-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Mercury	1.2		0.50	ng/L	1		1631E	Total/NA

- 1
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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-86315-1	EFFLUENT	Water	02/07/14 11:40	02/08/14 10:14

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- 1
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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-86315-1**

**Date Collected: 02/07/14 11:40**

**Matrix: Water**

**Date Received: 02/08/14 10:14**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.2		0.50	ng/L		02/10/14 11:35	02/12/14 10:56	1

- 1
- 2
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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

## Metals

### Prep Batch: 207400

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-86315-1	EFFLUENT	Total/NA	Water	1631E	
400-86381-A-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-86381-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-207400/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-207400/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-207400/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 207477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-86315-1	EFFLUENT	Total/NA	Water	1631E	207400
400-86381-A-1-B MS	Matrix Spike	Total/NA	Water	1631E	207400
400-86381-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	207400
LCS 400-207400/2-A	Lab Control Sample	Total/NA	Water	1631E	207400
LCSD 400-207400/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	207400
MB 400-207400/1-A	Method Blank	Total/NA	Water	1631E	207400



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-207400/1-A**  
**Matrix: Water**  
**Analysis Batch: 207477**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 207400**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		02/11/14 16:00	02/12/14 08:55	1

**Lab Sample ID: LCS 400-207400/2-A**  
**Matrix: Water**  
**Analysis Batch: 207477**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 207400**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.60		ng/L		92	79 - 121

**Lab Sample ID: LCSD 400-207400/3-A**  
**Matrix: Water**  
**Analysis Batch: 207477**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 207400**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.56		ng/L		91	79 - 121	1	20

**Lab Sample ID: 400-86381-A-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 207477**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 207400**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	410		250	635		ng/L		91	71 - 125

**Lab Sample ID: 400-86381-A-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 207477**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 207400**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	410		250	655		ng/L		99	71 - 125	3	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-86315-1**

**Date Collected: 02/07/14 11:40**

**Matrix: Water**

**Date Received: 02/08/14 10:14**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			207400	02/10/14 11:35	VLC	TAL PEN
Total/NA	Analysis	1631E		1	207477	02/12/14 10:56	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-14
Arkansas DEQ	State Program	6	88-0689	09-01-14
Florida	NELAP	4	E81010	06-30-14
Georgia	State Program	4	N/A	06-30-14
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14
Louisiana	NELAP	6	30976	06-30-14
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-14
Michigan	State Program	5	9912	05-04-14
New Jersey	NELAP	2	FL006	06-30-14
North Carolina DENR	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-13 *
Tennessee	State Program	4	TN02907	06-30-14
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-14
West Virginia DEP	State Program	3	136	06-30-14

\* Expired certification is currently pending renewal and is considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-86315-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001



Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
phone 850.474.1001 fax 850.474.4789

400-86315

Chain of Custody Record



TestAmerica Laboratories, Inc.

COC No. 400-86315 COC

Date: 2/7/14

Site Contact: Alan Pinnix

Job No. 1 of 1 COCs

Carrier: Fed Ex

Lab Contact: Marty Edwards

SDG No.

Mercury, low level (Method 1631B)

Filtered Sample

Project Manager: Alan Pinnix  
Tel/Fax: 919-854-1282

Analysis Turnaround Time

Calendar (C) or Work Days (W)

TAT if different from Below

2 weeks

1 week

2 days

1 day

Client Contact

ARCADIS

801 Corporate Center Drive, Suite 300

Raleigh, NC 27607

919-854-5448

Project Name: UNC - Airport Road

Site: Chapel Hill, NC

P O # NC000239.0019.0001B

Sample Identification

Effluent

Sample Date

2/7/2014

Sample Time

1140

Sample Type

Grab

Matrix

W

# of Cont.

3

Sample Specific Notes:

1

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification

Non-Hazard

Flammable

Skin Irritant

Poison B

Unknown

Special Instructions/QC Requirements & Comments:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client

Disposal By Lab

Archive For

Months

Relinquished by: *dividm...*

Relinquished by:

Relinquished by:

Company: ARCADIS

Date/Time: 2-7-14 11:00

Received by: *Marty Edwards*

Company:

Date/Time:

Relinquished by:

Company:

Date/Time:

Received by:

Company:

Date/Time:

Received by:

Company:

Date/Time:

Received by:

Company:

Date/Time:

Received by:

Company:

Date/Time:

Received by:

Company:

Date/Time:

Received by:

Company:

Date/Time:

Received by:

IP# S= 5.60°C



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-86315-1

**Login Number: 86315**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Ricketts, Erin**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.6°C IR #5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-99763-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
4/2/2014 1:30:39 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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[www.testamericainc.com](http://www.testamericainc.com)

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

**Job ID: 680-99763-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-99763-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 03/25/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.2 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample Effluent (680-99763-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 04/01/2014.

1,2-Dichloroethane exceeded the recovery criteria high for LCS 680-322201/4. 1,2-Dichloroethane and trans-1,3-Dichloropropene exceeded the recovery criteria high for LCSD 680-322201/5. These analytes were biased high and were not detected in the associated samples; therefore, the data have been reported.

Refer to the QC report for details.

No other difficulties were encountered during the volatiles analysis.

All other quality control parameters were within the acceptance limits.

### METALS (ICP)

Sample Effluent (680-99763-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared and analyzed on 03/27/2014.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-99763-1	Effluent	Water	03/23/14 16:30	03/25/14 09:37

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD exceeds the control limits

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-99763-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone (MEK)	69		10		ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-99763-1**

**Date Collected: 03/23/14 16:30**

**Matrix: Water**

**Date Received: 03/25/14 09:37**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			04/01/14 16:27	1
Benzene	1.0	U	1.0		ug/L			04/01/14 16:27	1
Bromoform	1.0	U	1.0		ug/L			04/01/14 16:27	1
Bromomethane	5.0	U	5.0		ug/L			04/01/14 16:27	1
Carbon disulfide	2.0	U	2.0		ug/L			04/01/14 16:27	1
Carbon tetrachloride	1.0	U	1.0		ug/L			04/01/14 16:27	1
Chlorobenzene	1.0	U	1.0		ug/L			04/01/14 16:27	1
Chlorodibromomethane	1.0	U	1.0		ug/L			04/01/14 16:27	1
Chloroethane	5.0	U	5.0		ug/L			04/01/14 16:27	1
Chloroform	1.0	U	1.0		ug/L			04/01/14 16:27	1
Chloromethane	1.0	U	1.0		ug/L			04/01/14 16:27	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			04/01/14 16:27	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			04/01/14 16:27	1
Dichlorobromomethane	1.0	U	1.0		ug/L			04/01/14 16:27	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			04/01/14 16:27	1
1,2-Dichloroethane	1.0	U*	1.0		ug/L			04/01/14 16:27	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			04/01/14 16:27	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			04/01/14 16:27	1
Diethyl ether	10	U	10		ug/L			04/01/14 16:27	1
Ethylbenzene	1.0	U	1.0		ug/L			04/01/14 16:27	1
2-Hexanone	10	U	10		ug/L			04/01/14 16:27	1
Methylene Chloride	5.0	U	5.0		ug/L			04/01/14 16:27	1
<b>2-Butanone (MEK)</b>	<b>69</b>		10		ug/L			04/01/14 16:27	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			04/01/14 16:27	1
Styrene	1.0	U	1.0		ug/L			04/01/14 16:27	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			04/01/14 16:27	1
Tetrachloroethene	1.0	U	1.0		ug/L			04/01/14 16:27	1
Toluene	1.0	U	1.0		ug/L			04/01/14 16:27	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			04/01/14 16:27	1
trans-1,3-Dichloropropene	1.0	U*	1.0		ug/L			04/01/14 16:27	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			04/01/14 16:27	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			04/01/14 16:27	1
Trichloroethene	1.0	U	1.0		ug/L			04/01/14 16:27	1
Vinyl chloride	1.0	U	1.0		ug/L			04/01/14 16:27	1
Xylenes, Total	2.0	U	2.0		ug/L			04/01/14 16:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	100		70 - 130		04/01/14 16:27	1
Dibromofluoromethane	96		70 - 130		04/01/14 16:27	1
Toluene-d8 (Surr)	105		70 - 130		04/01/14 16:27	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		03/27/14 09:42	03/27/14 15:35	1
Chromium	10	U	10		ug/L		03/27/14 09:42	03/27/14 15:35	1
Copper	20	U	20		ug/L		03/27/14 09:42	03/27/14 15:35	1
Lead	10	U	10		ug/L		03/27/14 09:42	03/27/14 15:35	1
Zinc	20	U	20		ug/L		03/27/14 09:42	03/27/14 15:35	1

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# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (70-130)	DBFM (70-130)	TOL (70-130)
680-99763-1	Effluent	100	96	105
LCS 680-322201/4	Lab Control Sample	104	104	113
LCSD 680-322201/5	Lab Control Sample Dup	101	101	112
MB 680-322201/8	Method Blank	98	95	104

### Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-322201/8**

**Matrix: Water**

**Analysis Batch: 322201**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			04/01/14 11:43	1
Benzene	1.0	U	1.0		ug/L			04/01/14 11:43	1
Bromoform	1.0	U	1.0		ug/L			04/01/14 11:43	1
Bromomethane	5.0	U	5.0		ug/L			04/01/14 11:43	1
Carbon disulfide	2.0	U	2.0		ug/L			04/01/14 11:43	1
Carbon tetrachloride	1.0	U	1.0		ug/L			04/01/14 11:43	1
Chlorobenzene	1.0	U	1.0		ug/L			04/01/14 11:43	1
Chlorodibromomethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
Chloroethane	5.0	U	5.0		ug/L			04/01/14 11:43	1
Chloroform	1.0	U	1.0		ug/L			04/01/14 11:43	1
Chloromethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			04/01/14 11:43	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			04/01/14 11:43	1
Dichlorobromomethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			04/01/14 11:43	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			04/01/14 11:43	1
Diethyl ether	10	U	10		ug/L			04/01/14 11:43	1
Ethylbenzene	1.0	U	1.0		ug/L			04/01/14 11:43	1
2-Hexanone	10	U	10		ug/L			04/01/14 11:43	1
Methylene Chloride	5.0	U	5.0		ug/L			04/01/14 11:43	1
2-Butanone (MEK)	10	U	10		ug/L			04/01/14 11:43	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			04/01/14 11:43	1
Styrene	1.0	U	1.0		ug/L			04/01/14 11:43	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
Tetrachloroethene	1.0	U	1.0		ug/L			04/01/14 11:43	1
Toluene	1.0	U	1.0		ug/L			04/01/14 11:43	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			04/01/14 11:43	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			04/01/14 11:43	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			04/01/14 11:43	1
Trichloroethene	1.0	U	1.0		ug/L			04/01/14 11:43	1
Vinyl chloride	1.0	U	1.0		ug/L			04/01/14 11:43	1
Xylenes, Total	2.0	U	2.0		ug/L			04/01/14 11:43	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		70 - 130		04/01/14 11:43	1
Dibromofluoromethane	95		70 - 130		04/01/14 11:43	1
Toluene-d8 (Surr)	104		70 - 130		04/01/14 11:43	1

**Lab Sample ID: LCS 680-322201/4**

**Matrix: Water**

**Analysis Batch: 322201**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	100	99.9		ug/L		100	39 - 162
Benzene	50.0	55.5		ug/L		111	74 - 123

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-322201/4

Matrix: Water

Analysis Batch: 322201

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	50.0	56.0		ug/L		112	60 - 134
Bromomethane	50.0	35.1		ug/L		70	10 - 171
Carbon disulfide	50.0	45.5		ug/L		91	63 - 142
Carbon tetrachloride	50.0	55.0		ug/L		110	70 - 131
Chlorobenzene	50.0	50.5		ug/L		101	79 - 120
Chlorodibromomethane	50.0	54.0		ug/L		108	63 - 134
Chloroethane	50.0	44.9		ug/L		90	47 - 148
Chloroform	50.0	48.0		ug/L		96	76 - 128
Chloromethane	50.0	39.0		ug/L		78	47 - 151
cis-1,2-Dichloroethene	50.0	49.2		ug/L		98	78 - 127
cis-1,3-Dichloropropene	50.0	60.4		ug/L		121	73 - 128
Dichlorobromomethane	50.0	58.2		ug/L		116	72 - 129
1,1-Dichloroethane	50.0	53.3		ug/L		107	69 - 132
1,2-Dichloroethane	50.0	61.6	*	ug/L		123	75 - 120
1,1-Dichloroethene	50.0	44.5		ug/L		89	73 - 134
1,2-Dichloropropane	50.0	59.3		ug/L		119	71 - 126
Diethyl ether	50.0	47.4		ug/L		95	40 - 160
Ethylbenzene	50.0	50.0		ug/L		100	78 - 125
2-Hexanone	100	114		ug/L		114	52 - 149
Methylene Chloride	50.0	48.6		ug/L		97	79 - 124
2-Butanone (MEK)	100	113		ug/L		113	55 - 142
4-Methyl-2-pentanone (MIBK)	100	126		ug/L		126	51 - 143
Styrene	50.0	50.5		ug/L		101	75 - 129
1,1,1,2-Tetrachloroethane	50.0	51.5		ug/L		103	71 - 127
Tetrachloroethene	50.0	49.4		ug/L		99	77 - 128
Toluene	50.0	53.9		ug/L		108	77 - 125
trans-1,2-Dichloroethene	50.0	47.1		ug/L		94	78 - 130
trans-1,3-Dichloropropene	50.0	61.3		ug/L		123	72 - 127
1,1,1-Trichloroethane	50.0	56.5		ug/L		113	76 - 126
1,1,2-Trichloroethane	50.0	55.8		ug/L		112	69 - 127
Trichloroethene	50.0	54.5		ug/L		109	80 - 120
Vinyl chloride	50.0	55.2		ug/L		110	58 - 141
Xylenes, Total	150	151		ug/L		101	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	104		70 - 130
Dibromofluoromethane	104		70 - 130
Toluene-d8 (Surr)	113		70 - 130

Lab Sample ID: LCSD 680-322201/5

Matrix: Water

Analysis Batch: 322201

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Acetone	100	97.0		ug/L		97	39 - 162	3	50
Benzene	50.0	55.9		ug/L		112	74 - 123	1	30
Bromoform	50.0	58.0		ug/L		116	60 - 134	4	30
Bromomethane	50.0	33.4		ug/L		67	10 - 171	5	50

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-322201/5

Matrix: Water

Analysis Batch: 322201

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	RPD Limit
Carbon disulfide	50.0	41.5		ug/L		83	63 - 142	9	30	
Carbon tetrachloride	50.0	55.4		ug/L		111	70 - 131	1	30	
Chlorobenzene	50.0	51.7		ug/L		103	79 - 120	2	30	
Chlorodibromomethane	50.0	54.9		ug/L		110	63 - 134	2	50	
Chloroethane	50.0	45.1		ug/L		90	47 - 148	0	40	
Chloroform	50.0	48.1		ug/L		96	76 - 128	0	30	
Chloromethane	50.0	39.3		ug/L		79	47 - 151	1	30	
cis-1,2-Dichloroethene	50.0	48.2		ug/L		96	78 - 127	2	30	
cis-1,3-Dichloropropene	50.0	59.4		ug/L		119	73 - 128	2	30	
Dichlorobromomethane	50.0	59.0		ug/L		118	72 - 129	1	30	
1,1-Dichloroethane	50.0	51.6		ug/L		103	69 - 132	3	30	
1,2-Dichloroethane	50.0	62.6	*	ug/L		125	75 - 120	2	30	
1,1-Dichloroethene	50.0	43.8		ug/L		88	73 - 134	2	30	
1,2-Dichloropropane	50.0	59.0		ug/L		118	71 - 126	0	30	
Diethyl ether	50.0	47.6		ug/L		95	40 - 160	0	50	
Ethylbenzene	50.0	51.4		ug/L		103	78 - 125	3	30	
2-Hexanone	100	116		ug/L		116	52 - 149	2	30	
Methylene Chloride	50.0	49.3		ug/L		99	79 - 124	1	30	
2-Butanone (MEK)	100	112		ug/L		112	55 - 142	0	30	
4-Methyl-2-pentanone (MIBK)	100	129		ug/L		129	51 - 143	2	30	
Styrene	50.0	51.4		ug/L		103	75 - 129	2	30	
1,1,1,2-Tetrachloroethane	50.0	51.9		ug/L		104	71 - 127	1	30	
Tetrachloroethene	50.0	48.3		ug/L		97	77 - 128	2	30	
Toluene	50.0	54.5		ug/L		109	77 - 125	1	30	
trans-1,2-Dichloroethene	50.0	45.8		ug/L		92	78 - 130	3	30	
trans-1,3-Dichloropropene	50.0	64.7	*	ug/L		129	72 - 127	5	50	
1,1,1-Trichloroethane	50.0	55.6		ug/L		111	76 - 126	2	30	
1,1,2-Trichloroethane	50.0	57.6		ug/L		115	69 - 127	3	30	
Trichloroethene	50.0	53.9		ug/L		108	80 - 120	1	30	
Vinyl chloride	50.0	54.4		ug/L		109	58 - 141	2	30	
Xylenes, Total	150	153		ug/L		102	80 - 124	1	30	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	101		70 - 130
Dibromofluoromethane	101		70 - 130
Toluene-d8 (Surr)	112		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-321512/1-A

Matrix: Water

Analysis Batch: 321839

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 321512

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		03/27/14 09:42	03/27/14 15:25	1
Chromium	10	U	10		ug/L		03/27/14 09:42	03/27/14 15:25	1
Copper	20	U	20		ug/L		03/27/14 09:42	03/27/14 15:25	1
Lead	10	U	10		ug/L		03/27/14 09:42	03/27/14 15:25	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 680-321512/1-A**  
**Matrix: Water**  
**Analysis Batch: 321839**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 321512**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	20	U	20		ug/L		03/27/14 09:42	03/27/14 15:25	1

**Lab Sample ID: LCS 680-321512/2-A**  
**Matrix: Water**  
**Analysis Batch: 321839**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 321512**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	99.6		ug/L		100	75 - 125
Chromium	100	104		ug/L		104	75 - 125
Copper	100	105		ug/L		105	75 - 125
Lead	50.0	51.4		ug/L		103	75 - 125
Zinc	100	103		ug/L		103	75 - 125

**Lab Sample ID: 680-99763-1 MS**  
**Matrix: Water**  
**Analysis Batch: 321839**

**Client Sample ID: Effluent**  
**Prep Type: Total Recoverable**  
**Prep Batch: 321512**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	20	U	100	102		ug/L		102	75 - 125
Chromium	10	U	100	102		ug/L		102	75 - 125
Copper	20	U	100	109		ug/L		109	75 - 125
Lead	10	U	50.0	50.2		ug/L		100	75 - 125
Zinc	20	U	100	111		ug/L		100	75 - 125

**Lab Sample ID: 680-99763-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 321839**

**Client Sample ID: Effluent**  
**Prep Type: Total Recoverable**  
**Prep Batch: 321512**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	20	U	100	99.5		ug/L		100	75 - 125	2	20
Chromium	10	U	100	103		ug/L		103	75 - 125	1	20
Copper	20	U	100	109		ug/L		109	75 - 125	0	20
Lead	10	U	50.0	52.4		ug/L		105	75 - 125	4	20
Zinc	20	U	100	113		ug/L		102	75 - 125	2	20

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## GC/MS VOA

### Analysis Batch: 322201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-99763-1	Effluent	Total/NA	Water	8260B	
LCS 680-322201/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-322201/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-322201/8	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 321512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-99763-1	Effluent	Total Recoverable	Water	3005A	
680-99763-1 MS	Effluent	Total Recoverable	Water	3005A	
680-99763-1 MSD	Effluent	Total Recoverable	Water	3005A	
LCS 680-321512/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-321512/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 321839

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-99763-1	Effluent	Total Recoverable	Water	6010C	321512
680-99763-1 MS	Effluent	Total Recoverable	Water	6010C	321512
680-99763-1 MSD	Effluent	Total Recoverable	Water	6010C	321512
LCS 680-321512/2-A	Lab Control Sample	Total Recoverable	Water	6010C	321512
MB 680-321512/1-A	Method Blank	Total Recoverable	Water	6010C	321512

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-99763-1**

**Date Collected: 03/23/14 16:30**

**Matrix: Water**

**Date Received: 03/25/14 09:37**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	322201	04/01/14 16:27	MMT	TAL SAV
Instrument ID: CMSO2										
Total Recoverable	Prep	3005A			50 mL	50 mL	321512	03/27/14 09:42	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	321839	03/27/14 15:35	BCB	TAL SAV
Instrument ID: ICPE										

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Savannah  
5102 LaRoche Avenue

Savannah, GA 31404  
phone 912.354.7858 fax 912.352.0165

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

### Chain of Custody Record

<b>Client Contact</b>		<b>Project Manager: Alan Pinnix</b>		<b>Site Contact: Alan Pinnix</b>		<b>Date: 3-25-14</b>	
<b>ARCADIS</b>		<b>Tel/Fax: 919-854-1282</b>		<b>Lab Contact: Jerry Lanier</b>		<b>COC No: _____ of _____ COCs</b>	
801 Corporate Center Drive, Suite 300 Raleigh, NC 27607		Analysis Turnaround Time		Carrier: Fed Ex		Job No. _____	
919-854-1282		Calendar (C) or Work Days (W)		PP Metals (Method 6010)*		SDG No. _____	
919-854-5448		TAT if different from Below		VOCs (Method 8260B)		Sample Specific Notes:	
Project Name: UNC - Airport Road		2 weeks <input type="checkbox"/>		N 3 1		*Report: As, Cr, Cu, Pb, and Zn only.	
Site: Chapel Hill, NC		1 week <input type="checkbox"/>		W 4			
P O # NC000239.0019.0001B		2 days <input type="checkbox"/>		Grab			
		1 day <input type="checkbox"/>		Sample Date			
		Sample Time		Sample Type			
		3/23/14 1630		Matrix			
		# of Cont.		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
		Effluent		Return To Client <input type="checkbox"/>		Disposal By Lab <input type="checkbox"/>	
				Poison B <input type="checkbox"/>		Archive For _____ Months	
				Skin Irritant <input type="checkbox"/>		680-99763 Chain of Custody	
				Flammable <input type="checkbox"/>			
				Unknown <input type="checkbox"/>			
				Special Instructions/QC Requirements & Comments:			
				Received by: <i>Neil Stanley</i>		Date/Time: 3-24-14/1700	
				Received by: <i>Wanda</i>		Date/Time: 03-25-14 0937	
				Received by:		Date/Time:	
				Company: ARCADIS		Company: TASAU	
				Company:		Company:	
				Company:		Company:	



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-99763-1

Login Number: 99763

List Number: 1

Creator: Banda, Christy S

List Source: TestAmerica Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-99763-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina DENR	State Program	4	269	12-31-14

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# TestAmerica

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## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-88227-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
4/3/2014 3:55:10 PM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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[www.testamericainc.com](http://www.testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-88227-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Mercury	0.52		0.50	ng/L	1		1631E	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola



# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-88227-1	EFFLUENT	Water	03/23/14 16:30	03/25/14 09:47

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-88227-1**

**Date Collected: 03/23/14 16:30**

**Matrix: Water**

**Date Received: 03/25/14 09:47**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.52		0.50	ng/L		03/25/14 11:45	04/03/14 09:59	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

## Metals

### Prep Batch: 212618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-88227-1	EFFLUENT	Total/NA	Water	1631E	
400-88585-B-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-88585-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-212618/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-212618/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-212618/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 212688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-88227-1	EFFLUENT	Total/NA	Water	1631E	212618
400-88585-B-1-B MS	Matrix Spike	Total/NA	Water	1631E	212618
400-88585-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	212618
LCS 400-212618/2-A	Lab Control Sample	Total/NA	Water	1631E	212618
LCSD 400-212618/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	212618
MB 400-212618/1-A	Method Blank	Total/NA	Water	1631E	212618



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-212618/1-A**  
**Matrix: Water**  
**Analysis Batch: 212688**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 212618**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		04/03/14 08:34	04/03/14 08:52	1

**Lab Sample ID: LCS 400-212618/2-A**  
**Matrix: Water**  
**Analysis Batch: 212688**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 212618**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.93		ng/L		99	79 - 121

**Lab Sample ID: LCSD 400-212618/3-A**  
**Matrix: Water**  
**Analysis Batch: 212688**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 212618**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	5.04		ng/L		101	79 - 121	2	20

**Lab Sample ID: 400-88585-B-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 212688**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 212618**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<0.50		2.50	2.62		ng/L		105	71 - 125

**Lab Sample ID: 400-88585-B-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 212688**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 212618**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	<0.50		2.50	2.69		ng/L		108	71 - 125	3	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-88227-1**

**Date Collected: 03/23/14 16:30**

**Matrix: Water**

**Date Received: 03/25/14 09:47**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			212618	03/25/14 11:45	VLC	TAL PEN
Total/NA	Analysis	1631E		1	212688	04/03/14 09:59	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-14
Arkansas DEQ	State Program	6	88-0689	09-01-14
Florida	NELAP	4	E81010	06-30-14
Georgia	State Program	4	N/A	06-30-14
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14
Louisiana	NELAP	6	30976	06-30-14
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-14
Michigan	State Program	5	9912	05-04-14
New Jersey	NELAP	2	FL006	06-30-14
North Carolina DENR	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14
Tennessee	State Program	4	TN02907	06-30-14
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-14
West Virginia DEP	State Program	3	136	06-30-14

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-88227-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-88227-1

**Login Number: 88227**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Crawford, Lauren E**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.8°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	Vials were received labeled and not in plastic bags.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-100788-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
5/7/2014 5:27:17 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

**Job ID: 680-100788-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-100788-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 04/25/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 4.6 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample Effluent (680-100788-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 05/07/2014.

No difficulties were encountered during the volatiles analysis.

All quality control parameters were within the acceptance limits.

### METALS (ICP)

Sample Effluent (680-100788-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/29/2014 and analyzed on 04/30/2014.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-100788-1	Effluent	Water	04/24/14 13:00	04/25/14 09:31

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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- 12
- 13
- 14
- 15

# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-100788-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-100788-1**

**Date Collected: 04/24/14 13:00**

**Matrix: Water**

**Date Received: 04/25/14 09:31**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			05/07/14 14:14	1
Benzene	1.0	U	1.0		ug/L			05/07/14 14:14	1
Bromoform	1.0	U	1.0		ug/L			05/07/14 14:14	1
Bromomethane	5.0	U	5.0		ug/L			05/07/14 14:14	1
Carbon disulfide	2.0	U	2.0		ug/L			05/07/14 14:14	1
Carbon tetrachloride	1.0	U	1.0		ug/L			05/07/14 14:14	1
Chlorobenzene	1.0	U	1.0		ug/L			05/07/14 14:14	1
Chlorodibromomethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
Chloroethane	5.0	U	5.0		ug/L			05/07/14 14:14	1
Chloroform	1.0	U	1.0		ug/L			05/07/14 14:14	1
Chloromethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			05/07/14 14:14	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			05/07/14 14:14	1
Dichlorobromomethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			05/07/14 14:14	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			05/07/14 14:14	1
Diethyl ether	10	U	10		ug/L			05/07/14 14:14	1
Ethylbenzene	1.0	U	1.0		ug/L			05/07/14 14:14	1
2-Hexanone	10	U	10		ug/L			05/07/14 14:14	1
Methylene Chloride	5.0	U	5.0		ug/L			05/07/14 14:14	1
2-Butanone (MEK)	10	U	10		ug/L			05/07/14 14:14	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			05/07/14 14:14	1
Styrene	1.0	U	1.0		ug/L			05/07/14 14:14	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
Tetrachloroethene	1.0	U	1.0		ug/L			05/07/14 14:14	1
Toluene	1.0	U	1.0		ug/L			05/07/14 14:14	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			05/07/14 14:14	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			05/07/14 14:14	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			05/07/14 14:14	1
Trichloroethene	1.0	U	1.0		ug/L			05/07/14 14:14	1
Vinyl chloride	1.0	U	1.0		ug/L			05/07/14 14:14	1
Xylenes, Total	2.0	U	2.0		ug/L			05/07/14 14:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		70 - 130		05/07/14 14:14	1
Dibromofluoromethane	122		70 - 130		05/07/14 14:14	1
Toluene-d8 (Surr)	98		70 - 130		05/07/14 14:14	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		04/29/14 10:55	04/30/14 20:59	1
Chromium	10	U	10		ug/L		04/29/14 10:55	04/30/14 20:59	1
Copper	20	U	20		ug/L		04/29/14 10:55	04/30/14 20:59	1
Lead	10	U	10		ug/L		04/29/14 10:55	04/30/14 20:59	1
Zinc	20	U	20		ug/L		04/29/14 10:55	04/30/14 20:59	1

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# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (70-130)	DBFM (70-130)	TOL (70-130)
680-100788-1	Effluent	98	122	98
LCS 680-327874/4	Lab Control Sample	96	109	94
LCSD 680-327874/5	Lab Control Sample Dup	102	118	98
MB 680-327874/8	Method Blank	94	121	93

### Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-327874/8**

**Matrix: Water**

**Analysis Batch: 327874**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			05/07/14 12:01	1
Benzene	1.0	U	1.0		ug/L			05/07/14 12:01	1
Bromoform	1.0	U	1.0		ug/L			05/07/14 12:01	1
Bromomethane	5.0	U	5.0		ug/L			05/07/14 12:01	1
Carbon disulfide	2.0	U	2.0		ug/L			05/07/14 12:01	1
Carbon tetrachloride	1.0	U	1.0		ug/L			05/07/14 12:01	1
Chlorobenzene	1.0	U	1.0		ug/L			05/07/14 12:01	1
Chlorodibromomethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
Chloroethane	5.0	U	5.0		ug/L			05/07/14 12:01	1
Chloroform	1.0	U	1.0		ug/L			05/07/14 12:01	1
Chloromethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			05/07/14 12:01	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			05/07/14 12:01	1
Dichlorobromomethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			05/07/14 12:01	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			05/07/14 12:01	1
Diethyl ether	10	U	10		ug/L			05/07/14 12:01	1
Ethylbenzene	1.0	U	1.0		ug/L			05/07/14 12:01	1
2-Hexanone	10	U	10		ug/L			05/07/14 12:01	1
Methylene Chloride	5.0	U	5.0		ug/L			05/07/14 12:01	1
2-Butanone (MEK)	10	U	10		ug/L			05/07/14 12:01	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			05/07/14 12:01	1
Styrene	1.0	U	1.0		ug/L			05/07/14 12:01	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
Tetrachloroethene	1.0	U	1.0		ug/L			05/07/14 12:01	1
Toluene	1.0	U	1.0		ug/L			05/07/14 12:01	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			05/07/14 12:01	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			05/07/14 12:01	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			05/07/14 12:01	1
Trichloroethene	1.0	U	1.0		ug/L			05/07/14 12:01	1
Vinyl chloride	1.0	U	1.0		ug/L			05/07/14 12:01	1
Xylenes, Total	2.0	U	2.0		ug/L			05/07/14 12:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	94		70 - 130		05/07/14 12:01	1
Dibromofluoromethane	121		70 - 130		05/07/14 12:01	1
Toluene-d8 (Surr)	93		70 - 130		05/07/14 12:01	1

**Lab Sample ID: LCS 680-327874/4**

**Matrix: Water**

**Analysis Batch: 327874**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	100	75.3		ug/L		75	39 - 162
Benzene	50.0	45.0		ug/L		90	74 - 123

TestAmerica Savannah



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-327874/4**

**Matrix: Water**

**Analysis Batch: 327874**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
Bromoform	50.0	52.1		ug/L		104	60 - 134	
Bromomethane	50.0	52.8		ug/L		106	10 - 171	
Carbon disulfide	50.0	47.6		ug/L		95	63 - 142	
Carbon tetrachloride	50.0	50.7		ug/L		101	70 - 131	
Chlorobenzene	50.0	51.9		ug/L		104	79 - 120	
Chlorodibromomethane	50.0	51.7		ug/L		103	63 - 134	
Chloroethane	50.0	56.7		ug/L		113	47 - 148	
Chloroform	50.0	53.8		ug/L		108	76 - 128	
Chloromethane	50.0	51.0		ug/L		102	47 - 151	
cis-1,2-Dichloroethene	50.0	54.9		ug/L		110	78 - 127	
cis-1,3-Dichloropropene	50.0	42.1		ug/L		84	73 - 128	
Dichlorobromomethane	50.0	44.7		ug/L		89	72 - 129	
1,1-Dichloroethane	50.0	52.0		ug/L		104	69 - 132	
1,2-Dichloroethane	50.0	39.5		ug/L		79	75 - 120	
1,1-Dichloroethene	50.0	52.6		ug/L		105	73 - 134	
1,2-Dichloropropane	50.0	41.3		ug/L		83	71 - 126	
Diethyl ether	50.0	44.3		ug/L		89	40 - 160	
Ethylbenzene	50.0	52.7		ug/L		105	78 - 125	
2-Hexanone	100	72.4		ug/L		72	52 - 149	
Methylene Chloride	50.0	48.3		ug/L		97	79 - 124	
2-Butanone (MEK)	100	78.6		ug/L		79	55 - 142	
4-Methyl-2-pentanone (MIBK)	100	66.2		ug/L		66	51 - 143	
Styrene	50.0	53.2		ug/L		106	75 - 129	
1,1,1,2-Tetrachloroethane	50.0	40.7		ug/L		81	71 - 127	
Tetrachloroethene	50.0	55.6		ug/L		111	77 - 128	
Toluene	50.0	47.7		ug/L		95	77 - 125	
trans-1,2-Dichloroethene	50.0	55.4		ug/L		111	78 - 130	
trans-1,3-Dichloropropene	50.0	44.1		ug/L		88	72 - 127	
1,1,1-Trichloroethane	50.0	49.5		ug/L		99	76 - 126	
1,1,2-Trichloroethane	50.0	41.3		ug/L		83	69 - 127	
Trichloroethene	50.0	48.9		ug/L		98	80 - 120	
Vinyl chloride	50.0	53.9		ug/L		108	58 - 141	
Xylenes, Total	150	158		ug/L		105	80 - 124	

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	96		70 - 130
Dibromofluoromethane	109		70 - 130
Toluene-d8 (Surr)	94		70 - 130

**Lab Sample ID: LCSD 680-327874/5**

**Matrix: Water**

**Analysis Batch: 327874**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	
									RPD	Limit
Acetone	100	79.1		ug/L		79	39 - 162	5	50	
Benzene	50.0	46.4		ug/L		93	74 - 123	3	30	
Bromoform	50.0	51.0		ug/L		102	60 - 134	2	30	
Bromomethane	50.0	59.9		ug/L		120	10 - 171	13	50	

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-327874/5

Matrix: Water

Analysis Batch: 327874

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	RPD Limit
Carbon disulfide	50.0	54.3		ug/L		109	63 - 142	13	30	
Carbon tetrachloride	50.0	51.9		ug/L		104	70 - 131	2	30	
Chlorobenzene	50.0	51.7		ug/L		103	79 - 120	0	30	
Chlorodibromomethane	50.0	53.1		ug/L		106	63 - 134	3	50	
Chloroethane	50.0	60.8		ug/L		122	47 - 148	7	40	
Chloroform	50.0	56.5		ug/L		113	76 - 128	5	30	
Chloromethane	50.0	55.5		ug/L		111	47 - 151	9	30	
cis-1,2-Dichloroethene	50.0	57.3		ug/L		115	78 - 127	4	30	
cis-1,3-Dichloropropene	50.0	43.9		ug/L		88	73 - 128	4	30	
Dichlorobromomethane	50.0	45.3		ug/L		91	72 - 129	1	30	
1,1-Dichloroethane	50.0	54.6		ug/L		109	69 - 132	5	30	
1,2-Dichloroethane	50.0	39.7		ug/L		79	75 - 120	1	30	
1,1-Dichloroethene	50.0	58.0		ug/L		116	73 - 134	10	30	
1,2-Dichloropropane	50.0	42.2		ug/L		84	71 - 126	2	30	
Diethyl ether	50.0	48.1		ug/L		96	40 - 160	8	50	
Ethylbenzene	50.0	53.1		ug/L		106	78 - 125	1	30	
2-Hexanone	100	78.0		ug/L		78	52 - 149	7	30	
Methylene Chloride	50.0	49.2		ug/L		98	79 - 124	2	30	
2-Butanone (MEK)	100	80.6		ug/L		81	55 - 142	2	30	
4-Methyl-2-pentanone (MIBK)	100	69.3		ug/L		69	51 - 143	5	30	
Styrene	50.0	53.5		ug/L		107	75 - 129	1	30	
1,1,1,2-Tetrachloroethane	50.0	42.4		ug/L		85	71 - 127	4	30	
Tetrachloroethene	50.0	57.1		ug/L		114	77 - 128	3	30	
Toluene	50.0	48.4		ug/L		97	77 - 125	1	30	
trans-1,2-Dichloroethene	50.0	59.3		ug/L		119	78 - 130	7	30	
trans-1,3-Dichloropropene	50.0	43.2		ug/L		86	72 - 127	2	50	
1,1,1-Trichloroethane	50.0	49.7		ug/L		99	76 - 126	0	30	
1,1,2-Trichloroethane	50.0	39.8		ug/L		80	69 - 127	4	30	
Trichloroethene	50.0	50.7		ug/L		101	80 - 120	4	30	
Vinyl chloride	50.0	62.5		ug/L		125	58 - 141	15	30	
Xylenes, Total	150	161		ug/L		107	80 - 124	2	30	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	102		70 - 130
Dibromofluoromethane	118		70 - 130
Toluene-d8 (Surr)	98		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-326653/1-A

Matrix: Water

Analysis Batch: 327051

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 326653

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		04/29/14 10:55	04/30/14 19:43	1
Chromium	10	U	10		ug/L		04/29/14 10:55	04/30/14 19:43	1
Copper	20	U	20		ug/L		04/29/14 10:55	04/30/14 19:43	1
Lead	10	U	10		ug/L		04/29/14 10:55	04/30/14 19:43	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 680-326653/1-A**  
**Matrix: Water**  
**Analysis Batch: 327051**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 326653**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	20	U	20		ug/L		04/29/14 10:55	04/30/14 19:43	1

**Lab Sample ID: LCS 680-326653/2-A**  
**Matrix: Water**  
**Analysis Batch: 327051**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 326653**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	101		ug/L		101	75 - 125
Chromium	100	103		ug/L		103	75 - 125
Copper	100	104		ug/L		104	75 - 125
Lead	50.0	52.4		ug/L		105	75 - 125
Zinc	100	99.7		ug/L		100	75 - 125

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## GC/MS VOA

### Analysis Batch: 327874

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-100788-1	Effluent	Total/NA	Water	8260B	
LCS 680-327874/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-327874/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-327874/8	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 326653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-100788-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-326653/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-326653/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 327051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-100788-1	Effluent	Total Recoverable	Water	6010C	326653
LCS 680-326653/2-A	Lab Control Sample	Total Recoverable	Water	6010C	326653
MB 680-326653/1-A	Method Blank	Total Recoverable	Water	6010C	326653

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-100788-1**

**Date Collected: 04/24/14 13:00**

**Matrix: Water**

**Date Received: 04/25/14 09:31**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	327874	05/07/14 14:14	MMT	TAL SAV
Instrument ID: CMSP										
Total Recoverable	Prep	3005A			50 mL	50 mL	326653	04/29/14 10:55	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	327051	04/30/14 20:59	BCB	TAL SAV
Instrument ID: ICPF										


**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Chain of Custody Record

TestAmerica Laboratories, Inc.

<b>Client Contact</b> ARCADIS 801 Corporate Center Drive, Suite 300 Raleigh, NC 27607 919-854-1282 919-854-5448 Project Name: <b>UNC - Airport Road</b> Site: <b>Chapel Hill, NC</b> P O # <b>NC000239.0019.0001A</b>		<b>Project Manager: Alan Pinnix</b> Tel/Fax: 919-854-1282 Analysis Turnaround Time Calendar (C) or Work Days (W) TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		<b>Site Contact: Alan Pinnix</b> Lab Contact: Jerry Lanier		<b>Date: 4-24-14</b> Carrier: Fed Ex COC No: _____ of _____ COCs	
<b>Sample Identification</b> Effluent		Sample Date: <b>4/24/14 1300</b> Sample Time: _____ Sample Type: Grab Matrix: W # of Cont.: 4		Filtered Sample VOCs (Method 8260B) PP Metals (Method 6010)*		Sample Specific Notes: *Report: As, Ct, Cu, Pb, and Zn only.	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		680-100788 Chain of Custody 		Special Instructions/QC Requirements & Comments: 680-100788	
Relinquished by: <i>Amil Thomas</i> Relinquished by: _____ Relinquished by: _____		Company: ARCADIS Company: _____ Company: _____		Received by: <i>m. kelly</i> Received by: _____ Received by: <i>4.6</i>		Date/Time: 4/24/14 Date/Time: _____ Date/Time: _____	



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-100788-1

Login Number: 100788

List Source: TestAmerica Savannah

List Number: 1

Creator: Kicklighter, Marilyn D

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-100788-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina DENR	State Program	4	269	12-31-14

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-89723-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix

*Mark Swafford*

Authorized for release by:  
5/5/2014 4:01:50 PM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

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**Job ID: 400-89723-1**

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**Laboratory: TestAmerica Pensacola**

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**Narrative**

**Job Narrative**  
**400-89723-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 4/25/2014 9:20 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

**Metals**

Method 1631E: The matrix spike duplicate (MSD) recoveries for batch 400-215684 were outside control limits. Sample matrix interference and/or non-homogeneity is suspected because the associated laboratory control sample and duplicate (LCS/LCSD) recoveries was within acceptance limits.

No other analytical or quality issues were noted.

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# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-89723-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-89723-1	EFFLUENT	Water	04/24/14 13:00	04/25/14 09:20

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-89723-1**

**Date Collected: 04/24/14 13:00**

**Matrix: Water**

**Date Received: 04/25/14 09:20**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		04/25/14 10:40	05/05/14 11:21	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

## Metals

### Prep Batch: 215684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-89723-1	EFFLUENT	Total/NA	Water	1631E	
400-89879-Z-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-89879-Z-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-215684/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-215684/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-215684/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 215792

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-89723-1	EFFLUENT	Total/NA	Water	1631E	215684
400-89879-Z-1-B MS	Matrix Spike	Total/NA	Water	1631E	215684
400-89879-Z-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	215684
LCS 400-215684/2-A	Lab Control Sample	Total/NA	Water	1631E	215684
LCSD 400-215684/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	215684
MB 400-215684/1-A	Method Blank	Total/NA	Water	1631E	215684



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-215684/1-A**  
**Matrix: Water**  
**Analysis Batch: 215792**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 215684**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		05/05/14 09:00	05/05/14 09:19	1

**Lab Sample ID: LCS 400-215684/2-A**  
**Matrix: Water**  
**Analysis Batch: 215792**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 215684**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.71		ng/L		94	79 - 121

**Lab Sample ID: LCSD 400-215684/3-A**  
**Matrix: Water**  
**Analysis Batch: 215792**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 215684**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.85		ng/L		97	79 - 121	3	20

**Lab Sample ID: 400-89879-Z-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 215792**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 215684**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<5.0		50.0	39.4		ng/L		73	71 - 125

**Lab Sample ID: 400-89879-Z-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 215792**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 215684**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	<5.0		50.0	37.5	F1	ng/L		69	71 - 125	5	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-89723-1**

**Date Collected: 04/24/14 13:00**

**Matrix: Water**

**Date Received: 04/25/14 09:20**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			215684	04/25/14 10:40	VLC	TAL PEN
Total/NA	Analysis	1631E		1	215792	05/05/14 11:21	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-14
Arkansas DEQ	State Program	6	88-0689	09-01-14
Florida	NELAP	4	E81010	06-30-14
Georgia	State Program	4	N/A	06-30-14
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14
Louisiana	NELAP	6	30976	06-30-14
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-14
Michigan	State Program	5	9912	06-30-14
New Jersey	NELAP	2	FL006	06-30-14
North Carolina DENR	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14
Tennessee	State Program	4	TN02907	06-30-14
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-14
West Virginia DEP	State Program	3	136	06-30-14

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-89723-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001



**Pensacola**  
3355 McLemore Drive

Pensacola, FL 32514  
phone 850.474.1001 fax 850.474.4789

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

### Chain of Custody Record

TestAmerica Laboratories, Inc.

<b>Client Contact</b> ARCADIS 801 Corporate Center Drive, Suite 300 Raleigh, NC 27607 919-854-1282 919-854-5448 Project Name: <b>UNC - Airport Road</b> Site: <b>Chapel Hill, NC</b> P O # <b>NC000239.0019.0001A</b>		<b>Project Manager: Alan Pinnix</b> Tel/Fax: 919-854-1282 Analysis Turnaround Time Calendar (C) or Work Days (W) TAT: if different from Below <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		<b>Site Contact: Alan Pinnix</b> Lab Contact: <b>Marty Edwards</b> Date: <b>4/24/14</b> Carrier: Fed Ex COC No: _____ of _____ COCs Job No. _____ SDG No. _____ Sample Specific Notes: _____ 400-89723 COC	
<b>Sample Identification</b> Effluent		Sample Date: <b>4/24/1300</b> Sample Time: _____ Sample Type: <b>Grab</b> Matrix: <b>W</b> # of Cont.: <b>3</b>		Mercury, low level (Method 1631B) _____ <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months <b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other _____ Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown					
<b>Special Instructions/QC Requirements &amp; Comments:</b>					
Relinquished by: <i>[Signature]</i> Relinquished by: _____ Relinquished by: _____		Company: <b>ARCADIS</b> Company: _____ Company: _____		Received by: <i>[Signature]</i> Received by: _____ Received by: _____	
		Date/Time: <b>4/24/14</b> Date/Time: _____ Date/Time: _____		Date/Time: <b>4-25-14</b> Date/Time: _____ Date/Time: _____	
16°C IR-5					



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-89723-1

**Login Number: 89723**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Crawford, Lauren E**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.6°C IR-5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	Vials rec'd labeled and unbagged. Did not follow clean hands/dirty hands.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-101673-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
6/6/2014 5:52:26 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

**Job ID: 680-101673-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-101673-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 05/23/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.4 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample Effluent (680-101673-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 06/05/2014.

Acetone exceeded the recovery criteria high for LCS 680-332391/5. 1,1-Dichloroethene and trans-1,2-Dichloroethene exceeded the recovery criteria high for LCSD 680-332391/6. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Refer to the QC report for details.

No other difficulties were encountered during the volatiles analysis.

All other quality control parameters were within the acceptance limits.

### METALS (ICP)

Sample Effluent (680-101673-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/31/2014 and analyzed on 06/02/2014.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-101673-1	Effluent	Water	05/22/14 13:00	05/23/14 09:34

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD exceeds the control limits

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
$\alpha$	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-101673-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diethyl ether	34		10		ug/L	1		8260B	Total/NA
Copper	20		20		ug/L	1		6010C	Total Recoverable
Zinc	67		20		ug/L	1		6010C	Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-101673-1**

**Date Collected: 05/22/14 13:00**

**Matrix: Water**

**Date Received: 05/23/14 09:34**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U*	25		ug/L			06/05/14 17:03	1
Benzene	1.0	U	1.0		ug/L			06/05/14 17:03	1
Bromoform	1.0	U	1.0		ug/L			06/05/14 17:03	1
Bromomethane	5.0	U	5.0		ug/L			06/05/14 17:03	1
Carbon disulfide	2.0	U	2.0		ug/L			06/05/14 17:03	1
Carbon tetrachloride	1.0	U	1.0		ug/L			06/05/14 17:03	1
Chlorobenzene	1.0	U	1.0		ug/L			06/05/14 17:03	1
Chlorodibromomethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
Chloroethane	5.0	U	5.0		ug/L			06/05/14 17:03	1
Chloroform	1.0	U	1.0		ug/L			06/05/14 17:03	1
Chloromethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			06/05/14 17:03	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			06/05/14 17:03	1
Dichlorobromomethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
1,1-Dichloroethene	1.0	U*	1.0		ug/L			06/05/14 17:03	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			06/05/14 17:03	1
<b>Diethyl ether</b>	<b>34</b>		10		ug/L			06/05/14 17:03	1
Ethylbenzene	1.0	U	1.0		ug/L			06/05/14 17:03	1
2-Hexanone	10	U	10		ug/L			06/05/14 17:03	1
Methylene Chloride	5.0	U	5.0		ug/L			06/05/14 17:03	1
2-Butanone (MEK)	10	U	10		ug/L			06/05/14 17:03	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			06/05/14 17:03	1
Styrene	1.0	U	1.0		ug/L			06/05/14 17:03	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
Tetrachloroethene	1.0	U	1.0		ug/L			06/05/14 17:03	1
Toluene	1.0	U	1.0		ug/L			06/05/14 17:03	1
trans-1,2-Dichloroethene	1.0	U*	1.0		ug/L			06/05/14 17:03	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			06/05/14 17:03	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			06/05/14 17:03	1
Trichloroethene	1.0	U	1.0		ug/L			06/05/14 17:03	1
Vinyl chloride	1.0	U	1.0		ug/L			06/05/14 17:03	1
Xylenes, Total	2.0	U	2.0		ug/L			06/05/14 17:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		70 - 130		06/05/14 17:03	1
Dibromofluoromethane	107		70 - 130		06/05/14 17:03	1
Toluene-d8 (Surr)	95		70 - 130		06/05/14 17:03	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		05/31/14 09:02	06/02/14 15:55	1
Chromium	10	U	10		ug/L		05/31/14 09:02	06/02/14 15:55	1
<b>Copper</b>	<b>20</b>		20		ug/L		05/31/14 09:02	06/02/14 15:55	1
Lead	10	U	10		ug/L		05/31/14 09:02	06/02/14 15:55	1
<b>Zinc</b>	<b>67</b>		20		ug/L		05/31/14 09:02	06/02/14 15:55	1

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# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB	DBFM	TOL
		(70-130)	(70-130)	(70-130)
680-101673-1	Effluent	98	107	95
LCS 680-332391/5	Lab Control Sample	95	103	91
LCSD 680-332391/6	Lab Control Sample Dup	96	112	91
MB 680-332391/9	Method Blank	86	94	93

### Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-332391/9**

**Matrix: Water**

**Analysis Batch: 332391**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			06/05/14 13:02	1
Benzene	1.0	U	1.0		ug/L			06/05/14 13:02	1
Bromoform	1.0	U	1.0		ug/L			06/05/14 13:02	1
Bromomethane	5.0	U	5.0		ug/L			06/05/14 13:02	1
Carbon disulfide	2.0	U	2.0		ug/L			06/05/14 13:02	1
Carbon tetrachloride	1.0	U	1.0		ug/L			06/05/14 13:02	1
Chlorobenzene	1.0	U	1.0		ug/L			06/05/14 13:02	1
Chlorodibromomethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
Chloroethane	5.0	U	5.0		ug/L			06/05/14 13:02	1
Chloroform	1.0	U	1.0		ug/L			06/05/14 13:02	1
Chloromethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			06/05/14 13:02	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			06/05/14 13:02	1
Dichlorobromomethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			06/05/14 13:02	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			06/05/14 13:02	1
Diethyl ether	10	U	10		ug/L			06/05/14 13:02	1
Ethylbenzene	1.0	U	1.0		ug/L			06/05/14 13:02	1
2-Hexanone	10	U	10		ug/L			06/05/14 13:02	1
Methylene Chloride	5.0	U	5.0		ug/L			06/05/14 13:02	1
2-Butanone (MEK)	10	U	10		ug/L			06/05/14 13:02	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			06/05/14 13:02	1
Styrene	1.0	U	1.0		ug/L			06/05/14 13:02	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
Tetrachloroethene	1.0	U	1.0		ug/L			06/05/14 13:02	1
Toluene	1.0	U	1.0		ug/L			06/05/14 13:02	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			06/05/14 13:02	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			06/05/14 13:02	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			06/05/14 13:02	1
Trichloroethene	1.0	U	1.0		ug/L			06/05/14 13:02	1
Vinyl chloride	1.0	U	1.0		ug/L			06/05/14 13:02	1
Xylenes, Total	2.0	U	2.0		ug/L			06/05/14 13:02	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	86		70 - 130		06/05/14 13:02	1
Dibromofluoromethane	94		70 - 130		06/05/14 13:02	1
Toluene-d8 (Surr)	93		70 - 130		06/05/14 13:02	1

**Lab Sample ID: LCS 680-332391/5**

**Matrix: Water**

**Analysis Batch: 332391**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	100	176	*	ug/L		176	39 - 162
Benzene	50.0	47.6		ug/L		95	74 - 123

TestAmerica Savannah



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-332391/5**

**Matrix: Water**

**Analysis Batch: 332391**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	50.0	45.8		ug/L		92	60 - 134
Bromomethane	50.0	64.6		ug/L		129	10 - 171
Carbon disulfide	50.0	62.8		ug/L		126	63 - 142
Carbon tetrachloride	50.0	41.6		ug/L		83	70 - 131
Chlorobenzene	50.0	48.1		ug/L		96	79 - 120
Chlorodibromomethane	50.0	45.6		ug/L		91	63 - 134
Chloroethane	50.0	73.0		ug/L		146	47 - 148
Chloroform	50.0	51.4		ug/L		103	76 - 128
Chloromethane	50.0	51.6		ug/L		103	47 - 151
cis-1,2-Dichloroethene	50.0	51.7		ug/L		103	78 - 127
cis-1,3-Dichloropropene	50.0	45.7		ug/L		91	73 - 128
Dichlorobromomethane	50.0	46.2		ug/L		92	72 - 129
1,1-Dichloroethane	50.0	50.9		ug/L		102	69 - 132
1,2-Dichloroethane	50.0	43.6		ug/L		87	75 - 120
1,1-Dichloroethene	50.0	55.8		ug/L		112	73 - 134
1,2-Dichloropropane	50.0	40.7		ug/L		81	71 - 126
Diethyl ether	50.0	57.5		ug/L		115	40 - 160
Ethylbenzene	50.0	50.3		ug/L		101	78 - 125
2-Hexanone	100	82.6		ug/L		83	52 - 149
Methylene Chloride	50.0	57.8		ug/L		116	79 - 124
2-Butanone (MEK)	100	76.5		ug/L		77	55 - 142
4-Methyl-2-pentanone (MIBK)	100	72.8		ug/L		73	51 - 143
Styrene	50.0	49.2		ug/L		98	75 - 129
1,1,1,2-Tetrachloroethane	50.0	39.6		ug/L		79	71 - 127
Tetrachloroethene	50.0	43.5		ug/L		87	77 - 128
Toluene	50.0	50.3		ug/L		101	77 - 125
trans-1,2-Dichloroethene	50.0	63.7		ug/L		127	78 - 130
trans-1,3-Dichloropropene	50.0	43.9		ug/L		88	72 - 127
1,1,1-Trichloroethane	50.0	41.9		ug/L		84	76 - 126
1,1,2-Trichloroethane	50.0	39.8		ug/L		80	69 - 127
Trichloroethene	50.0	43.1		ug/L		86	80 - 120
Vinyl chloride	50.0	48.9		ug/L		98	58 - 141
Xylenes, Total	150	140		ug/L		93	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	95		70 - 130
Dibromofluoromethane	103		70 - 130
Toluene-d8 (Surr)	91		70 - 130

**Lab Sample ID: LCSD 680-332391/6**

**Matrix: Water**

**Analysis Batch: 332391**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD
									Limit
Acetone	100	114		ug/L		114	39 - 162	43	50
Benzene	50.0	47.4		ug/L		95	74 - 123	0	30
Bromoform	50.0	41.8		ug/L		84	60 - 134	9	30
Bromomethane	50.0	70.1		ug/L		140	10 - 171	8	50

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-332391/6

Matrix: Water

Analysis Batch: 332391

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	RPD Limit
Carbon disulfide	50.0	66.4		ug/L		133	63 - 142	6	30	
Carbon tetrachloride	50.0	43.4		ug/L		87	70 - 131	4	30	
Chlorobenzene	50.0	47.7		ug/L		95	79 - 120	1	30	
Chlorodibromomethane	50.0	46.1		ug/L		92	63 - 134	1	50	
Chloroethane	50.0	72.4		ug/L		145	47 - 148	1	40	
Chloroform	50.0	57.1		ug/L		114	76 - 128	11	30	
Chloromethane	50.0	55.2		ug/L		110	47 - 151	7	30	
cis-1,2-Dichloroethene	50.0	55.7		ug/L		111	78 - 127	7	30	
cis-1,3-Dichloropropene	50.0	42.9		ug/L		86	73 - 128	6	30	
Dichlorobromomethane	50.0	46.0		ug/L		92	72 - 129	0	30	
1,1-Dichloroethane	50.0	56.5		ug/L		113	69 - 132	10	30	
1,2-Dichloroethane	50.0	42.3		ug/L		85	75 - 120	3	30	
1,1-Dichloroethene	50.0	70.1	*	ug/L		140	73 - 134	23	30	
1,2-Dichloropropane	50.0	46.0		ug/L		92	71 - 126	12	30	
Diethyl ether	50.0	58.7		ug/L		117	40 - 160	2	50	
Ethylbenzene	50.0	50.1		ug/L		100	78 - 125	0	30	
2-Hexanone	100	81.4		ug/L		81	52 - 149	1	30	
Methylene Chloride	50.0	55.4		ug/L		111	79 - 124	4	30	
2-Butanone (MEK)	100	84.6		ug/L		85	55 - 142	10	30	
4-Methyl-2-pentanone (MIBK)	100	68.7		ug/L		69	51 - 143	6	30	
Styrene	50.0	48.2		ug/L		96	75 - 129	2	30	
1,1,1,2-Tetrachloroethane	50.0	39.2		ug/L		78	71 - 127	1	30	
Tetrachloroethene	50.0	47.4		ug/L		95	77 - 128	9	30	
Toluene	50.0	45.4		ug/L		91	77 - 125	10	30	
trans-1,2-Dichloroethene	50.0	68.6	*	ug/L		137	78 - 130	7	30	
trans-1,3-Dichloropropene	50.0	40.0		ug/L		80	72 - 127	9	50	
1,1,1-Trichloroethane	50.0	46.2		ug/L		92	76 - 126	10	30	
1,1,2-Trichloroethane	50.0	40.3		ug/L		81	69 - 127	1	30	
Trichloroethene	50.0	47.5		ug/L		95	80 - 120	10	30	
Vinyl chloride	50.0	52.0		ug/L		104	58 - 141	6	30	
Xylenes, Total	150	152		ug/L		101	80 - 124	8	30	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	96		70 - 130
Dibromofluoromethane	112		70 - 130
Toluene-d8 (Surr)	91		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-331602/1-A

Matrix: Water

Analysis Batch: 331897

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 331602

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		05/31/14 09:02	06/02/14 14:31	1
Chromium	10	U	10		ug/L		05/31/14 09:02	06/02/14 14:31	1
Copper	20	U	20		ug/L		05/31/14 09:02	06/02/14 14:31	1
Lead	10	U	10		ug/L		05/31/14 09:02	06/02/14 14:31	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 680-331602/1-A  
Matrix: Water  
Analysis Batch: 331897

Client Sample ID: Method Blank  
Prep Type: Total Recoverable  
Prep Batch: 331602

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	20	U	20		ug/L		05/31/14 09:02	06/02/14 14:31	1

Lab Sample ID: LCS 680-331602/2-A  
Matrix: Water  
Analysis Batch: 331897

Client Sample ID: Lab Control Sample  
Prep Type: Total Recoverable  
Prep Batch: 331602

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	114		ug/L		114	75 - 125
Chromium	100	107		ug/L		107	75 - 125
Copper	100	110		ug/L		110	75 - 125
Lead	50.0	50.5		ug/L		101	75 - 125
Zinc	100	104		ug/L		104	75 - 125

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## GC/MS VOA

### Analysis Batch: 332391

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-101673-1	Effluent	Total/NA	Water	8260B	
LCS 680-332391/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-332391/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-332391/9	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 331602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-101673-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-331602/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-331602/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 331897

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-101673-1	Effluent	Total Recoverable	Water	6010C	331602
LCS 680-331602/2-A	Lab Control Sample	Total Recoverable	Water	6010C	331602
MB 680-331602/1-A	Method Blank	Total Recoverable	Water	6010C	331602

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-101673-1**

**Date Collected: 05/22/14 13:00**

**Matrix: Water**

**Date Received: 05/23/14 09:34**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	332391	06/05/14 17:03	MMT	TAL SAV
Instrument ID: CMSP										
Total Recoverable	Prep	3005A			50 mL	50 mL	331602	05/31/14 09:02	BJB	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	331897	06/02/14 15:55	BWR	TAL SAV
Instrument ID: ICPE										

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Savannah  
5102 LaRoche Avenue

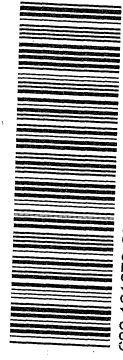
Savannah, GA 31404  
phone 912.354.7858 fax 912.352.0165

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

### Chain of Custody Record

<b>Client Contact</b> ARCADIS 801 Corporate Center Drive, Suite 300 Raleigh, NC 27607 919-854-1282 919-854-5448 Project Name: UNC - Airport Road Site: Chapel Hill, NC P O # NC000239.0019.0001B			<b>Project Manager:</b> Alan Pinnix Tel/Fax: 919-854-1282 Analysis Turnaround Time Calendar (C) or Work Days (W) TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day			<b>Site Contact:</b> Alan Pinnix Lab Contact: Jerry Lanier			<b>Date:</b> 5-22-14 Carrier: Fed Ex COCs Job No. SDG No.		
<b>Sample Identification</b> Effluent			Sample Date 5/22/14	Sample Time 1300	Sample Type Grab	Matrix W	# of Cont. 4	Filtered Sample VOCs (Method 8260B)      2 NP Metals (Method 6010)*      4			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Polson B <input type="checkbox"/> Unknown			Special Instructions/QC Requirements & Comments:			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Relinquished by: <i>Alan Pinnix</i> Date/Time: 5/22/14 1700			Company: ARCADIS			Received by: <i>JA</i> Date/Time: 5/23/14 09:34					
Relinquished by:			Company:			Received by:					
Relinquished by:			Company:			Received by:					



*0.4 gal*  
680-101673



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-101673-1

**Login Number: 101673**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Kicklighter, Marilyn D**

Question	Answer	Comment
Radioactivity wasn't checked or is <= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-101673-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina DENR	State Program	4	269	12-31-14

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-91088-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
6/3/2014 3:46:29 PM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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**TotalAccess**

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[www.testamericainc.com](http://www.testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

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**Job ID: 400-91088-1**

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**Laboratory: TestAmerica Pensacola**

---

**Narrative**

**Job Narrative**  
**400-91088-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 5/23/2014 9:12 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6° C.

**Metals**

Method 1631E: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 400-218817 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample and duplicate (LCS/LCSD) recoveries was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-91088-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Mercury	2.5		0.50	ng/L	1		1631E	Total/NA

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-91088-1	EFFLUENT	Water	05/22/14 13:00	05/23/14 09:12

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-91088-1**

Date Collected: 05/22/14 13:00

Matrix: Water

Date Received: 05/23/14 09:12

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.5		0.50	ng/L		05/23/14 10:45	06/03/14 12:58	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

## Metals

### Prep Batch: 218817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-91088-1	EFFLUENT	Total/NA	Water	1631E	
400-91111-C-3-B MS	Matrix Spike	Total/NA	Water	1631E	
400-91111-C-3-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-218817/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-218817/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-218817/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 218882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-91088-1	EFFLUENT	Total/NA	Water	1631E	218817
400-91111-C-3-B MS	Matrix Spike	Total/NA	Water	1631E	218817
400-91111-C-3-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	218817
LCS 400-218817/2-A	Lab Control Sample	Total/NA	Water	1631E	218817
LCSD 400-218817/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	218817
MB 400-218817/1-A	Method Blank	Total/NA	Water	1631E	218817



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-218817/1-A**  
**Matrix: Water**  
**Analysis Batch: 218882**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 218817**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		06/03/14 09:01	06/03/14 09:18	1

**Lab Sample ID: LCS 400-218817/2-A**  
**Matrix: Water**  
**Analysis Batch: 218882**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 218817**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.78		ng/L		96	79 - 121

**Lab Sample ID: LCSD 400-218817/3-A**  
**Matrix: Water**  
**Analysis Batch: 218882**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 218817**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.82		ng/L		96	79 - 121	1	20

**Lab Sample ID: 400-91111-C-3-B MS**  
**Matrix: Water**  
**Analysis Batch: 218882**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 218817**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.84		2.50	2.46	F1	ng/L		65	71 - 125

**Lab Sample ID: 400-91111-C-3-C MSD**  
**Matrix: Water**  
**Analysis Batch: 218882**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 218817**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.84		2.50	2.44	F1	ng/L		64	71 - 125	1	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-91088-1**

**Date Collected: 05/22/14 13:00**

**Matrix: Water**

**Date Received: 05/23/14 09:12**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			218817	05/23/14 10:45	VLC	TAL PEN
Total/NA	Analysis	1631E		1	218882	06/03/14 12:58	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-14
Arkansas DEQ	State Program	6	88-0689	09-01-14
Florida	NELAP	4	E81010	06-30-14
Georgia	State Program	4	N/A	06-30-14
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14
Louisiana	NELAP	6	30976	06-30-14
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-14
Michigan	State Program	5	9912	06-30-14
New Jersey	NELAP	2	FL006	06-30-14
North Carolina DENR	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14
Tennessee	State Program	4	TN02907	06-30-14
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-14
West Virginia DEP	State Program	3	136	06-30-14



# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-91088-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-91088-1

**Login Number: 91088**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Meade, Chris J**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.6°C IR5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	The vials for Hg-1631E were labeled by client.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-102800-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
7/10/2014 9:13:18 AM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

**Job ID: 680-102800-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-102800-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 06/28/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.6 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample Effluent (680-102800-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 07/08/2014.

Diethyl ether exceeded the recovery criteria low for LCSD 680-338006/5 because the spike was inadvertently omitted. Diethyl ether exceeded the RPD limit. Refer to the QC report for details.

Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### METALS (ICP)

Sample Effluent (680-102800-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/01/2014 and analyzed on 07/02/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-102800-1	Effluent	Water	06/27/14 13:00	06/28/14 09:21

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD exceeds the control limits
*	RPD of the LCS and LCSD exceeds the control limits

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
$\alpha$	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-102800-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-102800-1**

**Date Collected: 06/27/14 13:00**

**Matrix: Water**

**Date Received: 06/28/14 09:21**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			07/08/14 20:19	1
Benzene	1.0	U	1.0		ug/L			07/08/14 20:19	1
Bromoform	1.0	U	1.0		ug/L			07/08/14 20:19	1
Bromomethane	5.0	U	5.0		ug/L			07/08/14 20:19	1
Carbon disulfide	2.0	U	2.0		ug/L			07/08/14 20:19	1
Carbon tetrachloride	1.0	U	1.0		ug/L			07/08/14 20:19	1
Chlorobenzene	1.0	U	1.0		ug/L			07/08/14 20:19	1
Chlorodibromomethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
Chloroethane	5.0	U	5.0		ug/L			07/08/14 20:19	1
Chloroform	1.0	U	1.0		ug/L			07/08/14 20:19	1
Chloromethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/08/14 20:19	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/08/14 20:19	1
Dichlorobromomethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			07/08/14 20:19	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			07/08/14 20:19	1
Diethyl ether	10	U *	10		ug/L			07/08/14 20:19	1
Ethylbenzene	1.0	U	1.0		ug/L			07/08/14 20:19	1
2-Hexanone	10	U	10		ug/L			07/08/14 20:19	1
Methylene Chloride	5.0	U	5.0		ug/L			07/08/14 20:19	1
2-Butanone (MEK)	10	U	10		ug/L			07/08/14 20:19	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			07/08/14 20:19	1
Styrene	1.0	U	1.0		ug/L			07/08/14 20:19	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
Tetrachloroethene	1.0	U	1.0		ug/L			07/08/14 20:19	1
Toluene	1.0	U	1.0		ug/L			07/08/14 20:19	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/08/14 20:19	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/08/14 20:19	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			07/08/14 20:19	1
Trichloroethene	1.0	U	1.0		ug/L			07/08/14 20:19	1
Vinyl chloride	1.0	U	1.0		ug/L			07/08/14 20:19	1
Xylenes, Total	2.0	U	2.0		ug/L			07/08/14 20:19	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene	97		70 - 130					07/08/14 20:19	1
Dibromofluoromethane	117		70 - 130					07/08/14 20:19	1
Toluene-d8 (Surr)	97		70 - 130					07/08/14 20:19	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		07/01/14 15:15	07/02/14 18:31	1
Chromium	10	U	10		ug/L		07/01/14 15:15	07/02/14 18:31	1
Copper	20	U	20		ug/L		07/01/14 15:15	07/02/14 18:31	1
Lead	10	U	10		ug/L		07/01/14 15:15	07/02/14 18:31	1
Zinc	20	U	20		ug/L		07/01/14 15:15	07/02/14 18:31	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (70-130)	DBFM (70-130)	TOL (70-130)
680-102800-1	Effluent	97	117	97
LCS 680-338006/4	Lab Control Sample	105	106	106
LCSD 680-338006/5	Lab Control Sample Dup	109	111	109
MB 680-338006/9	Method Blank	98	121	97

### Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-338006/9**

**Matrix: Water**

**Analysis Batch: 338006**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			07/08/14 12:00	1
Benzene	1.0	U	1.0		ug/L			07/08/14 12:00	1
Bromoform	1.0	U	1.0		ug/L			07/08/14 12:00	1
Bromomethane	5.0	U	5.0		ug/L			07/08/14 12:00	1
Carbon disulfide	2.0	U	2.0		ug/L			07/08/14 12:00	1
Carbon tetrachloride	1.0	U	1.0		ug/L			07/08/14 12:00	1
Chlorobenzene	1.0	U	1.0		ug/L			07/08/14 12:00	1
Chlorodibromomethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
Chloroethane	5.0	U	5.0		ug/L			07/08/14 12:00	1
Chloroform	1.0	U	1.0		ug/L			07/08/14 12:00	1
Chloromethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/08/14 12:00	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/08/14 12:00	1
Dichlorobromomethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			07/08/14 12:00	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			07/08/14 12:00	1
Diethyl ether	10	U	10		ug/L			07/08/14 12:00	1
Ethylbenzene	1.0	U	1.0		ug/L			07/08/14 12:00	1
2-Hexanone	10	U	10		ug/L			07/08/14 12:00	1
Methylene Chloride	5.0	U	5.0		ug/L			07/08/14 12:00	1
2-Butanone (MEK)	10	U	10		ug/L			07/08/14 12:00	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			07/08/14 12:00	1
Styrene	1.0	U	1.0		ug/L			07/08/14 12:00	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
Tetrachloroethene	1.0	U	1.0		ug/L			07/08/14 12:00	1
Toluene	1.0	U	1.0		ug/L			07/08/14 12:00	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/08/14 12:00	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/08/14 12:00	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			07/08/14 12:00	1
Trichloroethene	1.0	U	1.0		ug/L			07/08/14 12:00	1
Vinyl chloride	1.0	U	1.0		ug/L			07/08/14 12:00	1
Xylenes, Total	2.0	U	2.0		ug/L			07/08/14 12:00	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		70 - 130		07/08/14 12:00	1
Dibromofluoromethane	121		70 - 130		07/08/14 12:00	1
Toluene-d8 (Surr)	97		70 - 130		07/08/14 12:00	1

**Lab Sample ID: LCS 680-338006/4**

**Matrix: Water**

**Analysis Batch: 338006**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	100	90.4		ug/L		90	39 - 162
Benzene	50.0	56.2		ug/L		112	74 - 123

TestAmerica Savannah



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-338006/4**

**Matrix: Water**

**Analysis Batch: 338006**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	50.0	56.5		ug/L		113	60 - 134
Bromomethane	50.0	46.9		ug/L		94	10 - 171
Carbon disulfide	50.0	53.5		ug/L		107	63 - 142
Carbon tetrachloride	50.0	53.3		ug/L		107	70 - 131
Chlorobenzene	50.0	54.2		ug/L		108	79 - 120
Chlorodibromomethane	50.0	55.2		ug/L		110	63 - 134
Chloroethane	50.0	48.8		ug/L		98	47 - 148
Chloroform	50.0	52.9		ug/L		106	76 - 128
Chloromethane	50.0	50.9		ug/L		102	47 - 151
cis-1,2-Dichloroethene	50.0	52.1		ug/L		104	78 - 127
cis-1,3-Dichloropropene	50.0	47.9		ug/L		96	73 - 128
Dichlorobromomethane	50.0	52.6		ug/L		105	72 - 129
1,1-Dichloroethane	50.0	53.4		ug/L		107	69 - 132
1,2-Dichloroethane	50.0	54.4		ug/L		109	75 - 120
1,1-Dichloroethene	50.0	52.2		ug/L		104	73 - 134
1,2-Dichloropropane	50.0	52.5		ug/L		105	71 - 126
Diethyl ether	50.0	52.6		ug/L		105	40 - 160
Ethylbenzene	50.0	54.0		ug/L		108	78 - 125
2-Hexanone	100	98.7		ug/L		99	52 - 149
Methylene Chloride	50.0	50.6		ug/L		101	79 - 124
2-Butanone (MEK)	100	87.0		ug/L		87	55 - 142
4-Methyl-2-pentanone (MIBK)	100	100		ug/L		100	51 - 143
Styrene	50.0	56.5		ug/L		113	75 - 129
1,1,1,2-Tetrachloroethane	50.0	53.3		ug/L		107	71 - 127
Tetrachloroethene	50.0	52.3		ug/L		105	77 - 128
Toluene	50.0	52.6		ug/L		105	77 - 125
trans-1,2-Dichloroethene	50.0	51.4		ug/L		103	78 - 130
trans-1,3-Dichloropropene	50.0	50.9		ug/L		102	72 - 127
1,1,1-Trichloroethane	50.0	59.6		ug/L		119	76 - 126
1,1,1,2-Trichloroethane	50.0	56.9		ug/L		114	69 - 127
Trichloroethene	50.0	51.2		ug/L		102	80 - 120
Vinyl chloride	50.0	53.1		ug/L		106	58 - 141
Xylenes, Total	150	164		ug/L		109	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	105		70 - 130
Dibromofluoromethane	106		70 - 130
Toluene-d8 (Surr)	106		70 - 130

**Lab Sample ID: LCSD 680-338006/5**

**Matrix: Water**

**Analysis Batch: 338006**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Acetone	100	109		ug/L		109	39 - 162	18	50
Benzene	50.0	55.5		ug/L		111	74 - 123	1	30
Bromoform	50.0	60.3		ug/L		121	60 - 134	6	30
Bromomethane	50.0	55.7		ug/L		111	10 - 171	17	50

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-338006/5

Matrix: Water

Analysis Batch: 338006

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	RPD Limit
Carbon disulfide	50.0	48.8		ug/L		98	63 - 142	9	30	
Carbon tetrachloride	50.0	53.2		ug/L		106	70 - 131	0	30	
Chlorobenzene	50.0	56.8		ug/L		114	79 - 120	5	30	
Chlorodibromomethane	50.0	58.0		ug/L		116	63 - 134	5	50	
Chloroethane	50.0	52.0		ug/L		104	47 - 148	6	40	
Chloroform	50.0	55.0		ug/L		110	76 - 128	4	30	
Chloromethane	50.0	44.6		ug/L		89	47 - 151	13	30	
cis-1,2-Dichloroethene	50.0	55.3		ug/L		111	78 - 127	6	30	
cis-1,3-Dichloropropene	50.0	47.2		ug/L		94	73 - 128	2	30	
Dichlorobromomethane	50.0	53.7		ug/L		107	72 - 129	2	30	
1,1-Dichloroethane	50.0	51.7		ug/L		103	69 - 132	3	30	
1,2-Dichloroethane	50.0	57.6		ug/L		115	75 - 120	6	30	
1,1-Dichloroethene	50.0	49.3		ug/L		99	73 - 134	6	30	
1,2-Dichloropropane	50.0	51.4		ug/L		103	71 - 126	2	30	
Diethyl ether	50.0	1.0	U *	ug/L		0	40 - 160	200	50	
Ethylbenzene	50.0	55.6		ug/L		111	78 - 125	3	30	
2-Hexanone	100	113		ug/L		113	52 - 149	14	30	
Methylene Chloride	50.0	52.4		ug/L		105	79 - 124	4	30	
2-Butanone (MEK)	100	115		ug/L		115	55 - 142	28	30	
4-Methyl-2-pentanone (MIBK)	100	113		ug/L		113	51 - 143	12	30	
Styrene	50.0	58.7		ug/L		117	75 - 129	4	30	
1,1,2,2-Tetrachloroethane	50.0	58.5		ug/L		117	71 - 127	9	30	
Tetrachloroethene	50.0	52.9		ug/L		106	77 - 128	1	30	
Toluene	50.0	54.9		ug/L		110	77 - 125	4	30	
trans-1,2-Dichloroethene	50.0	53.1		ug/L		106	78 - 130	3	30	
trans-1,3-Dichloropropene	50.0	50.4		ug/L		101	72 - 127	1	50	
1,1,1-Trichloroethane	50.0	58.5		ug/L		117	76 - 126	2	30	
1,1,2-Trichloroethane	50.0	58.6		ug/L		117	69 - 127	3	30	
Trichloroethene	50.0	50.5		ug/L		101	80 - 120	1	30	
Vinyl chloride	50.0	51.0		ug/L		102	58 - 141	4	30	
Xylenes, Total	150	170		ug/L		114	80 - 124	4	30	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	109		70 - 130
Dibromofluoromethane	111		70 - 130
Toluene-d8 (Surr)	109		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-337165/1-A

Matrix: Water

Analysis Batch: 337518

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 337165

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		07/01/14 15:15	07/02/14 17:49	1
Chromium	10	U	10		ug/L		07/01/14 15:15	07/02/14 17:49	1
Copper	20	U	20		ug/L		07/01/14 15:15	07/02/14 17:49	1
Lead	10	U	10		ug/L		07/01/14 15:15	07/02/14 17:49	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 680-337165/1-A**  
**Matrix: Water**  
**Analysis Batch: 337518**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 337165**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	20	U	20		ug/L		07/01/14 15:15	07/02/14 17:49	1

**Lab Sample ID: LCS 680-337165/2-A**  
**Matrix: Water**  
**Analysis Batch: 337518**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 337165**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	112		ug/L		112	75 - 125
Chromium	100	102		ug/L		102	75 - 125
Copper	100	105		ug/L		105	75 - 125
Lead	50.0	50.7		ug/L		101	75 - 125
Zinc	100	98.4		ug/L		98	75 - 125

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## GC/MS VOA

### Analysis Batch: 338006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-102800-1	Effluent	Total/NA	Water	8260B	
LCS 680-338006/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-338006/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-338006/9	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 337165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-102800-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-337165/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-337165/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 337518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-102800-1	Effluent	Total Recoverable	Water	6010C	337165
LCS 680-337165/2-A	Lab Control Sample	Total Recoverable	Water	6010C	337165
MB 680-337165/1-A	Method Blank	Total Recoverable	Water	6010C	337165

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-102800-1**

**Date Collected: 06/27/14 13:00**

**Matrix: Water**

**Date Received: 06/28/14 09:21**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	338006	07/08/14 20:19	MMT	TAL SAV
Instrument ID: CMSA2										
Total Recoverable	Prep	3005A			50 mL	50 mL	337165	07/01/14 15:15	SP	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	337518	07/02/14 18:31	BCB	TAL SAV
Instrument ID: ICPE										

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-102800-1

**Login Number: 102800**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Conner, Keaton**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-102800-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina (WW/SW)	State Program	4	269	12-31-14

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-92742-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
7/8/2014 4:51:32 PM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

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**Job ID: 400-92742-1**

---

**Laboratory: TestAmerica Pensacola**

---

**Narrative**

**Job Narrative**  
**400-92742-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 6/28/2014 9:16 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.8° C.

**Metals**

Method 1631E: The matrix spike duplicate (MSD) recovery for batch 400-222718 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample and duplicate (LCS/LCSD) recoveries was within acceptance limits.

Method 1631E: The following sample was diluted to bring the concentration of target analytes within the calibration range: 001 Outfall (400-92815-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-92742-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Mercury	0.65		0.50	ng/L	1		1631E	Total/NA

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-92742-1	EFFLUENT	Water	06/27/14 13:00	06/28/14 09:16

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- 1
- 2
- 3
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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-92742-1**

**Date Collected: 06/27/14 13:00**

**Matrix: Water**

**Date Received: 06/28/14 09:16**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.65		0.50	ng/L		07/07/14 12:55	07/08/14 13:00	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

## Metals

### Prep Batch: 222718

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-92742-1	EFFLUENT	Total/NA	Water	1631E	
400-92815-B-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-92815-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-222718/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-222718/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-222718/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 222806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-92742-1	EFFLUENT	Total/NA	Water	1631E	222718
400-92815-B-1-B MS	Matrix Spike	Total/NA	Water	1631E	222718
400-92815-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	222718
LCS 400-222718/2-A	Lab Control Sample	Total/NA	Water	1631E	222718
LCSD 400-222718/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	222718
MB 400-222718/1-A	Method Blank	Total/NA	Water	1631E	222718





# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-222718/1-A**  
**Matrix: Water**  
**Analysis Batch: 222806**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 222718**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		07/08/14 08:43	07/08/14 09:21	1

**Lab Sample ID: LCS 400-222718/2-A**  
**Matrix: Water**  
**Analysis Batch: 222806**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 222718**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.55		ng/L		111	79 - 121

**Lab Sample ID: LCSD 400-222718/3-A**  
**Matrix: Water**  
**Analysis Batch: 222806**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 222718**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	5.36		ng/L		107	79 - 121	3	20

**Lab Sample ID: 400-92815-B-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 222806**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 222718**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	670		250	935		ng/L		106	71 - 125

**Lab Sample ID: 400-92815-B-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 222806**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 222718**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	670		250	985	F1	ng/L		126	71 - 125	5	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-92742-1**

**Date Collected: 06/27/14 13:00**

**Matrix: Water**

**Date Received: 06/28/14 09:16**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			222718	07/07/14 12:55	VLC	TAL PEN
Total/NA	Analysis	1631E		1	222806	07/08/14 13:00	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-14 *
Arizona	State Program	9	AZ0710	01-11-15
Arkansas DEQ	State Program	6	88-0689	09-01-14
Florida	NELAP	4	E81010	06-30-15
Georgia	State Program	4	N/A	06-30-14 *
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14 *
Louisiana	NELAP	6	30976	06-30-14 *
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-15
Michigan	State Program	5	9912	06-30-14 *
New Jersey	NELAP	2	FL006	06-30-15
North Carolina (WW/SW)	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14 *
Tennessee	State Program	4	TN02907	06-30-15
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-15

\* Certification renewal pending - certification considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-92742-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-92742-1

**Login Number: 92742**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Meade, Chris J**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.8°C IR5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	Vials for Hg-1631E were labeled by client.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-103602-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
8/1/2014 11:34:54 AM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

**Job ID: 680-103602-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-103602-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 07/24/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample Effluent (680-103602-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 07/31/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### METALS (ICP)

Sample Effluent (680-103602-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/25/2014 and analyzed on 07/26/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-103602-1	Effluent	Water	07/23/14 15:30	07/24/14 09:09

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-103602-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Zinc	44		20		ug/L	1		6010C	Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-103602-1**

**Date Collected: 07/23/14 15:30**

**Matrix: Water**

**Date Received: 07/24/14 09:09**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			07/31/14 13:09	1
Benzene	1.0	U	1.0		ug/L			07/31/14 13:09	1
Bromoform	1.0	U	1.0		ug/L			07/31/14 13:09	1
Bromomethane	5.0	U	5.0		ug/L			07/31/14 13:09	1
Carbon disulfide	2.0	U	2.0		ug/L			07/31/14 13:09	1
Carbon tetrachloride	1.0	U	1.0		ug/L			07/31/14 13:09	1
Chlorobenzene	1.0	U	1.0		ug/L			07/31/14 13:09	1
Chlorodibromomethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
Chloroethane	5.0	U	5.0		ug/L			07/31/14 13:09	1
Chloroform	1.0	U	1.0		ug/L			07/31/14 13:09	1
Chloromethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/31/14 13:09	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/31/14 13:09	1
Dichlorobromomethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			07/31/14 13:09	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			07/31/14 13:09	1
Diethyl ether	10	U	10		ug/L			07/31/14 13:09	1
Ethylbenzene	1.0	U	1.0		ug/L			07/31/14 13:09	1
2-Hexanone	10	U	10		ug/L			07/31/14 13:09	1
Methylene Chloride	5.0	U	5.0		ug/L			07/31/14 13:09	1
2-Butanone (MEK)	10	U	10		ug/L			07/31/14 13:09	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			07/31/14 13:09	1
Styrene	1.0	U	1.0		ug/L			07/31/14 13:09	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
Tetrachloroethene	1.0	U	1.0		ug/L			07/31/14 13:09	1
Toluene	1.0	U	1.0		ug/L			07/31/14 13:09	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/31/14 13:09	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/31/14 13:09	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			07/31/14 13:09	1
Trichloroethene	1.0	U	1.0		ug/L			07/31/14 13:09	1
Vinyl chloride	1.0	U	1.0		ug/L			07/31/14 13:09	1
Xylenes, Total	2.0	U	2.0		ug/L			07/31/14 13:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	97		70 - 130		07/31/14 13:09	1
Dibromofluoromethane	111		70 - 130		07/31/14 13:09	1
Toluene-d8 (Surr)	101		70 - 130		07/31/14 13:09	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		07/25/14 11:00	07/26/14 11:47	1
Chromium	10	U	10		ug/L		07/25/14 11:00	07/26/14 11:47	1
Copper	20	U	20		ug/L		07/25/14 11:00	07/26/14 11:47	1
Lead	10	U	10		ug/L		07/25/14 11:00	07/26/14 11:47	1
<b>Zinc</b>	<b>44</b>		20		ug/L		07/25/14 11:00	07/26/14 11:47	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (70-130)	DBFM (70-130)	TOL (70-130)
680-103602-1	Effluent	97	111	101
LCS 680-341737/4	Lab Control Sample	103	105	102
LCSD 680-341737/5	Lab Control Sample Dup	103	105	103
MB 680-341737/8	Method Blank	98	112	96

### Surrogate Legend

BFB = 4-Bromofluorobenzene

DBFM = Dibromofluoromethane

TOL = Toluene-d8 (Surr)

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-341737/8**

**Matrix: Water**

**Analysis Batch: 341737**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			07/31/14 12:09	1
Benzene	1.0	U	1.0		ug/L			07/31/14 12:09	1
Bromoform	1.0	U	1.0		ug/L			07/31/14 12:09	1
Bromomethane	5.0	U	5.0		ug/L			07/31/14 12:09	1
Carbon disulfide	2.0	U	2.0		ug/L			07/31/14 12:09	1
Carbon tetrachloride	1.0	U	1.0		ug/L			07/31/14 12:09	1
Chlorobenzene	1.0	U	1.0		ug/L			07/31/14 12:09	1
Chlorodibromomethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
Chloroethane	5.0	U	5.0		ug/L			07/31/14 12:09	1
Chloroform	1.0	U	1.0		ug/L			07/31/14 12:09	1
Chloromethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/31/14 12:09	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/31/14 12:09	1
Dichlorobromomethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			07/31/14 12:09	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			07/31/14 12:09	1
Diethyl ether	10	U	10		ug/L			07/31/14 12:09	1
Ethylbenzene	1.0	U	1.0		ug/L			07/31/14 12:09	1
2-Hexanone	10	U	10		ug/L			07/31/14 12:09	1
Methylene Chloride	5.0	U	5.0		ug/L			07/31/14 12:09	1
2-Butanone (MEK)	10	U	10		ug/L			07/31/14 12:09	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			07/31/14 12:09	1
Styrene	1.0	U	1.0		ug/L			07/31/14 12:09	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
Tetrachloroethene	1.0	U	1.0		ug/L			07/31/14 12:09	1
Toluene	1.0	U	1.0		ug/L			07/31/14 12:09	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			07/31/14 12:09	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			07/31/14 12:09	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			07/31/14 12:09	1
Trichloroethene	1.0	U	1.0		ug/L			07/31/14 12:09	1
Vinyl chloride	1.0	U	1.0		ug/L			07/31/14 12:09	1
Xylenes, Total	2.0	U	2.0		ug/L			07/31/14 12:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		70 - 130		07/31/14 12:09	1
Dibromofluoromethane	112		70 - 130		07/31/14 12:09	1
Toluene-d8 (Surr)	96		70 - 130		07/31/14 12:09	1

**Lab Sample ID: LCS 680-341737/4**

**Matrix: Water**

**Analysis Batch: 341737**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	100	98.0		ug/L		98	39 - 162
Benzene	50.0	51.2		ug/L		102	74 - 123

TestAmerica Savannah



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-341737/4**

**Matrix: Water**

**Analysis Batch: 341737**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromoform	50.0	46.8		ug/L		94	60 - 134
Bromomethane	50.0	33.5		ug/L		67	10 - 171
Carbon disulfide	50.0	49.6		ug/L		99	63 - 142
Carbon tetrachloride	50.0	49.7		ug/L		99	70 - 131
Chlorobenzene	50.0	52.5		ug/L		105	79 - 120
Chlorodibromomethane	50.0	54.2		ug/L		108	63 - 134
Chloroethane	50.0	51.7		ug/L		103	47 - 148
Chloroform	50.0	53.2		ug/L		106	76 - 128
Chloromethane	50.0	64.8		ug/L		130	47 - 151
cis-1,2-Dichloroethene	50.0	53.9		ug/L		108	78 - 127
cis-1,3-Dichloropropene	50.0	52.7		ug/L		105	73 - 128
Dichlorobromomethane	50.0	52.4		ug/L		105	72 - 129
1,1-Dichloroethane	50.0	53.7		ug/L		107	69 - 132
1,2-Dichloroethane	50.0	47.5		ug/L		95	75 - 120
1,1-Dichloroethene	50.0	43.8		ug/L		88	73 - 134
1,2-Dichloropropane	50.0	51.3		ug/L		103	71 - 126
Diethyl ether	50.0	62.4		ug/L		125	40 - 160
Ethylbenzene	50.0	54.0		ug/L		108	78 - 125
2-Hexanone	100	101		ug/L		101	52 - 149
Methylene Chloride	50.0	53.3		ug/L		107	79 - 124
2-Butanone (MEK)	100	96.8		ug/L		97	55 - 142
4-Methyl-2-pentanone (MIBK)	100	96.8		ug/L		97	51 - 143
Styrene	50.0	52.5		ug/L		105	75 - 129
1,1,1,2-Tetrachloroethane	50.0	49.0		ug/L		98	71 - 127
Tetrachloroethene	50.0	56.1		ug/L		112	77 - 128
Toluene	50.0	51.3		ug/L		103	77 - 125
trans-1,2-Dichloroethene	50.0	54.1		ug/L		108	78 - 130
trans-1,3-Dichloropropene	50.0	52.0		ug/L		104	72 - 127
1,1,1-Trichloroethane	50.0	57.0		ug/L		114	76 - 126
1,1,2-Trichloroethane	50.0	50.5		ug/L		101	69 - 127
Trichloroethene	50.0	55.3		ug/L		111	80 - 120
Vinyl chloride	50.0	50.3		ug/L		101	58 - 141
Xylenes, Total	150	161		ug/L		107	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	103		70 - 130
Dibromofluoromethane	105		70 - 130
Toluene-d8 (Surr)	102		70 - 130

**Lab Sample ID: LCSD 680-341737/5**

**Matrix: Water**

**Analysis Batch: 341737**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Acetone	100	98.0		ug/L		98	39 - 162	0	50
Benzene	50.0	51.4		ug/L		103	74 - 123	0	30
Bromoform	50.0	47.4		ug/L		95	60 - 134	1	30
Bromomethane	50.0	36.0		ug/L		72	10 - 171	7	50

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-341737/5

Matrix: Water

Analysis Batch: 341737

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	RPD Limit
Carbon disulfide	50.0	50.0		ug/L		100	63 - 142	1	30	
Carbon tetrachloride	50.0	50.0		ug/L		100	70 - 131	1	30	
Chlorobenzene	50.0	52.9		ug/L		106	79 - 120	1	30	
Chlorodibromomethane	50.0	55.1		ug/L		110	63 - 134	2	50	
Chloroethane	50.0	56.8		ug/L		114	47 - 148	9	40	
Chloroform	50.0	54.5		ug/L		109	76 - 128	2	30	
Chloromethane	50.0	48.8		ug/L		98	47 - 151	28	30	
cis-1,2-Dichloroethene	50.0	54.0		ug/L		108	78 - 127	0	30	
cis-1,3-Dichloropropene	50.0	52.9		ug/L		106	73 - 128	0	30	
Dichlorobromomethane	50.0	53.1		ug/L		106	72 - 129	1	30	
1,1-Dichloroethane	50.0	54.3		ug/L		109	69 - 132	1	30	
1,2-Dichloroethane	50.0	46.9		ug/L		94	75 - 120	1	30	
1,1-Dichloroethene	50.0	42.7		ug/L		85	73 - 134	3	30	
1,2-Dichloropropane	50.0	52.1		ug/L		104	71 - 126	1	30	
Diethyl ether	50.0	62.2		ug/L		124	40 - 160	0	50	
Ethylbenzene	50.0	54.4		ug/L		109	78 - 125	1	30	
2-Hexanone	100	100		ug/L		100	52 - 149	1	30	
Methylene Chloride	50.0	54.4		ug/L		109	79 - 124	2	30	
2-Butanone (MEK)	100	96.8		ug/L		97	55 - 142	0	30	
4-Methyl-2-pentanone (MIBK)	100	96.2		ug/L		96	51 - 143	1	30	
Styrene	50.0	53.6		ug/L		107	75 - 129	2	30	
1,1,2,2-Tetrachloroethane	50.0	49.3		ug/L		99	71 - 127	1	30	
Tetrachloroethene	50.0	57.8		ug/L		116	77 - 128	3	30	
Toluene	50.0	52.1		ug/L		104	77 - 125	2	30	
trans-1,2-Dichloroethene	50.0	54.9		ug/L		110	78 - 130	1	30	
trans-1,3-Dichloropropene	50.0	52.6		ug/L		105	72 - 127	1	50	
1,1,1-Trichloroethane	50.0	55.6		ug/L		111	76 - 126	3	30	
1,1,2-Trichloroethane	50.0	50.3		ug/L		101	69 - 127	0	30	
Trichloroethene	50.0	55.2		ug/L		110	80 - 120	0	30	
Vinyl chloride	50.0	50.5		ug/L		101	58 - 141	0	30	
Xylenes, Total	150	162		ug/L		108	80 - 124	1	30	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	103		70 - 130
Dibromofluoromethane	105		70 - 130
Toluene-d8 (Surr)	103		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-340879/1-A

Matrix: Water

Analysis Batch: 341072

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 340879

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		07/25/14 11:00	07/26/14 10:34	1
Chromium	10	U	10		ug/L		07/25/14 11:00	07/26/14 10:34	1
Copper	20	U	20		ug/L		07/25/14 11:00	07/26/14 10:34	1
Lead	10	U	10		ug/L		07/25/14 11:00	07/26/14 10:34	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 680-340879/1-A

Matrix: Water

Analysis Batch: 341072

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 340879

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	20	U	20		ug/L		07/25/14 11:00	07/26/14 10:34	1

Lab Sample ID: LCS 680-340879/2-A

Matrix: Water

Analysis Batch: 341072

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 340879

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	102		ug/L		102	75 - 125
Chromium	100	101		ug/L		101	75 - 125
Copper	100	102		ug/L		102	75 - 125
Lead	50.0	49.0		ug/L		98	75 - 125
Zinc	100	102		ug/L		102	75 - 125

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## GC/MS VOA

### Analysis Batch: 341737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-103602-1	Effluent	Total/NA	Water	8260B	
LCS 680-341737/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-341737/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-341737/8	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 340879

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-103602-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-340879/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-340879/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 341072

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-103602-1	Effluent	Total Recoverable	Water	6010C	340879
LCS 680-340879/2-A	Lab Control Sample	Total Recoverable	Water	6010C	340879
MB 680-340879/1-A	Method Blank	Total Recoverable	Water	6010C	340879

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-103602-1**

**Date Collected: 07/23/14 15:30**

**Matrix: Water**

**Date Received: 07/24/14 09:09**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	341737	07/31/14 13:09	MMT	TAL SAV
Instrument ID: CMSP2										
Total Recoverable	Prep	3005A			50 mL	50 mL	340879	07/25/14 11:00	SP	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	341072	07/26/14 11:47	BCB	TAL SAV
Instrument ID: ICPE										

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



Savannah  
5102 LaRoche Avenue

Savannah, GA 31404  
phone 912.354.7858 fax 912.352.0165

TestAmerica  
THE LEADER IN ENVIRONMENTAL TESTING

Chain of Custody Record

TestAmerica Laboratories, Inc.

Project Manager: Alan Pinnix Tel/Fax: 919-854-1282		Site Contact: Alan Pinnix		Date: 7-23-14		COC No: _____	
Lab Contact: Jerry Lanier		Carrier: Fed Ex		Job No. _____		COCs _____	
Analysis Turnaround Time Calendar (C) or Work Days (W) TAT if different from Below <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Sample Date		Sample Time		Sample Type	
Sample Date: 7-23-14		Sample Time: 1530		Sample Type: Grab		Matrix: W	
Sample Identification		Sample Date		Sample Time		Sample Type	
Effluent		7-23-14		1530		Grab	
Sample Identification		Sample Date		Sample Time		Sample Type	
Filtered Sample		N		3		1	
VOCs (Method 8260B)		N		3		1	
PP Metals (Method 6010)*		N		3		1	
Sample Specific Notes:		*Report: As, Cr, Cu, Pb, and Zn only.					
SDG No.							
Job No.							



680-103602 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

Possible Hazard Identification  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Relinquished by:	Company: ARCADIS	Date/Time: 7-23-14/1700	Received by:	Company: (P. Bruce) LTD	Date/Time: 7/24/14 9:09
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-103602-1

**Login Number: 103602**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: White, Menica R**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-103602-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina (WW/SW)	State Program	4	269	12-31-14

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-93739-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
7/31/2014 4:44:15 PM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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results through  
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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

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**Job ID: 400-93739-1**

---

**Laboratory: TestAmerica Pensacola**

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**Narrative**

**Job Narrative**  
**400-93739-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 7/24/2014 9:25 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.4° C.

**Metals**

Method(s) 1631E: The following samples was diluted to bring the concentration of target analytes within the calibration range: (400-93900-1 MS), (400-93900-1 MSD), 001 Outfall (400-93900-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-93739-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Mercury	0.93		0.50	ng/L	1		1631E	Total/NA

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-93739-1	EFFLUENT	Water	07/23/14 15:30	07/24/14 09:25

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-93739-1**

Date Collected: 07/23/14 15:30

Matrix: Water

Date Received: 07/24/14 09:25

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.93		0.50	ng/L		07/24/14 11:30	07/31/14 13:22	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

## Metals

### Prep Batch: 225307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-93739-1	EFFLUENT	Total/NA	Water	1631E	
400-93900-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-93900-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-225307/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-225307/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-225307/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 225387

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-93739-1	EFFLUENT	Total/NA	Water	1631E	225307
400-93900-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	225307
400-93900-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	225307
LCS 400-225307/2-A	Lab Control Sample	Total/NA	Water	1631E	225307
LCSD 400-225307/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	225307
MB 400-225307/1-A	Method Blank	Total/NA	Water	1631E	225307



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-225307/1-A**  
**Matrix: Water**  
**Analysis Batch: 225387**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 225307**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		07/31/14 08:32	07/31/14 08:56	1

**Lab Sample ID: LCS 400-225307/2-A**  
**Matrix: Water**  
**Analysis Batch: 225387**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 225307**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.45		ng/L		89	79 - 121

**Lab Sample ID: LCSD 400-225307/3-A**  
**Matrix: Water**  
**Analysis Batch: 225387**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 225307**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.58		ng/L		92	79 - 121	3	20

**Lab Sample ID: 400-93900-C-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 225387**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 225307**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1300		500	1800		ng/L		94	71 - 125

**Lab Sample ID: 400-93900-C-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 225387**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 225307**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	1300		500	1800		ng/L		94	71 - 125	0	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-93739-1**

**Date Collected: 07/23/14 15:30**

**Matrix: Water**

**Date Received: 07/24/14 09:25**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			225307	07/24/14 11:30	VLC	TAL PEN
Total/NA	Analysis	1631E		1	225387	07/31/14 13:22	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-15
Arizona	State Program	9	AZ0710	01-11-15
Arkansas DEQ	State Program	6	88-0689	09-01-14
Florida	NELAP	4	E81010	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14 *
Louisiana	NELAP	6	30976	06-30-15
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-15
Michigan	State Program	5	9912	06-30-14 *
New Jersey	NELAP	2	FL006	06-30-15
North Carolina (WW/SW)	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14 *
Tennessee	State Program	4	TN02907	06-30-15
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-15
West Virginia DEP	State Program	3	136	06-30-15

\* Certification renewal pending - certification considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-93739-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency


**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001



**Chain of Custody Record**

TestAmerica Laboratories, Inc.

<b>Client Contact</b>		<b>Project Manager: Alan Pinnix</b>		<b>Site Contact: Alan Pinnix</b>		<b>Date: 7-23-14</b>	
ARCADIS		Tel/Fax: 919-854-1282		Lab Contact: Marty Edwards		COC No: _____	
801 Corporate Center Drive, Suite 300		Analysis Turnaround Time		Carrier: Fed Ex		1 of 1 COCs	
Raleigh, NC 27607		Calendar (C) or Work Days (W)		Mercury, low level (Method 1631B)		Job No. _____	
919-854-1282		TAT if different from Below		400-93739 COC		SDG No. _____	
919-854-5448		<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day				Sample Specific Notes:	
Project Name: UNIC - Airport Road		Sample Date		Sample Time		Sample Type	
Site: Chapel Hill, NC		7-23-14		1530		Grab	
P O # NC000239.0019.0001B		Sample Matrix		# of Cont.		Sample Specific Notes:	
Effluent		W		3		N 3	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other  
 Possible Hazard Identification  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments: 0.4°C IR5

Relinquished by: <i>Phil Thudby</i>	Company: ARCADIS	Date/Time: 7-23-14/1700	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by: <i>John S...</i>	Company: TA	Date/Time: 7-24-14 9:25

## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-93739-1

**Login Number: 93739**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Crawford, Lauren E**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.4°C IR-5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	Vials were labeled by client.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Savannah

5102 LaRoche Avenue

Savannah, GA 31404

Tel: (912)354-7858

TestAmerica Job ID: 680-104763-1

Client Project/Site: UNC Airport Road

For:

ARCADIS U.S., Inc.

801 Corporate Center Drive

Suite 300

Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:

9/11/2014 4:11:08 PM

Jerry Lanier, Project Manager I

(912)354-7858 e.3410

[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

**Job ID: 680-104763-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

### CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-104763-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

#### **RECEIPT**

The samples were received on 08/29/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.8 C.

#### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Sample Effluent (680-104763-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 09/10/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **METALS (ICP)**

Sample Effluent (680-104763-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/04/2014 and analyzed on 09/05/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-104763-1	Effluent	Water	08/28/14 12:45	08/29/14 09:36

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-104763-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diethyl ether	11		10		ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-104763-1**

**Date Collected: 08/28/14 12:45**

**Matrix: Water**

**Date Received: 08/29/14 09:36**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			09/10/14 18:45	1
Benzene	1.0	U	1.0		ug/L			09/10/14 18:45	1
Bromoform	1.0	U	1.0		ug/L			09/10/14 18:45	1
Bromomethane	5.0	U	5.0		ug/L			09/10/14 18:45	1
Carbon disulfide	2.0	U	2.0		ug/L			09/10/14 18:45	1
Carbon tetrachloride	1.0	U	1.0		ug/L			09/10/14 18:45	1
Chlorobenzene	1.0	U	1.0		ug/L			09/10/14 18:45	1
Chlorodibromomethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
Chloroethane	5.0	U	5.0		ug/L			09/10/14 18:45	1
Chloroform	1.0	U	1.0		ug/L			09/10/14 18:45	1
Chloromethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			09/10/14 18:45	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			09/10/14 18:45	1
Dichlorobromomethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			09/10/14 18:45	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			09/10/14 18:45	1
<b>Diethyl ether</b>	<b>11</b>		10		ug/L			09/10/14 18:45	1
Ethylbenzene	1.0	U	1.0		ug/L			09/10/14 18:45	1
2-Hexanone	10	U	10		ug/L			09/10/14 18:45	1
Methylene Chloride	5.0	U	5.0		ug/L			09/10/14 18:45	1
2-Butanone (MEK)	10	U	10		ug/L			09/10/14 18:45	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			09/10/14 18:45	1
Styrene	1.0	U	1.0		ug/L			09/10/14 18:45	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
Tetrachloroethene	1.0	U	1.0		ug/L			09/10/14 18:45	1
Toluene	1.0	U	1.0		ug/L			09/10/14 18:45	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			09/10/14 18:45	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			09/10/14 18:45	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			09/10/14 18:45	1
Trichloroethene	1.0	U	1.0		ug/L			09/10/14 18:45	1
Vinyl chloride	1.0	U	1.0		ug/L			09/10/14 18:45	1
Xylenes, Total	2.0	U	2.0		ug/L			09/10/14 18:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		70 - 130		09/10/14 18:45	1
Dibromofluoromethane (Surr)	100		70 - 130		09/10/14 18:45	1
1,2-Dichloroethane-d4 (Surr)	102		70 - 130		09/10/14 18:45	1
4-Bromofluorobenzene (Surr)	99		70 - 130		09/10/14 18:45	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		09/04/14 08:51	09/05/14 17:18	1
Chromium	10	U	10		ug/L		09/04/14 08:51	09/05/14 17:18	1
Copper	20	U	20		ug/L		09/04/14 08:51	09/05/14 17:18	1
Lead	10	U	10		ug/L		09/04/14 08:51	09/05/14 17:18	1
Zinc	20	U	20		ug/L		09/04/14 08:51	09/05/14 17:18	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TOL	DBFM	12DCE	BFB
		(70-130)	(70-130)	(70-130)	(70-130)
680-104763-1	Effluent	106	100	102	99
LCS 680-348182/4	Lab Control Sample	99	100	102	95
LCSD 680-348182/5	Lab Control Sample Dup	100	98	99	96
MB 680-348182/25	Method Blank	105	100	99	94

### Surrogate Legend

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

12DCE = 1,2-Dichloroethane-d4 (Surr)

BFB = 4-Bromofluorobenzene (Surr)

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-348182/25**

**Matrix: Water**

**Analysis Batch: 348182**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			09/10/14 16:04	1
Benzene	1.0	U	1.0		ug/L			09/10/14 16:04	1
Bromoform	1.0	U	1.0		ug/L			09/10/14 16:04	1
Bromomethane	5.0	U	5.0		ug/L			09/10/14 16:04	1
Carbon disulfide	2.0	U	2.0		ug/L			09/10/14 16:04	1
Carbon tetrachloride	1.0	U	1.0		ug/L			09/10/14 16:04	1
Chlorobenzene	1.0	U	1.0		ug/L			09/10/14 16:04	1
Chlorodibromomethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
Chloroethane	5.0	U	5.0		ug/L			09/10/14 16:04	1
Chloroform	1.0	U	1.0		ug/L			09/10/14 16:04	1
Chloromethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			09/10/14 16:04	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			09/10/14 16:04	1
Dichlorobromomethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			09/10/14 16:04	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			09/10/14 16:04	1
Diethyl ether	10	U	10		ug/L			09/10/14 16:04	1
Ethylbenzene	1.0	U	1.0		ug/L			09/10/14 16:04	1
2-Hexanone	10	U	10		ug/L			09/10/14 16:04	1
Methylene Chloride	5.0	U	5.0		ug/L			09/10/14 16:04	1
2-Butanone (MEK)	10	U	10		ug/L			09/10/14 16:04	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			09/10/14 16:04	1
Styrene	1.0	U	1.0		ug/L			09/10/14 16:04	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
Tetrachloroethene	1.0	U	1.0		ug/L			09/10/14 16:04	1
Toluene	1.0	U	1.0		ug/L			09/10/14 16:04	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			09/10/14 16:04	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			09/10/14 16:04	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			09/10/14 16:04	1
Trichloroethene	1.0	U	1.0		ug/L			09/10/14 16:04	1
Vinyl chloride	1.0	U	1.0		ug/L			09/10/14 16:04	1
Xylenes, Total	2.0	U	2.0		ug/L			09/10/14 16:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	105		70 - 130		09/10/14 16:04	1
Dibromofluoromethane (Surr)	100		70 - 130		09/10/14 16:04	1
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		09/10/14 16:04	1
4-Bromofluorobenzene (Surr)	94		70 - 130		09/10/14 16:04	1

**Lab Sample ID: LCS 680-348182/4**

**Matrix: Water**

**Analysis Batch: 348182**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	224		ug/L		89	39 - 162

TestAmerica Savannah



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-348182/4**

**Matrix: Water**

**Analysis Batch: 348182**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	48.3		ug/L		97	74 - 123
Bromoform	50.0	44.9		ug/L		90	60 - 134
Bromomethane	50.0	44.5		ug/L		89	10 - 171
Carbon disulfide	50.0	50.4		ug/L		101	63 - 142
Carbon tetrachloride	50.0	49.0		ug/L		98	70 - 131
Chlorobenzene	50.0	50.0		ug/L		100	79 - 120
Chlorodibromomethane	50.0	46.4		ug/L		93	63 - 134
Chloroethane	50.0	53.8		ug/L		108	47 - 148
Chloroform	50.0	49.4		ug/L		99	76 - 128
Chloromethane	50.0	45.2		ug/L		90	47 - 151
cis-1,2-Dichloroethene	50.0	50.3		ug/L		101	78 - 127
cis-1,3-Dichloropropene	50.0	49.7		ug/L		99	73 - 128
Dichlorobromomethane	50.0	48.7		ug/L		97	72 - 129
1,1-Dichloroethane	50.0	51.7		ug/L		103	69 - 132
1,2-Dichloroethane	50.0	50.5		ug/L		101	75 - 120
1,1,1-Dichloroethane	50.0	48.4		ug/L		97	73 - 134
1,2-Dichloropropane	50.0	47.3		ug/L		95	71 - 126
Diethyl ether	50.0	46.2		ug/L		92	40 - 160
Ethylbenzene	50.0	50.1		ug/L		100	78 - 125
2-Hexanone	250	224		ug/L		90	52 - 149
Methylene Chloride	50.0	44.5		ug/L		89	79 - 124
2-Butanone (MEK)	250	234		ug/L		93	55 - 142
4-Methyl-2-pentanone (MIBK)	250	223		ug/L		89	51 - 143
Styrene	50.0	47.6		ug/L		95	75 - 129
1,1,1,2-Tetrachloroethane	50.0	44.7		ug/L		89	71 - 127
Tetrachloroethene	50.0	53.5		ug/L		107	77 - 128
Toluene	50.0	47.4		ug/L		95	77 - 125
trans-1,2-Dichloroethene	50.0	51.0		ug/L		102	78 - 130
trans-1,3-Dichloropropene	50.0	48.7		ug/L		97	72 - 127
1,1,1-Trichloroethane	50.0	53.1		ug/L		106	76 - 126
1,1,2-Trichloroethane	50.0	44.7		ug/L		89	69 - 127
Trichloroethene	50.0	52.4		ug/L		105	80 - 120
Vinyl chloride	50.0	49.1		ug/L		98	58 - 141
Xylenes, Total	100	97.8		ug/L		98	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	99		70 - 130
Dibromofluoromethane (Surr)	100		70 - 130
1,2-Dichloroethane-d4 (Surr)	102		70 - 130
4-Bromofluorobenzene (Surr)	95		70 - 130

**Lab Sample ID: LCSD 680-348182/5**

**Matrix: Water**

**Analysis Batch: 348182**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Acetone	250	214		ug/L		86	39 - 162	4	50
Benzene	50.0	48.1		ug/L		96	74 - 123	1	30

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-348182/5

Matrix: Water

Analysis Batch: 348182

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	RPD Limit
Bromoform	50.0	46.6		ug/L		93	60 - 134	4	30	
Bromomethane	50.0	47.9		ug/L		96	10 - 171	7	50	
Carbon disulfide	50.0	55.4		ug/L		111	63 - 142	10	30	
Carbon tetrachloride	50.0	49.5		ug/L		99	70 - 131	1	30	
Chlorobenzene	50.0	50.3		ug/L		101	79 - 120	1	30	
Chlorodibromomethane	50.0	46.8		ug/L		94	63 - 134	1	50	
Chloroethane	50.0	50.7		ug/L		101	47 - 148	6	40	
Chloroform	50.0	49.0		ug/L		98	76 - 128	1	30	
Chloromethane	50.0	47.0		ug/L		94	47 - 151	4	30	
cis-1,2-Dichloroethene	50.0	49.9		ug/L		100	78 - 127	1	30	
cis-1,3-Dichloropropene	50.0	47.7		ug/L		95	73 - 128	4	30	
Dichlorobromomethane	50.0	48.8		ug/L		98	72 - 129	0	30	
1,1-Dichloroethane	50.0	50.9		ug/L		102	69 - 132	2	30	
1,2-Dichloroethane	50.0	49.9		ug/L		100	75 - 120	1	30	
1,1-Dichloroethene	50.0	48.0		ug/L		96	73 - 134	1	30	
1,2-Dichloropropane	50.0	46.5		ug/L		93	71 - 126	2	30	
Diethyl ether	50.0	45.5		ug/L		91	40 - 160	2	50	
Ethylbenzene	50.0	51.3		ug/L		103	78 - 125	2	30	
2-Hexanone	250	224		ug/L		90	52 - 149	0	30	
Methylene Chloride	50.0	46.5		ug/L		93	79 - 124	4	30	
2-Butanone (MEK)	250	224		ug/L		89	55 - 142	4	30	
4-Methyl-2-pentanone (MIBK)	250	225		ug/L		90	51 - 143	1	30	
Styrene	50.0	48.4		ug/L		97	75 - 129	2	30	
1,1,1,2-Tetrachloroethane	50.0	45.8		ug/L		92	71 - 127	3	30	
Tetrachloroethene	50.0	52.9		ug/L		106	77 - 128	1	30	
Toluene	50.0	45.8		ug/L		92	77 - 125	3	30	
trans-1,2-Dichloroethene	50.0	49.1		ug/L		98	78 - 130	4	30	
trans-1,3-Dichloropropene	50.0	47.6		ug/L		95	72 - 127	2	50	
1,1,1-Trichloroethane	50.0	54.1		ug/L		108	76 - 126	2	30	
1,1,1,2-Trichloroethane	50.0	43.7		ug/L		87	69 - 127	2	30	
Trichloroethene	50.0	52.2		ug/L		104	80 - 120	0	30	
Vinyl chloride	50.0	38.9		ug/L		78	58 - 141	23	30	
Xylenes, Total	100	100		ug/L		100	80 - 124	2	30	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	100		70 - 130
Dibromofluoromethane (Surr)	98		70 - 130
1,2-Dichloroethane-d4 (Surr)	99		70 - 130
4-Bromofluorobenzene (Surr)	96		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-347296/1-A

Matrix: Water

Analysis Batch: 347790

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 347296

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		09/04/14 08:51	09/05/14 16:25	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 680-347296/1-A

Matrix: Water

Analysis Batch: 347790

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 347296

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	10	U	10		ug/L		09/04/14 08:51	09/05/14 16:25	1
Copper	20	U	20		ug/L		09/04/14 08:51	09/05/14 16:25	1
Lead	10	U	10		ug/L		09/04/14 08:51	09/05/14 16:25	1
Zinc	20	U	20		ug/L		09/04/14 08:51	09/05/14 16:25	1

Lab Sample ID: LCS 680-347296/2-A

Matrix: Water

Analysis Batch: 347790

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 347296

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	101		ug/L		101	75 - 125
Chromium	100	103		ug/L		103	75 - 125
Copper	100	103		ug/L		103	75 - 125
Lead	50.0	49.3		ug/L		99	75 - 125
Zinc	100	107		ug/L		107	75 - 125

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## GC/MS VOA

### Analysis Batch: 348182

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-104763-1	Effluent	Total/NA	Water	8260B	
LCS 680-348182/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-348182/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-348182/25	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 347296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-104763-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-347296/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-347296/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 347790

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-104763-1	Effluent	Total Recoverable	Water	6010C	347296
LCS 680-347296/2-A	Lab Control Sample	Total Recoverable	Water	6010C	347296
MB 680-347296/1-A	Method Blank	Total Recoverable	Water	6010C	347296

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-104763-1**

**Date Collected: 08/28/14 12:45**

**Matrix: Water**

**Date Received: 08/29/14 09:36**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	348182	09/10/14 18:45	TF1	TAL SAV
Instrument ID: CMSP2										
Total Recoverable	Prep	3005A			50 mL	50 mL	347296	09/04/14 08:51	SP	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	347790	09/05/14 17:18	BCB	TAL SAV
Instrument ID: ICPF										

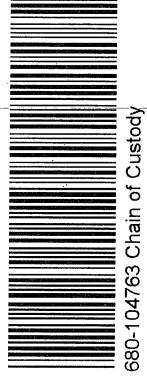
**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

**Chain of Custody Record**

TestAmerica Laboratories, Inc.

<b>Client Contact</b>		<b>Project Manager:</b> Alan Pinnix <b>Tel/Fax:</b> 919-854-1282		<b>Site Contact:</b> Alan Pinnix <b>Lab Contact:</b> Jerry Lanier		<b>Date:</b> 8/28/14 <b>Carrier:</b> Fed Ex		<b>COC No:</b> _____ of _____ COCs	
<b>Analysis Turnaround Time</b>		Calendar (C) or Work Days (W)		TAT if different from Below		Job No.		SDG No.	
<input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Sample Date		Sample Time		Sample Type		Matrix	
8/28/14		1245		Grab		W		4	
Sample Identification		Sample Date		Sample Time		Sample Type		Matrix	
Effluent		8/28/14		1245		Grab		W	
Sample Specific Notes:		Sample Date		Sample Time		Sample Type		Matrix	
*Report: As, Cr, Cu, Pb, and Zn only.		8/28/14		1245		Grab		W	
Filtered Sample VOCs (Method 8260B) PF Metals (Method 6010)*		N		3		1		2	
Sample Specific Notes: *Report: As, Cr, Cu, Pb, and Zn only.		N		3		1		2	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown		N		3		1		2	
Special Instructions/QC Requirements & Comments:		N		3		1		2	
Relinquished by: <i>Phil [Signature]</i> Relinquished by: _____ Relinquished by: _____		N		3		1		2	
Date/Time: 8-28-14 1700 Date/Time: _____ Date/Time: _____		N		3		1		2	
Company: ARCADIS Company: _____ Company: _____		N		3		1		2	
Relinquished by: <i>[Signature]</i> Relinquished by: _____ Relinquished by: _____		N		3		1		2	
Date/Time: 8-29-14 9:36 28 Date/Time: _____ Date/Time: _____		N		3		1		2	
Company: TASA Company: _____ Company: _____		N		3		1		2	
Relinquished by: _____ Relinquished by: _____ Relinquished by: _____		N		3		1		2	
Date/Time: _____ Date/Time: _____ Date/Time: _____		N		3		1		2	
Company: _____ Company: _____ Company: _____		N		3		1		2	



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-104763-1

**Login Number: 104763**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: West, Lauren H**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-104763-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina (WW/SW)	State Program	4	269	12-31-14

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-95159-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
9/10/2014 9:58:41 AM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

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**Job ID: 400-95159-1**

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**Laboratory: TestAmerica Pensacola**

---

**Narrative**

**Job Narrative**  
**400-95159-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 8/29/2014 9:27 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.0° C.

**Metals**

Method 1631E: The matrix spike duplicate (MSD) recoveries for batch 400-229199 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample and duplicate (LCS/LCSD) recoveries was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-95159-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-95159-1	EFFLUENT	Water	08/28/14 12:00	08/29/14 09:27

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-95159-1**

**Date Collected: 08/28/14 12:00**

**Matrix: Water**

**Date Received: 08/29/14 09:27**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		08/29/14 10:00	09/09/14 11:28	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

## Metals

### Prep Batch: 229199

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-95159-1	EFFLUENT	Total/NA	Water	1631E	
550-30917-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	
550-30917-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-229199/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-229199/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-229199/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 229313

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-95159-1	EFFLUENT	Total/NA	Water	1631E	229199
550-30917-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	229199
550-30917-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	229199
LCS 400-229199/2-A	Lab Control Sample	Total/NA	Water	1631E	229199
LCSD 400-229199/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	229199
MB 400-229199/1-A	Method Blank	Total/NA	Water	1631E	229199



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-229199/1-A**  
**Matrix: Water**  
**Analysis Batch: 229313**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 229199**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		09/09/14 08:39	09/09/14 09:30	1

**Lab Sample ID: LCS 400-229199/2-A**  
**Matrix: Water**  
**Analysis Batch: 229313**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 229199**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.15		ng/L		83	79 - 121

**Lab Sample ID: LCSD 400-229199/3-A**  
**Matrix: Water**  
**Analysis Batch: 229313**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 229199**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.27		ng/L		85	79 - 121	3	20

**Lab Sample ID: 550-30917-C-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 229313**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 229199**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	9.1		5.00	14.1		ng/L		99	71 - 125

**Lab Sample ID: 550-30917-C-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 229313**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 229199**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	9.1		5.00	16.0	F1	ng/L		137	71 - 125	13	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-95159-1**

**Date Collected: 08/28/14 12:00**

**Matrix: Water**

**Date Received: 08/29/14 09:27**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			229199	08/29/14 10:00	VLC	TAL PEN
Total/NA	Analysis	1631E		1	229313	09/09/14 11:28	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-15
Arizona	State Program	9	AZ0710	01-11-15
Arkansas DEQ	State Program	6	88-0689	09-01-14 *
Florida	NELAP	4	E81010	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	08-01-14 *
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-14 *
Louisiana	NELAP	6	30976	06-30-15
Maryland	State Program	3	233	09-30-14
Massachusetts	State Program	1	M-FL094	06-30-15
Michigan	State Program	5	9912	06-30-14 *
New Jersey	NELAP	2	FL006	06-30-15
North Carolina (WW/SW)	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-14 *
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14 *
Tennessee	State Program	4	TN02907	06-30-15
Texas	NELAP	6	T104704286-12-5	09-30-14
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-15
West Virginia DEP	State Program	3	136	06-30-15

\* Certification renewal pending - certification considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-95159-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-95159-1

**Login Number: 95159**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Crawford, Lauren E**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR-5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	Vials for Hg-1631E were labeled by client.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-105719-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
10/7/2014 3:30:50 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

**Job ID: 680-105719-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

### CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-105719-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

#### **RECEIPT**

The samples were received on 09/27/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.8 C.

#### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Sample Effluent (680-105719-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 10/07/2014.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 352300.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **METALS (ICP)**

Sample Effluent (680-105719-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/30/2014 and analyzed on 10/01/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-105719-1	Effluent	Water	09/25/14 16:00	09/27/14 09:30

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-105719-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	20		20		ug/L	1		6010C	Total
Zinc	83		20		ug/L	1		6010C	Recoverable Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah



# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-105719-1**

**Date Collected: 09/25/14 16:00**

**Matrix: Water**

**Date Received: 09/27/14 09:30**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			10/07/14 12:50	1
Benzene	1.0	U	1.0		ug/L			10/07/14 12:50	1
Bromoform	1.0	U	1.0		ug/L			10/07/14 12:50	1
Bromomethane	5.0	U	5.0		ug/L			10/07/14 12:50	1
Carbon disulfide	2.0	U	2.0		ug/L			10/07/14 12:50	1
Carbon tetrachloride	1.0	U	1.0		ug/L			10/07/14 12:50	1
Chlorobenzene	1.0	U	1.0		ug/L			10/07/14 12:50	1
Chlorodibromomethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
Chloroethane	5.0	U	5.0		ug/L			10/07/14 12:50	1
Chloroform	1.0	U	1.0		ug/L			10/07/14 12:50	1
Chloromethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/07/14 12:50	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/07/14 12:50	1
Dichlorobromomethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			10/07/14 12:50	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			10/07/14 12:50	1
Diethyl ether	10	U	10		ug/L			10/07/14 12:50	1
Ethylbenzene	1.0	U	1.0		ug/L			10/07/14 12:50	1
2-Hexanone	10	U	10		ug/L			10/07/14 12:50	1
Methylene Chloride	5.0	U	5.0		ug/L			10/07/14 12:50	1
2-Butanone (MEK)	10	U	10		ug/L			10/07/14 12:50	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			10/07/14 12:50	1
Styrene	1.0	U	1.0		ug/L			10/07/14 12:50	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
Tetrachloroethene	1.0	U	1.0		ug/L			10/07/14 12:50	1
Toluene	1.0	U	1.0		ug/L			10/07/14 12:50	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/07/14 12:50	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/07/14 12:50	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			10/07/14 12:50	1
Trichloroethene	1.0	U	1.0		ug/L			10/07/14 12:50	1
Vinyl chloride	1.0	U	1.0		ug/L			10/07/14 12:50	1
Xylenes, Total	2.0	U	2.0		ug/L			10/07/14 12:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		70 - 130		10/07/14 12:50	1
1,2-Dichloroethane-d4 (Surr)	93		70 - 130		10/07/14 12:50	1
Dibromofluoromethane (Surr)	98		70 - 130		10/07/14 12:50	1
4-Bromofluorobenzene (Surr)	97		70 - 130		10/07/14 12:50	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		09/30/14 14:27	10/01/14 13:53	1
Chromium	10	U	10		ug/L		09/30/14 14:27	10/01/14 13:53	1
<b>Copper</b>	<b>20</b>		20		ug/L		09/30/14 14:27	10/01/14 13:53	1
Lead	10	U	10		ug/L		09/30/14 14:27	10/01/14 13:53	1
<b>Zinc</b>	<b>83</b>		20		ug/L		09/30/14 14:27	10/01/14 13:53	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TOL	12DCE	DBFM	BFB
		(70-130)	(70-130)	(70-130)	(70-130)
680-105719-1	Effluent	99	93	98	97
LCS 680-352300/4	Lab Control Sample	94	90	93	97
LCSD 680-352300/5	Lab Control Sample Dup	95	95	93	98
MB 680-352300/8	Method Blank	99	97	99	98

### Surrogate Legend

TOL = Toluene-d8 (Surr)

12DCE = 1,2-Dichloroethane-d4 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-352300/8**

**Matrix: Water**

**Analysis Batch: 352300**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	25	U	25		ug/L			10/07/14 12:07	1
Benzene	1.0	U	1.0		ug/L			10/07/14 12:07	1
Bromoform	1.0	U	1.0		ug/L			10/07/14 12:07	1
Bromomethane	5.0	U	5.0		ug/L			10/07/14 12:07	1
Carbon disulfide	2.0	U	2.0		ug/L			10/07/14 12:07	1
Carbon tetrachloride	1.0	U	1.0		ug/L			10/07/14 12:07	1
Chlorobenzene	1.0	U	1.0		ug/L			10/07/14 12:07	1
Chlorodibromomethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
Chloroethane	5.0	U	5.0		ug/L			10/07/14 12:07	1
Chloroform	1.0	U	1.0		ug/L			10/07/14 12:07	1
Chloromethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/07/14 12:07	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/07/14 12:07	1
Dichlorobromomethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			10/07/14 12:07	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			10/07/14 12:07	1
Diethyl ether	10	U	10		ug/L			10/07/14 12:07	1
Ethylbenzene	1.0	U	1.0		ug/L			10/07/14 12:07	1
2-Hexanone	10	U	10		ug/L			10/07/14 12:07	1
Methylene Chloride	5.0	U	5.0		ug/L			10/07/14 12:07	1
2-Butanone (MEK)	10	U	10		ug/L			10/07/14 12:07	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			10/07/14 12:07	1
Styrene	1.0	U	1.0		ug/L			10/07/14 12:07	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
Tetrachloroethene	1.0	U	1.0		ug/L			10/07/14 12:07	1
Toluene	1.0	U	1.0		ug/L			10/07/14 12:07	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/07/14 12:07	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/07/14 12:07	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			10/07/14 12:07	1
Trichloroethene	1.0	U	1.0		ug/L			10/07/14 12:07	1
Vinyl chloride	1.0	U	1.0		ug/L			10/07/14 12:07	1
Xylenes, Total	2.0	U	2.0		ug/L			10/07/14 12:07	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		70 - 130		10/07/14 12:07	1
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		10/07/14 12:07	1
Dibromofluoromethane (Surr)	99		70 - 130		10/07/14 12:07	1
4-Bromofluorobenzene (Surr)	98		70 - 130		10/07/14 12:07	1

**Lab Sample ID: LCS 680-352300/4**

**Matrix: Water**

**Analysis Batch: 352300**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	234		ug/L		93	39 - 162

TestAmerica Savannah



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-352300/4**

**Matrix: Water**

**Analysis Batch: 352300**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	47.0		ug/L		94	74 - 123
Bromoform	50.0	57.5		ug/L		115	60 - 134
Bromomethane	50.0	49.8		ug/L		100	10 - 171
Carbon disulfide	50.0	51.1		ug/L		102	63 - 142
Carbon tetrachloride	50.0	55.9		ug/L		112	70 - 131
Chlorobenzene	50.0	49.1		ug/L		98	79 - 120
Chlorodibromomethane	50.0	54.5		ug/L		109	63 - 134
Chloroethane	50.0	52.9		ug/L		106	47 - 148
Chloroform	50.0	47.3		ug/L		95	76 - 128
Chloromethane	50.0	50.8		ug/L		102	47 - 151
cis-1,2-Dichloroethene	50.0	49.3		ug/L		99	78 - 127
cis-1,3-Dichloropropene	50.0	49.5		ug/L		99	73 - 128
Dichlorobromomethane	50.0	51.1		ug/L		102	72 - 129
1,1-Dichloroethane	50.0	46.9		ug/L		94	69 - 132
1,2-Dichloroethane	50.0	46.6		ug/L		93	75 - 120
1,1,1-Dichloroethane	50.0	48.2		ug/L		96	73 - 134
1,2-Dichloropropane	50.0	49.0		ug/L		98	71 - 126
Diethyl ether	50.0	47.9		ug/L		96	40 - 160
Ethylbenzene	50.0	48.0		ug/L		96	78 - 125
2-Hexanone	250	229		ug/L		92	52 - 149
Methylene Chloride	50.0	51.4		ug/L		103	79 - 124
2-Butanone (MEK)	250	213		ug/L		85	55 - 142
4-Methyl-2-pentanone (MIBK)	250	220		ug/L		88	51 - 143
Styrene	50.0	48.2		ug/L		96	75 - 129
1,1,1,2-Tetrachloroethane	50.0	47.1		ug/L		94	71 - 127
Tetrachloroethene	50.0	49.0		ug/L		98	77 - 128
Toluene	50.0	45.8		ug/L		92	77 - 125
trans-1,2-Dichloroethene	50.0	49.5		ug/L		99	78 - 130
trans-1,3-Dichloropropene	50.0	51.0		ug/L		102	72 - 127
1,1,1-Trichloroethane	50.0	51.7		ug/L		103	76 - 126
1,1,2-Trichloroethane	50.0	45.2		ug/L		90	69 - 127
Trichloroethene	50.0	48.0		ug/L		96	80 - 120
Vinyl chloride	50.0	50.8		ug/L		102	58 - 141
Xylenes, Total	100	97.4		ug/L		97	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	94		70 - 130
1,2-Dichloroethane-d4 (Surr)	90		70 - 130
Dibromofluoromethane (Surr)	93		70 - 130
4-Bromofluorobenzene (Surr)	97		70 - 130

**Lab Sample ID: LCSD 680-352300/5**

**Matrix: Water**

**Analysis Batch: 352300**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Acetone	250	252		ug/L		101	39 - 162	7	50
Benzene	50.0	47.4		ug/L		95	74 - 123	1	30

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-352300/5

Matrix: Water

Analysis Batch: 352300

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD
									Limit
Bromoform	50.0	60.4		ug/L		121	60 - 134	5	30
Bromomethane	50.0	51.1		ug/L		102	10 - 171	2	50
Carbon disulfide	50.0	50.0		ug/L		100	63 - 142	2	30
Carbon tetrachloride	50.0	54.5		ug/L		109	70 - 131	3	30
Chlorobenzene	50.0	48.8		ug/L		98	79 - 120	1	30
Chlorodibromomethane	50.0	56.7		ug/L		113	63 - 134	4	50
Chloroethane	50.0	53.0		ug/L		106	47 - 148	0	40
Chloroform	50.0	47.2		ug/L		94	76 - 128	0	30
Chloromethane	50.0	46.9		ug/L		94	47 - 151	8	30
cis-1,2-Dichloroethene	50.0	47.9		ug/L		96	78 - 127	3	30
cis-1,3-Dichloropropene	50.0	51.9		ug/L		104	73 - 128	5	30
Dichlorobromomethane	50.0	53.0		ug/L		106	72 - 129	4	30
1,1-Dichloroethane	50.0	46.0		ug/L		92	69 - 132	2	30
1,2-Dichloroethane	50.0	48.1		ug/L		96	75 - 120	3	30
1,1-Dichloroethene	50.0	48.3		ug/L		97	73 - 134	0	30
1,2-Dichloropropane	50.0	52.3		ug/L		105	71 - 126	7	30
Diethyl ether	50.0	52.7		ug/L		105	40 - 160	9	50
Ethylbenzene	50.0	48.7		ug/L		97	78 - 125	2	30
2-Hexanone	250	255		ug/L		102	52 - 149	11	30
Methylene Chloride	50.0	53.3		ug/L		107	79 - 124	3	30
2-Butanone (MEK)	250	230		ug/L		92	55 - 142	8	30
4-Methyl-2-pentanone (MIBK)	250	242		ug/L		97	51 - 143	10	30
Styrene	50.0	49.9		ug/L		100	75 - 129	4	30
1,1,2,2-Tetrachloroethane	50.0	48.8		ug/L		98	71 - 127	3	30
Tetrachloroethene	50.0	48.3		ug/L		97	77 - 128	2	30
Toluene	50.0	47.3		ug/L		95	77 - 125	3	30
trans-1,2-Dichloroethene	50.0	48.9		ug/L		98	78 - 130	1	30
trans-1,3-Dichloropropene	50.0	52.1		ug/L		104	72 - 127	2	50
1,1,1-Trichloroethane	50.0	50.4		ug/L		101	76 - 126	3	30
1,1,2-Trichloroethane	50.0	47.9		ug/L		96	69 - 127	6	30
Trichloroethene	50.0	48.2		ug/L		96	80 - 120	0	30
Vinyl chloride	50.0	48.2		ug/L		96	58 - 141	5	30
Xylenes, Total	100	99.6		ug/L		100	80 - 124	2	30

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	95		70 - 130
1,2-Dichloroethane-d4 (Surr)	95		70 - 130
Dibromofluoromethane (Surr)	93		70 - 130
4-Bromofluorobenzene (Surr)	98		70 - 130

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-351401/1-A

Matrix: Water

Analysis Batch: 351622

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 351401

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Arsenic	20	U	20		ug/L		09/30/14 14:27	10/01/14 13:44	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 680-351401/1-A**  
**Matrix: Water**  
**Analysis Batch: 351622**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 351401**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Chromium	10	U	10		ug/L		09/30/14 14:27	10/01/14 13:44	1
Copper	20	U	20		ug/L		09/30/14 14:27	10/01/14 13:44	1
Lead	10	U	10		ug/L		09/30/14 14:27	10/01/14 13:44	1
Zinc	20	U	20		ug/L		09/30/14 14:27	10/01/14 13:44	1

**Lab Sample ID: LCS 680-351401/2-A**  
**Matrix: Water**  
**Analysis Batch: 351622**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 351401**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	100	98.6		ug/L		99	80 - 120
Copper	100	103		ug/L		103	80 - 120
Lead	500	486		ug/L		97	80 - 120
Zinc	100	94.1		ug/L		94	80 - 120

**Lab Sample ID: 680-105719-1 MS**  
**Matrix: Water**  
**Analysis Batch: 351622**

**Client Sample ID: Effluent**  
**Prep Type: Total Recoverable**  
**Prep Batch: 351401**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	10	U	100	99.7		ug/L		100	75 - 125
Copper	20		100	124		ug/L		104	75 - 125
Lead	10	U	500	488		ug/L		98	75 - 125
Zinc	83		100	173		ug/L		90	75 - 125

**Lab Sample ID: 680-105719-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 351622**

**Client Sample ID: Effluent**  
**Prep Type: Total Recoverable**  
**Prep Batch: 351401**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
										RPD	Limit
Arsenic	20	U	100	104		ug/L		104	75 - 125	5	20
Chromium	10	U	100	95.6		ug/L		96	75 - 125	4	20
Copper	20		100	120		ug/L		100	75 - 125	3	20
Lead	10	U	500	471		ug/L		94	75 - 125	4	20
Zinc	83		100	170		ug/L		87	75 - 125	2	20

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## GC/MS VOA

### Analysis Batch: 352300

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-105719-1	Effluent	Total/NA	Water	8260B	
LCS 680-352300/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-352300/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-352300/8	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 351401

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-105719-1	Effluent	Total Recoverable	Water	3005A	
680-105719-1 MS	Effluent	Total Recoverable	Water	3005A	
680-105719-1 MSD	Effluent	Total Recoverable	Water	3005A	
LCS 680-351401/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-351401/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 351622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-105719-1	Effluent	Total Recoverable	Water	6010C	351401
680-105719-1 MS	Effluent	Total Recoverable	Water	6010C	351401
680-105719-1 MSD	Effluent	Total Recoverable	Water	6010C	351401
LCS 680-351401/2-A	Lab Control Sample	Total Recoverable	Water	6010C	351401
MB 680-351401/1-A	Method Blank	Total Recoverable	Water	6010C	351401

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-105719-1**

**Date Collected: 09/25/14 16:00**

**Matrix: Water**

**Date Received: 09/27/14 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	352300	10/07/14 12:50	CAR	TAL SAV
Instrument ID: CMSP										
Total Recoverable	Prep	3005A			50 mL	50 mL	351401	09/30/14 14:27	SP	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	351622	10/01/14 13:53	BCB	TAL SAV
Instrument ID: ICPE										

**Laboratory References:**

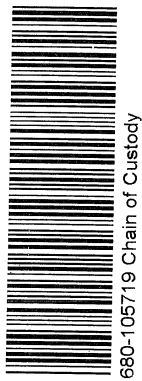
TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858



**Chain of Custody Record**

TestAmerica Laboratories, Inc.

Client Contact		Project Manager: Alan Pinnix Tel/Fax: 919-854-1282		Site Contact: Alan Pinnix Lab Contact: Jerry Lanier		Date: 9/25/14 Carrier: Fed Ex		COC No: _____ of _____ COCs	
ARCADIS		801 Corporate Center Drive, Suite 300 Raleigh, NC 27607		Analysis Turnaround Time Calendar (C) or Work Days (W) TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Job No.		SDG No.	
919-854-1282		919-854-5448		Project Name: UNC - Airport Road		Sample Date: 9/25/14 17:00		Sample Type: Grab	
Site: Chapel Hill, NC		P O # NC000239.0019.0001A		Sample Time: 1600		Matrix: W		# of Cont: 4	
Sample Identification		Effluent		Sample Date		Sample Type		Matrix	
Sample Specific Notes:		*Report: As, Cr, Cu, Pb, and Zn only.		VOCs (Method 826B)		FP Metals (Method 6010)*		Filtered Sample	
				N 3 1					



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other  
 Possible Hazard Identification  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Relinquished by: <i>David...</i>	Company: ARCADIS	Reserved by: <i>J West</i>	Company: TASA
Relinquished by:	Company:	Received by:	Company:
Relinquished by:	Company:	Received by:	Company:
Date/Time: 9/26/14 17:00	Date/Time: 9/27/14 9:30	Date/Time: 9/27/14 9:30	Date/Time: 0.8



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-105719-1

**Login Number: 105719**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: West, Lauren H**

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-105719-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina (WW/SW)	State Program	4	269	12-31-14

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Pensacola

3355 McLemore Drive

Pensacola, FL 32514

Tel: (850)474-1001

TestAmerica Job ID: 400-96339-1

Client Project/Site: UNC-Airport Road

For:

ARCADIS U.S., Inc.

801 Corporate Center Drive

Suite 300

Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:

10/3/2014 3:27:20 PM

Mark Swafford, Project Manager I

(850)474-1001

[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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results through

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[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

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**Job ID: 400-96339-1**

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**Laboratory: TestAmerica Pensacola**

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**Narrative**

**Job Narrative**  
**400-96339-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 9/27/2014 9:16 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.1° C.

**Metals**

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-96339-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-96339-1	EFFLUENT	Water	09/25/14 16:00	09/27/14 09:16

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-96339-1**

**Date Collected: 09/25/14 16:00**

**Matrix: Water**

**Date Received: 09/27/14 09:16**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		09/29/14 09:00	10/03/14 11:23	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

## Metals

### Prep Batch: 231876

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-96339-1	EFFLUENT	Total/NA	Water	1631E	
400-96406-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-96406-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-231876/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-231876/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-231876/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 231954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-96339-1	EFFLUENT	Total/NA	Water	1631E	231876
400-96406-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	231876
400-96406-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	231876
LCS 400-231876/2-A	Lab Control Sample	Total/NA	Water	1631E	231876
LCSD 400-231876/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	231876
MB 400-231876/1-A	Method Blank	Total/NA	Water	1631E	231876



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-231876/1-A**  
**Matrix: Water**  
**Analysis Batch: 231954**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 231876**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		10/02/14 15:00	10/03/14 09:03	1

**Lab Sample ID: LCS 400-231876/2-A**  
**Matrix: Water**  
**Analysis Batch: 231954**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 231876**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.34		ng/L		87	79 - 121

**Lab Sample ID: LCSD 400-231876/3-A**  
**Matrix: Water**  
**Analysis Batch: 231954**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 231876**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.18		ng/L		84	79 - 121	4	20

**Lab Sample ID: 400-96406-C-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 231954**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 231876**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	300		250	525		ng/L		92	71 - 125

**Lab Sample ID: 400-96406-C-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 231954**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 231876**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	300		250	555		ng/L		104	71 - 125	6	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-96339-1**

**Date Collected: 09/25/14 16:00**

**Matrix: Water**

**Date Received: 09/27/14 09:16**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			231876	09/29/14 09:00	VLC	TAL PEN
Total/NA	Analysis	1631E		1	231954	10/03/14 11:23	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-15
Arizona	State Program	9	AZ0710	01-11-15
Arkansas DEQ	State Program	6	88-0689	09-01-14 *
Florida	NELAP	4	E81010	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200041	10-09-14
Iowa	State Program	7	367	07-31-14 *
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-15
Louisiana	NELAP	6	30976	06-30-15
Maryland	State Program	3	233	09-30-15
Massachusetts	State Program	1	M-FL094	06-30-15
Michigan	State Program	5	9912	06-30-14 *
New Jersey	NELAP	2	FL006	06-30-15
North Carolina (WW/SW)	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-15
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14 *
Tennessee	State Program	4	TN02907	06-30-15
Texas	NELAP	6	T104704286-12-5	09-30-15
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-15
West Virginia DEP	State Program	3	136	06-30-15

\* Certification renewal pending - certification considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-96339-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-96339-1

**Login Number: 96339**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Akers, Stephanie C**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.1°C, IR-6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	Bottles arrived single-bagged and labeled.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-106382-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
10/27/2014 3:32:34 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

**Job ID: 680-106382-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-106382-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 10/17/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.6 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Sample Effluent (680-106382-1) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 10/26/2014.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 355343.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### METALS (ICP)

Sample Effluent (680-106382-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 10/20/2014 and analyzed on 10/21/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-106382-1	Effluent	Water	10/16/14 14:30	10/17/14 09:35

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-106382-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-106382-1**

**Date Collected: 10/16/14 14:30**

**Matrix: Water**

**Date Received: 10/17/14 09:35**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			10/26/14 17:10	1
Benzene	1.0	U	1.0		ug/L			10/26/14 17:10	1
Bromoform	1.0	U	1.0		ug/L			10/26/14 17:10	1
Bromomethane	5.0	U	5.0		ug/L			10/26/14 17:10	1
2-Butanone (MEK)	10	U	10		ug/L			10/26/14 17:10	1
Carbon disulfide	2.0	U	2.0		ug/L			10/26/14 17:10	1
Carbon tetrachloride	1.0	U	1.0		ug/L			10/26/14 17:10	1
Chlorobenzene	1.0	U	1.0		ug/L			10/26/14 17:10	1
Chlorodibromomethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
Chloroethane	5.0	U	5.0		ug/L			10/26/14 17:10	1
Chloroform	1.0	U	1.0		ug/L			10/26/14 17:10	1
Chloromethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/26/14 17:10	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/26/14 17:10	1
Dichlorobromomethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			10/26/14 17:10	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			10/26/14 17:10	1
Diethyl ether	5.0	U	5.0		ug/L			10/26/14 17:10	1
Ethylbenzene	1.0	U	1.0		ug/L			10/26/14 17:10	1
2-Hexanone	10	U	10		ug/L			10/26/14 17:10	1
Methylene Chloride	5.0	U	5.0		ug/L			10/26/14 17:10	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			10/26/14 17:10	1
Methyl tert-butyl ether	10	U	10		ug/L			10/26/14 17:10	1
Styrene	1.0	U	1.0		ug/L			10/26/14 17:10	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
Tetrachloroethene	1.0	U	1.0		ug/L			10/26/14 17:10	1
Toluene	1.0	U	1.0		ug/L			10/26/14 17:10	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/26/14 17:10	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/26/14 17:10	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			10/26/14 17:10	1
Trichloroethene	1.0	U	1.0		ug/L			10/26/14 17:10	1
Vinyl chloride	1.0	U	1.0		ug/L			10/26/14 17:10	1
Xylenes, Total	2.0	U	2.0		ug/L			10/26/14 17:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		70 - 130		10/26/14 17:10	1
Dibromofluoromethane (Surr)	99		70 - 130		10/26/14 17:10	1
1,2-Dichloroethane-d4 (Surr)	92		70 - 130		10/26/14 17:10	1
Toluene-d8 (Surr)	100		70 - 130		10/26/14 17:10	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		10/20/14 13:30	10/21/14 22:02	1
Chromium	10	U	10		ug/L		10/20/14 13:30	10/21/14 22:02	1
Copper	20	U	20		ug/L		10/20/14 13:30	10/21/14 22:02	1
Lead	10	U	10		ug/L		10/20/14 13:30	10/21/14 22:02	1
Zinc	20	U	20		ug/L		10/20/14 13:30	10/21/14 22:02	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB	DBFM	12DCE	TOL
		(70-130)	(70-130)	(70-130)	(70-130)
680-106382-1	Effluent	100	99	92	100
LCS 680-355343/4	Lab Control Sample	98	103	100	100
LCSD 680-355343/5	Lab Control Sample Dup	99	104	99	96
MB 680-355343/9	Method Blank	99	102	95	98

### Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)  
DBFM = Dibromofluoromethane (Surr)  
12DCE = 1,2-Dichloroethane-d4 (Surr)  
TOL = Toluene-d8 (Surr)

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-355343/9**

**Matrix: Water**

**Analysis Batch: 355343**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			10/26/14 10:26	1
Benzene	1.0	U	1.0		ug/L			10/26/14 10:26	1
Bromoform	1.0	U	1.0		ug/L			10/26/14 10:26	1
Bromomethane	5.0	U	5.0		ug/L			10/26/14 10:26	1
2-Butanone (MEK)	10	U	10		ug/L			10/26/14 10:26	1
Carbon disulfide	2.0	U	2.0		ug/L			10/26/14 10:26	1
Carbon tetrachloride	1.0	U	1.0		ug/L			10/26/14 10:26	1
Chlorobenzene	1.0	U	1.0		ug/L			10/26/14 10:26	1
Chlorodibromomethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
Chloroethane	5.0	U	5.0		ug/L			10/26/14 10:26	1
Chloroform	1.0	U	1.0		ug/L			10/26/14 10:26	1
Chloromethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/26/14 10:26	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/26/14 10:26	1
Dichlorobromomethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			10/26/14 10:26	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			10/26/14 10:26	1
Diethyl ether	5.0	U	5.0		ug/L			10/26/14 10:26	1
Ethylbenzene	1.0	U	1.0		ug/L			10/26/14 10:26	1
2-Hexanone	10	U	10		ug/L			10/26/14 10:26	1
Methylene Chloride	5.0	U	5.0		ug/L			10/26/14 10:26	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			10/26/14 10:26	1
Methyl tert-butyl ether	10	U	10		ug/L			10/26/14 10:26	1
Styrene	1.0	U	1.0		ug/L			10/26/14 10:26	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
Tetrachloroethene	1.0	U	1.0		ug/L			10/26/14 10:26	1
Toluene	1.0	U	1.0		ug/L			10/26/14 10:26	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			10/26/14 10:26	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			10/26/14 10:26	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			10/26/14 10:26	1
Trichloroethene	1.0	U	1.0		ug/L			10/26/14 10:26	1
Vinyl chloride	1.0	U	1.0		ug/L			10/26/14 10:26	1
Xylenes, Total	2.0	U	2.0		ug/L			10/26/14 10:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		70 - 130		10/26/14 10:26	1
Dibromofluoromethane (Surr)	102		70 - 130		10/26/14 10:26	1
1,2-Dichloroethane-d4 (Surr)	95		70 - 130		10/26/14 10:26	1
Toluene-d8 (Surr)	98		70 - 130		10/26/14 10:26	1

TestAmerica Savannah



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-355343/4**

**Matrix: Water**

**Analysis Batch: 355343**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	242		ug/L		97	39 - 162
Benzene	50.0	51.3		ug/L		103	74 - 123
Bromoform	50.0	52.0		ug/L		104	60 - 134
Bromomethane	50.0	61.1		ug/L		122	10 - 171
2-Butanone (MEK)	250	267		ug/L		107	55 - 142
Carbon disulfide	50.0	55.7		ug/L		111	63 - 142
Carbon tetrachloride	50.0	53.6		ug/L		107	70 - 131
Chlorobenzene	50.0	49.9		ug/L		100	79 - 120
Chlorodibromomethane	50.0	58.6		ug/L		117	63 - 134
Chloroethane	50.0	59.1		ug/L		118	47 - 148
Chloroform	50.0	51.8		ug/L		104	76 - 128
Chloromethane	50.0	55.7		ug/L		111	47 - 151
cis-1,2-Dichloroethene	50.0	51.9		ug/L		104	78 - 127
cis-1,3-Dichloropropene	50.0	53.2		ug/L		106	73 - 128
Dichlorobromomethane	50.0	54.6		ug/L		109	72 - 129
1,1-Dichloroethane	50.0	52.4		ug/L		105	69 - 132
1,2-Dichloroethane	50.0	52.1		ug/L		104	75 - 120
1,1-Dichloroethene	50.0	50.7		ug/L		101	73 - 134
1,2-Dichloropropane	50.0	51.2		ug/L		102	71 - 126
Diethyl ether	50.0	55.1		ug/L		110	40 - 160
Ethylbenzene	50.0	50.7		ug/L		101	78 - 125
2-Hexanone	250	273		ug/L		109	52 - 149
Methylene Chloride	50.0	52.9		ug/L		106	79 - 124
4-Methyl-2-pentanone (MIBK)	250	267		ug/L		107	51 - 143
Methyl tert-butyl ether	50.0	54.5		ug/L		109	76 - 126
Styrene	50.0	52.4		ug/L		105	75 - 129
1,1,2,2-Tetrachloroethane	50.0	53.3		ug/L		107	71 - 127
Tetrachloroethene	50.0	51.6		ug/L		103	77 - 128
Toluene	50.0	51.3		ug/L		103	77 - 125
trans-1,2-Dichloroethene	50.0	51.7		ug/L		103	78 - 130
trans-1,3-Dichloropropene	50.0	54.1		ug/L		108	72 - 127
1,1,1-Trichloroethane	50.0	52.2		ug/L		104	76 - 126
1,1,2-Trichloroethane	50.0	51.7		ug/L		103	69 - 127
Trichloroethene	50.0	52.3		ug/L		105	80 - 120
Vinyl chloride	50.0	62.3		ug/L		125	58 - 141
Xylenes, Total	100	102		ug/L		102	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	98		70 - 130
Dibromofluoromethane (Surr)	103		70 - 130
1,2-Dichloroethane-d4 (Surr)	100		70 - 130
Toluene-d8 (Surr)	100		70 - 130

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-355343/5

Matrix: Water

Analysis Batch: 355343

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	242		ug/L		97	39 - 162	0	50
Benzene	50.0	51.0		ug/L		102	74 - 123	0	30
Bromoform	50.0	52.0		ug/L		104	60 - 134	0	30
Bromomethane	50.0	63.9		ug/L		128	10 - 171	5	50
2-Butanone (MEK)	250	256		ug/L		102	55 - 142	4	30
Carbon disulfide	50.0	58.5		ug/L		117	63 - 142	5	30
Carbon tetrachloride	50.0	55.1		ug/L		110	70 - 131	3	30
Chlorobenzene	50.0	49.1		ug/L		98	79 - 120	1	30
Chlorodibromomethane	50.0	57.6		ug/L		115	63 - 134	2	50
Chloroethane	50.0	56.4		ug/L		113	47 - 148	5	40
Chloroform	50.0	52.6		ug/L		105	76 - 128	2	30
Chloromethane	50.0	64.0		ug/L		128	47 - 151	14	30
cis-1,2-Dichloroethene	50.0	53.1		ug/L		106	78 - 127	2	30
cis-1,3-Dichloropropene	50.0	53.2		ug/L		106	73 - 128	0	30
Dichlorobromomethane	50.0	54.1		ug/L		108	72 - 129	1	30
1,1-Dichloroethane	50.0	55.1		ug/L		110	69 - 132	5	30
1,2-Dichloroethane	50.0	51.4		ug/L		103	75 - 120	1	30
1,1-Dichloroethene	50.0	61.0		ug/L		122	73 - 134	18	30
1,2-Dichloropropane	50.0	50.6		ug/L		101	71 - 126	1	30
Diethyl ether	50.0	55.9		ug/L		112	40 - 160	2	50
Ethylbenzene	50.0	50.0		ug/L		100	78 - 125	1	30
2-Hexanone	250	254		ug/L		102	52 - 149	7	30
Methylene Chloride	50.0	54.4		ug/L		109	79 - 124	3	30
4-Methyl-2-pentanone (MIBK)	250	250		ug/L		100	51 - 143	7	30
Methyl tert-butyl ether	50.0	55.0		ug/L		110	76 - 126	1	30
Styrene	50.0	51.2		ug/L		102	75 - 129	2	30
1,1,2,2-Tetrachloroethane	50.0	51.4		ug/L		103	71 - 127	4	30
Tetrachloroethene	50.0	50.4		ug/L		101	77 - 128	2	30
Toluene	50.0	49.6		ug/L		99	77 - 125	3	30
trans-1,2-Dichloroethene	50.0	53.3		ug/L		107	78 - 130	3	30
trans-1,3-Dichloropropene	50.0	53.6		ug/L		107	72 - 127	1	50
1,1,1-Trichloroethane	50.0	52.6		ug/L		105	76 - 126	1	30
1,1,2-Trichloroethane	50.0	50.3		ug/L		101	69 - 127	3	30
Trichloroethene	50.0	51.7		ug/L		103	80 - 120	1	30
Vinyl chloride	50.0	66.1		ug/L		132	58 - 141	6	30
Xylenes, Total	100	99.5		ug/L		100	80 - 124	3	30

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	99		70 - 130
Dibromofluoromethane (Surr)	104		70 - 130
1,2-Dichloroethane-d4 (Surr)	99		70 - 130
Toluene-d8 (Surr)	96		70 - 130

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-354408/1-A**  
**Matrix: Water**  
**Analysis Batch: 354793**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 354408**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		10/20/14 13:30	10/21/14 20:16	1
Chromium	10	U	10		ug/L		10/20/14 13:30	10/21/14 20:16	1
Copper	20	U	20		ug/L		10/20/14 13:30	10/21/14 20:16	1
Lead	10	U	10		ug/L		10/20/14 13:30	10/21/14 20:16	1
Zinc	20	U	20		ug/L		10/20/14 13:30	10/21/14 20:16	1

**Lab Sample ID: LCS 680-354408/2-A**  
**Matrix: Water**  
**Analysis Batch: 354793**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 354408**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	103		ug/L		103	80 - 120
Chromium	100	101		ug/L		101	80 - 120
Copper	100	104		ug/L		104	80 - 120
Lead	500	504		ug/L		101	80 - 120
Zinc	100	102		ug/L		102	80 - 120

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## GC/MS VOA

### Analysis Batch: 355343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-106382-1	Effluent	Total/NA	Water	8260B	
LCS 680-355343/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-355343/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-355343/9	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 354408

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-106382-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-354408/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-354408/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 354793

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-106382-1	Effluent	Total Recoverable	Water	6010C	354408
LCS 680-354408/2-A	Lab Control Sample	Total Recoverable	Water	6010C	354408
MB 680-354408/1-A	Method Blank	Total Recoverable	Water	6010C	354408



# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-106382-1**

**Date Collected: 10/16/14 14:30**

**Matrix: Water**

**Date Received: 10/17/14 09:35**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	355343	10/26/14 17:10	TAR	TAL SAV
Instrument ID: CMSA2										
Total Recoverable	Prep	3005A			50 mL	50 mL	354408	10/20/14 13:30	SP	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	354793	10/21/14 22:02	BCB	TAL SAV
Instrument ID: ICPE										

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-106382-1

**Login Number: 106382**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: White, Menica R**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-106382-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina (WW/SW)	State Program	4	269	12-31-14

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-97274-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
10/28/2014 9:01:46 AM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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Have a Question?



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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits
F2	MS/MSD RPD exceeds control limits

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

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**Job ID: 400-97274-1**

---

**Laboratory: TestAmerica Pensacola**

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**Narrative**

**Job Narrative**  
**400-97274-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 10/17/2014 9:42 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

**Metals**

Method 1631E: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 400-234397 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample and duplicate (LCS/LCSD) recoveries was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-97274-1**

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-97274-1	EFFLUENT	Water	10/16/14 14:30	10/17/14 09:42

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-97274-1**

**Date Collected: 10/16/14 14:30**

**Matrix: Water**

**Date Received: 10/17/14 09:42**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		10/21/14 17:10	10/27/14 11:33	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

## Metals

### Prep Batch: 234397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-97274-1	EFFLUENT	Total/NA	Water	1631E	
400-97343-B-2-B MS	Matrix Spike	Total/NA	Water	1631E	
400-97343-B-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-234397/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-234397/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-234397/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 234499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-97274-1	EFFLUENT	Total/NA	Water	1631E	234397
400-97343-B-2-B MS	Matrix Spike	Total/NA	Water	1631E	234397
400-97343-B-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	234397
LCS 400-234397/2-A	Lab Control Sample	Total/NA	Water	1631E	234397
LCSD 400-234397/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	234397
MB 400-234397/1-A	Method Blank	Total/NA	Water	1631E	234397





# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-234397/1-A**  
**Matrix: Water**  
**Analysis Batch: 234499**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 234397**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		10/27/14 08:46	10/27/14 09:35	1

**Lab Sample ID: LCS 400-234397/2-A**  
**Matrix: Water**  
**Analysis Batch: 234499**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 234397**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.05		ng/L		81	79 - 121

**Lab Sample ID: LCSD 400-234397/3-A**  
**Matrix: Water**  
**Analysis Batch: 234499**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 234397**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.49		ng/L		90	79 - 121	10	20

**Lab Sample ID: 400-97343-B-2-B MS**  
**Matrix: Water**  
**Analysis Batch: 234499**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 234397**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<5.0		50.0	15.9	F1	ng/L		32	71 - 125

**Lab Sample ID: 400-97343-B-2-C MSD**  
**Matrix: Water**  
**Analysis Batch: 234499**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 234397**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	<5.0		50.0	11.4	F1 F2	ng/L		23	71 - 125	33	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-97274-1**

**Date Collected: 10/16/14 14:30**

**Matrix: Water**

**Date Received: 10/17/14 09:42**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			234397	10/21/14 17:10	VLC	TAL PEN
Total/NA	Analysis	1631E		1	234499	10/27/14 11:33	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-15
Arizona	State Program	9	AZ0710	01-11-15
Arkansas DEQ	State Program	6	88-0689	09-01-14 *
Florida	NELAP	4	E81010	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200041	10-09-15
Iowa	State Program	7	367	07-31-14 *
Kansas	NELAP	7	E-10253	10-31-14
Kentucky (UST)	State Program	4	53	06-30-15
Louisiana	NELAP	6	30976	06-30-15
Maryland	State Program	3	233	09-30-15
Massachusetts	State Program	1	M-FL094	06-30-15
Michigan	State Program	5	9912	06-30-14 *
North Carolina (WW/SW)	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-15
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-14 *
Tennessee	State Program	4	TN02907	06-30-15
Texas	NELAP	6	T104704286-12-5	09-30-15
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-15
West Virginia DEP	State Program	3	136	06-30-15

\* Certification renewal pending - certification considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-97274-1

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Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

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**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-97274-1

**Login Number: 97274**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Summers, Dustin H**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.3°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-107684-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
12/4/2014 3:05:28 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

**Job ID: 680-107684-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-107684-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 11/26/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.3 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples Effluent (680-107684-1) and Trip Blank (680-107684-2) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/04/2014.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 361490.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### METALS (ICP)

Sample Effluent (680-107684-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/28/2014 and analyzed on 12/01/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-107684-1	Effluent	Water	11/24/14 15:30	11/26/14 09:52
680-107684-2	Trip Blank	Water	11/24/14 00:00	11/26/14 09:52

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Client Sample ID: Effluent

Lab Sample ID: 680-107684-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diethyl ether	11		5.0		ug/L	1		8260B	Total/NA
Zinc	22		20		ug/L	1		6010C	Total Recoverable

## Client Sample ID: Trip Blank

Lab Sample ID: 680-107684-2

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah



# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-107684-1**

**Date Collected: 11/24/14 15:30**

**Matrix: Water**

**Date Received: 11/26/14 09:52**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			12/04/14 01:36	1
Benzene	1.0	U	1.0		ug/L			12/04/14 01:36	1
Bromoform	1.0	U	1.0		ug/L			12/04/14 01:36	1
Bromomethane	5.0	U	5.0		ug/L			12/04/14 01:36	1
2-Butanone (MEK)	10	U	10		ug/L			12/04/14 01:36	1
Carbon disulfide	2.0	U	2.0		ug/L			12/04/14 01:36	1
Carbon tetrachloride	1.0	U	1.0		ug/L			12/04/14 01:36	1
Chlorobenzene	1.0	U	1.0		ug/L			12/04/14 01:36	1
Chlorodibromomethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
Chloroethane	5.0	U	5.0		ug/L			12/04/14 01:36	1
Chloroform	1.0	U	1.0		ug/L			12/04/14 01:36	1
Chloromethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/04/14 01:36	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/04/14 01:36	1
Dichlorobromomethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			12/04/14 01:36	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			12/04/14 01:36	1
<b>Diethyl ether</b>	<b>11</b>		5.0		ug/L			12/04/14 01:36	1
Ethylbenzene	1.0	U	1.0		ug/L			12/04/14 01:36	1
2-Hexanone	10	U	10		ug/L			12/04/14 01:36	1
Methylene Chloride	5.0	U	5.0		ug/L			12/04/14 01:36	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			12/04/14 01:36	1
Methyl tert-butyl ether	10	U	10		ug/L			12/04/14 01:36	1
Styrene	1.0	U	1.0		ug/L			12/04/14 01:36	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
Tetrachloroethene	1.0	U	1.0		ug/L			12/04/14 01:36	1
Toluene	1.0	U	1.0		ug/L			12/04/14 01:36	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/04/14 01:36	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/04/14 01:36	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			12/04/14 01:36	1
Trichloroethene	1.0	U	1.0		ug/L			12/04/14 01:36	1
Vinyl chloride	1.0	U	1.0		ug/L			12/04/14 01:36	1
Xylenes, Total	2.0	U	2.0		ug/L			12/04/14 01:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130		12/04/14 01:36	1
Dibromofluoromethane (Surr)	103		70 - 130		12/04/14 01:36	1
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		12/04/14 01:36	1
Toluene-d8 (Surr)	106		70 - 130		12/04/14 01:36	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		11/28/14 09:20	12/01/14 13:59	1
Chromium	10	U	10		ug/L		11/28/14 09:20	12/01/14 13:59	1
Copper	20	U	20		ug/L		11/28/14 09:20	12/01/14 13:59	1
Lead	10	U	10		ug/L		11/28/14 09:20	12/01/14 13:59	1
<b>Zinc</b>	<b>22</b>		20		ug/L		11/28/14 09:20	12/01/14 13:59	1

TestAmerica Savannah

# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

**Client Sample ID: Trip Blank**

**Lab Sample ID: 680-107684-2**

Date Collected: 11/24/14 00:00

Matrix: Water

Date Received: 11/26/14 09:52

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			12/04/14 01:59	1
Benzene	1.0	U	1.0		ug/L			12/04/14 01:59	1
Bromoform	1.0	U	1.0		ug/L			12/04/14 01:59	1
Bromomethane	5.0	U	5.0		ug/L			12/04/14 01:59	1
2-Butanone (MEK)	10	U	10		ug/L			12/04/14 01:59	1
Carbon disulfide	2.0	U	2.0		ug/L			12/04/14 01:59	1
Carbon tetrachloride	1.0	U	1.0		ug/L			12/04/14 01:59	1
Chlorobenzene	1.0	U	1.0		ug/L			12/04/14 01:59	1
Chlorodibromomethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
Chloroethane	5.0	U	5.0		ug/L			12/04/14 01:59	1
Chloroform	1.0	U	1.0		ug/L			12/04/14 01:59	1
Chloromethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/04/14 01:59	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/04/14 01:59	1
Dichlorobromomethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			12/04/14 01:59	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			12/04/14 01:59	1
Diethyl ether	5.0	U	5.0		ug/L			12/04/14 01:59	1
Ethylbenzene	1.0	U	1.0		ug/L			12/04/14 01:59	1
2-Hexanone	10	U	10		ug/L			12/04/14 01:59	1
Methylene Chloride	5.0	U	5.0		ug/L			12/04/14 01:59	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			12/04/14 01:59	1
Methyl tert-butyl ether	10	U	10		ug/L			12/04/14 01:59	1
Styrene	1.0	U	1.0		ug/L			12/04/14 01:59	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
Tetrachloroethene	1.0	U	1.0		ug/L			12/04/14 01:59	1
Toluene	1.0	U	1.0		ug/L			12/04/14 01:59	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/04/14 01:59	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/04/14 01:59	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			12/04/14 01:59	1
Trichloroethene	1.0	U	1.0		ug/L			12/04/14 01:59	1
Vinyl chloride	1.0	U	1.0		ug/L			12/04/14 01:59	1
Xylenes, Total	2.0	U	2.0		ug/L			12/04/14 01:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130		12/04/14 01:59	1
Dibromofluoromethane (Surr)	106		70 - 130		12/04/14 01:59	1
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		12/04/14 01:59	1
Toluene-d8 (Surr)	105		70 - 130		12/04/14 01:59	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB	DBFM	12DCE	TOL
		(70-130)	(70-130)	(70-130)	(70-130)
680-107684-1	Effluent	106	103	100	106
680-107684-2	Trip Blank	106	106	99	105
LCS 680-361490/4	Lab Control Sample	109	103	102	104
LCSD 680-361490/5	Lab Control Sample Dup	109	100	99	102
MB 680-361490/10	Method Blank	106	106	109	107

### Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

12DCE = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-361490/10**

**Matrix: Water**

**Analysis Batch: 361490**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			12/03/14 19:34	1
Benzene	1.0	U	1.0		ug/L			12/03/14 19:34	1
Bromoform	1.0	U	1.0		ug/L			12/03/14 19:34	1
Bromomethane	5.0	U	5.0		ug/L			12/03/14 19:34	1
2-Butanone (MEK)	10	U	10		ug/L			12/03/14 19:34	1
Carbon disulfide	2.0	U	2.0		ug/L			12/03/14 19:34	1
Carbon tetrachloride	1.0	U	1.0		ug/L			12/03/14 19:34	1
Chlorobenzene	1.0	U	1.0		ug/L			12/03/14 19:34	1
Chlorodibromomethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
Chloroethane	5.0	U	5.0		ug/L			12/03/14 19:34	1
Chloroform	1.0	U	1.0		ug/L			12/03/14 19:34	1
Chloromethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/03/14 19:34	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/03/14 19:34	1
Dichlorobromomethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			12/03/14 19:34	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			12/03/14 19:34	1
Diethyl ether	5.0	U	5.0		ug/L			12/03/14 19:34	1
Ethylbenzene	1.0	U	1.0		ug/L			12/03/14 19:34	1
2-Hexanone	10	U	10		ug/L			12/03/14 19:34	1
Methylene Chloride	5.0	U	5.0		ug/L			12/03/14 19:34	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			12/03/14 19:34	1
Methyl tert-butyl ether	10	U	10		ug/L			12/03/14 19:34	1
Styrene	1.0	U	1.0		ug/L			12/03/14 19:34	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
Tetrachloroethene	1.0	U	1.0		ug/L			12/03/14 19:34	1
Toluene	1.0	U	1.0		ug/L			12/03/14 19:34	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/03/14 19:34	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/03/14 19:34	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			12/03/14 19:34	1
Trichloroethene	1.0	U	1.0		ug/L			12/03/14 19:34	1
Vinyl chloride	1.0	U	1.0		ug/L			12/03/14 19:34	1
Xylenes, Total	2.0	U	2.0		ug/L			12/03/14 19:34	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		70 - 130		12/03/14 19:34	1
Dibromofluoromethane (Surr)	106		70 - 130		12/03/14 19:34	1
1,2-Dichloroethane-d4 (Surr)	109		70 - 130		12/03/14 19:34	1
Toluene-d8 (Surr)	107		70 - 130		12/03/14 19:34	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 680-361490/4**

**Matrix: Water**

**Analysis Batch: 361490**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	228		ug/L		91	39 - 162
Benzene	50.0	52.1		ug/L		104	74 - 123
Bromoform	50.0	56.3		ug/L		113	60 - 134
Bromomethane	50.0	44.1		ug/L		88	10 - 171
2-Butanone (MEK)	250	255		ug/L		102	55 - 142
Carbon disulfide	50.0	42.9		ug/L		86	63 - 142
Carbon tetrachloride	50.0	54.9		ug/L		110	70 - 131
Chlorobenzene	50.0	51.0		ug/L		102	79 - 120
Chlorodibromomethane	50.0	56.6		ug/L		113	63 - 134
Chloroethane	50.0	48.7		ug/L		97	47 - 148
Chloroform	50.0	49.9		ug/L		100	76 - 128
Chloromethane	50.0	48.6		ug/L		97	47 - 151
cis-1,2-Dichloroethene	50.0	50.4		ug/L		101	78 - 127
cis-1,3-Dichloropropene	50.0	56.8		ug/L		114	73 - 128
Dichlorobromomethane	50.0	53.1		ug/L		106	72 - 129
1,1-Dichloroethane	50.0	50.2		ug/L		100	69 - 132
1,2-Dichloroethane	50.0	49.2		ug/L		98	75 - 120
1,1-Dichloroethene	50.0	47.9		ug/L		96	73 - 134
1,2-Dichloropropane	50.0	52.4		ug/L		105	71 - 126
Diethyl ether	50.0	48.8		ug/L		98	40 - 160
Ethylbenzene	50.0	53.2		ug/L		106	78 - 125
2-Hexanone	250	260		ug/L		104	52 - 149
Methylene Chloride	50.0	50.4		ug/L		101	79 - 124
4-Methyl-2-pentanone (MIBK)	250	256		ug/L		102	51 - 143
Methyl tert-butyl ether	50.0	52.7		ug/L		105	76 - 126
Styrene	50.0	53.4		ug/L		107	75 - 129
1,1,2,2-Tetrachloroethane	50.0	50.9		ug/L		102	71 - 127
Tetrachloroethene	50.0	52.4		ug/L		105	77 - 128
Toluene	50.0	52.9		ug/L		106	77 - 125
trans-1,2-Dichloroethene	50.0	50.9		ug/L		102	78 - 130
trans-1,3-Dichloropropene	50.0	62.1		ug/L		124	72 - 127
1,1,1-Trichloroethane	50.0	51.3		ug/L		103	76 - 126
1,1,2-Trichloroethane	50.0	51.3		ug/L		103	69 - 127
Trichloroethene	50.0	53.5		ug/L		107	80 - 120
Vinyl chloride	50.0	46.4		ug/L		93	58 - 141
Xylenes, Total	100	108		ug/L		108	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	109		70 - 130
Dibromofluoromethane (Surr)	103		70 - 130
1,2-Dichloroethane-d4 (Surr)	102		70 - 130
Toluene-d8 (Surr)	104		70 - 130

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCSD 680-361490/5**

**Matrix: Water**

**Analysis Batch: 361490**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	232		ug/L		93	39 - 162	2	50
Benzene	50.0	51.9		ug/L		104	74 - 123	0	30
Bromoform	50.0	55.5		ug/L		111	60 - 134	1	30
Bromomethane	50.0	43.9		ug/L		88	10 - 171	0	50
2-Butanone (MEK)	250	262		ug/L		105	55 - 142	3	30
Carbon disulfide	50.0	43.2		ug/L		86	63 - 142	1	30
Carbon tetrachloride	50.0	54.2		ug/L		108	70 - 131	1	30
Chlorobenzene	50.0	49.7		ug/L		99	79 - 120	2	30
Chlorodibromomethane	50.0	56.3		ug/L		113	63 - 134	1	50
Chloroethane	50.0	46.8		ug/L		94	47 - 148	4	40
Chloroform	50.0	49.9		ug/L		100	76 - 128	0	30
Chloromethane	50.0	46.4		ug/L		93	47 - 151	5	30
cis-1,2-Dichloroethene	50.0	51.2		ug/L		102	78 - 127	2	30
cis-1,3-Dichloropropene	50.0	57.1		ug/L		114	73 - 128	1	30
Dichlorobromomethane	50.0	53.1		ug/L		106	72 - 129	0	30
1,1-Dichloroethane	50.0	50.7		ug/L		101	69 - 132	1	30
1,2-Dichloroethane	50.0	50.1		ug/L		100	75 - 120	2	30
1,1-Dichloroethene	50.0	47.9		ug/L		96	73 - 134	0	30
1,2-Dichloropropane	50.0	52.0		ug/L		104	71 - 126	1	30
Diethyl ether	50.0	49.4		ug/L		99	40 - 160	1	50
Ethylbenzene	50.0	52.5		ug/L		105	78 - 125	1	30
2-Hexanone	250	260		ug/L		104	52 - 149	0	30
Methylene Chloride	50.0	50.1		ug/L		100	79 - 124	1	30
4-Methyl-2-pentanone (MIBK)	250	258		ug/L		103	51 - 143	1	30
Methyl tert-butyl ether	50.0	52.8		ug/L		106	76 - 126	0	30
Styrene	50.0	52.8		ug/L		106	75 - 129	1	30
1,1,2,2-Tetrachloroethane	50.0	51.0		ug/L		102	71 - 127	0	30
Tetrachloroethene	50.0	50.7		ug/L		101	77 - 128	3	30
Toluene	50.0	51.7		ug/L		103	77 - 125	2	30
trans-1,2-Dichloroethene	50.0	50.3		ug/L		101	78 - 130	1	30
trans-1,3-Dichloropropene	50.0	62.4		ug/L		125	72 - 127	0	50
1,1,1-Trichloroethane	50.0	52.5		ug/L		105	76 - 126	2	30
1,1,2-Trichloroethane	50.0	51.6		ug/L		103	69 - 127	0	30
Trichloroethene	50.0	53.0		ug/L		106	80 - 120	1	30
Vinyl chloride	50.0	46.9		ug/L		94	58 - 141	1	30
Xylenes, Total	100	105		ug/L		105	80 - 124	3	30

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	109		70 - 130
Dibromofluoromethane (Surr)	100		70 - 130
1,2-Dichloroethane-d4 (Surr)	99		70 - 130
Toluene-d8 (Surr)	102		70 - 130

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-360760/1-A**  
**Matrix: Water**  
**Analysis Batch: 361155**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 360760**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		11/28/14 09:20	12/01/14 12:46	1
Chromium	10	U	10		ug/L		11/28/14 09:20	12/01/14 12:46	1
Copper	20	U	20		ug/L		11/28/14 09:20	12/01/14 12:46	1
Lead	10	U	10		ug/L		11/28/14 09:20	12/01/14 12:46	1
Zinc	20	U	20		ug/L		11/28/14 09:20	12/01/14 12:46	1

**Lab Sample ID: LCS 680-360760/2-A**  
**Matrix: Water**  
**Analysis Batch: 361155**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 360760**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	97.6		ug/L		98	80 - 120
Chromium	100	96.7		ug/L		97	80 - 120
Copper	100	94.2		ug/L		94	80 - 120
Lead	500	480		ug/L		96	80 - 120
Zinc	100	99.0		ug/L		99	80 - 120

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## GC/MS VOA

### Analysis Batch: 361490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-107684-1	Effluent	Total/NA	Water	8260B	
680-107684-2	Trip Blank	Total/NA	Water	8260B	
LCS 680-361490/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-361490/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-361490/10	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 360760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-107684-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-360760/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-360760/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 361155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-107684-1	Effluent	Total Recoverable	Water	6010C	360760
LCS 680-360760/2-A	Lab Control Sample	Total Recoverable	Water	6010C	360760
MB 680-360760/1-A	Method Blank	Total Recoverable	Water	6010C	360760

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Client Sample ID: Effluent

Date Collected: 11/24/14 15:30

Date Received: 11/26/14 09:52

## Lab Sample ID: 680-107684-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	361490	12/04/14 01:36	JD1	TAL SAV
Instrument ID: CMSAC										
Total Recoverable	Prep	3005A			50 mL	50 mL	360760	11/28/14 09:20	SP	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	361155	12/01/14 13:59	BCB	TAL SAV
Instrument ID: ICPE										

## Client Sample ID: Trip Blank

Date Collected: 11/24/14 00:00

Date Received: 11/26/14 09:52

## Lab Sample ID: 680-107684-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	361490	12/04/14 01:59	JD1	TAL SAV
Instrument ID: CMSAC										

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

**Chain of Custody Record**

TestAmerica Laboratories, Inc.

<b>Client Contact</b> ARCADIS 801 Corporate Center Drive, Suite 300 Raleigh, NC 27607 919-854-1282 919-854-5448 Project Name: UNC - Airport Road Site: Chapel Hill, NC P O # NC000239.0019.0001B		<b>Project Manager: Alan Pinnix</b> Tel/Fax: 919-854-1282 Analysis Turnaround Time Calendar (C) or Work Days (W) <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day TAT if different from Below _____		<b>Site Contact: Alan Pinnix</b> Date: 11/24/14 <b>Lab Contact: Jerry Lanier</b> Carrier: Fed Ex		COC No: _____ Job No. _____ of _____ COCs SDG No. _____ Sample Specific Notes: _____ *Report: As, Cr, Cu, Pb, and Zn only.	
<b>Sample Identification</b> Effluent Trip Blank 89-26-14		Sample Date: 11/24/2014 Sample Time: 1530 Sample Type: Grab Matrix: W		Filtered Sample VOCs (Method 8260B) 3 PP Metals (Method 6010)* 1 189-26-14		# of Cont. 4 2 4 680-107684 Chain of Custody	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Special Instructions/QC Requirements & Comments:			
Relinquished by: <i>Amil Pinnix</i> Date/Time: 11-25-14 / 1300 Company: ARCADIS		Received by: <i>Christy Sando</i> Date/Time: 11-26-14 0958 Company: TH SAV		Relinquished by: _____ Date/Time: _____ Company: _____			Received by: _____ Date/Time: _____ Company: _____
Relinquished by: _____ Date/Time: 12/4/2014 Company: _____		Relinquished by: _____ Date/Time: _____ Company: _____		Relinquished by: _____ Date/Time: _____ Company: _____			Relinquished by: _____ Date/Time: _____ Company: _____



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-107684-1

**Login Number: 107684**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Banda, Christy S**

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-107684-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina (WW/SW)	State Program	4	269	12-31-14 *

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\* Certification renewal pending - certification considered valid.

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-98963-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
12/3/2014 4:15:13 PM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-98963-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Mercury	0.99		0.50	ng/L	1		1631E	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola



# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-98963-1	EFFLUENT	Water	11/24/14 15:30	11/26/14 09:46

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-98963-1**

**Date Collected: 11/24/14 15:30**

**Matrix: Water**

**Date Received: 11/26/14 09:46**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.99		0.50	ng/L		11/26/14 11:00	12/03/14 10:07	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

## Metals

### Prep Batch: 238628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-98963-1	EFFLUENT	Total/NA	Water	1631E	
660-64194-L-1-B MS	Matrix Spike	Total/NA	Water	1631E	
660-64194-L-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-238628/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-238628/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-238628/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 238689

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-98963-1	EFFLUENT	Total/NA	Water	1631E	238628
660-64194-L-1-B MS	Matrix Spike	Total/NA	Water	1631E	238628
660-64194-L-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	238628
LCS 400-238628/2-A	Lab Control Sample	Total/NA	Water	1631E	238628
LCSD 400-238628/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	238628
MB 400-238628/1-A	Method Blank	Total/NA	Water	1631E	238628





# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-238628/1-A**  
**Matrix: Water**  
**Analysis Batch: 238689**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 238628**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		12/03/14 08:56	12/03/14 09:18	1

**Lab Sample ID: LCS 400-238628/2-A**  
**Matrix: Water**  
**Analysis Batch: 238689**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 238628**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.26		ng/L		85	79 - 121

**Lab Sample ID: LCSD 400-238628/3-A**  
**Matrix: Water**  
**Analysis Batch: 238689**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 238628**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	4.27		ng/L		85	79 - 121	0	20

**Lab Sample ID: 660-64194-L-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 238689**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 238628**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<5.0		50.0	42.4		ng/L		85	71 - 125

**Lab Sample ID: 660-64194-L-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 238689**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 238628**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	<5.0		50.0	43.0		ng/L		86	71 - 125	1	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-98963-1**

**Date Collected: 11/24/14 15:30**

**Matrix: Water**

**Date Received: 11/26/14 09:46**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			238628	11/26/14 11:00	VLC	TAL PEN
Total/NA	Analysis	1631E		1	238689	12/03/14 10:07	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-15
Arizona	State Program	9	AZ0710	01-11-15
Arkansas DEQ	State Program	6	88-0689	09-01-15
Florida	NELAP	4	E81010	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200041	10-09-15
Iowa	State Program	7	367	07-31-14 *
Kansas	NELAP	7	E-10253	01-31-15
Kentucky (UST)	State Program	4	53	06-30-15
Louisiana	NELAP	6	30976	06-30-15
Maryland	State Program	3	233	09-30-15
Massachusetts	State Program	1	M-FL094	06-30-15
Michigan	State Program	5	9912	06-30-15
New Jersey	NELAP	2	FL006	06-30-15
North Carolina (WW/SW)	State Program	4	314	12-31-14
Oklahoma	State Program	6	9810	08-31-15
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-15
Tennessee	State Program	4	TN02907	06-30-15
Texas	NELAP	6	T104704286-12-5	09-30-15
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-15
West Virginia DEP	State Program	3	136	06-30-15

\* Certification renewal pending - certification considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-98963-1

---

Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-98963-1

**Login Number: 98963**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Crawford, Lauren E**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.1°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Savannah  
5102 LaRoche Avenue  
Savannah, GA 31404  
Tel: (912)354-7858

TestAmerica Job ID: 680-108201-1  
Client Project/Site: UNC Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
12/18/2014 2:04:43 PM

Jerry Lanier, Project Manager I  
(912)354-7858 e.3410  
[jerry.lanier@testamericainc.com](mailto:jerry.lanier@testamericainc.com)

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# Case Narrative

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

**Job ID: 680-108201-1**

**Laboratory: TestAmerica Savannah**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: UNC Airport Road**

**Report Number: 680-108201-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### RECEIPT

The samples were received on 12/12/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.7 C.

### VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples Effluent (680-108201-1) and Trip Blank (680-108201-2) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/17/2014.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 363585.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### METALS (ICP)

Sample Effluent (680-108201-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/16/2014 and analyzed on 12/17/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-108201-1	Effluent	Water	12/11/14 13:30	12/12/14 09:17
680-108201-2	Trip Blank	Water	12/11/14 00:00	12/12/14 09:17

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# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Client Sample ID: Effluent

Lab Sample ID: 680-108201-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diethyl ether	26		5.0		ug/L	1		8260B	Total/NA
Zinc	100		20		ug/L	1		6010C	Total Recoverable

## Client Sample ID: Trip Blank

Lab Sample ID: 680-108201-2

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Savannah

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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

**Client Sample ID: Effluent**

**Lab Sample ID: 680-108201-1**

**Date Collected: 12/11/14 13:30**

**Matrix: Water**

**Date Received: 12/12/14 09:17**

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			12/17/14 20:39	1
Benzene	1.0	U	1.0		ug/L			12/17/14 20:39	1
Bromoform	1.0	U	1.0		ug/L			12/17/14 20:39	1
Bromomethane	5.0	U	5.0		ug/L			12/17/14 20:39	1
2-Butanone (MEK)	10	U	10		ug/L			12/17/14 20:39	1
Carbon disulfide	2.0	U	2.0		ug/L			12/17/14 20:39	1
Carbon tetrachloride	1.0	U	1.0		ug/L			12/17/14 20:39	1
Chlorobenzene	1.0	U	1.0		ug/L			12/17/14 20:39	1
Chlorodibromomethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
Chloroethane	5.0	U	5.0		ug/L			12/17/14 20:39	1
Chloroform	1.0	U	1.0		ug/L			12/17/14 20:39	1
Chloromethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 20:39	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/17/14 20:39	1
Dichlorobromomethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 20:39	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			12/17/14 20:39	1
<b>Diethyl ether</b>	<b>26</b>		5.0		ug/L			12/17/14 20:39	1
Ethylbenzene	1.0	U	1.0		ug/L			12/17/14 20:39	1
2-Hexanone	10	U	10		ug/L			12/17/14 20:39	1
Methylene Chloride	5.0	U	5.0		ug/L			12/17/14 20:39	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			12/17/14 20:39	1
Methyl tert-butyl ether	10	U	10		ug/L			12/17/14 20:39	1
Styrene	1.0	U	1.0		ug/L			12/17/14 20:39	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
Tetrachloroethene	1.0	U	1.0		ug/L			12/17/14 20:39	1
Toluene	1.0	U	1.0		ug/L			12/17/14 20:39	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 20:39	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/17/14 20:39	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			12/17/14 20:39	1
Trichloroethene	1.0	U	1.0		ug/L			12/17/14 20:39	1
Vinyl chloride	1.0	U	1.0		ug/L			12/17/14 20:39	1
Xylenes, Total	2.0	U	2.0		ug/L			12/17/14 20:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		70 - 130		12/17/14 20:39	1
Dibromofluoromethane (Surr)	92		70 - 130		12/17/14 20:39	1
1,2-Dichloroethane-d4 (Surr)	94		70 - 130		12/17/14 20:39	1
Toluene-d8 (Surr)	96		70 - 130		12/17/14 20:39	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		12/16/14 09:14	12/17/14 13:47	1
Chromium	10	U	10		ug/L		12/16/14 09:14	12/17/14 13:47	1
Copper	20	U	20		ug/L		12/16/14 09:14	12/17/14 13:47	1
Lead	10	U	10		ug/L		12/16/14 09:14	12/17/14 13:47	1
<b>Zinc</b>	<b>100</b>		20		ug/L		12/16/14 09:14	12/17/14 13:47	1

TestAmerica Savannah

# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

**Client Sample ID: Trip Blank**

**Lab Sample ID: 680-108201-2**

Date Collected: 12/11/14 00:00

Matrix: Water

Date Received: 12/12/14 09:17

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			12/17/14 14:57	1
Benzene	1.0	U	1.0		ug/L			12/17/14 14:57	1
Bromoform	1.0	U	1.0		ug/L			12/17/14 14:57	1
Bromomethane	5.0	U	5.0		ug/L			12/17/14 14:57	1
2-Butanone (MEK)	10	U	10		ug/L			12/17/14 14:57	1
Carbon disulfide	2.0	U	2.0		ug/L			12/17/14 14:57	1
Carbon tetrachloride	1.0	U	1.0		ug/L			12/17/14 14:57	1
Chlorobenzene	1.0	U	1.0		ug/L			12/17/14 14:57	1
Chlorodibromomethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
Chloroethane	5.0	U	5.0		ug/L			12/17/14 14:57	1
Chloroform	1.0	U	1.0		ug/L			12/17/14 14:57	1
Chloromethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 14:57	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/17/14 14:57	1
Dichlorobromomethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 14:57	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			12/17/14 14:57	1
Diethyl ether	5.0	U	5.0		ug/L			12/17/14 14:57	1
Ethylbenzene	1.0	U	1.0		ug/L			12/17/14 14:57	1
2-Hexanone	10	U	10		ug/L			12/17/14 14:57	1
Methylene Chloride	5.0	U	5.0		ug/L			12/17/14 14:57	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			12/17/14 14:57	1
Methyl tert-butyl ether	10	U	10		ug/L			12/17/14 14:57	1
Styrene	1.0	U	1.0		ug/L			12/17/14 14:57	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
Tetrachloroethene	1.0	U	1.0		ug/L			12/17/14 14:57	1
Toluene	1.0	U	1.0		ug/L			12/17/14 14:57	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 14:57	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/17/14 14:57	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			12/17/14 14:57	1
Trichloroethene	1.0	U	1.0		ug/L			12/17/14 14:57	1
Vinyl chloride	1.0	U	1.0		ug/L			12/17/14 14:57	1
Xylenes, Total	2.0	U	2.0		ug/L			12/17/14 14:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		70 - 130		12/17/14 14:57	1
Dibromofluoromethane (Surr)	92		70 - 130		12/17/14 14:57	1
1,2-Dichloroethane-d4 (Surr)	91		70 - 130		12/17/14 14:57	1
Toluene-d8 (Surr)	99		70 - 130		12/17/14 14:57	1

TestAmerica Savannah

# Surrogate Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB	DBFM	12DCE	TOL
		(70-130)	(70-130)	(70-130)	(70-130)
680-108201-1	Effluent	89	92	94	96
680-108201-2	Trip Blank	89	92	91	99
LCS 680-363585/4	Lab Control Sample	86	96	106	89
LCSD 680-363585/5	Lab Control Sample Dup	82	88	98	84
MB 680-363585/10	Method Blank	90	91	89	100

### Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

12DCE = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)



# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 680-363585/10**

**Matrix: Water**

**Analysis Batch: 363585**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			12/17/14 14:14	1
Benzene	1.0	U	1.0		ug/L			12/17/14 14:14	1
Bromoform	1.0	U	1.0		ug/L			12/17/14 14:14	1
Bromomethane	5.0	U	5.0		ug/L			12/17/14 14:14	1
2-Butanone (MEK)	10	U	10		ug/L			12/17/14 14:14	1
Carbon disulfide	2.0	U	2.0		ug/L			12/17/14 14:14	1
Carbon tetrachloride	1.0	U	1.0		ug/L			12/17/14 14:14	1
Chlorobenzene	1.0	U	1.0		ug/L			12/17/14 14:14	1
Chlorodibromomethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
Chloroethane	5.0	U	5.0		ug/L			12/17/14 14:14	1
Chloroform	1.0	U	1.0		ug/L			12/17/14 14:14	1
Chloromethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 14:14	1
cis-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/17/14 14:14	1
Dichlorobromomethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
1,2-Dichloroethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 14:14	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			12/17/14 14:14	1
Diethyl ether	5.0	U	5.0		ug/L			12/17/14 14:14	1
Ethylbenzene	1.0	U	1.0		ug/L			12/17/14 14:14	1
2-Hexanone	10	U	10		ug/L			12/17/14 14:14	1
Methylene Chloride	5.0	U	5.0		ug/L			12/17/14 14:14	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			12/17/14 14:14	1
Methyl tert-butyl ether	10	U	10		ug/L			12/17/14 14:14	1
Styrene	1.0	U	1.0		ug/L			12/17/14 14:14	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
Tetrachloroethene	1.0	U	1.0		ug/L			12/17/14 14:14	1
Toluene	1.0	U	1.0		ug/L			12/17/14 14:14	1
trans-1,2-Dichloroethene	1.0	U	1.0		ug/L			12/17/14 14:14	1
trans-1,3-Dichloropropene	1.0	U	1.0		ug/L			12/17/14 14:14	1
1,1,1-Trichloroethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
1,1,2-Trichloroethane	1.0	U	1.0		ug/L			12/17/14 14:14	1
Trichloroethene	1.0	U	1.0		ug/L			12/17/14 14:14	1
Vinyl chloride	1.0	U	1.0		ug/L			12/17/14 14:14	1
Xylenes, Total	2.0	U	2.0		ug/L			12/17/14 14:14	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		70 - 130		12/17/14 14:14	1
Dibromofluoromethane (Surr)	91		70 - 130		12/17/14 14:14	1
1,2-Dichloroethane-d4 (Surr)	89		70 - 130		12/17/14 14:14	1
Toluene-d8 (Surr)	100		70 - 130		12/17/14 14:14	1

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-363585/4

Matrix: Water

Analysis Batch: 363585

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	217		ug/L		87	39 - 162
Benzene	50.0	45.0		ug/L		90	74 - 123
Bromoform	50.0	44.6		ug/L		89	60 - 134
Bromomethane	50.0	59.4		ug/L		119	10 - 171
2-Butanone (MEK)	250	214		ug/L		85	55 - 142
Carbon disulfide	50.0	44.1		ug/L		88	63 - 142
Carbon tetrachloride	50.0	52.5		ug/L		105	70 - 131
Chlorobenzene	50.0	46.6		ug/L		93	79 - 120
Chlorodibromomethane	50.0	48.6		ug/L		97	63 - 134
Chloroethane	50.0	38.9		ug/L		78	47 - 148
Chloroform	50.0	49.9		ug/L		100	76 - 128
Chloromethane	50.0	43.0		ug/L		86	47 - 151
cis-1,2-Dichloroethene	50.0	46.7		ug/L		93	78 - 127
cis-1,3-Dichloropropene	50.0	46.7		ug/L		93	73 - 128
Dichlorobromomethane	50.0	47.6		ug/L		95	72 - 129
1,1-Dichloroethane	50.0	46.8		ug/L		94	69 - 132
1,2-Dichloroethane	50.0	54.9		ug/L		110	75 - 120
1,1-Dichloroethene	50.0	41.9		ug/L		84	73 - 134
1,2-Dichloropropane	50.0	42.6		ug/L		85	71 - 126
Diethyl ether	50.0	43.5		ug/L		87	40 - 160
Ethylbenzene	50.0	45.2		ug/L		90	78 - 125
2-Hexanone	250	210		ug/L		84	52 - 149
Methylene Chloride	50.0	44.0		ug/L		88	79 - 124
4-Methyl-2-pentanone (MIBK)	250	210		ug/L		84	51 - 143
Methyl tert-butyl ether	50.0	46.9		ug/L		94	76 - 126
Styrene	50.0	43.2		ug/L		86	75 - 129
1,1,2,2-Tetrachloroethane	50.0	39.7		ug/L		79	71 - 127
Tetrachloroethene	50.0	47.9		ug/L		96	77 - 128
Toluene	50.0	46.5		ug/L		93	77 - 125
trans-1,2-Dichloroethene	50.0	45.2		ug/L		90	78 - 130
trans-1,3-Dichloropropene	50.0	51.3		ug/L		103	72 - 127
1,1,1-Trichloroethane	50.0	51.0		ug/L		102	76 - 126
1,1,2-Trichloroethane	50.0	43.8		ug/L		88	69 - 127
Trichloroethene	50.0	46.9		ug/L		94	80 - 120
Vinyl chloride	50.0	39.7		ug/L		79	58 - 141
Xylenes, Total	100	91.1		ug/L		91	80 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	86		70 - 130
Dibromofluoromethane (Surr)	96		70 - 130
1,2-Dichloroethane-d4 (Surr)	106		70 - 130
Toluene-d8 (Surr)	89		70 - 130

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-363585/5

Matrix: Water

Analysis Batch: 363585

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	200		ug/L		80	39 - 162	8	50
Benzene	50.0	41.6		ug/L		83	74 - 123	8	30
Bromoform	50.0	41.8		ug/L		84	60 - 134	7	30
Bromomethane	50.0	56.4		ug/L		113	10 - 171	5	50
2-Butanone (MEK)	250	199		ug/L		80	55 - 142	7	30
Carbon disulfide	50.0	41.6		ug/L		83	63 - 142	6	30
Carbon tetrachloride	50.0	49.3		ug/L		99	70 - 131	6	30
Chlorobenzene	50.0	43.9		ug/L		88	79 - 120	6	30
Chlorodibromomethane	50.0	43.8		ug/L		88	63 - 134	10	50
Chloroethane	50.0	36.5		ug/L		73	47 - 148	7	40
Chloroform	50.0	46.3		ug/L		93	76 - 128	7	30
Chloromethane	50.0	35.8		ug/L		72	47 - 151	18	30
cis-1,2-Dichloroethene	50.0	42.8		ug/L		86	78 - 127	9	30
cis-1,3-Dichloropropene	50.0	43.2		ug/L		86	73 - 128	8	30
Dichlorobromomethane	50.0	43.9		ug/L		88	72 - 129	8	30
1,1-Dichloroethane	50.0	43.6		ug/L		87	69 - 132	7	30
1,2-Dichloroethane	50.0	50.0		ug/L		100	75 - 120	9	30
1,1-Dichloroethene	50.0	40.7		ug/L		81	73 - 134	3	30
1,2-Dichloropropane	50.0	39.3		ug/L		79	71 - 126	8	30
Diethyl ether	50.0	40.2		ug/L		80	40 - 160	8	50
Ethylbenzene	50.0	42.8		ug/L		86	78 - 125	5	30
2-Hexanone	250	189		ug/L		76	52 - 149	11	30
Methylene Chloride	50.0	41.8		ug/L		84	79 - 124	5	30
4-Methyl-2-pentanone (MIBK)	250	189		ug/L		76	51 - 143	11	30
Methyl tert-butyl ether	50.0	43.0		ug/L		86	76 - 126	9	30
Styrene	50.0	40.1		ug/L		80	75 - 129	7	30
1,1,2,2-Tetrachloroethane	50.0	37.8		ug/L		76	71 - 127	5	30
Tetrachloroethene	50.0	44.3		ug/L		89	77 - 128	8	30
Toluene	50.0	42.8		ug/L		86	77 - 125	8	30
trans-1,2-Dichloroethene	50.0	42.3		ug/L		85	78 - 130	7	30
trans-1,3-Dichloropropene	50.0	46.6		ug/L		93	72 - 127	9	50
1,1,1-Trichloroethane	50.0	47.7		ug/L		95	76 - 126	7	30
1,1,2-Trichloroethane	50.0	40.1		ug/L		80	69 - 127	9	30
Trichloroethene	50.0	44.2		ug/L		88	80 - 120	6	30
Vinyl chloride	50.0	36.9		ug/L		74	58 - 141	7	30
Xylenes, Total	100	85.3		ug/L		85	80 - 124	7	30

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
4-Bromofluorobenzene (Surr)	82		70 - 130
Dibromofluoromethane (Surr)	88		70 - 130
1,2-Dichloroethane-d4 (Surr)	98		70 - 130
Toluene-d8 (Surr)	84		70 - 130

TestAmerica Savannah

# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 680-363376/1-A**  
**Matrix: Water**  
**Analysis Batch: 363699**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 363376**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	20	U	20		ug/L		12/16/14 09:14	12/17/14 12:26	1
Chromium	10	U	10		ug/L		12/16/14 09:14	12/17/14 12:26	1
Copper	20	U	20		ug/L		12/16/14 09:14	12/17/14 12:26	1
Lead	10	U	10		ug/L		12/16/14 09:14	12/17/14 12:26	1
Zinc	20	U	20		ug/L		12/16/14 09:14	12/17/14 12:26	1

**Lab Sample ID: LCS 680-363376/2-A**  
**Matrix: Water**  
**Analysis Batch: 363699**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 363376**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	106		ug/L		106	80 - 120
Chromium	100	105		ug/L		105	80 - 120
Copper	100	103		ug/L		103	80 - 120
Lead	500	521		ug/L		104	80 - 120
Zinc	100	108		ug/L		108	80 - 120

# QC Association Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## GC/MS VOA

### Analysis Batch: 363585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-108201-1	Effluent	Total/NA	Water	8260B	
680-108201-2	Trip Blank	Total/NA	Water	8260B	
LCS 680-363585/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-363585/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-363585/10	Method Blank	Total/NA	Water	8260B	

## Metals

### Prep Batch: 363376

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-108201-1	Effluent	Total Recoverable	Water	3005A	
LCS 680-363376/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 680-363376/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 363699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-108201-1	Effluent	Total Recoverable	Water	6010C	363376
LCS 680-363376/2-A	Lab Control Sample	Total Recoverable	Water	6010C	363376
MB 680-363376/1-A	Method Blank	Total Recoverable	Water	6010C	363376

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Client Sample ID: Effluent

Date Collected: 12/11/14 13:30

Date Received: 12/12/14 09:17

## Lab Sample ID: 680-108201-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	363585	12/17/14 20:39	MMT	TAL SAV
Instrument ID: CMSAA										
Total Recoverable	Prep	3005A			50 mL	50 mL	363376	12/16/14 09:14	SP	TAL SAV
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	363699	12/17/14 13:47	BCB	TAL SAV
Instrument ID: ICPF										

## Client Sample ID: Trip Blank

Date Collected: 12/11/14 00:00

Date Received: 12/12/14 09:17

## Lab Sample ID: 680-108201-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	363585	12/17/14 14:57	MMT	TAL SAV
Instrument ID: CMSAA										

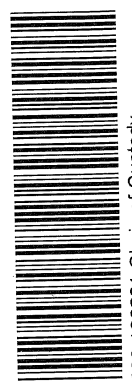
**Laboratory References:**

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

**Chain of Custody Record**

TestAmerica Laboratories, Inc.

<b>Client Contact</b>		<b>Project Manager: Alan Pinnix</b>		<b>Site Contact: Alan Pinnix</b>		<b>Date: 12/11/14</b>		<b>COC No:</b>	
ARCADIS		Tel/Fax: 919-854-1282		Lab Contact: Jerry Lanier		Carrier: Fed Ex		1 of 1 COCs	
801 Corporate Center Drive, Suite 300		Analysis Turnaround Time		Calendar (C) or Work Days (W)		TAT if different from Below		Job No.	
Raleigh, NC 27607		Sample Date		Sample Time		Sample Type		Matrix	
919-854-1282		12/11/2014		1330		Grab		W	
919-854-5448		2 weeks		1 week		2 days		1 day	
Project Name: UNC - Airport Road		Sample Date		Sample Time		Sample Type		Matrix	
Site: Chapel Hill, NC		12/11/2014		1330		Grab		W	
P O # NC000239.0019.0001B		Sample Date		Sample Time		Sample Type		Matrix	
Sample Identification		Effluent		1330		Grab		W	
Sample Specific Notes:		VOCs (Method 8260B)		3		N		1	
*Report: As, Cr, Cu, Pb, and Zn only.		PP Metals (Method 6010)*		1		N		1	
Sample Specific Notes:		2		4		2		4	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other		Possible Hazard Identification		Non-Hazard <input type="checkbox"/>		Flammable <input type="checkbox"/>		Skin Irritant <input type="checkbox"/>	
Special Instructions/QC Requirements & Comments:		Poison B <input type="checkbox"/>		Unknown <input type="checkbox"/>		Return To Client <input type="checkbox"/>		Disposal By Lab <input type="checkbox"/>	
Archive For _____ Months		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		Return To Client <input type="checkbox"/>		Disposal By Lab <input type="checkbox"/>		Archive For _____ Months	
Relinquished by: <i>John J. [Signature]</i>		Date/Time: 12-11-14/1700		Company: ARCADIS		Received by: <i>Jeff Banda</i>		Date/Time: 12-12-14 0917	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	



680-108201 Chain of Custody

(680-108201) 1.0 (CF=3) 0.7c



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 680-108201-1

**Login Number: 108201**

**List Source: TestAmerica Savannah**

**List Number: 1**

**Creator: Banda, Christy S**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





# Certification Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC Airport Road

TestAmerica Job ID: 680-108201-1

## Laboratory: TestAmerica Savannah

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
North Carolina (WW/SW)	State Program	4	269	12-31-15

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# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.  
TestAmerica Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

TestAmerica Job ID: 400-99610-1  
Client Project/Site: UNC-Airport Road

For:  
ARCADIS U.S., Inc.  
801 Corporate Center Drive  
Suite 300  
Raleigh, North Carolina 27607-5073

Attn: Mr. Alan Pinnix



Authorized for release by:  
12/17/2014 10:47:50 AM

Mark Swafford, Project Manager I  
(850)474-1001  
[mark.swafford@testamericainc.com](mailto:mark.swafford@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Detection Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-99610-1**

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Mercury	0.75		0.50	ng/L	1		1631E	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Pensacola

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# Sample Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-99610-1	EFFLUENT	Water	12/11/14 13:30	12/12/14 09:23

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- 3
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# Client Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-99610-1**

**Date Collected: 12/11/14 13:30**

**Matrix: Water**

**Date Received: 12/12/14 09:23**

**Method: 1631E - Mercury, Low Level (CVAFS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.75		0.50	ng/L		12/12/14 14:55	12/16/14 10:15	1

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# QC Association Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

## Metals

### Prep Batch: 240155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-99610-1	EFFLUENT	Total/NA	Water	1631E	
400-99664-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	
400-99664-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	
LCS 400-240155/2-A	Lab Control Sample	Total/NA	Water	1631E	
LCSD 400-240155/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	
MB 400-240155/1-A	Method Blank	Total/NA	Water	1631E	

### Analysis Batch: 240224

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-99610-1	EFFLUENT	Total/NA	Water	1631E	240155
400-99664-C-1-B MS	Matrix Spike	Total/NA	Water	1631E	240155
400-99664-C-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	1631E	240155
LCS 400-240155/2-A	Lab Control Sample	Total/NA	Water	1631E	240155
LCSD 400-240155/3-A	Lab Control Sample Dup	Total/NA	Water	1631E	240155
MB 400-240155/1-A	Method Blank	Total/NA	Water	1631E	240155





# QC Sample Results

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

## Method: 1631E - Mercury, Low Level (CVAFS)

**Lab Sample ID: MB 400-240155/1-A**  
**Matrix: Water**  
**Analysis Batch: 240224**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 240155**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.50		0.50	ng/L		12/15/14 16:00	12/16/14 09:07	1

**Lab Sample ID: LCS 400-240155/2-A**  
**Matrix: Water**  
**Analysis Batch: 240224**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 240155**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.14		ng/L		103	79 - 121

**Lab Sample ID: LCSD 400-240155/3-A**  
**Matrix: Water**  
**Analysis Batch: 240224**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 240155**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	5.00	5.08		ng/L		102	79 - 121	1	20

**Lab Sample ID: 400-99664-C-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 240224**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 240155**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<0.50		2.50	2.42		ng/L		97	71 - 125

**Lab Sample ID: 400-99664-C-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 240224**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 240155**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	<0.50		2.50	2.54		ng/L		102	71 - 125	5	24

# Lab Chronicle

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

**Client Sample ID: EFFLUENT**

**Lab Sample ID: 400-99610-1**

**Date Collected: 12/11/14 13:30**

**Matrix: Water**

**Date Received: 12/12/14 09:23**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1631E			240155	12/12/14 14:55	VLC	TAL PEN
Total/NA	Analysis	1631E		1	240224	12/16/14 10:15	VLC	TAL PEN

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

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# Certification Summary

Client: ARCADIS U.S., Inc.  
 Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

## Laboratory: TestAmerica Pensacola

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alabama	State Program	4	40150	06-30-15
Arizona	State Program	9	AZ0710	01-11-16
Arkansas DEQ	State Program	6	88-0689	09-01-15
Florida	NELAP	4	E81010	06-30-15
Georgia	State Program	4	N/A	06-30-15
Illinois	NELAP	5	200041	10-09-15
Iowa	State Program	7	367	07-31-14 *
Kansas	NELAP	7	E-10253	01-31-15
Kentucky (UST)	State Program	4	53	06-30-15
Louisiana	NELAP	6	30976	06-30-15
Maryland	State Program	3	233	09-30-15
Massachusetts	State Program	1	M-FL094	06-30-15
Michigan	State Program	5	9912	06-30-15
New Jersey	NELAP	2	FL006	06-30-15
North Carolina (WW/SW)	State Program	4	314	12-31-15
Oklahoma	State Program	6	9810	08-31-15
Pennsylvania	NELAP	3	68-00467	01-31-15
Rhode Island	State Program	1	LAO00307	12-30-14
South Carolina	State Program	4	96026	06-30-15
Tennessee	State Program	4	TN02907	06-30-15
Texas	NELAP	6	T104704286-12-5	09-30-15
USDA	Federal		P330-13-00193	07-01-16
Virginia	NELAP	3	460166	06-14-15
West Virginia DEP	State Program	3	136	06-30-15

\* Certification renewal pending - certification considered valid.

# Method Summary

Client: ARCADIS U.S., Inc.  
Project/Site: UNC-Airport Road

TestAmerica Job ID: 400-99610-1

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Method	Method Description	Protocol	Laboratory
1631E	Mercury, Low Level (CVAFS)	EPA	TAL PEN

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**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001





## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 400-99610-1

**Login Number: 99610**

**List Source: TestAmerica Pensacola**

**List Number: 1**

**Creator: Crawford, Lauren E**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.0°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ARCADIS

## **Appendix C**

Laboratory Analytical Data Reports  
for Air Discharge Samples

Research Triangle Park Laboratories, Inc.

7201 ACC Blvd., Suite 104  
Raleigh, NC 27617



919 510-0228 Telephone  
919 510-0141 Fax

Web Site: [www.rtp-labs.com](http://www.rtp-labs.com)

---

April 28, 2014

ARCADIS G&M of North Carolina, Inc.  
801 Corporate Center, Suite 300  
Raleigh, NC 27607

Attn: Alan Pinnix

**PROJECT: "UNC Airport Road"; Contract Number: NC000239.0019**  
**RTP Labs ID: 14-065**

Enclosed with this letter is the report on the chemical analysis for the Tedlar bag sample received on March 27, 2014 for a normal turnaround. The sample was analyzed by EPA Method TO-15 GC/MS for 60 VOC target compounds and included benzene, chloroform; 1,2-dichloroethane; methylene chloride; 1,1,2,2-tetrachloroethane; trichloroethylene; trichlorofluoromethane; and vinyl chloride.

Please call if you have any questions.

Sincerely,



Alston Sykes, Principal Chemist

Attachments: GC/MS reports, COC form





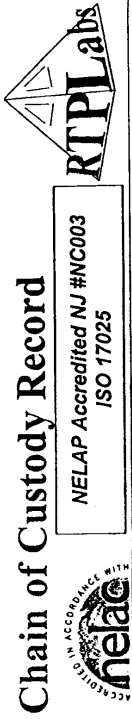
**EPA Method TO-15 GC/MS VOLATILE ORGANICS**

**Data File:** c:\varianws\wsdatafiles\voc110812\14-065-01.sms

**Acquisition Date:** 3/28/2014

**Comment:** Arcadis/UNC Airport Air Stripper, 3/27/14; 50mL.

CAS NO.	COMPOUND	CONCENTRATION	UNITS	MDL and Reporting Limit
75-71-8	Dichlorodifluoromethane (Freon 12)	Not Found	ppbv	1
76-14-2	1,2-Chloro-1,1,2,2-Tetrafluoroethane	Not Found	ppbv	1
74-87-3	Chloromethane	4.22	ppbv	1
75-01-4	Vinyl chloride	Not Found	ppbv	1
106-99-0	1,3-Butadiene	Not Found	ppbv	1
74-83-9	Bromomethane	Not Found	ppbv	1
75-00-3	Chloroethane	Not Found	ppbv	1
75-69-4	Trichloromonofluoromethane	Not Found	ppbv	1
75-35-4	1,1-dichloroethene	Not Found	ppbv	1
76-13-1	1,1,2-trichloro-1,2,2-trifluoroethane	Not Found	ppbv	1
64-17-5	Ethanol	13.19	ppbv	1
75-15-0	Carbon disulfide	Not Found	ppbv	1
67-63-0	Isopropyl alcohol	2.30	ppbv	1
75-09-2	Methylene chloride	1.93	ppbv	1
67-64-1	Acetone	29.96	ppbv	1
156-60-5	t-1,2-dichloroethene	Not Found	ppbv	1
11-05-3	Hexane	2.18	ppbv	1
1634-04-4	Methyl-t-butyl ether (MTBE)	Not Found	ppbv	1
75-34-3	1,1-Dichloroethane	Not Found	ppbv	1
108-05-4	Vinyl acetate	Not Found	ppbv	1
156-59-2	cis-1,2-dichloroethene	Not Found	ppbv	1
110-82-7	Cyclohexane	1.51	ppbv	1
67-66-3	Chloroform	Below MDL	ppbv	1
141-78-6	Ethyl Acetate	2.34	ppbv	1
109-99-9	Tetrahydrofuran	28.29	ppbv	1
71-55-6	1,1,1-trichloroethane	Not Found	ppbv	1
56-23-5	Carbon Tetrachloride	Below MDL	ppbv	1
78-93-3	2-Butanone	Not Found	ppbv	1
142-82-5	Heptane	25.70	ppbv	1
71-43-2	Benzene	13.78	ppbv	1
107-06-2	1,2-dichloroethane	8.95	ppbv	1
79-01-6	Trichloroethylene	Not Found	ppbv	1
78-87-5	1,2-dichloropropane	Not Found	ppbv	1
75-27-4	Bromodichloromethane	Not Found	ppbv	1
123-91-1	1,4-dioxane	Below MDL	ppbv	1
10061-01-5	cis-1,3-dichloropropene	Not Found	ppbv	1
108-88-3	Toluene	1.96	ppbv	1
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Found	ppbv	1
1006-02-6	t-1,3-dichloropropene	Not Found	ppbv	1
127-18-4	Tetrachloroethylene	Not Found	ppbv	1
79-00-5	1,1,2-trichloroethane	Not Found	ppbv	1
124-48-1	Dibromochloromethane	Not Found	ppbv	1
106-93-4	1,2-dibromoethane	Not Found	ppbv	1
591-78-6	2-Hexanone	Not Found	ppbv	1
100-41-4	Ethylbenzene	Not Found	ppbv	1
108-90-7	Chlorobenzene	1.19	ppbv	1
1330-20-7	m/p-Xylene	Below MDL	ppbv	1
95-47-6	o-Xylene	Below MDL	ppbv	1
100-42-5	Styrene	Not Found	ppbv	1
75-25-2	Tribromomethane	Not Found	ppbv	1
79-34-5	1,1,2,2-tetrachloroethane	Not Found	ppbv	1
622-96-8	1-ethyl-4-methylbenzene	Not Found	ppbv	1
108-67-8	1,3,5-trimethylbenzene	Not Found	ppbv	1
95-63-6	1,2,4-trimethylbenzene	Not Found	ppbv	1
541-73-1	1,3-dichlorobenzene	5.31	ppbv	1
106-46-7	1,4-dichlorobenzene	5.64	ppbv	1
100-44-7	Benzyl chloride	Not Found	ppbv	1
95-50-1	1,2-dichlorobenzene	Not Found	ppbv	1
87-68-3	1,1,2,3,4,4-hexachloro-1,3-butadiene	Not Found	ppbv	1
120-82-1	1,2,4-trichlorobenzene	Not Found	ppbv	1



Research Triangle Park Laboratories, Inc  
8109 Ebenezer Church Road  
Raleigh, North Carolina 27612-7307  
Phone: 919-510-0228 Fax: 919-510-0141  
Web Site: www.rtp-labs.com

Client (Billing): **ARCADIS** Send Report To Attention: **ALAN PINNIX** Phone Number: (919) 854-1282 Fax Number: (919) 854-5448 Date: **3/27/14**

Address: **801 CORPORATE CENTER DRIVE** State: **NC** Zip Code: **27607** E-Mail: **APINNIX@ARCADIS-US.COM** Page: **1** of **1**

City: **RALEIGH** Project Name: **UNC AIRPORT ROAD WASTE DISPOSAL AREA** Requested Analyses: **Air Samples** RTP Labs Project Tracking Number: **14-065**

Contract/Purchase Order No.: **NC000239.0013** Matrix: **Air** Compliance Test: **TO-15** Tracking # Sample Fraction: **-01**

Comments: **AIR STRIPPER** Date Sampled: **3-27-14** TIME: **PM 0945** # of Containers: **1** X

Sample ID No. & Description	Date Sampled	TIME	Matrix	Ambient	Source	Liquid/Solid	Compliance Test	Preservatives	Field Initial	Lab Receipt	Final	Tracking # Sample Fraction
1 AIR STRIPPER	3-27-14	PM 0945	Air	X	X		TO-15					-01
2 VER DISCHARGE												
3												
4												
5												
6												
7												
8												
9												
10												

Turn Around Time Requested for Report: Business Days; \*Rush Multipliers (Xx)  
 1 day\*(4x)  2 days\*(3x)  3 days\*(2x)  5 days\*(1.5x)  10 days\*(1.1x)  15 days

QC Requirements:  Screen  Standard  EPA Level IV for Compliance  Requires approved QAPP sent to Lab

Relinquished By: *Alan Pinnix* Date: **3-27-14** Time: **1030** Received By: *Ann Shaw* Date: **3/27/14** Time: **1057**

Research Triangle Park Laboratories, Inc.

7201 ACC Blvd., Suite 104  
Raleigh, NC 27617



919 510-0228 Telephone  
919 510-0141 Fax

Web Site: [www.rtp-labs.com](http://www.rtp-labs.com)

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September 15, 2014

ARCADIS G&M of North Carolina, Inc.  
801 Corporate Center, Suite 300  
Raleigh, NC 27607

Attn: Alan Pinnix

**PROJECT: "UNC Airport Road"; Contract Number: NC000239.0019**  
**RTP Labs ID: 14-156**

Enclosed with this letter is the report on the chemical analysis for the Tedlar bag sample received on August 28, 2014 for a normal turnaround. The sample was analyzed by EPA Method TO-15 GC/MS for 60 VOC target compounds and included benzene, chloroform; 1,2-dichloroethane; methylene chloride; 1,1,2,2-tetrachloroethane; trichloroethylene; trichlorofluoromethane; and vinyl chloride.

Please call if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads 'Alston Sykes'.

Alston Sykes, Principal Chemist

Attachments: GC/MS reports, COC form



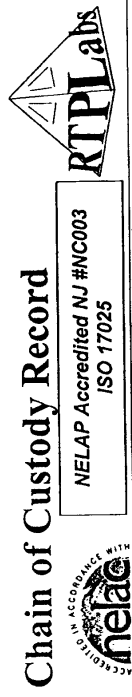
**EPA Method TO-15 GC/MS VOLATILE ORGANICS**

Data File: c:\varianws\wsdatafiles\voc110812\14-156-01.sms

Acquisition Date: 9/2/2014 13:32

Comment: Arcadis/UNC Airport AS Discharge; 8-28-14; 50mL

CAS NO.	COMPOUND	CONCENTRATION	UNITS	MDL and Reporting Limit
75-71-8	Dichlorodifluoromethane (Freon 12)	Not Found	ppbv	1
76-14-2	1,2-Chloro-1,1,2,2-Tetrafluoroethane	Not Found	ppbv	1
74-87-3	Chloromethane	5.04	ppbv	1
75-01-4	Vinyl chloride	Not Found	ppbv	1
106-99-0	1,3-Butadiene	Not Found	ppbv	1
74-83-9	Bromomethane	Not Found	ppbv	1
75-00-3	Chloroethane	166.39	ppbv	1
75-69-4	Trichloromonofluoromethane	Not Found	ppbv	1
75-35-4	1,1-dichloroethene	Not Found	ppbv	1
76-13-1	1,1,2-trichloro-1,2,2-trifluoroethane	Not Found	ppbv	1
64-17-5	Ethanol	Not Found	ppbv	1
75-15-0	Carbon disulfide	Not Found	ppbv	1
67-63-0	Isopropyl alcohol	12.84	ppbv	1
75-09-2	Methylene chloride	Not Found	ppbv	1
67-64-1	Acetone	19.16	ppbv	1
156-60-5	t-1,2-dichloroethene	Not Found	ppbv	1
11-05-3	Hexane	4.23	ppbv	1
1634-04-4	Methyl-t-butyl ether (MTBE)	Not Found	ppbv	1
75-34-3	1,1-Dichloroethane	Not Found	ppbv	1
108-05-4	Vinyl acetate	Not Found	ppbv	1
156-59-2	cis-1,2-dichloroethene	Not Found	ppbv	1
110-82-7	Cyclohexane	2.53	ppbv	1
67-66-3	Chloroform	Below MDL	ppbv	1
141-78-6	Ethyl Acetate	Not Found	ppbv	1
109-99-9	Tetrahydrofuran	1.93	ppbv	1
71-55-6	1,1,1-trichloroethane	Not Found	ppbv	1
56-23-5	Carbon Tetrachloride	Not Found	ppbv	1
78-93-3	2-Butanone	3.42	ppbv	1
142-82-5	Heptane	3.70	ppbv	1
71-43-2	Benzene	1.39	ppbv	1
107-06-2	1,2-dichloroethane	12.68	ppbv	1
79-01-6	Trichloroethylene	1.70	ppbv	1
78-87-5	1,2-dichloropropane	Not Found	ppbv	1
75-27-4	Bromodichloromethane	Not Found	ppbv	1
123-91-1	1,4-dioxane	1.18	ppbv	1
10061-01-5	cis-1,3-dichloropropene	Not Found	ppbv	1
108-88-3	Toluene	3.53	ppbv	1
108-10-1	4-Methyl-2-pentanone (MIBK)	Not Found	ppbv	1
1006-02-6	t-1,3-dichloropropene	Not Found	ppbv	1
127-18-4	Tetrachloroethylene	Not Found	ppbv	1
79-00-5	1,1,2-trichloroethane	Not Found	ppbv	1
124-48-1	Dibromochloromethane	Not Found	ppbv	1
106-93-4	1,2-dibromoethane	Not Found	ppbv	1
591-78-6	2-Hexanone	Not Found	ppbv	1
100-41-4	Ethylbenzene	Below MDL	ppbv	1
108-90-7	Chlorobenzene	2.68	ppbv	1
1330-20-7	m/p-Xylene	3.55	ppbv	1
95-47-6	o-Xylene	1.14	ppbv	1
100-42-5	Styrene	Not Found	ppbv	1
75-25-2	Tribromomethane	Below MDL	ppbv	1
79-34-5	1,1,2,2-tetrachloroethane	Not Found	ppbv	1
622-96-8	1-ethyl-4-methylbenzene	Not Found	ppbv	1
108-67-8	1,3,5-trimethylbenzene	Not Found	ppbv	1
95-63-6	1,2,4-trimethylbenzene	Not Found	ppbv	1
541-73-1	1,3-dichlorobenzene	13.46	ppbv	1
106-46-7	1,4-dichlorobenzene	13.97	ppbv	1
100-44-7	Benzyl chloride	Not Found	ppbv	1
95-50-1	1,2-dichlorobenzene	Not Found	ppbv	1
87-68-3	1,1,2,3,4,4-hexachloro-1,3-butadiene	Not Found	ppbv	1
120-82-1	1,2,4-trichlorobenzene	Not Found	ppbv	1



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Chain of Custody Record

Client (Billing): **ARCADIS**      Send Report To Attention: **ALAN PINNIX**      Phone Number: **(919) 854-1282**      Fax Number: **(919) 854-5448**      Date: **8/28/14**

Address: **801 CORPORATE CENTER DRIVE**      City: **RALEIGH**      State: **NC**      Zip Code: **27607**

Contract/Purchase Order No.: **0019**      Project Name: **UNC AIRPORT ROAD WASTE DISPOSAL AREA**

E-Mail: **APINNI@ARCADIS-US.COM**      Requested Analyses: **Air Samples**

Page **1** of **1**      RTP Labs Project Tracking Number: **14-156**

Sample ID No. & Description	Date Sampled	TIME	Matrix		Compliance Test	# of Containers	TO-15	Preservatives			Tracking # Sample Fraction	
			Air	Liquid/Solid				Initial	Field Lab	Final		
<del>1 AIR SAMPLE</del>						1	X					
<del>2 VER DISCHARGE</del>						1	X					
3 AS Discharge	8/28/14	1230	X			1	X					01
4												
5												
6												
7												
8												
9												
10												

Comments: **Air Samples**

QC Requirements:    Screen     Standard

Data Pack: Std  Full  1.1x surcharge

Electronic Deliverable:  1.1x surcharge

Turn Around Time Requested for Report: Business Days: \*Rush Multipliers (Xx)  
 1 day\*(4x)     2 days\*(3x)     3 days\*(2x)     5 days\*(1.5x)     10 days\*(1.1x)     15 days

Relinquished By: *[Signature]*      Date: **8/28/14**      Time: **2:24 pm**

Received By: *[Signature]*      Date: **8-28-14**      Time: **2:24 pm**