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September 23, 2015

Brian Jankauskas, P.E.
New York State Department of Environmental Conservation
Remedial Bureau A, 12th Floor
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7015

Subject: **Response to NYSDEC Comment Letter – July 9, 2015 and Update to Revised AST Decommissioning Workplan (dated September 15, 2015)**
Ciba Geigy/Hercules Main Plant/Pretreatment Plant
AST Cleaning Work Plan
EPA ID: NYD002069748
Site No.: 557011

Dear Brian:

On behalf of Hercules Incorporated, a wholly owned subsidiary of Ashland Inc. (Ashland) and BASF Corporation, Antea® Group is providing this response to the New York State Department of Environmental Conservation's (NYSDEC's) July 9, 2015 Comment letter regarding the Aboveground Storage Tank Cleaning Work Plan, dated April 24, 2015. Note that the April 24, 2015 Work Plan was replaced by the Revised AST Decommissioning Work Plan, submitted on September 15, 2015. This letter also attempts to address the questions posed during our conversation on September 21, 2015. For convenience, this letter presents each of the Department's comments followed by a response.

Following your review of the responses and revisions to the noted documents, we would request approval of the work plan.

Aboveground Storage Tank Cleaning Work Plan

1. *Section 5 and Section 7 – The disposal facilities typically require complete analysis of materials prior to receiving material. Suggest additional testing be conducted of the material (sludge) within the storage tank. Based on the results, post cleaning samples should be analyzed appropriately to cover an additional chemicals detected beyond the metals, hex, cyanide and vanadium.*

   Response: Section 5.0 was revised to include information regarding the collection of a liquid waste sample from the AST on 5-20-15 as well as the analyte list that the sample was analyzed for. If

present, sludge will also be analyzed with a similar analyte list, which will also include any additional analyses that an accepting disposal facility may require. Note: A disposal facility for sludge will be identified once the presence of sludge is confirmed and a sample can be collected.

Section 7.0 was revised to indicate that COCs would include the indicated chemicals (RCRA metals, hexavalent chromium, vanadium and cyanide) plus additional analytes including the TAL metals that were detected in the 5-20-15 liquid waste sample (aluminum, antimony, beryllium, calcium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, sodium and zinc) and also any additional analytes that may be detected in any sludge samples collected.

Appendix B Field Sampling Plan

2. *Section 2 confirmatory rinsate samples – Analysis should cover the chemicals indicated and any other chemicals detected from the sludge as indicated above.*

   Response: Confirmatory Rinsate Samples, last sentence – Was revised to indicate COCs would include indicated chemicals plus TAL metals (detected in 5-20-15 liquid waste sample) and any additional analytes that are detected in any sludge samples collected. See also response to Comment 1 above.

3. *Section 4.2 – Suggest indicating "when visual dust is observed from field work, additional readings will be noted and appropriate actions will be taken."*

   Response: Added suggested text as well as a reference to the CAMP, which details action levels for response actions.

4. *Section 5.1.1.2, first bullet – Suggest indicating the liquid column shall be determined.*

   Response: Added as requested.

5. *Section 5.1.1.2, first bullet – Suggest indicating the depth of the sample to be collected when the tank contains a large quantity of liquid.*

   Response: Sampling depth was added and is recommended to be the midpoint of the water column.

6. *Section 5.1.1.2, third bullet – Suggest indicating if the outlet will be permitted to flow for XX gallons prior to collecting the sample. If so how will the material be handled?*

   Response: Revised to indicate that 20 gallons of water will be purged from the tank prior to sampling and that purge water will be contained in appropriate containers and then returned to tank.

7. *Section 5.2.1 – Include material for rinsate dike.*

   Response: Added as requested.

8. *Section 5.2.2, first bullet – Suggest indicating the sample location will be bias towards a location where contamination may be present based on visual observations.*

   Response: Added as requested.

9. *Section 5.2.2, second bullet – Suggest protocol for rinsate water (de-ionized water) describe how rinsate water will be contained (temporary containment) against the container prior to sample collection for a contact time (minimum 10 minutes). On slope/vertical surfaces rinsate shall be placed up the slope/wall and permitted to flow into the temporary containment.*

   Response: Revised to include protocol for sampling, which includes the suggested protocols.

   Potable water will be used in place of de-ionized water as it is impractical to have the quantity of de-ionized water that would be necessary to rinse various cleaned surfaces. Potable water will be tested prior to usage to assess water quality and verify the source is clean.

Site Health and Safety Plan

10. *Section 7.2, instrumentation – include dust monitor.*

    Response: A dust monitor was added to the table included under 3. Instrumentation.

Finally, during a phone call on September 21, 2015, it was requested that the Permittee provide waste characterization and disposal facility details in advance of transport. The work plan has been revised to reflect this request. Waste generated during these activities, will not be transported off-site without prior notification of these details to NYSDEC.

Should you have any questions or require additional information please feel free to contact James Vondracek (Ashland), Stephen Havlik (BASF) or me at 914.495.9937 or Christopher.Meyer@AnteaGroup.com .

Sincerely,

Christopher Meyer
Senior Project Manager
Antea Group

CC: Mr. James Vondracek – Ashland
Mr. Stephen Havlik – BASF
Mr. John Swartwout – NYSDEC

AST Decommissioning Work Plan

Former CIBA-GEIGY/HERCULES Plant Site
89 Lower Warren Street, Queensbury, NY
EPA ID: NYD002069748

Antea Group Project No. GLENSFALLS
September 23, 2015

Prepared for:
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AST Decommissioning Work Plan

Former CIBA-GEIGY/HERCULES Plant Site
Queensbury, New York

1.0 INTRODUCTION

On Thursday July 17, 2014, the New York State Department of Environmental Conservation (NYSDEC) conducted an annual Resource Conservation and Recovery Act (RCRA) site inspection at the former Ciba-Geigy/Hercules Plant Site (EPA ID No. NYD002069748) (the Site) located in the Town of Queensbury, New York (Figure 1). The Site is currently operating under NYSDEC Part 373 Hazardous Waste Permit #5-5234-0008/00096, dated March 6, 2015, for Post-Closure Care and is comprised of several Areas of Concern (AOCs) and Solid Waste Management Units (SWMUs). The Permittees for the Site are BASF Corporation (BASF) and Hercules Incorporated (Hercules).

During the NYSDEC site inspection, three vessels were observed within the Pretreatment Plant (PTP) SWMU including one aboveground storage tank (AST) and two skid mounted vessels. Figure 2 shows the location of the PTP SWMU. The vessels consisted of an AST whose volume has been estimated at 500,000 gallons (T-110) and two vessels (reportedly sand filters with approximately 8,000 pounds capacity each), which are both attached to the same skid-mounted support structure. According to available documentation, the tank and vessels were historically used for

- storage and/or treatment of facility process water during plant operation,
- for treatment of water from interim remedial measures (IRMs), and
- later for construction water and storm water generated during corrective measure implementation as well as water generated from operation of the current groundwater extraction system (GWES).

Figure 2 presents a general layout of the PTP process including the AST and vessels as configured during corrective measures implementation. Photographs of the tanks and vessels are included as Appendix G.

In July 2014, the NYSDEC inquired as to whether the AST and skid mounted vessels had been properly cleaned after the current GWES Pretreatment Process was shut-down in 2002, and if so, whether or not documentation/certification could be provided confirming the cleaning was completed in accordance with applicable NYSDEC regulations. In response to the NYSDEC's request, a review of available project records was

conducted and summarized in a letter dated August 12, 2014; however, no information could be located which directly detailed/certified the final cleaning of the AST and vessels.

As such, this work plan has been prepared for cleaning, waste disposal, inspection and confirmatory sampling of AST T-110 and the vessels. The work plan was prepared in accordance with the requirements of the NYSDEC Part 373 Hazardous Waste Management Permit for the Site, NYSDEC's guidance document entitled "DER-10 Technical Guidance for Site Investigation and Remediation" and all applicable NYSDEC Department of Environmental Remediation regulations, guidance documents and procedures, which specifically include NYCRR Part 373 regulations for Hazardous Waste Management Facilities.

Following completion of the tank and vessel cleaning activities, the Permittees will develop a work plan for characterization of soil and groundwater in the vicinity of the AST as required in the Part 373 Hazardous Waste Management Permit. The scope of work for characterization of soil and groundwater in the vicinity of the AST will be developed following completion of the cleaning activities and following a review and assessment of existing soil and groundwater data in the area of the PTP SWMU.

2.0 AST SYSTEM OPERATIONAL HISTORY

The Pretreatment Plant is currently inactive and appears to have been permanently removed from service sometime between February 2002 and November 2003. The Pretreatment Plant including the AST was built in 1972-1973 for storage and/or treatment of facility process water during plant operation. Initially, the wastewater treatment process neutralized acidity with slaked lime and removed solids by settling. In 1974-1975, a second treatment stage was added which removed heavy metals by closer control of pH in addition to fine sand and press filtration. During plant operation, wastewater collected from the industrial sewer lines was fed into T-110. From this tank, water was piped to neutralization tanks to adjust the pH and then transferred to clarifiers. The top water from the clarifiers was passed through sand filters. After passing through the sand filters, treated water was discharged to the Hudson River until 1983 when it was diverted to the Effluent Pump Station (EPS) and pumped to the City of Glens Falls Publically-Owned Treatment Works (POTW).

Reportedly, up until 1990 the AST and vessels were cleaned annually. Solids from the tank and vessels, press filter cakes, press cloths and filters were reportedly disposed of at a properly licensed facility. Most of the Pretreatment Plant was decommissioned in 1990 in conjunction with decommissioning/demolition of the Main Plant and a scaled down operation was left in place to treat water collected from the sanitary and industrial sewer system.

This scaled-down system was later modified in 1999-2000 to handle construction water and storm water generated as part of the corrective measure construction activities as well as water generated from operation of the groundwater extraction system (GWES). As part of this modification, the AST and vessels were cleaned in late June/early July 2000 and the sludge was placed beneath the RCRA Cap. Following modification, the treatment process began with discharge of collected water to T-110 via the force main, settling in T-110, followed by pressure filtration through sand media and bag filters. Tables from the Corrective Measures Design Documents, which summarize the treatment process step-by-step, are included in Appendix A for reference. A brief description of each major component of the system and its function is also presented below:

- Equalization Tank (T-110) – allows for contaminant load equalization and settlement of particles
- Influent Feed Pump – transfers water through the treatment system
- Filtration Systems – filters particulates that did not precipitate in the Equalization Tank
- Anion Exchange System – removes sulfate from the process stream
- Chemical Addition System – adds a chemical to lower or raise pH
- Metall:X™ Contactor Assemblies – removes multivalent anions from the process stream
- Backwash System – backwashes media filters to remove solids

After the RCRA Cap and permeable cover were constructed, only water from the current GWES was sent to the Pretreatment Plant. Monitoring data indicated that the components added to the process during construction were no longer needed. As a result, the Anion Exchange System and Metall: X™ Contactors were removed and the process returned to its approximate pre-construction configuration. Continued monitoring of the GWES revealed that the influent to the Pretreatment Plant consistently met POTW discharge criteria. These findings were presented to the POTW and a discharge permit modification was obtained February 11, 2002. As a result, effluent from the GWES was pumped to the EPS wet well for equalization, then discharged directly to the POTW. Operation of the Pretreatment Plant was no longer required and appears to have been permanently removed from service sometime between February 2002 and November 2003.

3.0 NOTIFICATIONS AND PERMIT REQUIREMENTS

In accordance with the conditions of the Permit #5-5234-0008/00096, dated March 6, 2015, NYSDEC will be notified at least 7 days in advance of, and be allowed to attend, the field activities conducted under this work plan, as well as any pre-bid meetings, job progress meetings, substantial completion meetings and inspections, and the final inspection meeting.

The Permittees do not anticipate there will be a need to obtain any other New York State or local access permits to implement the work.

As requested waste characterization and disposal information will be provided to the NYSDEC in advance of transport.

4.0 PERFORMANCE STANDARDS

NYSDEC does not have published performance standards for target levels of contaminants of concern (COCs) that would demonstrate successful cleaning of the tank systems' and associated ancillary equipment and facilities. Therefore proposed criteria for demonstrating successful cleaning of the AST will be attainment of levels of COCs in confirmatory rinse water samples at concentrations that are at and/or below Part 703 Class GA groundwater quality standards for detected analytes. Site COCs include RCRA metals, hexavalent chromium, vanadium and cyanide. In addition, any additional analytes that are detected in liquid and sludge waste characterization samples will be evaluated against their specific Class GA standard, if one exists.

Analyte	Performance Standard (ug/L)
Arsenic	25
Barium	1,000
Cadmium	5
Chromium	50
Lead	25
Mercury	0.7
Selenium	10
Silver	50
Hexavalent Chromium	50
Vanadium	14* Class A SW Standard
Cyanide	200

5.0 WASTE CHARACTERIZATION SAMPLING

On May 20, 2015, prior to initiation of decommissioning activities a waste characterization sample was collected from liquid contained in the AST to characterize the waste and support evaluation of disposal options. A copy of these data is included in Appendix F. The liquid sample was analyzed for volatile organic compounds (VOCs) by EPA Method 8260, semi-volatile organic compounds (SVOCs) by EPA Method 8270, TAL metals by EPA Method 6010C, hexavalent chromium by EPA method 7196A, mercury by EPA Method 7470A, phenols by EPA Method 420.1, ammonia by EPA Method 350.1, cyanide by EPA Method 9012B, sulfide, corrosivity, chemical oxygen demand (COD), biochemical

oxygen demand (BOD), total suspended solids (TSS) and ignitability. Samples were analyzed by Test America, which is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified analytical laboratory.

A sludge sample was not collected at this time due to access restrictions and a lack of material near the accessible sampling point. Collection of a sample of sludge (if present) will be conducted following draining of the AST and prior to the start of cleaning activities. Laboratory tests for characterization of sludge will be determined based on requirements of the accepting facility.

Laboratory analytical procedures will adhere to the latest version of the New York State (NYS) Analytical Service Protocol (ASP) and/or to United States Environmental Protection Agency (USEPA) SW-846 methodologies as appropriate.

The general procedures for sample collection are described in the Field Sampling Plan, which is included in Appendix B.

6.0 AST SYSTEM DECOMMISSIONING

The following decommissioning procedures will be completed for Tank T-110 and the sand filter vessels.

6.1 Decontamination/Cleaning Procedures

Decontamination and cleaning procedures will be completed as follows:

- Utilizing a vacuum truck the waste materials from the AST T-110 and vessels will be vacuumed out and pumped into a temporary holding tank or directly into a tanker truck depending on the volume of material.
- Following removal of free-liquid wastes and pipe cleaning, AST T-110 and vessels will be entered, utilizing confined space entry protocols as applicable, to remove residual waste and sludge from the bottom. Depending on the quantity and consistency of residual wastes, the wastes
    - may be removed using hand tools such as shovels, squeegees etc., and transferred to a holding tank, or
    - may be removed with a pump during tank decontamination.

- Pressure washing will continue until the AST and vessel interiors are visually clean, and then triple rinsed. The quantity of wash water will be kept to a minimum to reduce the amount required for treatment/disposal.
- Decontamination water and residual waste that accumulate at the bottom of AST T-110 and vessels will be removed using a pump, and transferred to the holding tank or tanker truck.
- Confirmation sampling results will confirm decontamination.
- If rinsate samples indicate that cleaning is not complete, the associated area will be re-cleaned by pressure washing, re-rinsed and then re-sampled.
- The residual waste from cleaning activities will be properly characterized and transported for treatment / disposal at a properly permitted disposal facility.

6.2 Visual Inspection

Upon completion of cleaning and decontamination activities, each vessel, AST T-100 and sumps/drains will be visually inspected for the presence of any cracks, fissures, missing seals, or any deterioration of the bottom or sidewalls. Associated piping will also be visually inspected during cleaning activities for signs of leakage or breaks in the pipe lines. If any are found which are believed to have undermined the integrity of the AST, vessels or piping system the location will be thoroughly documented and reported.

6.3 Site Equipment Cleaning and Decontamination

A temporary decontamination pad will constructed on-site for equipment decontamination. General cleanup of equipment utilized to handle contaminated material will be performed at the temporary equipment decontamination pad. Gross removal of bulk debris will be initially performed by brushing or scraping, followed by thorough decontamination with a pressure washer/steam cleaner. Small tools and equipment that cannot be safely pressure washed will be hand washed with a warm detergent solution within the equipment decontamination pad.

Decontamination waste will be segregated by physical state (e.g. solid or liquid) and properly containerized. The containers will be sealed at the end of each workday and labeled with the date, type of waste (i.e., decontamination waste) and the name of a point of contact. The waste will be sampled, profiled and disposed of off-site following the completion of the cleaning activities.

7.0 CONFIRMATORY SAMPLING

Confirmatory rinsate samples will be collected and analyzed during the cleaning activities.

- For the two skid-mounted vessels (<500 gallon), one rinsate sample will be collected from within each vessel.
- Due to the size of the 500,000 gallon tank (approximately 60 feet in diameter and 25 feet in height), the bottom will be considered as one area and the sidewalls will be divided into quadrants prior to rinsate sampling.
    - One rinsate sample will be collected from the bottom and each sidewall quadrant.
    - One rinsate sample will be collected for every 25 feet of pipe run that will need to be cleaned or removed and will cover all ancillary equipment along the pipe run (e.g., valves, elbows, filters, and gauges).
    - One rinsate sample will also be collected from each sump and floor drain.

The rinsate samples will be analyzed for site COCs (RCRA metals, hexavalent chromium, vanadium and cyanide) plus any analytes that are detected in liquid and sludge waste characterization samples. Additional analytes detected in the liquid waste sample collected on May 20, 2015 included metals (aluminum, antimony, beryllium, calcium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, sodium and zinc), which will be included in the analyte list. Any additional analytes, which may be detected in sludge sample (if present) will be included.

Rinsate samples will be analyzed by a NYSDOH ELAP certified analytical laboratory. Laboratory analytical procedures will adhere to the latest version of the NYS ASP and/or to USEPA SW-846 methodologies as appropriate.

The general procedures for sample collection are described below and in the Field Sampling Plan, which is included in Appendix B.

Confirmatory rinsate samples will be collected according to the following procedure:

- Identify area and number of locations to be sampled.
- Rinsate samples may be collected directly into the appropriate sample containers or be collected with dedicated or decontaminated sampling equipment and transferred to the sampling containers.
- Samples will be representative of the areas decontaminated.

8.0 WASTE HANDLING/DISPOSAL

All waste generated from decommissioning activities will be containerized, characterized and disposed at a properly permitted disposal facility that is approved by the Permittees. Disposal facility information will be provided to NYSDEC in advance of transport. Personnel Protective Equipment (e.g., disposable gloves, disposable clothing, and

other disposable equipment) will also be containerized, and properly disposed of at a disposal facility that is approved by the Permittees.

9.0 HEALTH AND SAFETY PROGRAM

A site-specific Health and Safety Plan (HASP) was prepared in accordance with the requirements of the Occupational Safety and Health Administration (OSHA) for the work proposed as part of the work plan. The HASP is included as Appendix C and contains site-specific health and safety information, and provides for worker and community protection. Activities conducted as part of this work plan will be performed in accordance with the HASP. The subcontractor will prepare their own HASP, which will at a minimum be as stringent as the HASP included in this Work Plan.

10.0 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP), which presents the requirements for real-time community air monitoring and associated response actions (if required) during the decommissioning activities was prepared for the proposed work activities. The CAMP is included as Appendix D and is consistent with the requirements for community air monitoring at remediation sites as established by the NYSDOH and the NYSDEC. The plan follows procedures and practices outlined under the NYSDOH's Generic Community Air Monitoring Plan, dated June 2000.

The intent of the CAMP is to provide for a measure of protection of downwind communities from potential airborne releases of constituents of concern during the cleaning of the ASTs. As such, the CAMP specifies the potential air emissions, air monitoring procedures, monitoring schedule and data collection and reporting for the activities to be conducted.

11.0 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

A site-specific Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) were developed for the proposed work. The FSP is included as Appendix B and the QAPP is included in Appendix E. The Quality Assurance/Quality Control Program (QA/QC) program was designed to maximize the quality and validity of the date generated during the decommissioning activities. The FSP and QAPP describe detailed sampling and analytical procedures, as well as any necessary QA/QC sampling required for the project. Adherence to the procedures in the FSP and QAPP will allow for valid and usable analytical data.

12.0 FINAL REPORT

Following completion of the field activities and receipt of analytical data, Antea Group will prepare an AST Closure Report describing the work performed, summarizing analytical results, and presenting findings and conclusions. The summary report will include water, sludge and confirmation rinsate sample analytical data, along with a map of sampling locations, and a summary of findings. The body of the report will include, at a minimum:

- The scope of work and methodologies utilized for the project;
- A comparison of the laboratory analytical results to applicable regulatory guidelines;
- A description of observations made during the visual inspection;
- A summary of the findings and conclusions for the project; and,
- A summary of any limitations to the project.

The attachments to the report will include, at a minimum:

- A scaled site plan showing the property outline and all significant features;
- Tables summarizing analytical data;
- Copies of laboratory reports and chain-of-custody sheets; and,
- Color photographs documenting site activities and visual inspection.

13.0 SCHEDULE

The Permittees are prepared to commence work immediately upon NYSDEC review and approval of this work plan, with the target of completing work yet this calendar year.

Figures

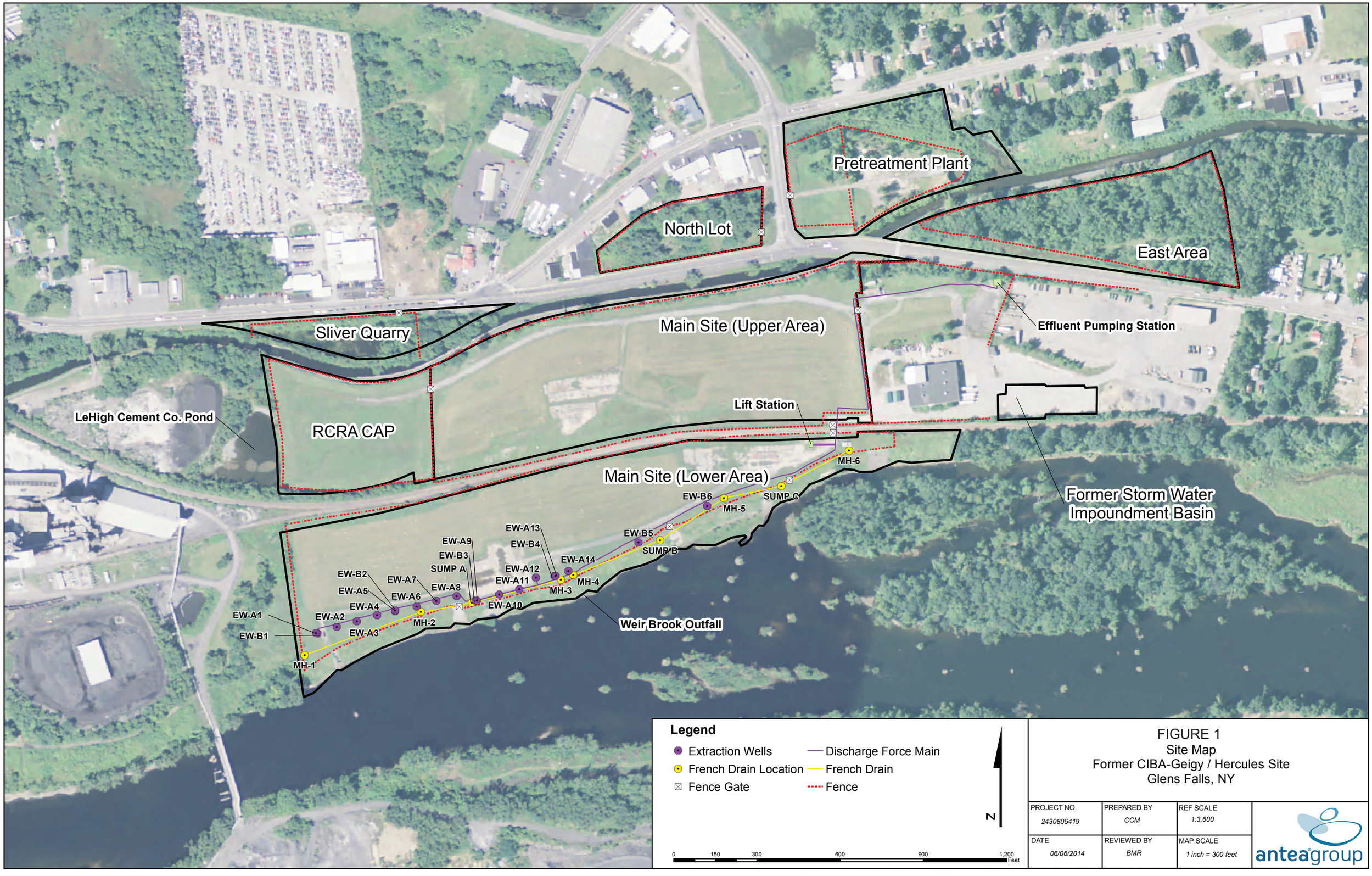

FIGURE 1
Site Map
Former CIBA-Geigy / Hercules Site
Glens Falls, NY

PROJECT NO.	PREPARED BY	REF SCALE
2430805419	CCM	1:3,600
DATE	REVIEWED BY	MAP SCALE
06/06/2014	BMR	1 inch = 300 feet

antea group

FIGURE 2
Former Pre-Treatment Plant
Former Ciba-Geigy/Hercules Site
Queensbury, New York

PROJECT NO.	PREPARED BY	DRAWN BY	
GLENS FALLS	LKO	LKO	anteagroup
DATE	REVIEWED BY	FILE NAME	
2-19-15	LG	GF_Aerial	

Appendix A

Design Document Pretreatment Plant Process Summary Table

TABLE 10-1
MAJOR EQUIPMENT LIST (MEL)[1]

ITEM	QUANTITY (and ID#)	TYPE	PURPOSE and (STATUS)**
Equalization Tank	1 (T-110)	Coated steel tank, 500,000-gallon total capacity, 350,000-gallon typical operating capacity	Receives influent from the GWES, provides for contaminant load equalization and allows settlement of particulates. In addition, receives recycled water from backwash operations and stores influent and backwash water during PTS shutdown for maintenance/repairs. Its large storage volume compared to the GWES pumping rate enables operation of the PTS on an intermittent, batch-treatment basis.
Influent Pump	2 (P-1001, P1002)	End Suction 2.5" x 3"	Transfer water through the process train at 200 gpm, at 70' TDH (1-operating, 1 spare)
Chemical Addition System	2 New units, CFP-1 & CFP-2	HCL and NaOH	To add a chemical prior to anion exchange to lower pH (HCL) or raise pH (NaOH). Chemical pumps are positive displacement metering pumps, 100:1 turndown ration, 100 psig.
Sand Filter	1 Duplex Unit (SF-1, SF-2)	IT Corporation 15 psig (maximum allowed for these non-pressure vessels), 8,000 lb. unit, 100 gpm each.	Filter particulates that did not precipitate in T-110 (350,000-gallon Equalization Tank). Backwash at 8 – 10 psid increase compared to clean units.
Holding Tank And Mixer	1 (T-1001) and (M1001)	New, IT, 2000-gallon, HDPE vertical, flat bottom.	Pump reservoir for P-1003 transfer to IX and MX vessels. Also, pH adjustment. (Chemtainer).
IX, MX Transfer Pump	1 (P-1003)	New, End Suction 2" x 3"	Transfer water through filters, anion vessels and MetallX vessels. (Goulds 3657/3757, 200 gpm @ 170' TDH – 20 HP)

** - All equipment was permanently removed from service sometime between February 2002 and November 2003.

TABLE 10-1
MAJOR EQUIPMENT LIST (MEL)[1]

ITEM	QUANTITY (and ID#)	TYPE	PURPOSE and (STATUS)**
Bag Filters	2 Duplex Units (BF-1 & BF-2)	IT Corporation 150 psig, 100 gpm each pair; 200 gpm total	Filter particulates from process stream downstream of treatment media. Change bags at 8 – 10 psid increase compared to new units. (ASME Model by Rosedale.)
Anion Exchange System	1 Duplex Unit (IX-1, IX-2)	IT Corporation 80 psig, 8,000 lb. unit, 100 gpm each; 200 gpm total	Remove sulfate from the process stream prior to metals removal. Brine regeneration on site; ASME rated, but not stamped, fiberglass vessels; top mounted motorized cycle valve. Backwash at 8 – 10 psid increase compared to clean units.
Brine Tank and Eductor	1 each (T-1002	1000-gallon storage vessel, Fiberglass	Regenerate SBA resin for sulfate removal and reuse. Eductor provides "pumpless" addition of Brine or Bleach (NaOCl) solution using city water. Bleach for cyanide rinse of anion resin.
MetallX Resin Filter	1 Duplex Unit (MX-1, MX-2)	IT Corporation 80 psig, 8,000 lb. unit, 100 gpm each; 200 gpm total	Remove multivalent anions from the process stream prior to discharge, last stage on WTP. No on site regeneration planned. Backwash at 8 to 10 psid increase compared to clean units.
Backwash Pump And Tank	1 (P-1004, T1003)	New, IT, End Suction 2" x3" 1000-g Tank, HDPE Vertical Flat	Backwash media filters to remove collected solids. (Goulds Pump No. 3657/3757 200 gpm @ 100" TDH, 10 HP)

1. This table is adapted from Table 1 prepared by IT Corporation as part of the Contractor's Pre-treatment Plan for contact –water management and treatment during construction of the CM at the site.

** - All equipment was permanently removed from service sometime between February 2002 and November 2003.

Appendix B

Field Sampling Plan (FSP)

Field Sampling Plan

Former CIBA-GEIGY/HERCULES Plant Site
89 Lower Warren Street, Queensbury, NY
EPA ID: NYD002069748

Antea Group Project No. GLENSFALLS
September 23, 2015

Prepared for:
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Table of Contents

Field Sampling Plan

Former CIBA-GEIGY/HERCULES Plant Site
Queensbury, New York

1.0 INTRODUCTION

This Field Sampling Plan (FSP) defines the methods and procedures for conducting sampling activities during decommissioning and demolition of the aboveground storage tank (AST) system,vessels, ancillary equipment and sumps located within the Pretreatment Plant (PTP) Solid Waste Management Unit (SWMU) at the at the Former Ciba Geigy/Hercules Main Plant Site located in Queensbury, New York. In general, the proposed decommissioning and demolition activities will include the following tasks:

- Waste characterization sampling
- Water/sludge removal
- Decontamination of ASTs and vessels (pressure washing)
- Waste handling and disposal
- Confirmatory sampling
- Visual inspection
- Site equipment cleaning and decontamination

A more detailed description of these activities can be found in Sections 6.0 and 7.0 of the AST System Decommissioning & Facilities Demolition Work Plan.

2.0 OVERVIEW OF FIELD SAMPLING ACTIVITIES

The following field sampling activities will be performed as part of the decommissioning activities:

- Waste Characterization Sampling – Sludge and water samples for waste classification and disposal purposes will be collected during the AST cleaning activities. The samples will be collected at a frequency depending on specific requirements of the selected disposal facility. Laboratory tests for characterization of each waste stream will be determined based on requirements of the accepting facility and typically include the RCRA hazardous characteristics of ignitability, corrosivity, reactivity and toxicity.

- Confirmatory Rinsate Samples – Confirmatory rinsate samples will be collected and analyzed during the decommissioning activities. For the two skid-mounted vessels (<500 gallon), one rinsate sample will be collected from within each vessel. Due to the size of the 500,000 gallon tank (approximately 60 feet in diameter and 25 feet in height), the bottom will be considered as one area and the sidewalls will be divided into quadrants prior to rinsate sampling. One rinsate sample will be collected from the bottom and each sidewall quadrant. One rinsate sample will be collected for every 25 feet of pipe run that will need to be cleaned or removed and will cover all ancillary equipment along the pipe run (e.g., valves, elbows, filters and gauges). One rinsate sample will also be collected from each sump and floor drain. The rinsate samples will be analyzed for site contaminants of concern, which include TAL metals, hexavalent chromium, vanadium, total cyanide and any additional analytes that are detected in sludge samples.

3.0 FIELD DOCUMENTATION

All field activities will be documented in field logbooks. Entries will be of sufficient detail that a complete daily record of significant events, observations, and measurements is obtained. The field logbook will provide a record of the activities conducted at the Site. Accordingly:

- Field books will be assigned a unique identification number.
- Field books will be bound with consecutively numbered pages.
- Field books will be controlled by the Site Manager while fieldwork is in progress.
- Entries will be written with waterproof ink.
- Entries will be signed and dated at the conclusion of each day of fieldwork.
- Erroneous entries made while fieldwork is in progress will be corrected by the person that made the entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing the correction.
- Corrections made after departing the field will be made by the person who made the original entries. Corrections will be made by drawing a line through the error, entering the correct information, and initialing and dating the time of the correction.

At a minimum, daily field book entries will include the following information:

- Location of field activity;

- Date and time of entry;
- Names and titles of field team members;
- Names and titles of any site visitors and site contacts;
- Weather information, for example: temperature, cloud coverage, precipitation, wind speed and direction;
- Purpose of field activity;
- A detailed description of the field work conducted;
- Important conversations;
- Unusual circumstances;
- Listing and use of equipment which allows for quantification of production;
- Sample media (soil, sediment, groundwater, etc.);
- Sample collection method;
- Number and volume of sample(s) taken;
- Description of sampling point(s) including location and depth;
- Volume of groundwater removed before sampling;
- Preservatives used;
- Analytical parameters;
- Date and time of sample collection;
- Sample identification number(s);
- Sample distribution (e.g., laboratory);
- Field observations;
- Any field measurements made, such as pH, temperature, conductivity, water level, etc.;
- References for all maps and photographs of the sampling site(s);
- Information pertaining to sample documentation such as:
    - Bottle lot numbers;

- Dates and method of sample shipments; and
- Chain-of-Custody Record and if shipped, Air Bill numbers.

4.0 FIELD INSTRUMENT CALIBRATION

All field instruments will be calibrated immediately prior to each day's use and more frequently if required by the equipment manufacturer. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and as required by the project. All instrument calibrations will be documented in the project field book. Records of all instrument calibration will be maintained by the Site Manager and will be subject to audit by the Project Manager. Copies of all of the instrument manuals and/or instruction sheets will be maintained on-site by the Site Manager.

The following types of portable field instruments will be used during the field work:

- Photoionization Detector;
- Particulate Monitor (dust, smoke, fumes, and mists);
- Water Quality Meter (pH, conductivity, and temperature).

4.1 Photoionization Detector

The PID will be a RAE® Systems MiniRAE 2000 (or equivalent), equipped with a 10.6 eV lamp. The MiniRAE 2000 is capable of ionizing and detecting compounds with an ionization potential of less than 10.6 eV. This accounts for the majority of the volatile organic compounds on the Target Compound List. The following calibration procedures will be followed for the MiniRAE 2000:

- Calibration will be performed at the beginning of each day of use with a standard calibration gas having an approximate concentration of 100 parts per million (ppm) of isobutylene. If the unit experiences abnormal function or erratic readings, additional calibration will be required.
- All calibration data will be recorded in the field logbook.
- A battery check will be completed at the beginning and end of each working day.

4.2 Particulate Monitor

The particulate monitor will be Thermo Scientific MIE DataRAM (or equivalent) capable of detecting mists, dust and aerosols at the levels stipulated in the Community Air Monitoring Plan (CAMP). Calibration is not required for this

meter. Meters at the perimeter community air monitoring stations will be set to collect and record readings at the unit's minimum frequency. The data will be logged using the instrument's internal memory and downloaded on a daily basis in the field. Readings from hand held units used in the work areas will be made at a minimum frequency of once every 15 minutes when activities capable of generating dust are ongoing, and recorded hourly in the field book. When visual dust is observed during work activities, additional readings will be noted and appropriate actions will be taken in accordance with the CAMP (Appendix D).

4.3 Water Quality Meter

The water quality meter will be a Horiba U-22 (or equivalent). All of the individual probes within the Horiba U-22 water quality meter, except for redox potential, are calibrated with 2 to 3 point calibration curves before the meter is deployed to the field. In addition, field calibration will consist of a daily check against a factory provided auto calibration solution. The concentrations in the auto calibration solution and the acceptable range of field calibration are as follows:

PARAMETER	CONCENTRATION	CALIBRATION RANGE
pH	4.01	3.9 – 4.1 standard units
Conductivity	4.49	4.40 – 4.58 mS/cm

5.0 GENERAL FIELD SAMPLING PROCEDURES

During the course of the decommissioning activities, the applicable procedures listed below will be followed for sample collection:

- Accurate and detailed field notes will be maintained including detailed descriptions of sample collection and handling procedures and sample characteristics. Sample characteristics for soil may include soil type, color, odor, moisture content, texture, grain size, shape and angularity, consistency, and any other observations, particularly relating to waste materials or unnatural materials. For water samples, the sample collector will describe color, odor, visual turbidity, and any observed phase separation.
- Sampling procedures will be performed with the overall intent of collecting representative samples and minimizing sample disturbance.
- Laboratory-supplied sample bottles (pre-preserved as applicable) will be labeled with the site name, project number, sample location, sample identification number, sample interval (for soil samples), date and time of sampling, and initials of sampler prior to being filled with sample material.

- All sample collection, handling and shipping information will be recorded in the field notebook and chain-of-custody documents as appropriate.
- All non-dedicated sampling equipment will be cleaned before entry to the Site, between sampling locations and intervals, and prior to departure from the Site.
- Sample containers will be capped immediately after filling and placed into a chilled cooler containing sufficient ice or cold packs to cool the samples to 4°C during transport to the laboratory.

5.1 Waste Characterization Samples

Samples of sludge and water contained in the AST and vessels will be collected as part of the tank cleaning activities. The general procedures for sample collection are described below.

5.1.1 Water

5.1.1.1 Materials

The following materials will be available for water sampling activities.

- Water level indicator (accurate to 0.01 foot);
- New dedicated bailers;
- Polypropylene/nylon rope;
- One-liter beaker (as an alternate to the bailers);
- Multi-parameter water quality meter
- PID;
- Sample bottles/labels;
- Chain-of-custody forms;
- Thermally insulated container with ice or cold packs;
- Sample preservation (may be added to bottle by analytical laboratory);
- Field book;
- Personal Protective Equipment (PPE) as needed (gloves, etc.); and
- Decontamination supplies (detergent, buckets, brushes, etc.).

5.1.1.2 Water Sampling Protocol

Water sampling protocol is described below.

- Water samples may be collected directly into the appropriate sample containers or be collected with dedicated or decontaminated sampling equipment and transferred to the sampling containers. The liquid column will be measured and noted prior to collection of samples. When a large quantity of water is present and effort will be made to collect liquid samples at the midpoint of the water column.
- A clean, dedicated, disposable bailer will be attached to a new dedicated polypropylene or nylon rope and lowered into each tank for sample collection purposes. Both the rope and the bailer will be properly discarded upon completion of the sampling event.
- If appropriate, water samples may be collected in laboratory supplied containers directly from an outlet on the tank. Prior to collection a minimum of 20 gallons of water will purged before collecting a sample. Purge water will be collected into appropriate containers (buckets etc.) and returned to the tank upon completion of sampling.
- A sample will be collected for VOC analysis (if required). Care will be taken not to agitate the sample when transferring it from the bailer to the laboratory-supplied vials. Samples for any additional parameters will be collected subsequent to the VOC samples.
- VOC samples will be collected in 40 milliliter (mL) glass vials with zero headspace and will be preserved by the laboratory with hydrochloric acid to a pH of less than two (in accordance with the instructions provided in the Region II CERCLA QA Manual, Revision 1, October, 1989, p. 31). The sample bottles for all other analytical parameters will be properly preserved in the laboratory prior to sample collection. Care will be taken to not overfill the bottles during sample collection thereby ensuring proper sample preservation.
- Sample containers will be capped immediately after filling and placed into a chilled cooler for transport to the laboratory.
- All samples will be properly preserved, stored on ice and transported to the laboratory under the proper chain-of-custody.

5.1.2 Sludge

5.1.2.1 Materials

The following materials will be available for sludge sampling activities.

- Sample retrieval device (Ponar Dredge or equivalent)
- Polypropylene/nylon rope;

- Stainless steel spatulas, bowls, and scoops;
- Polyethylene sheeting;
- PID;
- Sample bottles/labels;
- Chain-of-custody forms;
- Thermally insulated container with ice or cold packs;
- Sample preservation (may be added to bottle by analytical laboratory);
- Field book;
- PPE as needed (gloves, etc.); and
- Decontamination supplies (detergent, buckets, brushes, etc.).

5.1.2.2 Sludge Sampling Protocol

Sludge sampling protocol is described below.

- Secure the dredge to a length of heavy rope and set the trip mechanism.
- Lower the dredge slowly until it is in contact with the sludge surface. Trip the dredge mechanism by allowing the line to slacken.
- Retrieve the dredge and empty contents into a bowl. Repeat the sampling procedure until the desired amount of sludge has been collected.
- Decant any free liquid and visually inspect it for any sheen or other evidence of potential contamination. After the liquid is decanted, collect and maintain samples as described below.
- Screen sample with a PID. Next, samples for volatile analysis will be collected directly from the bowl into the appropriate containers in a manner that minimizes headspace. All remaining sample material will then be homogenized using the coning and quartering method. This method includes removing any debris not considered part of the sample, thoroughly mixing the sample in the center of a decontaminated stainless steel pan or bowl, then quartering and mixing the individual sample corners. The entire sample will be rolled to the center of the pan followed by a final mix. Sample collection will be conducted after homogenization. Soil samples will not require preservation except for maintaining the media to approximately 4°C.
- Sample containers will be capped immediately after filling and placed into a chilled cooler for transport to the laboratory.
- All samples will be properly preserved, stored on ice and transported to the laboratory under the proper chain-of-custody.

5.2 Confirmatory Rinsate Samples

Confirmatory rinsate samples will be collected as part of the decommissioning activities. The general procedures for sample collection are described below.

5.2.1 Materials

The following materials will be available for rinsate sampling activities.

- Rinsate dike (i.e. plastic sheeting) to contain final rinse water;
- One-liter beaker (as an alternate to the bailers);
- Multi-parameter water quality meter
- PID;
- Sample bottles/labels;
- Chain-of-custody forms;
- Thermally insulated container with ice or cold packs;
- Sample preservation (may be added to bottle by analytical laboratory);
- Field book;
- PPE as needed (gloves, etc.); and
- Decontamination supplies (detergent, buckets, brushes, etc.).

5.2.2 Confirmatory Rinsate Sampling Protocol

Confirmatory rinsate samples will be collected according to the following procedure:

- Identify area and number of locations to be sampled. When visual evidence of impacts are present the sample location will be biased towards that location(s).
- Rinsate samples may be collected directly into the appropriate sample containers or be collected with dedicated or decontaminated sampling equipment and transferred to the sampling containers.
- Rinsate water will consist of potable rinse water sprayed over the representative surface area.
- Temporary containment will be placed in areas to be sampled so that rinsate water can be contained. On horizontal surfaces, rinsate water will be contained within the temporary structure and must be in contact with the containers surface for a minimum of ten minutes of contact time before sampling.

- On vertical and sloped surfaces rinsate will be sprayed up the wall and permitted to flow into a temporary containment structure. Surfaces will sprayed so that the entire area being sampled has contact with the rinsate water. In order to produce a representative sample, the rinsate water will be sprayed at the top of the proposed sample area, at a lower pressure (to reduce misting) for a period of approximately ten minutes.
- Samples will be representative of the areas decontaminated.
- Sample containers will be capped immediately after filling and placed into a chilled cooler for transport to the laboratory.

All samples will be properly preserved, stored on ice and transported to the laboratory under the proper chain-of-custody.

6.0 SAMPLE CUSTODY PROCEDURES

The primary objective of the sample custody procedures is to create an accurate written record which can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. For the purpose of this document, the USEPA Office of Enforcement and Compliance Monitoring, National Enforcement Investigation Center (NEIC) Policies and Procedures (May 1986) definition of custody applies. USEPA states that a sample is under custody if:

1. It is in one's possession, or
2. It is in one's view, after being in one's possession, or
3. It is locked up after being in one's possession, or
4. It is in a designated secure area.

The Site Manager or the field personnel collecting the samples will maintain custody for samples collected. The Site Manager or field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory.

A self-adhesive sample label will be affixed to each container before sample collection. These labels will be covered with clear waterproof tape if necessary to protect the label from water or solvents. The sample label will contain the following information:

- Laboratory Name
- Sample ID Number
- Sample Location
- Sample Matrix
- Date and Time of Sample Collection
- Designation as grab or composite
- Parameters to be tested
- Preservative Added
- Name of Sampler.

All sampling containers will be supplied by the laboratory, and are to be cleaned by the bottle supplier in accordance with standard laboratory procedures. Analytical proof of cleanliness will be available for review. Sample containers will be enclosed in clear plastic bags and packed with cushioning material (e.g. vermiculite) inside the coolers.

The Site Manager will maintain custody of the sample bottles. Sample bottles needed for a specific sampling task will be properly preserved in the laboratory prior to sample collection. After the Site Manager has verified the integrity of the bottles and that the proper bottles have been assigned for the task, the bottles will be relinquished to the sampling team. The sampler will place a sufficient volume of sample in the appropriate laboratory-grade bottles for use as sample containers. Care will be taken to not overfill the bottles during sample collection, thereby ensuring proper sample preservation.

The samples collected for analysis will be stored in an insulated cooler for shipment to the laboratory. The laboratory should receive the samples within 48 hours of sampling. Field chain-of-custody records completed at the time of sample collection will be placed inside the cooler for shipment to the laboratory. These record forms will be sealed in a zip-lock type plastic bag to protect them against moisture. Each cooler will contain sufficient ice or cold packs to insure that an approximate 4^0C temperature is maintained, and will be packed in a manner to prevent damage to sample containers. Sample coolers will be sealed with packaging tape and the Site Manager will sign and date a custody seal and place it on the cooler in such a way that any tampering during shipment will be detected.

All coolers will be shipped by an overnight courier according to current US DOT regulations. Upon receiving the samples, the sample custodian at the laboratory will inspect the condition of the samples, compare the information on the sample labels against the field chain-of-custody record, assign a laboratory control number, and log the

control number into the computer sample inventory system. The sample custodian will then store the sample in a secure sample storage cooler maintained at approximately 4°C and maintain custody until the sample is assigned to an analyst for analysis. Custody will be maintained until disposal of the analyzed samples.

The sample custodian will note any damaged sample vials, void space within the vials, or discrepancies between the sample label and information on the field chain-of-custody record when logging the sample. This information will also be communicated to field personnel so proper action can be taken. The chain-of-custody form will be signed by both the relinquishing and receiving parties and the reason for transfer indicated each time the sample custody changes.

An internal chain-of-custody form will be used by the laboratory to document sample possession from laboratory sample custodian to analysts and final disposition. All chain-of-custody information will be supplied with the data packages for inclusion in the document control file.

7.0 DECONTAMINATION PROCEDURES

7.1 General

Decontamination of all field investigation and sampling equipment will follow guidelines established in the USEPA Region II CERCLA Quality Assurance Manual, Final Copy, October 1989, and specific decontamination procedures detailed below.

Equipment cleaning areas will generally be established within or adjacent to the specific work area. The equipment cleaning procedures described below include pre-field, field and post-field cleaning of sampling equipment. The non-disposable equipment will be cleaned after completing each sampling event. All rinse water will be contained and treated on site or sent to an approved disposal facility. The Site Manager will monitor cleaning procedures.

All solvents and water used in the decontamination process will be contained and collected for characterization and proper disposal. Solids (e.g., disposable gloves, disposable clothing, and other disposable equipment) generated from personnel cleaning procedures will be collected for proper disposal. Decontamination procedures will be fully documented in the field notebook.

7.2 Sample Equipment Decontamination

Typical sampling equipment cleaning materials may include:

- phosphate-free detergent solution soap;
- potable water (which will be obtained from a treated municipal water source);
- appropriate cleaning solvent (e.g., dilute nitric acid, pesticide grade hexane or methanol);
- buckets/wash basins;
- brushes;
- polyethylene sheeting;
- aluminum foil;
- large heavy duty garbage bags;
- spray bottles;
- Plastic bags with "zip" type seals;
- paper towels/Hand wipes®; and
- non-phthalate, latex, disposable gloves (surgical gloves). Note: These gloves will also be worn by the sampling team and changed between sample points.

All sampling equipment will be stored in a clean environment and, where appropriate, the equipment will be covered in aluminum foil.

Field decontamination procedures, as described below, will include the establishment of cleaning stations. These stations will be located away from the immediate work area so as not to adversely impact the cleaning procedure, but close enough to the sampling teams to keep equipment handling to a minimum.

A designated area will be established to conduct large scale cleaning. All heavy equipment will be inspected to determine if an initial cleaning at this location prior to use on-site is needed. The frequency of subsequent on-site cleaning will depend on actual equipment use in the collection of environmental samples or during remedial activities. All fluids and residues produced from the decontamination procedures will be collected and stored on-site until analyses can be conducted and a decision regarding final disposition of the materials is made pursuant to state and federal requirements.

All sampling equipment (e.g. hand-operated coring devices, hand-augers, and bowls) will be cleaned before each use and prior to leaving the site. The field sampling equipment-cleaning procedure when analyzing for organic constituents is as follows:

- Phosphate-free detergent solution;
- Potable water rinse;
- Deionized water rinse;
- Repeat water rinse twice (i.e., triple rinse) and allow to air dry; and
- Wrap equipment completely with aluminum foil to prevent contact with other materials during storage and/or transport to the sampling location.

The initial step, a soap and water wash, is to remove all visible particulate matter and residual oils and grease (this may be preceded by a steam cleaning to facilitate residuals removal). When analyzing for organic constituents when tools appear heavily contaminated, this may be followed by a potable water rinse to remove the detergent and a rinse sequence of solvent (e.g., hexane, and methanol) and deionized water.

All heavy equipment will be pressure washed prior to onsite usage, between locations if the equipment comes in direct contact with contaminated media, and prior to leaving the site. All down-hole equipment (augers and buckets) will be pressure washed between uses at each location. Equipment will be scrubbed manually as needed to remove heavy soils prior to steam cleaning. Clean equipment will be stored in an in-active work area on-site until use.

Appendix C

Health and Safety Plan (HASP)

Health, Safety, Security & Environment

Hercules – Glens Falls, New York

Site Health and Safety Plan

Project Number:	GLENSFALLS
Project Name:	Former CIBA/Hercules Plant
Address:	89 Lower Warren Street
City, State	Queensbury, New York

Prepared By:	Antea Group
Address:	5788 Widewaters Parkway, 2nd Floor
City, State, Zip:	Syracuse, NY 13214

Telephone:	800.477.7411	Fax:	315.445.0793

Updated: July 24, 2015

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APPENDICES

FIGURES

SITE HEALTH AND SAFETY PLAN

Antea Group believes that all work-related injuries and illnesses are preventable and has a goal of zero work related injuries and illnesses for its worksites. This plan outlines the processes and procedures Antea Group will employ to achieve this goal.

- The Project Manager or Site Safety Officer (SSO) will hold daily on-site safety meetings ***prior to the start of field work*** to review site safety concerns, procedures, review key elements of the Site Health and Safety Plan (HASP) and Job Safety Analyses (JSAs) with all members of the field crew, including Antea Group employees and subcontractors. Other site safety meetings will be held as needed. Subcontractor personnel must participate in safety discussions as requested by Antea Group. See Antea Group's tailgate meeting checklist and guidance document for details (Appendix A).
- All field team members who may be exposed to site impacts during the course of their work, shall have completed OSHA 40-hour HAZWOPER and annual refresher training (29 CFR 1910.120). ***Documentation of training shall be readily available***.
- Each Antea Group team member must review, sign and date the HASP and the Antea Group Acknowledgement Agreement at the end of this document. Each subcontractor employee and visitor must review the HASP and sign, date, and describe their affiliation on the Subcontractor Acknowledgement Agreement at the end of this document.
- The signed HASP is kept in the field and readily available for duration of field work and returned to the project file upon completion of field activities.
- The HASP shall be revised or rewritten if site activities are changed significantly, if areas of differing hazards are involved, or as information about contaminants and hazards changes. Changing conditions may justify either increasing or decreasing HASP restrictions or action levels, depending upon the additional information generated.
- **STOP WORK AUTHORITY—ALL WORKERS HAVE THE AUTHORITY AND RESPONSIBILITY TO STOP ANY WORK, OR REFUSE TO DO WORK, THAT THEY FEEL IS UNSAFE.**

1.0 GENERAL INFORMATION

ANTEA GROUP PROJECT NUMBER:	**GLENSFALLS**		
Client:	Ashland, Inc.	Site Owner:	BASF
Site Name:	Former CIBA/Hercules	Client Claim/PO Number:	N/A
Site Address:	89 Lower Warren Street, Queensbury, New York 120804		
Project Manager:	Mark Schumacher		
Plan Prepared by:	Luke Gladue	Date:	1/20/2010
Approved by:	Greg Drumm	Date:	1/20/2010
Revised by:	Greg Drumm	Date:	5/5/2010
Revision Approved by:	Greg Drumm	Date:	5/13/2010
Revised by:	Patrick Storz	Date:	8/23/2010
Revision Approved by:	Patrick Storz	Date:	8/23/2010
Revised by:	Greg Drumm	Date:	9/24/2010
Revision Approved by:	Greg Drumm	Date:	9/24/2010
Revised by:	Chris Vandegrift	Date:	1/25/2011
Revision Approved by:	Chris Vandegrift	Date:	1/25/2011
Revised by:	Bryan Reles	Date:	2/9/2012
Revision Approved by:	Mark Schumacher	Date:	2/9/2012
Revised by:	Luke Gladue	Date:	2/27/2013
Revision Approved by:	Mark Schumacher	Date:	2/27/2013

Revised by:	Bryan Reles	Date:	2/26/2014
Revision Approved by:	Mark Schumacher	Date:	
Revised by:	Adam Johnson	Date:	4/24/2015
Revision Approved by:	Mark Schumacher	Date:	4-24-2015
Revised by:	Mark Schumacher	Date:	7/24/2015
Revision Approved by:	Mark Schumacher	Date:	7-24-2015

Place date(s) in appropriate box (es) for current phase(s) of site activities.

Site Activities	Soil Borings	Monitoring Well Installation	Tank Removal	Soil Excavation	Recovery Well Installation	Pilot Tests	Treatment System Construction	Ground Water Sampling	Groundwater Extraction System Operation	O&M
Site Assessment										
Remedial Investigation										
Site Remediation Activities			2015 (AST)					Bi-Annually	2004 - Indefinite	2004 - Indefinite

2.0 EMERGENCY CONTINGENCY PLAN

2.1 Local Emergency Telephone Numbers

Can 911 be used at this site? Yes [X] No [ ] If yes, be certain it is activated and enhanced.

Since cellular telephones may not reach a local 911 operator, also supply the following information. (Provide area code)

Ambulance	518-743-9884	Fire Department	518-761-3822
Hospital Emergency Room	518-926-1000	Police Department	518-761-3840
Poison Control Center	800-222-1222	HazMat Response Unit	518-761-3822
(List utility companies as appropriate)	National Grid: 800-642-4272	Verizon FiOS: 877-417-7607	
	Water & Sewer: 518-761-3857		

2.2 Hospital Routes

INCLUDE A MAP WITH HIGHLIGHTED EMERGENCY HOSPITAL ROUTE(S) at the end of the HASP.

Emergency Hospital* Name: Glens Falls Hospital Phone number: 518-926-1000

Hospital Address: 100 Park Street, Glens Falls, New York 12801

Hospital Directions: Head west on Lower Warren Street toward the Feeder Canal trails. Follow Lower Warren Street as it becomes Warren Street/Rt-32. Enter roundabout and take 4th exit onto Glen St/US-9/Rt-32. Turn right onto Park Street.

*** Hospital should be notified immediately if an injury occurs which requires medical attention.**

Estimated driving distance: 2.35 Miles Estimated driving time: 6 Minutes

Does hospital accept chemically contaminated patients? Yes [X] No [ ]

2.3 Evacuation Routes

Identify prevailing wind direction, if known. Evacuation route and meeting location must be upwind or crosswind):
Wind varies throughout the year.

PRIMARY EVACUATION ROUTE AND MEETING LOCATION: **Exit trailer/building/fenced in locations and head out towards Lower Warren Street. Will meet by DPW plow near entrance at Lower Warren Street.**

SECONDARY EVACUATION ROUTE AND MEETING LOCATION: **N/A – Only one exit.**

2.4 Emergency Contacts

PHONE NUMBERS (provide area codes)			
	Name or Description	**Work**	**24-hr. Emergency**
	Consultant		
Project Manager:	Christopher Meyer	914-495-9937	800-477-7411
Site Contacts:	Mark Schumacher	315-552-9832	315-263-1183
	Bryan Reles	315-552-9836	607-765-1480
	Luke Gladue	518-788-8399	518-788-8399
Hub Manager:	Aaron Lapine	914-495-9934	949-244-4951
Corporate HSSE :	Susan Dake or Darius Szewczak	(800) 477-7411	(800) 651-3117
Antea Group Operator	Corporate Office	(800) 477-7411	(800) 651-3117
	Consultant PM\UM to call		
Client Contact:	Gerald Hincka	248-699-0231	248-705-4107
Ashland Contact:	James E. Vondracek	908-243-3548	1-800-ASHLAND
	Regulatory Agency		
NYS Dept. of Env. Cons. (DEC)	Region 5 – Warrensburg Office	518-623-1200	Spill Resp.: 518-457-7362
	DEC Site Contact: Brian Jankauskas, P.E.	518-402-9620	
US EPA, Region 2, RCRA	James Reidy	212-637-3660	

2.5 Reporting Procedures and First Aid

Call emergency services (911) ASAP if situation is an emergency, i.e. workers or the public are in immediate peril.

Report all accidents, injuries, and illnesses IMMEDIATELY to the Antea Group PM, Office Leader or Antea Group HSSE. **Antea Group is a member of WorkCare, a 24-hour occupational medical management service. If an employee is injured or becomes ill, immediately contact WorkCare to assist in the medical evaluation and management of the employee.**
(888) 449-7787

Report all NEAR MISSES as soon as reasonably possible (no later than 24 hrs after the event). Use Antea Group's online reporting system to submit your near miss. If necessary, use the attached reporting form to capture facts and details immediately while in the field. See Appendix B for reporting form.

2.5.1 First Aid Equipment

- Standard first aid kit/CPR mask
- Portable eye wash

2.5.2 First Aid Procedures

(if an emergency, call 911) (all Antea Group employees onsite must have up-to-date first aid/CPR training).

Ingestion:	Follow instructions from Poison Control Center or the MSDS, contact Antea Group Corporate HSSE to engage Antea Group's medical case management service as necessary.
Inhalation:	Move victim to fresh air. Contact Antea Group Corporate HSSE to engage Antea Group's medical case management service as necessary.
Dermal Exposure:	Remove contaminated clothing. Wash thoroughly with soap and water. Contact Antea Group Corporate HSSE to engage Antea Group's medical case management service as necessary.

A first aid kit and portable eyewash is provided in each employee's field bag and is available on-site. If a worker suffers a chemical splash in the eye, flush the eye for 15 minutes and arrange for off-site medical treatment immediately. Workers will also be instructed to thoroughly wash with soap and water any unprotected skin that comes in direct contact with contaminated soil or water. Contact Antea Group Corporate HSSE to engage Antea Group's medical case management service as necessary.

Trained workers who choose to provide CPR or First Aid must use Universal Precautions to control possible exposure to blood borne and infectious agents. CPR kits are available in employee field bags.

2.5.3 Site Emergencies

In the event of a fire or explosion, or other imminently dangerous situation (e.g. rupturing a natural gas line), evacuate the site immediately and call the appropriate emergency phone numbers listed in Section 2.1. Call the Antea Group PM or Office Leader and inform him/her of the situation as soon as possible.

2.6 SITE RESOURCES

If no, identify closest available resource with directions.

Water supply available on site:	Yes	X	No		Bathrooms available on site:	Yes	X	No	
Telephone available on site:	Yes	X	No		Electricity available on site:	Yes	X	No	
Other resources available on site:	Yes	X	No		If "yes", identify:	Site job trailer for storage/shelter.			

2.7 Project HSSE Team

Team Members (list)	
Project Manager:	Christopher Meyer
Antea Group on-site Personnel: (On-site personnel Are responsible for Antea Group site health and safety.)	Bryan Reles, Luke Gladue
Antea Group Site Safety Officer:	Mark Schumacher

PROJECT TEAM OSHA TRAINING RECORDS
(DOCUMENTATION MUST BE AVAILABLE FROM ANTEA GROUP AND APPROPRIATE CONTRACTORS UPON REQUEST)

Name	40 Hr Training Date	8-Hr Refresher Date	Site Supervisor Training Date
Mark Schumacher	**3/1/1988**	**12/19/2013**	**3/2/1989**
Bryan Reles	**2/12/2007**	**12/19/2013**	**12/3/2007**
Luke Gladue	**1/21/2005**	**12/19/2013**	**1/21/2005**

All workers who have to potential to be exposed to site impacts must have up-to-date HAZWOPER training. In addition, Antea Group employees must, at a minimum, have defensive driver training, first aid/CPR and medical monitoring. See subcontractor Section 12 for minimum required subcontractor training.

2.8 Perimeter Establishment

Map/Sketch attached:	**Yes**	**X**	**No**		**Site secured:**	**Yes**	**X**	**No**	
Perimeter identified:	**Yes**	**X**	**No**		**Zone(s) of Contamination identified:**	**Yes**	**X**	**No**	

2.9 Work Zones

A three-zone control system will be used during activities as determined necessary by the Antea Group Site Safety Officer. The purpose of the zones is to control the flow of personnel to or from potentially contaminated work areas. Guidelines for establishing these zone/areas are as follows:

Exclusion Zone (EZ): Primary exclusion zones will be established around each field activity and, at a minimum, this zone will radiate to a distance of 25 feet from the point of operations. Appropriate personal protective equipment must be worn in this zone. This zone will be separated from the contaminant reduction zone by cones (recommended cone height – 42 inches) or barricades and clearly marked yellow **CAUTION** tape to prevent personnel from entering the exclusion zone boundary without appropriate protective equipment or leaving without proper decontamination.

Contaminant Reduction Zone (CRZ): The CRZ is the transition area between the EZ and the Support Zone (clean area). All personnel and equipment must be decontaminated in the CRZ upon exiting the EZ and before entering the Support Zone. The CRZ will be set up along the perimeter of the EZ at a point upwind of field activities.

Support Zone (SZ): The support zone is considered to be uncontaminated; as such, protective clothing and equipment are not required but should be available for use in emergencies. All equipment and materials are stored and maintained within this zone. Protective clothing is donned in the support zone before entering the contaminant reduction zone.

2.10 Site Security

Site security must be determined on a site-specific basis. The need for additional personnel, on-site security guards, fencing, etc. should be discussed with the client site manager, or other members of management. Equipment stored overnight will be locked and secured to prevent vandalism and protect the public. A description of the additional safety requirements should be listed below:

LIST SITE SECURITY MEASURES: ALL SECTIONS OF SITE ARE FENCED AND SHOULD BE CHAINED/LOCKED AT END OF THE

THE WORK DAY. ALL DOORS TO BUILDINGS SHOULD BE CHECKED TO MAKE SURE LOCKS ARE IN PLACE.

When work scheduling requires that an excavation be left open overnight, security fencing will be erected to restrict access to the site or work zones described in Section 2.9.

2.11 Site Map

Attach a site map to the "Figures" section at the end of the Site Health and Safety Plan. The Site Map can also to be used to outline Traffic Control (see Section 10).

3.0 SITE CHARACTERIZATION

A. Summary of Previous Site Investigation(s): Series of historical investigations between early 1980s and 2000. Final Corrective Measures put into place in 2001. Ground water extraction system installed in 2000-2001, brought into operation soon after. Groundwater sampling conducted routinely (Bi-annually in recent years), and reported annually.

B. Source of Previous Site Investigation Information: Historic site documents.

C. General Facility Description:

Gasoline Service Station [ ] Refinery [ ] Bulk Terminal [ ] Other: Former Chemical Production Facility

Description: Active [ ] Years has the site been operating: [ ] Closed/Abandoned [X]

Current property use (operations on-site, products, raw materials used, etc.): No current uses. Only site activities are site monitoring and remediation/extraction system maintenance.

Was the site previously used for industrial purposes: Yes [X] No [ ]

Describe previous site uses: Production of dyes, wallpaper, and chemicals.

Surface cover on-site includes:

[X]	Soil/bare ground	[ ]	Clay caps	[ ]	Plastic cover		
[X]	Grass	[X]	Paving/asphalt	[X]	Water bodies		
[X]	Woods	[ ]	Swamp	[X]	Brush/scrub		
[X]	Buildings	[X]	Unpaved roads	[X]	Other	Soil Cap	

Approximate site surface area: [ ] sq. ft. or 65 acres

Percentage of surface area: Concete Pad/unpaved road 15 % bare soil [ ] %

vegetated 85 % under water [ ] %

Potential for dust generation on-site: High [ ] Medium [X] Low [ ]

Any site access restrictions: Yes [ ] No [X] Please list:

Fenced/locked [X] Posting (signs) [X] Security guards [ ]

Evidence of public access to the site? Yes [ ] No [X]

If "yes," describe:

D. Regulatory Contacts

Are regulatory agencies involved with the site (Y/N)? Federal? [X] State? [X] Local? [ ]

Name	Agency	Phone (incl. area code)
Brian Jankauskas, P.E.	NYSDEC, Region 5	(518)-402-9620
James Reidy	USEPA, Region 2, RCRA	(212)-637-3660
		( )
		( )

4.0 WASTE CHARACTERIZATION

4.1 Waste/Contaminant Type(s)

Characteristic(s):										
	X	Liquid	X	Soil	X	Solid	x	Sludge		Gas
	x	Corrosive	x	Ignitable		Radioactive		Explosive	x	Flammable
	X	Volatile	X	Toxic		Reactive		Unknown	x	Other

4.2 Major Spills/Releases

Type	Date	Chemical	Quantity	Impacted Media*

(*air, surface water, soil, or ground water)

Free Product: Yes [ ] No [X] Dissolved: Yes [ ] No [X]

Have removal actions occurred? Yes [ ] No [X]

If "yes," describe: _____

Is there evidence that contaminants present could cause vapor problems in structures on-site?

Yes [ ] No [X] If "yes," is building mechanically ventilated? Yes [ ] No [ ]

Exhaust Ventilation: _____ General Building Ventilation: _____

4.3 Chemicals/Waste Stored On-site (including petroleum products)

		How Many?	Size?	Chemical?
	Drums			
	Tanks			
	Vats			
	Surface impoundments			
	Pits/landfills			
	Other			

Identify all chemical products Antea Group will use or store on site:

Alconox, Muriatic Acid, Bleach, ZEP Citrus Degreaser, WD-40, Pine Sol, PVC Glue/Primer, utility marking paints, gasoline

Material Safety Data Sheets (MSDS) are **required** for site chemicals.
Please indicate where MSDS can be found for this site:

[x] MSDS Log/Binder (In Field) [X] Attached (Additional Info. Optional)

5.0 REMEDIATION SYSTEM INFORMATION

Is there a remediation system onsite? Yes [X] No [ ]

Describe: Extraction system consisting of six vaults, 6 man-holes and 3 sumps/vaults for removal of water from overburden, and Two separate bedrock horizons (Horizons A and B). Water is pumped from the vaults located adjacent to the Hudson River up to Effluent pump house (Northeast corner of the property by Lower Warrant St.) , where the water is then pumped to the local POTW.

List the Remediation System hazards identified at this site:

[ ]	Inadequate Ventilation	[ ]	Unguarded Equipment	[X]	Slip, trip, fall or overhead hazards
[x]	Noise Exposures	[x]	Confined Space	[ ]	Security Issues
[X]	Energized Equipment requiring lockout/tagout	[ ]	Temperature Extremes	[ ]	List Other:

If building ventilation system is not adequate, identify manual ventilation procedure:

Identify PPE/procedures required to mitigate the remaining system hazards identified above: Lockout/ Tag out procedures for anything involving electrical components of the system, situational awareness around vaults due to depth of vaults.

Have sound level surveys been conducted on site? Yes [ ] No [X]

If "Yes," record range of survey results and approximate distance from source. Note: hearing protection must be worn if noise levels prevent normal conversation at a distance of three feet, or anytime noise levels are measured to be over 85 dB.

dBA	Source	Distance from Source	Date

Check all energy sources on the remediation site:

[X]	Electrical	[X]	Mechanical	[ ]	Other (describe)
[x]	Thermal	[ ]	Hydraulic		
[x]	Chemical	[ ]	Pneumatic		

Are written Lockout/Tagout procedures required? Yes [X] No [ ] Where are they located? In each of the vaults.

Remediation Systems in Shutdown Mode (See Antea Group's Lockout/tagout practice for details)

Remediation systems that are shut down for **service or maintenance** reasons for extended periods of time, will be locked and tagged in accordance with the requirements of 29 CFR 1910.147, OSHA's Lockout/tagout standard, outlined in Antea Group's Lockout/Tagout written practice.

Remediation systems shut down for business reasons **other than equipment service or maintenance** (i.e. outside the scope of 29 CFR 1910.147), and which will be left in that condition at least until the next visit by a Antea Group employee, will be secured in accordance with the following procedure.

a) The system will be locked, using a standard Antea Group padlock, so that the power cannot be turned on, and a yellow "caution" tag will be applied. The tag must include the following information:

1) Caution
2) Do not operate
3) Do not remove the tag unless authorized
4) Name of person applying the tag
5) Date tag applied
6) Reason why equipment is shut down

b) Systems shutdown and locked for other business reasons can only be unlocked and have the tag removed with the approval of the Antea Group Project Manager for the site or the Office Leader for that region. However, unlike systems locked and tagged under 29 CFR 1910.147:

- The person applying or removing the lock and tag does not have to be an authorized LOTO trained employee under 29 CFR 1910.147.
- The person removing the lock and tag does not have to be the same person who applied the devices.

6.0 HAZARD EVALUATION

Identify all chemicals that are present or are suspected of being present on site and list their maximum concentrations in soil/water. Attach MSDS for each chemical of concern in **Appendix C**.

Chemical Name	TLV/*PEL*	**Maximum Concentration in Soil	*Maximum Concentration in Water	Health Hazards/ Comments
Primary				
Chromium	***TLV:*** *0.5 mg/m3 TWA* ***PEL:*** *1 mg/m3 TWA*	Current concern. unknown	60 mg/L	irritation eyes, skin; lung fibrosis (histologic)
Cyanide	***TLV****: 4.7 ppm, 5 mg/m3 Ceiling; Skin (as both Cyanide salts and Hydrogen Cyanide)* ***PEL:*** *5 mg/m3 TWA; Skin*	Current concern. unknown	7.3 mg/L	Irritation-Eyes, Skin, Nose, Throat; Acute Toxicity
Vanadium	***TLV:*** *0.05 mg/m3 TWA* ***PEL:*** *0.5 mg/m3 Ceiling*	Current concern. unknown	1.5 mg/L	Irritation-Eye, Nose, Throat, Skin, Acute and chronic bronchial damage
Secondary				
Metals/Inorganics:				
Aluminum	**PEL:** 15 mg/m3 TWA	Current concern. unknown	30 mg/L	Irritation eyes, skin, respiratory system
Ammonia	**TLV:** 25 ppm (17 mg/m3) TWA Or 35 ppm	Current concern. unknown	8.2 mg/L	irritation eyes, nose, throat; dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum; skin burns, vesiculation

	(24 mg/m3) STEL **PEL:** TWA 50 ppm (35 mg/m^3)				
Antimony	**Both:** 0.5 mg/m3 TWA	Current concern. unknown	0.053J	mg/L	irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly
Arsenic	**PEL:** 0.01 mg/m3 TWA **TLV**: 0.01 mg/m3	Current concern. unknown	0.018 J	mg/L	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]
Barium	**Both**: 0.5 mg/m3 TWA	Current concern. unknown	1.2	mg/L	Irritation of eyes, skin, upper respiratory system; skin burns (by hydroxide, carbonate); gastroenteritis; muscle spasm; slow pulse, extrasystoles; hypokalemia. INGES ACUTE: Abdominal cramps, profuse watery diarrhea; vomiting; severe muscle weakness; cardiac arrhythmia; unconsciousness; respiratory arrest.
Beryllium Beryllium (continued)	**TLV:** 0.00005 mg/m3 TWA (inhalable particulate matter) **PEL:** 0.002 mg/m3 TWA 0.005 mg/m3 Ceiling 0.025 mg/m3 Peak (30 minutes)	Current concern. unknown	0.0027J	mg/L	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]
Cadmium	**TLV:** 0.01 mg/m3 TWA (total particulate) 0.002 mg/m3 TWA (respirable particulate fraction) **PEL:** 5 µg/m3 TWA 2.5 µg/m3 Action Level	Current concern. unknown	0.055	mg/L	pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]
Chloride	N/A	Current concern. unknown	430	mg/L	*Note*No MSDS for Chloride
Cobalt	**TLV:** 0.02 mg/m3 TWA **PEL:** 0.1 mg/m3 TWA	Current concern. unknown	0.062	mg/L	Cough, dyspnea (breathing difficulty), wheezing, decreased pulmonary function; weight loss; dermatitis; diffuse nodular fibrosis; resp hypersensitivity, asthma
Hex. Chromium	**TLV:** (as insoluble) 0.01 mg/m3 TWA (Water Soluble) 0.05 mg/m3 TWA **PEL:** 5 µg/m3 TWA	Current concern. unknown	53	mg/L	Lung cancer, nasal septum ulcerations and perforations, skin ulcerations, and allergic and irritant contact dermatitis. *Note* No MSDS for Hexavalent Chromium
Copper	**Both**: 1 mg/m3 TWA	Current concern. unknown	0.270	mg/L	Irritation-Eye, Nose, Throat, Skin; Cumulative Lung Damage
Flouride	N/A	Current concern. unknown	6.1	mg/L	*Note* No MSDS for Flouride
Iron	**(Both as iron oxide)** **TLV:** 5 mg/m3 TWA **PEL:** 10 mg/m3 TWA	Current concern. unknown	120	mg/L	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)
Lead	**TLV:** 0.05 mg/m3 TWA	Current concern. unknown	1.4	mg/L	lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal

	PEL: 0.05 mg/m3 TWA 0.03 mg/m3 Action Level				pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension
Magnesium	No PEL for Magnesium. As magnesium oxide: **TLV:** 10 mg/m3 TWA **PEL:** 15 mg/m3 TWA	Current concern. unknown	65	mg/L	Irritation of eyes, mucous membranes; cough; headache, dullness, weakness; elevated body temperature, metal fume fever; eye redness, pain; INGES. ACUTE: Abdominal pain, diarrhea
Manganese	**TLV:** 0.02 mg/m3 (respirable fraction) TWA 0.1 mg/m3 (inhalable fraction) TWA **PEL**: 5 mg/m3 Ceiling	Current concern. unknown	16	mg/L	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage
Mercury	**TLV:** 0.025 mg/m3 **PEL:** 1 mg/10m3 Ceiling	Current concern. unknown	0.0088	mg/L	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria; erethism (a central nervous system disorder characterized by irritability, weakness, sensitivity to stimulation, shyness, depression, insomnia, and eventually memory loss and tremors.)
Methyl Mercury	**TLV:** 0.01 mg/m3 TWA, 0.03 mg/m3 STEL **PEL:** 0.01 mg/m3 TWA, 0.04 mg/m3 CEILING	Current concern. unknown	2	ng/L	Toxic if inhaled. May cause respiratory tract irritation. May be fatal if absorbed through skin. May cause Skin irritation. May cause eye irritation. May be fatal if swallowed.
Nickel	**TLV:** Elemental: 1.5 mg/m3 TWA, Insoluble compounds: 0.2 mg/m3 TWA, Nickel subsulfide: 0.1 mg/m3 TWA **PEL:** 1 mg/m3 TWA	Current concern. unknown	0.037 J	mg/L	sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]
Nitrate	N/A	Current concern. unknown	6	mg/L	*Note* No MSDS for Nitrate
Nitrite	N/A	Current concern. unknown	0.16	mg/L	*Note* No MSDS for Nitrite
Ortho-phosphate	N/A	Current concern. unknown	4.5	mg/L	*Note* No MSDS for Orthophosphate
Phosphorus	N/A	Current concern. unknown	4.7	mg/L	*Note* No MSDS for Phosphorus
Potassium	N/A	Current concern. unknown	980	mg/L	Very hazardous in case of skin contant, eye contact, ingestion, or inhalation. Severe over exposure can produce lung damage, choking, unconsciousness or death.
Selenium	**Both:** 0.2 mg/m3 TWS	Current concern. unknown	0.012 J	mg/L	irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns
Sodium	N/A	Current concern. unknown	3,600	mg/L	Very hazardous in case of skin contact and eye contact.
Strontium	N/A	Current concern.	6.8	mg/L	*Note* No MSDS for Strontium

		unknown			
Sulfate	N/A	Current concern. unknown	750	mg/L	*Note* No MSDS for Sulfate
Thallium	**Both:** 0.1 mg/m3 TWA	Current concern. unknown	0.025 J	mg/L	nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peri neuritis, tremor; retrosternal (occurring behind the sternum) tightness, chest pain, pulmonary edema; convulsions, chorea, psychosis; liver, kidney damage; alopecia; paresthesia legs
Thiocyanate	N/A	Current concern. unknown	1.4	mg/L	*Note* No MSDS for Thiocyanate
Zinc	N/A	Current concern. unknown	0.890	mg/L	Slightly hazardous in case of skin contact, eye contact, ingestion, and inhalation.
VOCs					
Acetone	**TLV:** 500 ppm (1,188 mg/m3) TWA 750 ppm (1,782 mg/m3) STEL **PEL:** 1,000 ppm (2,400 mg/m3) TWA	Current concern. unknown	59	µg/L	Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis
Benzene Benzene (Continued)	**TLV:** 0.5 ppm (1.6 mg/m3) TWA 2.5 ppm (8 mg/m3) STEL **PEL:** 1 ppm TWA 5 ppm STEL	Current concern. unknown	1.6	µg/L	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]
Chlorobenzene	**TLV**: 10 ppm, 46 mg/m3 TWA **PEL:** 75 ppm, 350 mg/m3 TWA	Current concern. unknown	86	µg/L	Skin, eye, nose irritation, headache; nausea; drowsiness, incoordination, unconsciousness; CHRONIC EXPOSURE: Numbness, cyanosis, hyperesthesia (increased sensation), muscle spasms; anemia. In animals: liver, lung, kidney damage, bone marrow suppression. INGES. ACUTE: Abdominal pain
Chloroform	**TLV:** 10 ppm, 49mg/m3 TWA **PEL:** 50 ppm, 240 mg/m3 Ceiling	Current concern. unknown	8.7	µg/L	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen]
cis-1,2-dichloroethene	***Both:*** *200 ppm TWA, 790 mg/m³*	Current concern. unknown	81	µg/L	Respiratory tract irritation, skin irritation, eye irritation, central nervous system depression.
1,1-Dichloroethene	N/A	Current concern. unknown	0.24	µg/L	Irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]
1,2-Dichlorobenzene	**PEL:** C 50 ppm (300 mg/m3)	Current concern. unknown	750	µg/L	irritation eyes, nose; liver, kidney damage; skin blisters
1,3-Dichlorobenzene	N/A	Current concern. unknown	1.6	µg/L	Irritation-Eye, Nose, Throat, Skin; Liver damage
1,4-Dichlorobenzene	**PEL:** 75 ppm TWA, 450 mg/m³	Current concern. unknown	71	µg/L	Irritant (skin, eye, nose)
Methyl Ethyl Ketone (a.k.a. 2-Butanone)	**TLV**: 200 ppm (590 mg/m3) TWA 300 ppm (885 mg/m3) STEL **PEL:** 200 ppm (590 mg/m3) TWA	Current concern. unknown	6.2	µg/L	Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis
Tetrachloroethene	**TLV:** 25 ppm (170 mg/m3)	Current concern. unknown	0.25	µg/L	irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination;

	TWA 100 ppm (685 mg/m3) STEL **PEL:** 100 ppm TWA 200 ppm Ceiling 300 ppm (peak) for a single time period up to 5 minutes for any 3 hours			headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]
Toluene	**TLV:** 20 ppm (75 mg/m3) TWA **PEL:** 200 ppm TWA 300 ppm Ceiling 500 ppm Peak (10 minutes)	Current concern. unknown	1.0 µg/L	Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage
trans-1,2-dichloroethene	*N/A*	Current concern. unknown	20 µg/L	N/A
Trichloroethene Trichloroethene (continued)	**TLV:** 10 ppm TWA; 25 ppm STEL **PEL:** 100 ppm TWA; Also, exposures shall not exceed 200 ppm (ceiling) with the following exception: exposures may exceed 200 ppm, but not more than 300 ppm (peak), for a single time period up to 5 minutes in any 2 hours.	Current concern. unknown	19 µg/L	irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]
Vinyl chloride	**TLV:** 1 ppm TWA **PEL:** 1 ppm TWA; 0.5 ppm Action Level	Current concern. unknown	2.4 µg/L	Carcinogen: lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities;

(*P*) = results pending; (NA) = not analyzed; (NE) = not established

**Most recent (2013) results for each constituent for each well.*

*** Excludes soil results that have been verified by more recent borings to be unrepresentative of soil conditions*

Potential Hazards (check boxes that apply to the site):

	corroded containers		open lagoons	x	underground tanks		air stack emissions
X	overhead electric lines		visible leachate	x	surface tanks		visible on-site releases
	visible soil contamination	x	odors		observed tanks		visible off-site releases
	observed free product	X	dust	X	confined spaces		visible on-site erosion
X	underground utilities		open pits		excess debris		on-site surface water contamination
x	building contamination		no hazards		high traffic issues		off-site surface water contamination

List Other

7.0 PERSONAL PROTECTION & MONITORING EQUIPMENT GUIDELINES

7.1 Personal Protection

Level of Protection: B [ ] C [ ] D [X] List any modifications: _____

1. **All personnel working on Antea Group sites must wear: long pants, sleeved shirt (short sleeves are acceptable), hard hat, high visibility traffic safety vests, safety glasses and safety shoes. Personnel may need to wear additional or more protective eye, ear and hand PPE appropriate for their work tasks.**

2. Nitrile gloves and Tyvek/saranex suit should be worn if contact with contaminated water or soil is likely.

3. Hearing protection must be worn if noise levels prevent normal conversation at a distance of three feet, or anytime noise levels are measured to be over 85 dB.

4. No smoking, eating, or drinking is allowed in the exclusion or contamination reduction zones. Smoking is only allowed in areas pre-approved by the Antea Group PM and client.

5. No Antea Group personnel shall conduct a permit required confined space entry. In addition, no personnel shall approach any excavation area where there is danger of a wall collapse.

6. Respiratory protection is dependent on conditions listed below Section 7.2. No site specific respiratory protection required onsite. Minimum Level C respiratory protection for most Antea Group release sites consists of a half-face air purifying respirator with combination P100 filters with organic vapor (minimum).

7. Fall protection is required for work that will be performed at 6 feet or more above ground level. All Antea Group and subcontractor personnel performing work from heights must be properly trained in the use of fall protection safety equipment.

7.2 Surveillance Equipment and Materials

1. Calibration: A qualified individual will calibrate before and after field activities all field instrumentation..

2. Frequency: The worker breathing zone will be initially monitored every hour (at a minimum) and recorded in Appendix F. If previous site monitoring data indicates that there are exposures are below action level, monitoring frequency may be reduced, as long as site conditions have not changed and site activities will not create new exposures. Periodic monitoring can be stopped when site monitoring data indicates that breathing zone shows no hazardous conditions or air contaminants. However, if monitoring is stopped, data to support this decision must be available onsite for review. (Table for recording data is provided in Appendix F.)

   In addition to periodic site monitoring, breathing zone monitoring should always be conducted and documented (in Appendix F) during tasks that may result in continuing or new exposures, such as active drilling, probing, or excavating. If there are more stringent state or federal regulatory requirements for site monitoring, those requirements must be followed.

3. Instrumentation

Instrument	Breathing Zone Reading	PPE Upgrade or Other Actions To Be Taken
Photo ionization detector (PID) or Flame ionization detector (FID)	Total Org.Vapors Bkgrd - 2 ppm 2 - 100 ppm 100 - 300 ppm 300- 500 ppm >500 ppm	**Level D.** Work may continue. **Level D.** Collect benzene detector tubes (unless there is previous site data to show that benzene at these PID levels is below 0.5 ppm) **Level C.** Air-purifying respirator with organic vapor canisters required if levels continue for **two hours or more** in the breathing zone. Workers can choose to don respirators at lower levels if nuisance odors are a concern. Collect benzene detector tubes. **Level C if levels continue for 15 minutes in the breathing zone**. If levels continue beyond 15 minutes **STOP WORK**. Contact Corporate HSSE. **STOP WORK, leave immediate area--** Contact Corporate HSSE
Explosion Meter	< 10% of LEL 10 - 20% of LEL > 20% of LEL	**Work may continue. Evaluate inhalation potential.** **Work may continue. Eliminate all ignition sources, Reduce the concentration &increase monitoring** frequency, consider use of ventilation. **Work must stop until LEL is Below 10%!**
Oxygen Meter	< 19.5% O_2 19.5% to 23.5% O_2 >23.5% O_2	**Leave area.** Re-enter only with SCBA. **Work may continue.** Investigate causes of changes above/below 21%. **Work must stop.** Ventilate before returning and retest atmosphere. O_2-rich atmospheres pose explosion hazards.
Sound Level Meter	< 85 dBA 85 - 90 dBA > 90 dBA	Suggest wearing hearing protection when it is necessary to raise voice to be heard at distance of 3 feet. **Hearing protection required.** Install warning signs for fixed noise sources. **Hearing protection required.** Employer must have Hearing Conservation Program.
Dust Monitor Note: See CAMP in Appendix D	< 100 µg/m^3 above background (15 min. period) > 100 µg/m^3 above background (15 min. period) > 150 µg/m^3 above background	**Level D.** Work may continue. **Work must stop.** Dust suppression required and dust levels must be reduced using dust suppression methods until no visible dust is present and levels are below 150 ug/m^3 above background. **Work must stop.** Emission controls required.

8.0 SAFETY STANDARD OPERATING PROCEDURES (ALSO SEE APPENDIX D FOR SITE SAFETY CHECKLIST)

8.1 Chemical Hazards

A photo ionization detector (PID) or flame ionization detector (FID) will be used to measure the relative concentration of hydrocarbon vapors. Monitoring for exposure to benzene vapors may be done using activated charcoal tubes and vacuum pumps, vapor badges, or benzene colorimetric tubes in the breathing zone when working with heavily contaminated soil or water. Action limits for use of respiratory protective equipment are outlined in Section 7.2 above. All respiratory protection equipment shall be NIOSH/MSHA-approved and use shall conform to OSHA 29 CFR 1910.134. Antea Group's written Respiratory Protection Program detailing selection, use, cleaning, storage, medical monitoring, training and fit testing of respiratory protective equipment is available to all employees via Antea Group's intranet.

In addition to being inhalation hazards, hydrocarbon compounds can also be absorbed through the skin. Skin contact with liquid hydrocarbons or fuel hydrocarbon-bearing soil should be prevented. In situations where sampling would result in direct skin contact with hydrocarbon liquids, saturated soil or contaminated equipment, nitrile gloves will be worn.

Drilling or digging may also liberate pockets of hydrogen sulfide (H_2S). While the characteristic "rotten egg" odor of H_2S is detectable at levels as low as 0.0005 ppm, prolonged detection is unreliable due to its olfactory fatigue properties. In open air

on a typical petroleum remediation site, risk from exposure to H_2S is minimal. However, should H_2S be encountered or expected, workers shall be instructed to stop drilling/digging and move to an upwind location until the vapors have dissipated, as measured by H_2S colorimetric detector tubes or other direct-reading instruments. The bore hole or excavation will be immediately backfilled.

When working in areas that are not open air and/or have to potential to accumulate gases or vapors, a combination explosimeter/oxygen (O_2) meter will be available on-site to monitor the levels of flammable gases, such as petroleum vapors and methane. An explosimeter should be used by a subcontractor to verify that the atmosphere inside an underground storage tank has been inerted prior to allowing the tank to be moved from its location.

8.2 Physical Hazards

1. Mechanical hazards: Ensure that mechanical equipment is properly guarded and overhead hazards are removed or secured to prevent being struck or entrapped by moving parts or heavy equipment or falling objects.

   Maintain a safe distance from heavy equipment and moving machinery parts.

   Tools and equipment used on site shall be in proper working condition. Workers using tools and equipment must be properly trained in their use.

   Antea Group has adopted a practice to eliminate the wide-spread use of fixed open-bladed knives (FOBKs), such as pocket or utility knives. FOBKs are not allowed on Antea Group field sites without prior approval by the Antea Group PM. Safer alternatives such as safety knives, shears, etc. should be used in place of FOBKs. See Antea Group's FOBK practice for more details.

2. Electrical hazards: Be aware of underground and overhead utilities. For protective measures against underground electrical cables see Section 8.3 Underground Utilities.

   For overhead power lines, OSHA requires a minimum distance of 10 feet from overhead lines transmitting up to 50kVs and an additional 4" of distance for every 10kV after 50kV, from any unguarded, energized overhead line. For example: 15 feet from lines transmitting up to 200kVs and 25 feet from 350kV lines. However, because power lines, rig masts and other elevated objects can move due to wind or other forces, **it is Antea Group's policy is to maintain at least 20 feet clearance from any lines, or an additional 5 feet from any OSHA minimum distance that exceeds 20 feet.** If it is critical to work within 20 feet of a line, or at OSHA minimum distance, efforts should be made to have the lines covered ("shrouded") or shut off and locked out by the local power company. If neither can be accomplished, contact Antea Group Corporate HSSE.

   Generators, powered hand tools and extension cords used on Antea Group sites must be grounded. Extension cords must be inspected at the start of each work day to ensure that they are not damaged. Frayed or otherwise damaged extension cords shall not be used onsite, and must be taken out of service unless they can be properly repaired.

   Heavy equipment, including drilling rigs and vacuum trucks, must be grounded when the potential for static electricity build up and its uncontrolled release exists. Confirm with the equipment operator that equipment is grounded as needed. All equipment will be properly locked/tagged out when required by the Energy Lockout/Tagout Program and Safe Electrical Work Policy and Procedure for Antea Group Project Work. Do not stand in water when operating electrical equipment.

3. Open excavations: Open excavations deeper than 6 feet that are not clearly visible to site workers and the public must have fall protection measures in place, such as barricades and warning signs. When scheduling or work conditions necessitate leaving excavations open overnight, security fencing will be erected to restrict access to the site or work zones described in Section 2.9

   Excavations must be properly constructed and maintained as per Section 8.12 of this HASP.

4. Hazardous plants or animals: Poisonous plants, and stinging, biting or other dangerous animals can be encountered on field sites. Identify workers with any allergies. Do not touch any plants that you cannot identify. Clear brush from well

locations and other work areas. If necessary, arrange for vegetation removal by a landscaping company. Do not approach or provoke any animals, including spiders or insects. If a worker is bitten or stung by insect or spider, provide first aid and monitor the worker for a reaction. If an insect, or spider bite is suspected to be serious, or a worker is bitten by snake or other animal, seek medical attention immediately. If the bite is not an emergency, call WorkCare (800) 455-6155 for medical assistance.

5. Slip, trip, fall hazards: Will be minimized by maintaining good housekeeping practices at all times. Keep the work area free of debris, unused tools, extra supplies, or any other objects that could interfere with walking and working surfaces.
6. Working from heights: All work performed above 6 feet from the ground surface must have fall protection measures in place such as safety harnesses for all personnel working at heights.
   Heavy equipment, including scissor lifts and cranes, must be in proper working condition and only operated by qualified personnel. Equipment that is used to hoist personnel above ground must be secured and stationary when not in use.

8.3 Underground Utilities

A minimum of 72 working hours prior to excavating, Underground Service Alert or the state equivalent:

Name DIGSAFE Phone 811 / 1-800-962-7962

will be contacted and informed of the scheduled field activities. The underground service locator company will identify which underground utilities (e.g. electrical, gas, sewer, water, telephone, cable TV) are present and will notify their respective owners. The utilities will be located by their owners. **Prior to drilling or direct push, air excavate (120% the width of the hole) and to a depth of at least 5 feet will be performed at all times** to ensure no utilities, lines or tanks are in the way. See Excavation Section 8.12. **Look for overhead utilities** as well.

Utility service locator company has been notified? **If applicable attach contact sheet to back of document.**	Date(s)	_____ _____	Confirmation #, if applicable:	_____ _____

If you are planning to drill the same location as a previously installed point and the diameter of the new boring/well is larger, you must manually clear the borehole.

8.4 Work Limitations (time of day, weather, heat/cold stress)

In the event of severe weather, such as high winds, heavy rain or snow, tornadoes, electrical storms, or extreme temperatures, the SSO and PM shall determine whether work can continue without compromising site worker health and safety.

In high ambient temperatures (especially with high humidity), ***follow heat-stress precautions***. Drink plenty of cool water and/or electrolyte-replacement beverages (e.g., Gatorade). Take frequent breaks out of direct sunlight removing protective clothing. Provide shade to workers if necessary. Increase number of breaks if pulse does not return to normal resting pulse during breaks. Alter schedules so work is conducted during early morning or evening. Work shall progress only under conditions of adequate lighting.

Symptoms of heat exhaustion and heat stress include:

- Profuse sweating **or** complete cessation of sweating;
- Changes in skin color;
- Increased respiration;
- Vision problems, confusion;
- Body temperatures in excess of 100°F; and
- Increased heart rate.

Any member of the work team who exhibits these symptoms should immediately be removed from the area and observed while resting in a shaded area after removal of impervious or restrictive clothing and after consumption of cool water or electrolyte fluid. If symptoms persist, immediate medical attention shall be sought.

In cold temperatures, especially when combined with high wind, follow hypothermia precautions:

- Drink warm liquids and take frequent work breaks in a wind-sheltered area. Monitor co-workers for signs of shivering, lack of coordination, or confusion. and remove workers exhibiting these signs from the work area to a heated warming shelter.
- Dress in removable layers of insulated clothing to prevent sweating and use protective waterproof gear;

- Frostbite (superficial or deep tissue) can occur on any exposed skin at temperatures of 30.2°F or colder.
- If available clothing does not give adequate protection to prevent hypothermia or frostbite (which can occur on any exposed skin), work should be modified or suspended until adequate clothing is available or until conditions improve.

If extreme cold conditions are encountered (e.g. < 10° F), discuss proper clothing requirements and a warming break schedule with the Project Manager. Consider rescheduling the work if possible.

8.5 Fire and Explosion Hazards

Each site will be inspected for fire and explosion hazards during a pre-work site walk-through.

During the course of underground storage tank removal, drilling, or remediation of petroleum impacted soil or ground water, the potential for fire and explosion of flammable vapors exists. Extreme caution should be taken to monitor for the presence of flammable vapors or conditions that could create flammable conditions. Explosimeters are available for this monitoring and action levels are defined in Section 7.2. Fire extinguishers must be available on all sites with the potential for flammable vapors or electrical fires (i.e., systems, control panels). Use of fire extinguishers by employees trained in their use is limited to employee rescue or extinguishing relatively small, controllable fires. Antea Group does not expect or require its employees to fight fires.

In the event of a fire or explosion, the following action plan should be followed:

Shut down equipment and shut off all supply lines immediately if this can be done safely. (Notify the site operator to shut down operations if necessary.)

Evacuate the immediate area. At this point you may not know if a soil vapor fire has started or if a supply line, natural gas line, etc. has been hit. Tank, supply line, or remediation system fires are extremely hazardous and precautions must be taken to evacuate the area immediately.

Call 911 to notify the fire department. Antea Group employees are not trained fire brigades. Every fire should be treated as an emergency. Even if site personnel extinguish the fire, professional fire departments should evaluate the situation to ensure that the danger is over and that a fire will not reoccur.

Evaluate the situation to identify the source of the flammable vapors and to assess the danger to employees, the public and property. From a safe distance, try to determine if the fire is due to a ruptured supply line, ignited soil vapors or methane, or is electrical. This information should be communicated to the fire department. Small fires from known sources (i.e., engine fires, electrical panel fires, etc.) may be extinguished if the employee can do it without high risk. A soil vapor fire may eventually burn itself out. Soil stockpiles must be placed away from nearby structures and property lines. Extinguishing fires in fuel vapor-laden soils with clean soil may be possible. **Employees or subcontractors shall not enter an excavation to attempt to extinguish a fire.**

Fire, Explosion and Vacuum Truck Operations—vacuum truck operators must ensure that the truck and hoses are properly bonded and grounded prior to initiating vacuum operations and that vacuum truck hoses are properly tested for continuity each work shift.

Vacuum truck operators must ensure that the materials to be collected are compatible with residual materials that may already be in the truck or the truck must be washed prior to use. Hydrocarbons and other vapors created by the vacuum pump exhaust shall be vented away from the work area and away from areas where people are present.

8.6 Noise/Hearing Protection

Workers shall be instructed in the recognition of noise hazards and shall be provided, and trained in the use of, hearing protective devices. Monitoring should be performed for on-site noise sources that are suspected to be above 85 dB. Record sound readings in Appendix G. If monitoring has not been performed for suspected noise sources, hearing protection must be worn. As a general rule, hearing protection should be worn when working around heavy equipment, particularly drill rigs, or when background noise is such that a worker has to raise their voice to be heard at a distance of 3 feet.

8.7 Levels of Protection

Work on petroleum remediation sites must be performed, at a minimum, in the following Level D protection:

- hard hat (a Antea Group requirement, unless wearing the hard hat creates additional safety risks and there are no overhead hazards present),
- steel-toed (safety-toed) work shoes/boots, meeting ANSI/ASTM standards
- sleeved shirt (short sleeve minimum) and long pants, or cotton coveralls
- eye protection- safety glasses (ANSI Z87), goggles or face shield as required
- high visibility safety vest (ANSI Class II preferred)
- gloves- sampling (nitrile) or work (leather, synthetic leather, Kevlar, etc. depending on work tasks), and
- hearing protection, as needed.

If monitoring equipment or site conditions indicate the need to upgrade the level of protection to Level C at a petroleum release site, air-purifying respirators with organic vapor canisters (at a minimum) will be donned, Tyvek coveralls with hoods, chemical resistant inner and outer gloves, and disposable boot covers will be donned as necessary. Contact Corporate HSSE regarding dermal protection.

At no time will an Antea Group employee conduct work on any site requiring Level A protection. On work sites requiring Level B protection, workers will be provided with additional training and equipment. Corporate HSSE must review and approve the work plan for Level B work before the work can be performed.

8.8 Decontamination Procedure

Level: B. [ ] C. [ ] D. [X]

Contamination may result from walking through contaminated soils or liquids, splashing liquids during sampling, use of or contact with contaminated equipment, or contact with air contaminants. Field team workers will be instructed to observe the following precautions to assure contaminants will not remain in contact with their skin.

- Tools, equipment and personnel will be decontaminated using procedure appropriate for level of personal protection worn.

- All contaminated, disposable clothing will be properly bagged for disposal and left on site. All personnel will be instructed to wash hands, face, neck and forearms at the end of the work shift and to shower at the end of the workday.

- No eating or drinking will be permitted in the vicinity of heavy equipment and/or drilling and excavating activities. Smoking is only permitted in pre-designated area when approved by Antea Group and the client.

Special decontamination requirements: _____

8.9 Confined Spaces

If entry into a confined space is necessary, a trained Antea Group subcontractor shall be used and a Confined Space Entry Permit must be completed and authorized, and confined space entry procedures followed. Detailed information on Antea Group's Confined Space Entry procedures can be found in the Antea Group Health & Safety Manual. Contact Corporate HSSE before any permit required confined space entry.

Does this site have any permit-required confined spaces?	Yes	X	No	
Does someone need to enter the permit-required confined space as part of the work?	Yes		No	X

If "yes," the Antea Group project team must confirm the subcontractor's permit required confined space program and employee training have been reviewed as part of the Antea Group pre-qualification process.

8.10 Investigation – Derived Material Disposal

Soil cuttings and well development or sampling water shall be placed in 55-gallon drums on-site, unless on-site disposal is allowed under both regulatory and client requirements. Drums must be in sound condition (new or reconditioned drums) with lid that seals and can be tightened in place. Disposal methods of drummed soil and water will be determined based on laboratory analytical data.

Drums stored on site until disposal shall be labeled, sealed, and if possible, placed on an impermeable surface in a secure location prior to Antea Group's field team leaving the site. At a minimum, non-hazardous waste containers must be marked with a description of the material, and emergency contact information (company name and phone number). Hazardous waste must be marked and labeled so that the container complies with applicable DOT or RCRA requirements. Drums must be removed within 90 days of waste generation.

8.11 Excavations

All soil excavation and utility trenching is to be undertaken in strict conformance with all applicable local, state, and federal regulations. Subcontractors performing excavations on-site must have a competent person in charge of the excavation, who performs daily inspections of the excavation. Entry into excavated areas or trenches is allowed only when:

1. Shoring, sloping and spoil pile placement is in conformance with 29 CFR 1926 Subpart P, and
2. Personal protection and monitoring, as detailed in this Site Health and Safety Plan, have been implemented, and there is no hazardous atmosphere or other unsafe condition in the excavation.

9.0 Drilling and Excavating Health and Safety Guidance Procedures

9.1 Preparation

Prior to conducting any subsurface work, a markout must ALWAYS be called in (approximately three working days before field work is scheduled - depending on the area). In some areas, not all markouts are performed by the "Call Before You Dig System," thus contacting the appropriate utility companies and assuring their markouts must be tracked by Antea Group or the subcontractor responsible for the markouts. Private utility mark-outs should also be arranged when site work and conditions warrant it.

- Always search the file and request the client search files for an as-built of the station/facility.

9.2 When on Site

- Subcontractors are required to perform an on-site inspection of their heavy machinery each day prior to the start of fieldwork. The Antea Group Site Safety Officer (SSO) will observe the inspection. Any safety concerns identified by the subcontractor must be addressed prior to the use of the equipment. During the inspection, the subcontractor must verify that all rig/vehicle kill switches are working properly. Antea Group employees on-site must be informed of the location of the kill switches and how to operate them.

- As part of your on-site health and safety meeting, walk the site with the field team to identify any additional site hazards and determine possible boring locations (make sure the locations shown on the work plan/site plan are in areas free of utilities/subsurface structures). Make sure all utilities have been marked out properly. It is Antea Group's responsibility to ensure all boring or excavation locations are clear of utilities prior to drilling. Often "as-builts" are incorrect or not available.

- Attempt to determine how all utilities are running. For the most part, utilities can run anywhere and can bend and twist in any direction but, there are a few basic things to keep in mind. Usually water and sewer lines will run to a bathroom. Electrical lines will run in between on-site lights, the kiosk, service station and car wash buildings. Storm water drains usually tie into one another and you can get a general idea of how they run by looking into them and seeing what direction the line is going. Obviously any cut outs in the asphalt should be avoided, especially if observed around the USTs (often, leak detection is an afterthought and is added following the completion of the service station rebuild and its location is obvious due to a continuous cut out in the asphalt around the tank field).

- ALWAYS AIR EXCAVATE (120% the width of the proposed hole) TO A DEPTH ONE FOOT BELOW THE ESTIMATED DEPTH OF UTILITIES AND AT LEAST FIVE FEET bgs. If you are drilling in the same location as a previously installed point and the diameter of the new boring/well is larger, you must manually clear the borehole. In addition, if you didn't advance the "old" boring yourself, you can't assume that it is a safe drilling location. Refusal may have been encountered in the "old" location. If refusal is encountered prior to five feet, move to a new location. If you make three attempts without success, call the project manager to discuss alternatives. If you can't reach the PM contact your Office Leader for further instruction.

- If you encounter pea-gravel while excavating STOP. Call the Antea Group PM for further instruction. Utilities or USTs may be present.

- If you hit/damage any utility/subsurface feature IMMEDIATELY contact the office for further instruction. If you can't reach the PM contact your Office Leader for further instruction. Also contact your HSSE Advisor.

9.3 Drilling Activities

- Drilling operations shall at all times be under the immediate supervision of a contractor's representative who has authority to modify the work methods as necessary to ensure safety.
- Contractors shall ensure properly designed cribbing (i.e., wooden mats) is always carried with mobile drill rig to work site.
- Where practical, drilling should always take place on "level" surfaces. If the proposed site is not level, consideration should be given to selecting another suitable site that is level, or to leveling the site by re-grading.
- Drilling locations must be clear of underground and overhead hazards as discussed in this HASP.
- Additionally, the guidance provided in the Environmental Remediation Drilling Safety Guidelines (ERDSG) industry document **should** be followed.

10.0 TRAFFIC CONROL AND ON-SITE VEHICLES/MOBILE EQUIPMENT

Petroleum site work frequently necessitates working in parking lots, streets or other areas with vehicular traffic. In such instances, the work team will be wearing high visibility traffic safety vests (ANSI Class II minimum recommended) and will use a combination of traffic cones (recommended height - 42-inches) and barricades as necessary to prevent contact between workers, pedestrians and motor vehicles. Proper placement of large contractor vehicles such as field trucks and drill rigs to add a layer of protection should be considered.

Check for specific DOT requirements when working in or near a road or road right-of-way. In such cases, traffic control set up will need to be subcontracted to a traffic control subcontractor.

The PM shall develop a **Site Specific Traffic Control Plan** for high traffic sites, or other high-risk locations. The plan (map) should include known site traffic patterns and the control equipment set up used to divert or restrict traffic and to define site work (exclusion) zones. **Include Traffic Control Plan in the "Figures" section at the end of the HASP.**

Onsite Vehicles:

- Enter and exit through the gates or pathway provided and designated for this use.
- Vehicles will not be driven over unprotected hoses or exposed piping.
- Vehicles may be left running **only** when operating auxiliary equipment or lights, and then only when driver can ensure the vehicle is secure with the transmission in park or neutral, the parking brake set and the wheels chocked.

Earth Moving Activities:
All mobile earth-moving equipment on-site must comply with 29 CFR 1926.602 for back-up alarms or signal persons.

Dig and Haul Projects:
Dump trucks should only dump the load on **level** ground so the hazard of "tip-over" is avoided. If absolutely necessary, the dump truck can dump into the slope (i.e., back of truck facing directly uphill).

Any truck that has a raised bed dumping feature (i.e., dump-truck) must always lower bed before driving forward to leave the immediate work area. This is due to two hazards:

- *Tip-over* due to change in gravity of raised bed and
- *Hitting overhead obstacles* (like power lines or canopies).

11.0 JOURNEY MANAGEMENT PLAN

Provide directions for the preferred route from Antea Group's office to the field site, with the preferred/safest exit and entry points to the site. Also, provide any specific information of problem traffic areas that should be avoided when traveling in the area of the site. Information can be provided via maps, written instruction or both, as appropriate and available. Use the "Figures" section at the end of the HASP. (Information regarding onsite traffic flow and mobile equipment is provided in Antea Group's Traffic Control Plan in Section 10.)

Additional Comments:

- Seatbelts must be worn by all occupants in traveling vehicles
- Including the requirements for drivers to have all appropriate licenses, and to have received defensive driver training within the last two years.

11.1 Lone or Isolated Worker

Workers should not be put into a situation where they are left alone or isolated with no means of quickly summoning help should he/she become incapacitated due to injury or vehicle accident.

- A positive means of communication, i.e. a device such as a walkie-talkie, vehicle radio or cell phone, should be provided to all field personnel.
- Lone employees should check in with their supervisor or their field office at the start of the day, mid-day, and a final status report call at the end of the day (so others know where the worker is and that he/she is safe).
- In high hazard/crime affected areas, operations teams should consider assigning two workers or hiring a security guard during site work. If the area appears too dangerous, work should be postponed until an appropriate security plan can be developed.

12.0 SUBCONTRACTOR TRAINING AND SAFETY DOCUMENTS

All subcontractors must meet OSHA training requirements for the work they will perform while onsite. Subcontractor workers that have the potential to be exposed to site impacts must have initial HAZWOPER training and up-to-date annual 8-hr refresher training. In addition, subcontractors driving on Antea Group business must have completed a defensive driver training class within the last two years.

Subcontractors shall be responsible for the development and implementation of their own HASP and/or JSAs to cover duties and hazards specific to that subcontractor's area of expertise or on-site functions. Subcontractors are given the opportunity to review Antea Group's HASP, and must sign the document, prior to the start of on-site work. Subcontractors are required to provide job safety analyses (JSAs) or written safety standard operating procedures, for the primary tasks they perform on-site. Contractors are required to review these safety documents with the work team during the appropriate on-site safety meetings (tailgate, etc). Any discrepancies or conflicting safety requirements between Antea Group and subcontractor HASPs shall be addressed prior to the start of field work.

All subcontractor employees must attend and participate in all on-site safety meetings as required by Antea Group. All on-site subcontractor workers must be able to effectively communicate with all field workers in English. If not, a translator/mentor must be assigned to those employees that cannot communicate in English to assure that all employees understand the safety information communicated on-site.

Any hazardous work situations, unsafe acts and conditions, near misses, or other safety incidents must be reported to the Antea Group Site Safety Officer immediately so that corrective measures may be taken, and the information can be reported to Antea Group management in a timely manner.

13.0 BEHAVIORAL SAFETY OBSERVATIONS

Behavior Based Safety is an established method of using reinforcement to change unsafe individual behaviors. The process starts with a behavioral hazard analysis to identify "at-risk" behaviors. These can be determined by using near miss/incident reviews, JSAs, audits, etc. Using the inventory of at-risk behaviors, a checklist is then developed to assist in the observation of work behavior. Observers record safe and at-risk behaviors and provide feedback to workers about their performance. The feedback reinforces the necessity for safe behaviors. Observation data also is used to identify barriers to safe behavior. Removing these barriers lowers the workers' exposure to at-risk conditions and makes it easier for employees to work safely. Antea Group has developed a behavior based safety observation (BBSO) checklist from an analysis of its near miss/incident data, JSAs and auditing data.

The checklist is attached as Appendix H. Field teams should perform one BBSO per field event. BBSOs can be performed on Antea Group employees or subcontractors.

14.0 ACKNOWLEDGMENT AGREEMENT

14.1 Antea Group Employee

SITE HEALTH AND SAFETY PLAN REVIEW RECORD

I acknowledge that I have read and understood the contents of this Site Health and Safety Plan and I agree to abide by all provisions as set forth. I have also checked in with the site client contact to alert them of our presence and for any daily safety issues. Please note: "no implements are to be brought on a Antea Group site, or while performing Antea Group business that are, or are intended to be used, as weapons (such as: guns, knives, etc.)". Firearms are expressly prohibited. By signing below you are certifying, that this policy is upheld. Antea Group retains the option to audit your personnel and equipment to assure your compliance.

NAME	SIGNATURE	CELL PHONE	DATE

NAME	SIGNATURE	CELL PHONE	DATE

14.2 Subcontractor & Visitor

SITE HEALTH AND SAFETY PLAN REVIEW RECORD

I have been given the opportunity to review the Health and Safety Plan for this site and have been briefed on its contents and on the nature of the contaminants and the level and degree of exposure likely as a result of participation in this project. I agree to conform to all the requirements of this plan. (This HASP does not replace the requirement or liability for your company to have it's own safety program and HASP.) I also acknowledge that this plan is specific for this Antea Group site and may not address unforeseen hazards not included in the Site Health and Safety Plan or your specific contracted task. Please note: "no implements are to be brought on a Antea Group site, or while performing Antea Group business that are, or are intended to be used, as weapons (such as: guns, knives, etc.)". Firearms are expressly prohibited.

By signing below I am certifying that this policy is upheld. Antea Group retains the option to audit your personnel and equipment to assure your compliance.

ALL WORKERS HAVE THE AUTHORITY TO STOP, AND/OR REFUSE TO PERFORM, ANY UNSAFE WORK.

NAME & AFFILIATION	SIGNATURE	CELL PHONE	DATE

NAME & AFFILIATION	SIGNATURE	CELL PHONE	DATE

APPENDIX A
DAILY TAILGATE MEETING OUTLINE/CHECKLIST

DAILY TAILGATE MEETING OUTLINE/CHECKLIST

SITE INFORMATION	
Date:	
Site Name:	
Site Location:	
Project / Site Number:	
Name of Antea Group Employee Leading Meeting	
Title of Antea Group Employee Leading Meeting:	

	YES	NO
Are all field team members in attendance for the tailgate meeting?		
Are there potential language barriers or concerns?		
Is safety information provided in language(s) that all workers understand? (If no an interpreter is required.)		
Identified worker with the least years of experience. Name: Company:		
How many years (or months) experience for worker? # of yrs / months:		
How many workers have less than 1 year experience?		
Is each one assigned an on-site mentor?		

TAILGATE DISCUSSIONS POINTS **(*see next page for additional guidelines*)**	**COVERED** YES	NO
INTRODUCTION- site background, field team introductions, training documentation review		
SITE HAZARDS- perform site walk-thru with team, locate utility markings, work locations, ID any site hazards		
Locate site/facility Emergency Stop switches		
EMERGENCY ACTION PLAN - emergency #s, evacuation signal & routes (walk them), 1st aid kits, training, etc		
WORK HAZARDS- scope-of-work, etc		
Antea Group discuss safety of Antea Group tasks to be performed- review JSAs		
Contractor(s) discusses safety of contractor work tasks to be performed- review JSAs		
List JSAs reviewed		
Heavy machinery inspection, kill switches located and tested		
Hand tools, power tools and other equipment inspected ***INSPECT portable fire extinguishers onsite***		
On-site impacts, other chemical on-site- monitoring procedures, PPE upgrade and action levels		
ONSITE VEHICLE MOVEMENT AND SPOTTER REQUIREMENTS - discuss movement of work vehicles and spotter procedures		
HIGHLIGHT SPECIFIC WORK CONCERNS- e.g. excavation, drilling, utilities, power lines, traffic, weather, etc.		
PPE REVIEW - review standard PPE, upgrades needed		
Gloves available on site match the glove type(s) listed in the JSAs for today's work? *NOTE: Any gloves not listed in JSA cannot be used onsite without management approval and field editing of onsite JSA*		
ANTEA GROUP OR CLIENT SPECIFIC SAFETY PROTOCOLS - FOBK practice, utility clearance requirements, etc.		
REQUIRED PERMITS. LIST:		
PROACTIVE SAFETY ACTIONS - report all near misses, stop work authority, STOP WORK as needed,		
FEEDBACK - Worker questions, comments, concerns		
Have all worker signed the site health and safety plan?		

DAILY TAILGATE MEETING OUTLINE/CHECKLIST

TAILGATE MEETING ATTENDANCE *(use additional sheets if required)*		
Worker Name	**Company Name**	**Signature**

AFTERNOON TAILGATE MEETING		YES	NO
Afternoon Tailgate held?			
List Topics:			
Name & Title or worker leading afternoon tailgate meeting:			

DAILY TAILGATE MEETING OUTLINE/CHECKLIST

DAILY TAILGATE MEETINGS

Daily tailgate meetings shall be held at the start of each work day, shift or task change.

The daily tailgate meetings shall review the planned work activities for the day, discuss and resolve the risks and mitigations, discuss any Health, Safety, Security and Environment (HSSE) concerns and raise the HSSE consciousness of each worker before they start work.

These meetings shall include, but are not limited to:

- A review of relevant Health and Safety Plan (HASP) elements to be performed at an appropriate frequency. A review shall be done whenever the HASP is updated and should also be done regularly to remind workforce of relevant elements.
- A Hazard Communication (HAZCOM) review.
- Address the risks of any issues arising from the site walk and the location of on-site equipment and materials.
- Complete the tailgate safety meeting forms.
- A review of applicable permit/s.
- A review of the right and obligation to 'Stop Work.'
- Complete and review *Job Safety Analyses* (JSAs) for the tasks to be completed. The focus should be on how to complete activities on a given site during that work day and activity. The JSA discussion should include identification of 'Stop Work' triggers.
- Implement the controls set forth in the HASP and JSAs. Verify that all parties on site have a complete understanding of the work plan and controls that are in place.
- In addition, allocate resources and complete permits.

PARTICIPATION AND PREPARATION

Effective daily tailgate meetings require participation. Team members should recognize the connection between the meetings and their personal safety.

Involvement of all team members is a critical factor for a successful meeting.

The conductor of the daily tailgate meeting shall prepare by achieving a thorough understanding of: JSAs, HASP, the scope of work, the subcontractors on site, and client requirements.

Additionally, the conductor of the meeting should have the required checklists available to verify that he or she covers all applicable and necessary topics.

TAILGATE MEETING LOCATIONS

When selecting the location of the meetings, the following shall be considered:

- Safety of personnel.
- Background noise.
- Uncomfortable or cramped locations.
- Weather and environment.

APPENDIX B
I-3 FIRST REPORT FIELD FORM

I-3 – FIRST REPORT FIELD FORM

All injuries/illnesses to Antea Group employees, contractor employees, and contractor or subcontractor employees require immediate notification to your Manager, and Lisa Hartwig or Dustin Rusch

GENERAL INFORMATION	
Antea Group Employee Name Reporting:	
Date of Incident:	
City/State of Antea Group Office:	
Site Project/ID Number:	
Site Location (Street, City, State):	
Antea Group Project Manager Name:	
Subcontractor Name (if applicable):	
Incident Location (Street, City, State):	
Short Description of Incident:	

CONDITIONS					
Weather:		**Temperature:**		**Lighting:**	

WHEN DID INCIDENT OCCUR						
	Month	**Day**	**Year**	**Time (hrs)**	**(min)**	**AM/PM**
Occurred						
Reported						

DETAILS		
Witness Name (s)	**Employee/Contractor/Other**	**Phone #**

Equipment Involved:	
Incident Type:	

Environmental Release Info	Product / Material	Amount	Unit

Full Description of Incident:	
Immediate Actions Taken:	

Reported by:	
Date:	

APPENDIX C
CLASS III HASP
HAZARDOUS PROPERTY INFORMATION
(including MSDS)

HAZARDOUS CHEMICAL PROPERTY INFORMATION
Explanations and Footnotes

A	Water solubility expressed as 0.2 g means 0.2 grams per 100 grams of water at 20 °C. Water solubility is expressed in different terms in different references. Many references use the term "insoluble" for materials that will not readily mix with water, such as gasoline. However, most of these materials are water soluble at the part per million or part per billion level. Gasoline, for example, is nearly insoluble and will be found as a discrete layer on top of the ground water. But certain gasoline constituents, such as benzene, toluene, and xylene, will also be found in solution in the ground water at the part per million or part per billion level.
B	Solubility of metals depends on the compound in which they are present.
C	Specific gravity is the ratio of the density of a substance to the density of a reference substance. For solids and liquids, the reference substance is water; for gases, the reference substance is air. Specific gravity is expressed in units of g/cc (for solids and liquids) or g/l (at 0 °C and 760 mm Hg) for gases.
D	Vapor density is the weight/unit volume expressed as grams/cubic centimeter liquids.
E	Flash point is the temperature at which a liquid or volatile solid gives off sufficient vapor to form an ignitable mixture with the air. Flash points may be determined by the open cup method or closed cup method. Several chlorinated hydrocarbons exhibit no flash point in the conventional sense, but will burn in the presence of high energy ignition sources or will form explosive mixtures at temperatures above 200 °F.
F	Vapor pressure is the pressure at a given temperature of a vapor in equilibrium with its liquid or solid form. It is expressed as mm Hg at 1 atm. Temperatures vary...see chart.
G	Lower explosive limit (LEL) and Upper explosive limit (UEL) are the minimum and maximum concentrations of a gas or vapor in air that will support flame. LEL and UEL are expressed as % in air at ambient or room temperature.
H	LD_{50} is the quantity of a substance administered by ingestion that is necessary to kill 50% of the test animals exposed to it within a specified time.
I	Threshold limit value as a time-weighted average (TLV-TWA) is the concentration for a normal 8-hr workday and 40-hr work week to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. Values reported are the current ACGIH Threshold Limit Value-Time Weighted Average (TLV-TWA) and OSHA Permissible Exposure Limit (PEL). All PELs are based on pre-1989 values, per OSHA's 1993 decision to vacate the 1989 PELs. STEL- 15 min exposure limit
J	Immediately Dangerous to Life and Health (IDLH) concentrations represent the maximum concentrations from which, in the event of a respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
K	Recommended Respiratory Protection/Max. Use Concentration is used to show the limits for respirator style and contaminant concentration. MUC can be calculated by multiplying the assigned protection factor for a respirator by the required OSHA permissible exposure limit (PEL), short term exposure limit (STEL) or the ceiling limit. The codes in the table refer to the following: ½ = Half-face, air-purifying respirator FF = Full-face, air-purifying respirator OV = Organic vapor canisters HEPA = High Efficiency Particulate Air canisters PAPR = Powered Air-purifying Respirator The Odor Threshold is the lowest concentration at which one may detect an odor or experience a warning effect such as taste, eye irritation, etc., which varies with individual susceptibility.
L	Hazard Property: A - Corrosive; D - Volatile; G - Carcinogen B - Flammable; E - Reactive; H - Infectious C - Toxic; F - Radioactive; I - Reproductive Toxin *Note: A reproductive toxin is a compound (chemical) that affects the reproductive organs (generally the sperm and eggs, but sometimes the physical structure of the testes or ovaries, too). It can affect the reproductive organs of males, females, or both; it can affect the reproductive organs of an adult or child; it can affect the reproductive organs of a developing fetus with or without affecting the mother.*
M	Dermal toxicity data is summarized in the following three categories: 1. **Skin Penetration** A - negligible penetration (solid-polar) + B - slight penetration (solid-nonpolar) ++ C - moderate penetration (liquid/solid-nonpolar) +++ D - high penetration (gas/liquid-nonpolar) 2. **Systemic Potency** E - Slightly Toxic (LD50 = 5 - 15 g/kg) Lethal dose for 70 kg adult = 1 pint to 1 quart F - Moderately Toxic (LD50 = 0.5 - 5 g/kg) Lethal dose for 70 kg adult = 1 ounce to 1 pint G - Extremely toxic (LD50 = 5 - 50 mg/kg) Lethal dose for 70 kg adult = 7 drops to 1 teaspoon 3. **Local Potency** H - slight - reddening of the skin I - moderate - irritation/inflammation of skin J - extreme - tissue destruction/necrosis
N	Acute Exposure Symptoms A - abdominal pains; G - diarrhea; M - respiratory irritation B - central nervous system depression; H - drowsiness; N - skin C - comatose; I - dyspnea; O - tremors D - convulsions; J - fever; P - unconsciousness E - confusion; K - headache; Q - vomiting F – dizziness; L - nausea; R - weakness

APPENDIX D
RAILWAY PEDESTRIAN SAFETY

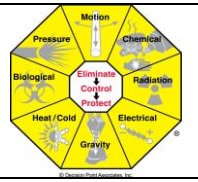
APPENDIX E
JOB SAFETY ANALYSIS

JOB SAFETY ANALYSIS

Job Safety Analysis for: ***(State Task)***			
CONTRACTOR:	*Antea Group Consultants*	DATE:	
PROJECT MANAGER/SITE SUPERVISOR (List Name(s)::**			
PERMITS REQUIRED (Y/N) List Type: **?**			
JSA TEAM MEMBERS:			
LOCATION OF WORKSITE	Street, w/Cross Street:		
	City, State, Zip:		
DESCRIPTION OF WORK:			
Team Leader Reviewed by Signature:		Date:	

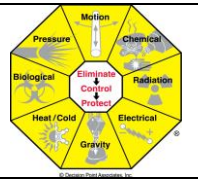
Sequence of Basic Job/Task Steps *List the tasks required to perform the activity in the sequence they are carried out.*	**Potential Hazards (Energy Sources) Involved with Task/Environment** *Against each task list the hazards that could cause injury when the task is performed.*	**Control Measures (Eliminate, Control, Protect)** *List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.*	**Stop Work Triggers**

JOB SAFETY ANALYSIS



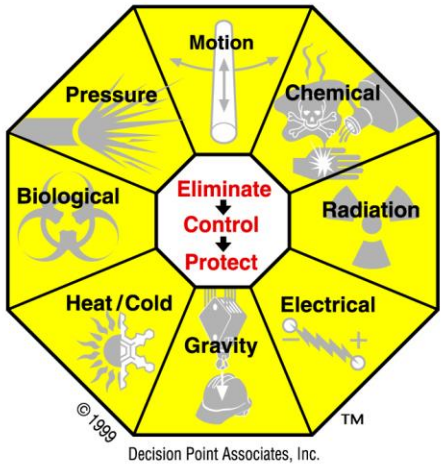
Sequence of Basic Job/Task Steps *List the tasks required to perform the activity in the sequence they are carried out.*	**Potential Hazards (Energy Sources) Involved with Task/Environment** *Against each task list the hazards that could cause injury when the task is performed.*	**Control Measures (Eliminate, Control, Protect)** *List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.*	**Stop Work Triggers** 

JOB SAFETY ANALYSIS



Sequence of Basic Job/Task Steps *List the tasks required to perform the activity in the sequence they are carried out.*	**Potential Hazards (Energy Sources) Involved with Task/Environment** *Against each task list the hazards that could cause injury when the task is performed.*	**Control Measures (Eliminate, Control, Protect)** *List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.*	**Stop Work Triggers** STOP

HRP Team Process
Worksite Hazard Assessment Tool
(WHAT energy is present?)



For use with a JSA big picture or a worksite HSE inspection. Using the HRP Octagon in a clockwise manner starting with Energy of Motion, assess the worksite and determine what energy sources are present and/or what recognized hazards are associated with those energy sources.

Use the following to help you DRAFT the job steps before starting the JSA:

DRAFT STEPS

1.

2.

3.

4.

5.

6.

7.

8.

ADDITIONAL FIELD NOTES/OBSERVATIONS:

Task Description: Scaffolding Safety **Date JSA Developed:** 03/25/2015

Name and Address of Worksite: Ashland Glens Falls – 89 Lower Warrant Street, Queensbury, NY 12804

Project Manager/Site Supervisor: Mark Schumacher

PPE Required for this Job

- ☒ Hard Hat
- ☒ Safety Glasses
- ☒ Safety Toe Shoes
- ☐ Hearing Protection
- ☒ Hi-Vis Traffic Safety Vest
- ☐ Respirator
- ☒ Gloves (specify type):
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Special Considerations

- ☒ Lighting
- ☒ Nearby Activities
- ☐ Simultaneous Operations
- ☒ Weather and Temperature Extremes
- ☒ Time of Day/Night
- ☐ Tight/Crowded Work Space
- ☐ Environmental Sensitivities
- ☐ Automatic Equipment
- ☐ Other:

Required Permits

- ☐ None
- ☐ Confined Space
- ☐ Hot Work
- ☐ Ground Disturbance
- ☒ Working From Heights
- ☐ Other Permit _____

JOB SAFETY ANALYSIS

Step Number	Sequence of Basic Task Steps (List the steps required to perform the activity in the sequence they occur)	Potential Hazards Involved With This Step (List the energy sources)	How will the energy be managed? List Control Measures (Eliminate, Control, Protect)	Stop Work Triggers for this task? (We will stop the job if any of these occur)
1.	Unloading Scaffolding	1.) Bumped, bruise hand, pinch finger (Motion) 2.) Strain back, arms (Motion & Gravity)	1.) Wear leather work gloves; avoid pinch points, hitting hand on objects. 2.) Use proper lifting techniques (bend knees, use legs to lift, keep back straight, do not twist, keep object close to body). Do not over lift (<40 lbs), use helper or mechanical device as needed. Maintain secure hold of materials while transporting.	Scaffolding material damaged-- inspect materials before use
2.	Setting Up Scaffolding	1.) Bumped, bruise hand, pinch finger (Motion) 2.) Strain back, arms (Motion & Gravity) 3.) Slip/trip/fall carrying materials (Motion & Gravity) 4.) Struck by falling scaffolding (Motion & Gravity)	1.) Wear leather work gloves; avoid pinch points, hitting hand on objects. 2.) Use proper lifting techniques (bend knees, use legs to lift, keep back straight, do not twist, keep object close to body). Do not over lift (<40 lbs), use helper or mechanical device as needed. Maintain secure hold of materials. 3.) Inspect path for obstacles, uneven terrain, slippery surfaces, watch where you are walking/keep clear view of path, and maintain good housekeeping. 4.) Install scaffolding with at least 2 people and per manufacturers' requirements. 5.) A competent person shall inspect scaffolding before each work shift, when in	Scaffolding material too heavy or too awkward to carry safely. Material in danger of falling.

			use, and before work resumes after scaffolding has been altered or moved.	
3.	Climbing Up the Scaffolding	1.) Hand injuries (Motion) 2.) Muscle strain (Motion, Gravity) 3.) Striking objects (Motion) 5.) Fall off scaffolding (Motion, Gravity) 6.) Scaffolding falling over (Gravity)	1.) Wear leather work gloves; avoid pinch points, hitting hand on objects. 2.) Do not over reach, do not twist, and avoid awkward positioning. 3.) Look out for objects- overhead hazards, tight areas, objects in the way, objects on ground. 5.) Fall protection required if working above 6 feet. Maintain 3 points of contact while climbing; do not hold objects while climbing. 6.) Make sure scaffolding remains stable while climbing, use spotter as necessary.	Scaffolding becomes unstable, worker distracted from task
4.	Working While on the Scaffolding	1.) Muscle strain (Motion, Gravity), 2.) Hand injury (Motion), 3.) Fall off scaffolding (Motion, Gravity) 4.) Scaffolding falling over (Gravity)	1.) Do not overexert while working on scaffolding, avoid twisting or awkward positioning that could cause loss of balance. 2.) Wear leather work gloves, avoid pinch points. 3.) Maintain 3 points of contact while climbing; do not hold objects while climbing. Fall protection required if working above 6 feet. 4.) Make sure scaffolding remains stable while climbing, use spotter as necessary. A competent person shall inspect scaffolding before each work shift, when in use, and before work resumes after scaffolding has been altered or moved.	Unable to maintain stability while working on scaffolding, worker distracted from task

Mark Schumacher		
Project Manager	Signature	Date

Site Safety Officer	Signature	Date

JSA Team Member Agreement

By my signature below, I understand and agree to the following statements and will strive to achieve a safe job outcome for me, my co-workers, and the job-site.

- I have participated in the development of this JSA and will use the proper equipment, procedures, and PPE
- I know and understand the energy sources and potential hazards involved in the steps.
- I understand and will apply the energy management actions for which I have responsibility.
- If any condition or activity occurs that I consider unsafe I will safely stop the job and report the situation

- If a Stop the Job trigger occurs, I will safely stop the job and alert others to do the same.

Print Name	Signature

Print Name	Signature

Task Description: Scissor Lift Safety **Date JSA Developed:** 03/25/2015

Name and Address of Worksite: Ashland Glens Falls – 89 Lower Warrant Street, Queensbury, NY 12804

Project Manager/Site Supervisor: Mark Schumacher

PPE Required for this Job

- ☒ Hard Hat
- ☒ Safety Glasses
- ☒ Safety Toe Shoes
- ☐ Hearing Protection
- ☒ Hi-Vis Traffic Safety Vest
- ☐ Respirator
- ☒ Gloves (specify type):
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Special Considerations

- ☒ Lighting
- ☒ Nearby Activities
- ☐ Simultaneous Operations
- ☒ Weather and Temperature Extremes
- ☐ Time of Day/Night
- ☐ Tight/Crowded Work Space
- ☐ Environmental Sensitivities
- ☒ Automatic Equipment
- ☐ Other:

Required Permits

- ☐ None
- ☐ Confined Space
- ☐ Hot Work
- ☐ Ground Disturbance
- ☒ Working From Heights
- ☐ Other Permit _____

JOB SAFETY ANALYSIS

Step Number	Sequence of Basic Task Steps (List the steps required to perform the activity in the sequence they occur)	Potential Hazards Involved With This Step (List the energy sources)	How will the energy be managed? List Control Measures (Eliminate, Control, Protect)	Stop Work Triggers for this task? (We will stop the job if any of these occur)
1.	Unload/load scissor lift from vehicle or storage location	1.) Bumped, bruise hand, pinch points (Motion) 2.) Foot injury (Motion) 3.) Contact with moving scissor lift (Motion)	1.) Wear leather work gloves; avoid pinch points, hitting hand on objects. 3.) Wear steel toe shoes. 2.) Back-up signals on moving machinery; qualified operator moving scissor lift; inspect unloading/loading area before operation.	Unloading/loading area is not clear of unnecessary people
2.	Moving scissor lift to and from work locations	1.) Foot injury (Motion) 2.) Contact with moving scissor lift (Motion) 3.) Falling off scissor lift (Motion & Gravity) 4.) Environmental release (Chemical)	1.) Wear steel toe shoes. 2.) Inspect path for obstacles uneven terrain, slippery surfaces, watch where you are walking/keep clear view of path, maintain good housekeeping, qualified operator moving scissor lift. 3.) Personnel must have fall protection equipment above 6 feet and be properly trained. 4.) Scissor lift must be inspected regularly for proper working condition; spill kit must be on-site.	Travel path is not clear of personnel or objects
3.	Working while on scissor lift	1.) Striking objects (Motion & Gravity) 2.) Falling off scissor lift (Motion & Gravity)	1.) Have a firm grasp of equipment being used; tie off applicable equipment; look out for objects- overhead hazards, tight areas, objects in the way, objects on ground. 2.) Personnel must have fall protection	High winds at work location; personnel become distracted

		3.) Environmental release (Chemical)	equipment above 6 feet and be properly trained. 3.) Scissor lift must be inspected regularly for proper working condition; spill kit must be on-site.	while working

Mark Schumacher		
Project Manager	Signature	Date

Site Safety Officer	Signature	Date

JSA Team Member Agreement

By my signature below, I understand and agree to the following statements and will strive to achieve a safe job outcome for me, my co-workers, and the job-site.

- I have participated in the development of this JSA and will use the proper equipment, procedures, and PPE
- I know and understand the energy sources and potential hazards involved in the steps.
- If a Stop the Job trigger occurs, I will safely stop the job and alert others to do the same.
- I understand and will apply the energy management actions for which I have responsibility.
- If any condition or activity occurs that I consider unsafe I will safely stop the job and report the situation

Print Name	Signature

Print Name	Signature

Task Description: Decontamination Procedures **Date JSA Developed:** 03/25/2015

Name and Address of Worksite: Ashland Glens Falls – 89 Lower Warrant Street, Queensbury, NY 12804

Project Manager/Site Supervisor: Mark Schumacher

PPE Required for this Job

- ☒ Hard Hat
- ☒ Safety Glasses
- ☒ Safety Toe Shoes
- ☐ Hearing Protection
- ☒ Hi-Vis Traffic Safety Vest
- ☐ Respirator
- ☒ Gloves (specify type):
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Special Considerations

- ☐ Lighting
- ☐ Nearby Activities
- ☐ Simultaneous Operations
- ☐ Weather and Temperature Extremes
- ☐ Time of Day/Night
- ☐ Tight/Crowded Work Space
- ☐ Environmental Sensitivities
- ☐ Automatic Equipment
- ☐ Other:

Required Permits

- ☐ None
- ☐ Confined Space
- ☐ Hot Work
- ☐ Ground Disturbance
- ☐ Working From Heights
- ☐ Other Permit _____

JOB SAFETY ANALYSIS

Step Number	Sequence of Basic Task Steps (List the steps required to perform the activity in the sequence they occur)	Potential Hazards Involved With This Step (List the energy sources)	How will the energy be managed? List Control Measures (Eliminate, Control, Protect)	STOP Stop Work Triggers for this task? (We will stop the job if any of these occur)
1.	Decon Set-Up	1.) Exposure to site traffic (Motion) 2.) Decon unit shifting while disconnecting from equipment (Motion & Gravity)	1.) Proper PPE (reflective vest); Identify high traffic areas; Use buddy system if more than one person; and be aware of other potential activities/work being conducted at site; Set up exclusion zone to include decon. 2.) Chalk tire of moveable equipment.	Safe decon location cannot be identified; unable to chalk tires
2.	Decon Operations	1.) Noise (Pressure) 2.) Pinch points and falling objects (Motion & Gravity) 3.) Slip/trip/fall hazards due to wet surface (Motion 4.) High pressure water or steam (Pressure & Heat/Cold)	1.) Hearing Protection must be worn. 2.) Secure equipment, wear hard hat, safety glasses, leather or synthetic work gloves, safety toed boots. 3.) Choose location that will minimize hazard. Lay down plywood or sand as needed 4.) Proper PPE to include safety face shield and gloves.	Correct PPE not available; slipping hazards cannot be mitigated
3.	Clean-Up	1.) Slip/trip/fall hazards (Motion & Gravity)	1.) Make careful visual sweep of site, Check for tools, debris, or dirt left on site. Watch your step.	Slipping hazards cannot be mitigated
4.	Preparation for Return to Office	1.) Materials falling off truck (Motion,	1.) Perform a pre-trip walk around to make sure everything is secure; Put all tools away where they will not fall off of truck;	Materials cannot be

		Gravity),	Make sure all safety pins and other securing devices are in place; Double check safety pin on equipment.	properly stored in truck

Mark Schumacher		
Project Manager	Signature	Date

Site Safety Officer	Signature	Date

JSA Team Member Agreement

By my signature below, I understand and agree to the following statements and will strive to achieve a safe job outcome for me, my co-workers, and the job-site.

- I have participated in the development of this JSA and will use the proper equipment, procedures, and PPE
- I know and understand the energy sources and potential hazards involved in the steps.
- If a Stop the Job trigger occurs, I will safely stop the job and alert others to do the same.
- I understand and will apply the energy management actions for which I have responsibility.
- If any condition or activity occurs that I consider unsafe I will safely stop the job and report the situation

Print Name	Signature

Print Name	Signature

Task Description: **Crane Operation Safety** **Date JSA Developed:** 03/25/2015

Task Description: Crane Operation Safety **Date JSA Developed:** 03/25/2015

Name and Address of Worksite: Ashland Glens Falls – 89 Lower Warrant Street, Queensbury, NY 12804

Project Manager/Site Supervisor: Mark Schumacher

PPE Required for this Job

- ☒ Hard Hat
- ☒ Safety Glasses
- ☒ Safety Toe Shoes
- ☐ Hearing Protection
- ☒ Hi-Vis Traffic Safety Vest
- ☐ Respirator
- ☒ Gloves (specify type):
- ☒ Other: Fire Extinguisher
- ☐ Other:
- ☐ Other:

Special Considerations

- ☒ Lighting
- ☒ Nearby Activities
- ☐ Simultaneous Operations
- ☒ Weather and Temperature Extremes
- ☐ Time of Day/Night
- ☒ Tight/Crowded Work Space
- ☐ Environmental Sensitivities
- ☒ Automatic Equipment
- ☐ Other:

Required Permits

- ☐ None
- ☐ Confined Space
- ☐ Hot Work
- ☐ Ground Disturbance
- ☐ Working From Heights
- ☐ Other Permit

JOB SAFETY ANALYSIS

Step Number	Sequence of Basic Task Steps (List the steps required to perform the activity in the sequence they occur)	Potential Hazards Involved With This Step (List the energy sources)	How will the energy be managed? List Control Measures (Eliminate, Control, Protect)	Stop Work Triggers for this task? (We will stop the job if any of these occur)
1.	Unload/load crane from vehicle or storage location	1.) Bumped, bruise hand, pinch points (Motion) 2.) Foot injury (Motion) 3.) Contact with moving crane (Motion)	1.) Wear leather work gloves; avoid pinch points, hitting hand on objects. 3.) Wear steel toe shoes. 2.) Back-up signals on moving machinery; qualified operator moving crane; inspect unloading/loading area before operation.	Unloading/loading area is not clear of unnecessary people
2.	Moving crane to/from work location	1.) Foot injury (Motion) 2.) Contact with moving crane (Motion) 3.) Falling off crane (Motion & Gravity) 4.) Environmental release (Chemical)	1.) Wear steel toe shoes. 2.) Inspect path for obstacles uneven terrain, slippery surfaces, watch where you are walking/keep clear view of path, maintain good housekeeping, qualified operator moving crane. 3.) Personnel must have fall protection equipment above 6 feet and be properly trained. 4.) Crane must be inspected regularly for proper working condition; spill kit must be on-site.	Travel path is not clear of personnel or objects
3.	Working while on crane	1.) Striking objects (Motion & Gravity) 2.) Falling off crane (Motion & Gravity)	1.) Have a firm grasp of equipment being used; tie off applicable equipment; look out for objects- overhead hazards, tight areas, objects in the way, objects on ground. 2.) Personnel must have fall protection	High winds at work location; personnel

		3.) Environmental release (Chemical)	equipment above 6 feet and be properly trained. 3.) Crane must be inspected regularly for proper working condition; spill kit must be on-site.	become distracted while working

Mark Schumacher		
Project Manager	Signature	Date

Site Safety Officer	Signature	Date

JSA Team Member Agreement

By my signature below, I understand and agree to the following statements and will strive to achieve a safe job outcome for me, my co-workers, and the job-site.

- I have participated in the development of this JSA and will use the proper equipment, procedures, and PPE
- I know and understand the energy sources and potential hazards involved in the steps.
- If a Stop the Job trigger occurs, I will safely stop the job and alert others to do the same.
- I understand and will apply the energy management actions for which I have responsibility.
- If any condition or activity occurs that I consider unsafe I will safely stop the job and report the situation

Print Name	Signature

Print Name	Signature

Task Description: Onsite Driving **Date JSA Developed:** 3/25/2014

Name and Address of Worksite: Ashland Glens Falls – 89 Lower Warren Street, Queensbury, NY 12809

Project Manager/Site Supervisor: Mark Schumacher

PPE Required for this Job

- ☐ Hard Hat
- ☐ Safety Glasses
- ☒ Safety Toe Shoes
- ☐ Hearing Protection
- ☐ Hi-Vis Traffic Safety Vest
- ☐ Respirator
- ☐ Gloves (specify type):Leather, Nitrile
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Special Considerations

- ☒ Lighting
- ☐ Nearby Activities
- ☐ Simultaneous Operations
- ☒ Weather and Temperature Extremes
- ☒ Time of Day/Night
- ☐ Tight/Crowded Work Space
- ☐ Environmental Sensitivities
- ☐ Automatic Equipment
- ☐ Other:

Required Permits

- ☒ None
- ☐ Confined Space
- ☐ Hot Work
- ☐ Ground Disturbance
- ☐ Working From Heights
- ☐ Other Permit _____

JOB SAFETY ANALYSIS

Step Number	Sequence of Basic Task Steps (List the steps required to perform the activity in the sequence they occur)	Potential Hazards Involved With This Step (List the energy sources)	How will the energy be managed? List Control Measures (Eliminate, Control, Protect)	Stop Work Triggers for this task? (We will stop the job if any of these occur)
1.	Check maps to become familiar with area of work	None	None	None
2.	Consider recent, present, and future weather prior to commencing work	1.) Icy conditions could make it difficult driving conditions across site (heat & cold) 2.) Recent snowfall could block site access (Heat & Cold) 3.)Excessive rains could make access to different parts of site impossible (Other)	1.) Contact Site Supervisor or Project Manager to schedule site salting 2.) Contact Site Supervisor or Project Manager to schedule site plowing 3.) Do not attempt to drive through inundated pads unless vehicle can handle the depths of water present.	-Icy conditions or flooded conditions exist onsite
3.	Drive to area of work, sticking to site access roads.	1.) Bottom out vehicle on ruts/potholes in site access roads (Motion) 2.) Vehicle could get swamped by water if former building pads are flooded (Other)	1.) Drive slowly across site (less than 15 mph) 2.) Do not attempt to drive through inundated pads unless vehicle can handle the depths of water present.	-Not comfortable with driving conditions onsite.
4.	If absolutely necessary and vehicle	1.) Vehicle could become stuck in ice/snow/mud.	1.) Only leave site access roads if vehicle has off road capabilities. Even so, check area of work to assess whether a vehicle should attempt to drive to location.	-Vehicle becomes stuck off of road -Unfamiliar with area

	has off road capabilities, drive off of vehicle access roads to work area.	2.) Could drive over one of extraction well vaults if unfamiliar with lower area.	2.) If you are unfamiliar with lower area south of access road, get out and walk area to be driven to. Make certain path of travel does cross extraction well vaults.	and tall grass/weeds or snow obscure view of ground surface.
Note If vehicle becomes bogged down and will not move, STOP immediately. Spinning wheels likely only make situation worse. Additionally, lower area south of access roads has known shallow buried utilities that could be damaged. Get out of vehicle, assess situation, and call for help if necessary.				

Mark Schumacher		
Project Manager	Signature	Date

Site Safety Officer	Signature	Date

JSA Team Member Agreement

By my signature below, I understand and agree to the following statements and will strive to achieve a safe job outcome for me, my co-workers, and the job-site.

- I have participated in the development of this JSA and will use the proper equipment, procedures, and PPE
- I know and understand the energy sources and potential hazards involved in the steps.
- If a Stop the Job trigger occurs, I will safely stop the job and alert others to do the same.
- I understand and will apply the energy management actions for which I have responsibility.
- If any condition or activity occurs that I consider unsafe I will safely stop the job and report the situation

Print Name	Signature

Print Name	Signature

APPENDIX F
On-site Chemical MSDS's

FIGURES

ROUTE TO HOSPITAL MAP
AND
SITE MAPS

Appendix D

Community Air Monitoring Plan (CAMP)

COMMUNITY AIR MONITORING PROGRAM

Former CIBA-GEIGY/HERCULES Plant Site
89 Lower Warren Street, Queensbury, NY
EPA ID: NYD002069748

Antea Group Project No. GLENSFALLS
August 12, 2015

Prepared for:
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&
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Inogen Environmental Alliance

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Community Air Monitoring Program

Former CIBA-GEIGY/HERCULES Plant Site
Queensbury, New York

1.0 INTRODUCTION

1.1 GENERAL

This Community Air Monitoring Plan (CAMP) presents requirements for real-time community air monitoring and associated response actions (if required) during decommissioning and demolition activities associated with the aboveground storage tank (AST) system and associated infrastructure located within the Pretreatment Plant (PTP) Solid Waste Management Unit (SWMU) at the at the Former Ciba Geigy/Hercules Plant Site located in Queensbury, New York. This CAMP is consistent with the requirements for community air monitoring at remediation sites as established by the New York State Department of Health (NYSDOH) and the New York State Department of Environmental Conservation (NYSDEC). The plan follows procedures and practices outlined under the NYSDOH's Generic Community Air Monitoring Plan, dated June 2000.

The intent of this CAMP is to provide for a measure of protection of downwind communities from potential airborne releases of constituents of concern (COCs) during the decommissioning and demolition activities.. As such, this CAMP specifies the potential air emissions, air monitoring procedures, monitoring schedule and data collection and reporting for the activities to be conducted as described below.

1.2 DECOMMISSIONING ACTIVITIES

In general, the proposed decommissioning activities will include the following tasks:

- Waste characterization sampling
- Water/sludge removal
- Decontamination of ASTs and vessels, including all ancillary piping and equipment and associated drains and sumps (pressure washing)
- Decommissioning of subgrade piping
- Demolition of ASTs, ancillary equipment, above ground piping, support structures and buildings
- Waste handling and disposal
- Confirmatory sampling

- Visual inspection
- Site equipment cleaning and decontamination

A more detailed description of the cleaning activities can be found in Sections 6.0 and 7.0 of the AST Decommissioning & Facilities Demolition Work Plan.

1.3 POTENTIAL AIR EMISSIONS RELATED TO DECOMMISSIONING ACTIVITIES

Activities which may affect air quality include removal of water and sludge from inside the AST and vessels, pressure washing tanks inside a building, pressure washing inside a tank open to the environment, demolition of infrastructure, handling of waste, equipment decontamination and vehicular traffic on the site.

2.0 AIR MONITORING PROCEDURES

2.1 GENERAL

Real-time air monitoring will be implemented at the site for VOCs, and particulate matter less than 10 microns in diameter (PM10). A site boundary will be established for the purpose of air monitoring. Upwind and downwind monitoring locations will be determined through visual observation (wind vane, windsock, or similar technique). Monitoring will occur at each cleaning location and will include the use of portable instruments capable of instantaneous readings, average readings (15 minute and 8 hour), and data logging. Baseline air sampling will take place prior to the start of work.

2.2 SAMPLING LOCATION SELECTION

Specific sampling activities and locations will be determined daily based on visual observation of the wind direction, precipitation and work tasks. Air monitoring equipment will be placed upwind, downwind, and at current working locations as selected daily. The locations will be established at the start of the workday. If the wind direction during the workday shifts greater than 45 degrees from the original upwind direction, then new upwind and downwind sampling locations will be established and location changes will be documented in the field logbook.

2.3 VOCs MONITORING

VOCs will be monitored continuously with instrumentation that is equipped with electronic data logging capabilities. A RAE® Systems MiniRAE 2000 (or equivalent) will be used to conduct the real-time VOC monitoring. All 15-minute readings will be recorded, as well as any instantaneous readings taken to facilitate activity decisions.

2.4 PARTICULATE MATTER MONITORING

Real-time particulate matter will be monitored continuously during site activities using instrumentation equipped with electronic data-logging capabilities. A Thermo Scientific MIE DataRAM (or equivalent) will be used to conduct the real-time PM10 monitoring. All 15-minute readings will be recorded, as well as any instantaneous readings taken to facilitate activity decisions.

2.5 ACTION LEVELS

The action levels provided below are to be used to initiate response actions, if necessary, based on real-time monitoring.

2.5.1 ACTION LEVELS FOR VOCs

If the ambient air concentration of total VOCs exceeds 5 parts per million (ppm) above the background (upwind location) for the 15-minute average, work activities will be temporarily halted while monitoring continues. If the total VOC concentration readily decreases (through observation of instantaneous readings) below 5 ppm above background, then intrusive site activities can resume with continuous monitoring.

If the ambient air concentrations of total VOCs persist at levels in excess of 5 ppm above background but less than 25 ppm above background, work activities will be halted, the source of the elevated VOC concentrations identified, corrective actions to reduce or abate the emissions undertaken, and air monitoring will be continued. Once these actions have been implemented, work activities can resume provided the following two conditions are met:

- The 15-minute average VOC concentrations remain below 5 ppm above background.
- The VOC level 200 feet downwind of the sample location, or half the distance to the nearest potential receptor or residential/commercial structure (whichever is less but in no case less than 20 feet), is below 5 ppm over background for the 15-minute average.

If the ambient air concentrations of total VOCs are above 25 ppm above background, the intrusive site activities will cease, and emissions control measures will be implemented.

2.5.2 ACTION LEVELS FOR PARTICULATE MATTER

If the ambient air concentration of PM_{10} at any one (or more) of the sampling locations is noted at levels in excess of 100 micrograms per cubic meter ($\mu g/m^3$) above the background (upwind location) for a 15-minute period, or if airborne mist, aerosol or dust is observed leaving the work area, site activities will be temporarily halted. The source of the elevated PM_{10} concentration will be identified, corrective actions to reduce or abate the emissions will be undertaken, and air monitoring will continue. Work may continue following the implementation of dust suppression techniques provided the PM_{10} levels do not exceed 150 $\mu g/m^3$ above background and provided no visible mist, aerosol or dust is migrating from the work area.

If, after implementation of dust suppression techniques, PM_{10} levels are greater than 150 $\mu g/m^3$ above background, work must be stopped and site activities must be re-evaluated. Work may only resume provided that the suppression measures and other controls are successful in reducing PM_{10} levels less than 150 $\mu g/m^3$ above background and in preventing visible dust from leaving the site.

If the ambient air concentration of PM_{10} is above 150 $\mu g/m^3$ above background, the site activities must cease and emissions control measures must be implemented.

2.6 METEOROLOGICAL MONITORING

Wind direction and precipitation are the only meteorological conditions considered relevant for the work activities and CAMP. Air monitoring may be waived on days where precipitation could affect air monitoring results. Wind direction monitoring will be conducted periodically at the site using a windsock, wind vane, or other appropriate equipment. Wind direction will be established at the start of each work day and may be re-established at any time during the work day if a significant shift in wind direction is noted.

2.7 INSTRUMENT CALIBRATION

Calibration of the VOC and PM_{10} instrumentation will occur in accordance with each of the equipment manufacturer's calibration and quality assurance requirements. The VOC and PM_{10} monitors will be calibrated at least daily, and calibrations will be recorded in the field activity logbook.

3.0 MONITORING SCHEDULE AND DATA COLLECTION/REPORTING

3.1 GENERAL

The proposed monitoring schedule and data collection and reporting requirements are discussed below.

3.2 MONITORING SCHEDULE

Community air monitoring will be performed when site activities have the potential to create aerosol, dust, vapors, etc. as defined in Section 1.3 above and as meteorological conditions allow.

3.3 DATA COLLECTION AND REPORTING

Air monitoring data will be collected continuously from VOC and PM_{10} monitors during intrusive site activities by an electronic data logging system. The data management software will be set up so that instantaneous observed readings would be recorded by the electronic data acquisition system and averaged over 15-minute time periods. The 15-minute readings and instantaneous readings taken to facilitate activity decisions will be recorded and archived for review by NYSDOH and NYSDEC personnel.

Appendix E

Quality Assurance Project Plan (QAPP)

QUALITY ASSURANCE PROJECT PLAN

Former CIBA-GEIGY/HERCULES Plant Site
89 Lower Warren Street, Queensbury, NY
EPA ID: NYD002069748

Antea Group Project No. GLENSFALLS
August 12, 2015

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Appendix

Quality Assurance Project Plan

Former CIBA-GEIGY/HERCULES Plant Site
Queensbury, New York

1.0 INTRODUCTION

This document represents the Quality Assurance Project Plan (QAPP), which is Appendix E of the AST System Decommissioning & Facilities Demolition Work Plan for the Former CIBA-GEIGY/HERCULES Main Plant Site (hereinafter the "Site"). This QAPP describes the field and laboratory Quality Assurance (QA) and Quality Control (QC) measures to be implemented during the project. This QAPP was prepared in accordance with New York State Department of Environmental Conservation (NYSDEC's) guidance document entitled "DER-10: Technical Guidance for Site Investigation and Remediation", which is dated May 2010.

2.0 SITE GOALS

The objectives of this project are to properly decommission and demolish the aboveground storage tank (AST) system including all ancillary piping valves, vessels, filter units, sumps and other associated process related equipment located within the Pretreatment Plant (PTP) Solid Waste Management Unit (SWMU) at the Site. Decommissioning activities will generally consist of:

- Waste characterization sampling
- Water/sludge removal
- Decontamination of ASTs and vessels, including all ancillary piping and equipment and associated drains and sumps (pressure washing)
- Decommissioning of subgrade piping
- Demolition of ASTs, ancillary equipment, above ground piping and support structures and buildings
- Waste handling and disposal
- Confirmatory sampling
- Visual inspection
- Site equipment cleaning and decontamination

NYSDEC does not have published performance standards for target levels of contaminants of concern (COCs) that would demonstrate successful cleaning of the tank systems' and associated ancillary equipment and facilities. Therefore proposed criteria for demonstrating successful cleaning will be attainment of levels of COCs in confirmatory rinse water samples at concentrations that are at and/or below Part 703 Class GA groundwater quality standards for detected analytes. Site COCs include RCRA metals, hexavalent chromium, vanadium and cyanide. In addition, any additional analytes that are detected in liquid and sludge waste characterization samples will be evaluated against their specific Class GA standard.

3.0 QUALITY ASSURANCE OBJECTIVES

3.1 DATA QUALITY OBJECTIVES

DQOs are qualitative and quantitative statements specifying the required quality of data necessary to support aboveground storage tank cleaning activities. Data quality is defined as the degree of certainty in a data set with respect to precision, accuracy, representativeness, completeness and comparability (PARCC). A description of PARCC parameters is described below.

Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation. Various measures of precision exist depending upon the "prescribed similar conditions".

Accuracy is the degree of agreement of a measurement (or an average of measurements) with an accepted reference or "true value". Accuracy is one estimate of the bias in a system.

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

Comparability expresses the confidence with which one data set can be compared to another data set.

It is the responsibility of the field team to collect representative and complete samples. It is the responsibility of the analytical laboratory to analyze these samples using accepted protocols resulting in data that meet PARCC standards.

The following categories of data quality may be utilized during the decommissioning activities. These categories consistent with those outlined in the USEPA Guidance document entitled Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, dated October 1988, and are described below.

- DQO Level 1 - Field Screening Utilizing Portable Instrumentation: Data used for site health and safety monitoring and field screening during site characterization activities. The data generally determines the presence or absence of certain constituents and is generally qualitative rather than quantitative. Field screening data provides the lowest data quality.
- DQO Level 2 - Field Laboratory Analysis: Data used for field screening during site characterization activities, evaluation of remedial alternatives, engineering design and monitoring during implementation of alternatives. The data generally determines levels of certain constituents relative to a calibration standard and is generally qualitative or quantitative.
- DQO Level 3 – Engineering Level Data: Data used for site characterization, risk assessment, evaluation of alternatives, engineering design and monitoring during implementation of alternatives. The data is quantitative and is generated using EPA analytical laboratory procedures; however, it does not include full Contract Laboratory Protocol (CLP) documentation.
- DQO Level 4 - Laboratory Analysis: Data used for risk assessment, evaluation of alternatives and engineering design. The data is quantitative and is generated using EPA analytical laboratory procedures. All analyses require full Analytical Services Protocol (ASP)/CLP analytical protocols including Data Usability Summary Reports (DUSR). Only data generated to confirm effectiveness of the tank cleaning activities (confirmatory samples) will require DQO Level 4.
- DQO Level 5 – Non-Standard Special Analytical Services: Data for use when analysis by non-standard procedures is required to obtain specific or lower detection limits or analyses are not of a nature typically performed under the CLP Routine Analytical Service (RAS) Program.

DQOs have been developed for the tasks outlined in the AST Decommissioning & Facilities Demolition Work Plan. The DQOs are designed to support tank cleaning operations and confirmatory sampling activities. During the cleaning process it is anticipated that DQO Levels 1 and 4 will primarily be utilized.

DQO Level 1 data (field screening) will be generated during cleaning operations including: air quality monitoring; and health and safety monitoring.

DQO Level 4 data (laboratory analysis by CLP/ASP Methods) will be generated during confirmatory sampling for the decontaminated tanks.

DQO Level 2 data (field analysis), DQO Level 3 data (engineering) and DQO Level 5 (non-standard) data are not expected to be generated as part of the initial cleaning activities. However, these data at these DQO levels may be generated during supplemental activities, if required.

3.2 FIELD SAMPLING QUALITY OBJECTIVES

The objectives with respect to field sampling activities are to maximize the confidence in the data in terms of PARCC. Field Internal Quality Control Checks will be utilized during this work through the use of field duplicates as presented below.

Precision will be calculated as relative percent difference (RPD) if there are only two analytical points, and percent relative standard deviation (%RSD) if there are more than two analytical points. Through the submission of field QC samples, the distinction may be made between analytical problems, sampling technique considerations, and sample matrix variability. This distinction will be made by the data reviewer based on industry guidelines and personal judgment.

To assure representativeness, a field sampling plan has been devised that estimates the number of samples to be collected. This plan is presented in the Field Sampling Plan (FSP). The data quality objective for the completeness of all data to be collected during this work is 100%. In other words, the objective is to collect samples from all of the locations noted in the FSP (Appendix B to the Aboveground Storage Tank Cleaning Work Plan). In the event 100% is not obtained due to inaccessibility of sampling points or other field conditions, the effect that the missing data will have on the projects objectives will be evaluated. If necessary, corrective action will be initiated to resolve any data gaps that develop as a result of less than 100% data completeness. Every effort will be made to obtain valid data for all sampling points, particularly those identified by the Site Manager as critical points.

In order to establish a degree of comparability, such that observations and conclusions can be directly compared with all historical data, standardized methods of field analysis, sample collection, holding times, sample preservation

and standard units of measurement for data will be used. In addition, field conditions will be documented and considered when evaluating data to determine the effects of sample characteristics on analytical results. Whenever possible, the same sampling team will obtain all samples to reduce inconsistencies which may be caused by technique and time variables.

3.3 LABORATORY DATA QUALITY OBJECTIVES

The laboratory will demonstrate analytical precision and accuracy by adherence to accepted manufacture and procedural methodologies.

The performance of the laboratory will be evaluated by the Project Manager and Project Quality Assurance Officer during data reduction. The evaluation will include a review of all deliverables for completeness and accuracy when applicable.

4.0 QUALITY CONTROL PROCEDURES

This section presents a general overview of the quality assurance and quality control procedures that will be implemented during the tank cleaning operations. These quality control procedures are to be implemented as follows:

- at the factory for certain manufactured products;
- in the field; and
- In the laboratory utilized for selected sample analyses.

4.1 SAMPLING ACTIVITIES

Sampling and analysis will be conducted to characterize waste and confirm decontamination of the tank systems, vessels, piping, ancillary equipment and sumps. General field sampling procedures are described in the FSP. Samples will be handled by all field and laboratory personnel in a manner, which allows for custody tracking and maintenance of the validity of the samples. Sample custody procedures are presented as Appendix A of this QAPP.

All sampling equipment, field measuring equipment and heavy equipment will be decontaminated according to the decontamination procedures presented in FSP.

All field activities will be documented in accordance with the FSP.

5.0 CALIBRATION PROCEDURES

Laboratory calibration and frequency for specific analytical methods and pieces of equipment are specified in USEPA SW846 and the laboratory's Standard Operating Procedures.

During the course of cleanup activities, samples may be screened with a photoionization detector (PID) in the field. A PID and particulate matter measuring device will be also be used to continuously monitor air quality upwind, downwind, and at the active cleaning location. A maintenance, calibration, and operation program will be implemented to ensure that routine calibration and maintenance is performed on all field instruments. This program will be monitored by the Site Manager. Trained team members will perform scheduled calibration, field calibrations, checks, and instrument maintenance prior to use each day. Additionally, calibration will be checked as necessary to ascertain that proper measurements are being taken.

Team members are familiar with the field calibration, operation, and maintenance of the equipment, and will perform the prescribed field operating procedures outlined in the operation and field manuals accompanying the respective instrument. Field personnel will keep records of all field instruments calibrations and field checks in the field logbooks. Calibration information recorded in field logbooks will include date, time, instrument model and serial number, a description of calibration or field check procedure, and any instrument deviations.

If on-site monitoring equipment should fail, the Site Manager will be contacted immediately. Replacement equipment will be provided or the malfunction will be repaired in a timely fashion.

6.0 ANALYTICAL PROCEDURES AND DATA EVALUATION

Confirmatory rinsate samples will be analyzed for site contaminants of concern (RCRA 8 metals, hexavalent chromium, vanadium and cyanide) plus any analytes that are detected in liquid and sludge waste characterization samples. Additional analytes detected in the liquid waste sample collected on May 20, 2015 included metals (aluminum, antimony, beryllium, calcium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, sodium

and zinc), which will be included in the analyte list. Any additional analytes, which may be detected in sludge samples (if present) will be also included.

In general, laboratory analytical procedures will adhere to NYS ASP 2005 and/or to USEPA SW-846 methodologies as appropriate. The laboratory will adhere to the requirements of NYS ASP 2005 in conjunction with the CLP. Samples will be analyzed by a laboratory that is a NYSDOH ELAP certified laboratory that participates in the CLP and is experienced in performing ASP analyses. A summary of the sampling program and analytical methods are shown in Table 6-1.

Upon receipt of analytical reports from the laboratory, the data packages will be evaluated to confirm that samples were analyzed within required holding time and at proper detection limits. Data validation will be conducted for all samples analyzed in accordance with ASP methodologies. The laboratory will provide ASP 2005 category B QA/QC backup for data packages with all confirmation sampling analytical reports. These packages will be reviewed for completeness and provided upon request.

Table 6-1

Analytical Methods/Quality Assurance Summary Table

Sample Matrix	Sample Location	Analytical Parameters	Analytical Methods	Preservation	Holding Time	Estimated Number of Samples	Duplicates and MS/MSD (1per 20)
Rinsate	500,000 gal AST; <500 gal AST; Ancillary piping and equipment, sumps and drains	TAL Metals (includes RCRA 8)	EPA 6010; EPA 7470 (Mercury)	Acetic acid in water; pH 4.93 +/- 0.05. Cool to 4°C.	6 months, except Mercury (28 days)	35	6
Rinsate	500,000 gal AST; <500 gal AST; Ancillary piping and equipment, sumps and drains	Hexavalent Chromium	EPA 7196a	Cool to 4°C.	24 hours	35	6
Rinsate	500,000 gal AST; <500 gal AST; Ancillary piping and equipment, sumps and drains	Total Cyanide	EPA 4500_CN_E	Sodium Hydroxide. Cool to 4°C.	180 days	35	6
Rinsate	500,000 gal AST; <500 gal AST;	Vanadium	EPA 6010	Acetic acid in water;	6 months	35	6

	Ancillary piping and equipment, sumps and drains			pH 4.93 +/- 0.05. Cool to 4°C.			

Notes:

Sample Frequency:

1: 500,000 gal AST - 1 per bottom / 1 per sidewall quadrant

2: <500 gal vessels - 1 per vessel

3: Ancillary Piping/Equipment - 1 per 25 feet of pipe run

4: Sumps/Drains – 1 per area

The project Quality Assurance/Quality Control (QA/QC) officer will review the data packages to confirm completeness of the ASP Category B deliverables and to prepare a Data Usability Summary Report (DUSR) in accordance with NYSDEC guidelines. The QA/QC officer will be independent from the analytical laboratory. At a minimum, the following information will be evaluated:

- chain-of-custody forms;
- date sampled/date analyzed;
- sample temperature at check-in;
- raw data;
- initial and continuing instrument calibrations;
- matrix spikes;
- laboratory duplicate analyses;
- surrogate recoveries (organics); and
- Laboratory control samples (inorganics).

Data reduction will consist of presenting analytical results on summary tables. Data resulting from rinsate analyses will then be used to confirm proper decontamination of the tank system and ancillary equipment.

7.0 PROJECT PERSONNEL

This Work Plan was prepared by a project team from Antea® Group (Antea Group) with extensive experience in site investigation and remediation, site development and construction management. The project team will consist of

individuals from Antea Group. The project team will be responsible for implementation of the AST Decommissioning & Facility Demolition Work Plan. Key personnel to be assigned to this project, and their project role, will be provided prior to the start of work; professional profiles for these persons will also be provided prior to the start of work.

The laboratory analytical contractor will be a NYSDOH-certified laboratory with ASP/CLP experience to be selected upon completion and approval of the AST Decommissioning & Facility Demolition Work Plan. Site contractors will be selected upon completion and approval of the AST Decommissioning & Facility Demolition Work Plan.

8.0 SCHEDULE

The estimated work schedule is presented in Section 13.0 of the AST Decommissioning & Facility Demolition Work Plan document. A start date will be established based on finalization of the Work Plan.

Appendix A

Sample Custody Procedures

SAMPLE CUSTODY PROCEDURES

The primary objective of the sample custody procedures is to create an accurate written record which can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. For the purpose of this document, the USEPA Office of Enforcement and Compliance Monitoring, National Enforcement Investigation Center (NEIC) Policies and Procedures (May 1986) definition of custody applies. USEPA states that a sample is under custody if:

1. It is in one's possession, or
2. It is in one's view, after being in one's possession, or
3. It is locked up after being in one's possession, or
4. It is in a designated secure area.

The Site Manager or the field personnel collecting the samples will maintain custody for samples collected during this investigation. The Site Manager or field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory.

A self-adhesive sample label will be affixed to each container before sample collection. These labels will be covered with clear waterproof tape if necessary to protect the label from water or solvents. The sample label will contain the following information:

- Laboratory Name
- Sample ID Number
- Sample Location
- Sample Matrix
- Date and Time of Sample Collection
- Designation as grab or composite
- Parameters to be tested
- Preservative Added
- Name of Sampler

All sampling containers will be supplied by the laboratory, and are to be cleaned by the bottle supplier in accordance with standard laboratory procedures. Analytical proof of cleanliness will be available for review. Sample containers will be enclosed in clear plastic bags and packed with cushioning material (e.g. vermiculite) inside the coolers.

The Site Manager will maintain custody of the sample bottles. Sample bottles needed for a specific sampling task will be properly preserved in the laboratory prior to sample collection. After the Site Manager has verified the integrity of the bottles and that the proper bottles have been assigned for the task, the bottles will be relinquished to the sampling team. The sampler will place a sufficient volume of sample in the appropriate laboratory-grade bottles for use as sample containers. Care will be taken to not overfill the bottles during sample collection, thereby ensuring proper sample preservation.

The samples collected for analyses will be stored in an insulated cooler for shipment to the laboratory. The laboratory should receive the samples within 48 hours of sampling. Field chain-of-custody records completed at the time of sample collection will be placed inside the cooler for shipment to the laboratory. These record forms will be sealed in a zip-lock type plastic bag to protect them against moisture. Each cooler will contain sufficient ice or cold packs to insure that an approximate 4^0C temperature is maintained, and will be packed in a manner to prevent damage to sample containers. Sample coolers will be sealed with strapping tape and the Site Manager will sign and date a custody seal and place it on the cooler in such a way that any tampering during shipment will be detected.

All coolers will be shipped by an overnight courier according to current US DOT regulations. Upon receiving the samples, the sample custodian at the laboratory will inspect the condition of the samples, compare the information on the sample labels against the field chain-of-custody record, assign a laboratory control number, and log the control number into the computer sample inventory system. The sample custodian will then store the sample in a secure sample storage cooler maintained at approximately 4°C and maintain custody until the sample is assigned to an analyst for analysis. Custody will be maintained until disposal of the analyzed samples.

The sample custodian will note any damaged sample vials, void space within the vials, or discrepancies between the sample label and information on the field chain-of-custody record when logging the sample. This information will also be communicated to field personnel so proper action can be taken. The chain-of-custody form will be

signed by both the relinquishing and receiving parties and the reason for transfer indicated each time the sample custody changes.

An internal chain-of-custody form will be used by the laboratory to document sample possession from laboratory sample custodian to analysts and final disposition. All chain-of-custody information will be supplied with the data packages for inclusion in the document control file.

Appendix F

Waste Characterization Results - Water

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: 680-112745-1
Client Project/Site: Hercules Glens Falls AST Waste Char.

For:
Ashland Inc
5200 Blazer Parkway
DS-4
Dublin, Ohio 43017

Attn: Mr. Jim Vondracek

Kathryn Smith

Authorized for release by:
6/4/2015 1:56:53 PM

Kathryn Smith, Project Manager II
(912)354-7858
kathy.smith@testamericainc.com

Definitions/Glossary

Client: Ashland Inc
Project/Site: Hercules Glens Falls AST Waste Char.

TestAmerica Job ID: 680-112745-1

Qualifiers

GC/MS VOA

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

GC/MS Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
E	Result exceeded calibration range.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD is outside acceptance limits.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
H	Sample was prepped or analyzed beyond the specified holding time

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)

Sample Summary

Client: Ashland Inc
Project/Site: Hercules Glens Falls AST Waste Char.

TestAmerica Job ID: 680-112745-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
680-112745-1	PTP AST	Water	05/20/15 13:30	05/21/15 09:12
680-112745-2	Trip Blank	Water	05/20/15 00:00	05/21/15 09:12

Job ID: 680-112745-1

Laboratory: TestAmerica Savannah

Narrative

CASE NARRATIVE
Client: Ashland Inc
Project: Hercules Glens Falls AST Waste Char.

Report Number: 680-112745-1

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 05/21/2015; 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)
Samples PTP AST (680-112745-1) and Trip Blank (680-112745-2) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 06/01/2015 and 06/02/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (AQUEOUS)
Sample PTP AST (680-112745-1) was analyzed for Semivolatile Organic Compounds (Aqueous) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 05/27/2015 and analyzed on 06/02/2015.

Several analytes recovered low for the MS/MSD of sample PTP ASTMSD (680-112745-1) in batch 680-385515. Caprolactam exceeded the RPD limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICP)
Sample PTP AST (680-112745-1) was analyzed for Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/26/2015 and analyzed on 05/27/2015.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HEXAVALENT CHROMIUM
Sample PTP AST (680-112745-1) was analyzed for hexavalent chromium in accordance with EPA SW-846 Method 7196A. The samples were analyzed on 05/21/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL MERCURY
Sample PTP AST (680-112745-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 05/27/2015 and analyzed on 05/28/2015.

Sample PTP AST (680-112745-1)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

IGNITABILITY
Sample PTP AST (680-112745-1) was analyzed for ignitability in accordance with EPA SW846 Method 1010A. The samples were analyzed

Job ID: 680-112745-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

on 05/29/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS
Sample PTP AST (680-112745-1) was analyzed for total suspended solids in accordance with SM 2540D. The samples were analyzed on 05/21/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

AMMONIA
Sample PTP AST (680-112745-1) was analyzed for ammonia in accordance with EPA Method 350.1. The samples were analyzed on 05/21/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PHENOLS
Sample PTP AST (680-112745-1) was analyzed for phenols in accordance with EPA Method 420.1. The samples were prepared and analyzed on 05/26/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

BIOCHEMICAL OXYGEN DEMAND
Sample PTP AST (680-112745-1) was analyzed for Biochemical Oxygen Demand in accordance with SM 5210B. The samples were analyzed on 05/21/2015 and 05/28/2015.

Biochemical Oxygen Demand recovered low for LCS 680-384258/2 and LCSD 680-384258/3. Sample PTP AST (680-112745-1) was reanalyzed outside of holding time, both sets of data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CHEMICAL OXYGEN DEMAND
Sample PTP AST (680-112745-1) was analyzed for chemical oxygen demand in accordance with SM 5220D. The samples were analyzed on 05/26/2015.

Sample PTP AST (680-112745-1)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL CYANIDE
Sample PTP AST (680-112745-1) was analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The samples were prepared and analyzed on 05/26/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH)
Sample PTP AST (680-112745-1) was analyzed for corrosivity (pH) in accordance with SM 4500 H+ B. The samples were analyzed on 05/23/2015.

This analysis is normally performed in the field and has a method-defined holding time of 15 minutes. This sample(s) was performed in the laboratory outside the 15 minute timeframe.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SULFIDE

Job ID: 680-112745-1 (Continued)

Laboratory: TestAmerica Savannah (Continued)

Sample PTP AST (680-112745-1) was analyzed for sulfide in accordance with SM 4500 S2 F. The samples were analyzed on 05/22/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client Sample ID: PTP AST

Date Collected: 05/20/15 13:30
Date Received: 05/21/15 09:12

Lab Sample ID: 680-112745-1

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	14		10	7.0	ug/L			06/02/15 17:47	1
Benzene	1.0	U	1.0	0.43	ug/L			06/02/15 17:47	1
Bromoform	1.0	U	1.0	0.43	ug/L			06/02/15 17:47	1
Bromomethane	5.0	U	5.0	2.5	ug/L			06/02/15 17:47	1
2-Butanone (MEK)	10	U	10	3.4	ug/L			06/02/15 17:47	1
Carbon disulfide	2.0	U	2.0	1.0	ug/L			06/02/15 17:47	1
Carbon tetrachloride	1.0	U	1.0	0.33	ug/L			06/02/15 17:47	1
Chlorobenzene	1.0	U	1.0	0.26	ug/L			06/02/15 17:47	1
Chlorodibromomethane	1.0	U	1.0	0.32	ug/L			06/02/15 17:47	1
Chloroethane	5.0	U	5.0	2.5	ug/L			06/02/15 17:47	1
Chloroform	1.0	U	1.0	0.50	ug/L			06/02/15 17:47	1
Chloromethane	1.0	U	1.0	0.40	ug/L			06/02/15 17:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.41	ug/L			06/02/15 17:47	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.40	ug/L			06/02/15 17:47	1
Dichlorobromomethane	1.0	U	1.0	0.44	ug/L			06/02/15 17:47	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			06/02/15 17:47	1
1,2-Dichloroethane	1.0	U	1.0	0.50	ug/L			06/02/15 17:47	1
1,1-Dichloroethene	1.0	U	1.0	0.36	ug/L			06/02/15 17:47	1
1,2-Dichloropropane	1.0	U	1.0	0.67	ug/L			06/02/15 17:47	1
Ethylbenzene	1.0	U	1.0	0.33	ug/L			06/02/15 17:47	1
2-Hexanone	10	U	10	2.0	ug/L			06/02/15 17:47	1
Methylene Chloride	5.0	U	5.0	2.5	ug/L			06/02/15 17:47	1
4-Methyl-2-pentanone (MIBK)	10	U	10	2.1	ug/L			06/02/15 17:47	1
Styrene	1.0	U	1.0	0.27	ug/L			06/02/15 17:47	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.62	ug/L			06/02/15 17:47	1
Tetrachloroethene	1.0	U	1.0	0.74	ug/L			06/02/15 17:47	1
Toluene	1.0	U	1.0	0.48	ug/L			06/02/15 17:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.37	ug/L			06/02/15 17:47	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.42	ug/L			06/02/15 17:47	1
1,1,1-Trichloroethane	1.0	U	1.0	0.37	ug/L			06/02/15 17:47	1
1,1,2-Trichloroethane	1.0	U	1.0	0.33	ug/L			06/02/15 17:47	1
Trichloroethene	1.0	U	1.0	0.48	ug/L			06/02/15 17:47	1
Vinyl chloride	1.0	U	1.0	0.50	ug/L			06/02/15 17:47	1
Xylenes, Total	1.0	U	1.0	0.23	ug/L			06/02/15 17:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*06/02/15 17:47*	*1*
Dibromofluoromethane (Surr)	*99*		*70 - 130*		*06/02/15 17:47*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 130*		*06/02/15 17:47*	*1*
Toluene-d8 (Surr)	*104*		*70 - 130*		*06/02/15 17:47*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	10	U F1	10	0.58	ug/L		05/27/15 15:58	06/02/15 00:27	1
2,4,5-Trichlorophenol	10	U F1	10	1.2	ug/L		05/27/15 15:58	06/02/15 00:27	1
2,4,6-Trichlorophenol	10	U	10	0.85	ug/L		05/27/15 15:58	06/02/15 00:27	1
2,4-Dichlorophenol	10	U	10	1.1	ug/L		05/27/15 15:58	06/02/15 00:27	1
2,4-Dimethylphenol	10	U	10	4.0	ug/L		05/27/15 15:58	06/02/15 00:27	1
2,4-Dinitrophenol	50	U	50	10	ug/L		05/27/15 15:58	06/02/15 00:27	1
2,4-Dinitrotoluene	10	U	10	1.2	ug/L		05/27/15 15:58	06/02/15 00:27	1

Client Sample ID: PTP AST
Lab Sample ID: 680-112745-1
Date Collected: 05/20/15 13:30
Matrix: Water
Date Received: 05/21/15 09:12

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chlorophenol	10	U	10	0.87	ug/L		05/27/15 15:58	06/02/15 00:27	1
2-Chloronaphthalene	10	U F1	10	0.80	ug/L		05/27/15 15:58	06/02/15 00:27	1
2-Methylnaphthalene	10	U F1	10	0.78	ug/L		05/27/15 15:58	06/02/15 00:27	1
2-Methylphenol	10	U	10	0.89	ug/L		05/27/15 15:58	06/02/15 00:27	1
2-Nitroaniline	50	U	50	1.3	ug/L		05/27/15 15:58	06/02/15 00:27	1
2-Nitrophenol	10	U	10	0.76	ug/L		05/27/15 15:58	06/02/15 00:27	1
3 & 4 Methylphenol	10	U	10	1.3	ug/L		05/27/15 15:58	06/02/15 00:27	1
3,3'-Dichlorobenzidine	60	U F1	60	30	ug/L		05/27/15 15:58	06/02/15 00:27	1
3-Nitroaniline	50	U	50	5.0	ug/L		05/27/15 15:58	06/02/15 00:27	1
4,6-Dinitro-2-methylphenol	50	U	50	10	ug/L		05/27/15 15:58	06/02/15 00:27	1
4-Bromophenyl phenyl ether	10	U F1	10	0.77	ug/L		05/27/15 15:58	06/02/15 00:27	1
4-Chloro-3-methylphenol	10	U	10	1.0	ug/L		05/27/15 15:58	06/02/15 00:27	1
4-Chloroaniline	20	U	20	2.2	ug/L		05/27/15 15:58	06/02/15 00:27	1
4-Chlorophenyl phenyl ether	10	U F1	10	0.84	ug/L		05/27/15 15:58	06/02/15 00:27	1
4-Nitroaniline	50	U	50	5.0	ug/L		05/27/15 15:58	06/02/15 00:27	1
Acenaphthene	10	U F1	10	0.76	ug/L		05/27/15 15:58	06/02/15 00:27	1
Acenaphthylene	10	U F1	10	0.85	ug/L		05/27/15 15:58	06/02/15 00:27	1
Acetophenone	10	U	10	0.57	ug/L		05/27/15 15:58	06/02/15 00:27	1
Anthracene	10	U F1	10	0.69	ug/L		05/27/15 15:58	06/02/15 00:27	1
Benzo[a]anthracene	10	U F1	10	0.55	ug/L		05/27/15 15:58	06/02/15 00:27	1
Benzo[a]pyrene	10	U F1	10	0.71	ug/L		05/27/15 15:58	06/02/15 00:27	1
Benzo[b]fluoranthene	10	U F1	10	2.6	ug/L		05/27/15 15:58	06/02/15 00:27	1
Benzo[g,h,i]perylene	10	U F1	10	0.87	ug/L		05/27/15 15:58	06/02/15 00:27	1
Benzo[k]fluoranthene	10	U F1	10	1.2	ug/L		05/27/15 15:58	06/02/15 00:27	1
Bis(2-chloroethoxy)methane	10	U	10	0.94	ug/L		05/27/15 15:58	06/02/15 00:27	1
Bis(2-chloroethyl)ether	10	U	10	1.1	ug/L		05/27/15 15:58	06/02/15 00:27	1
Bis(2-ethylhexyl) phthalate	10	U F1	10	1.6	ug/L		05/27/15 15:58	06/02/15 00:27	1
Chrysene	10	U F1	10	0.51	ug/L		05/27/15 15:58	06/02/15 00:27	1
Dibenz(a,h)anthracene	10	U F1	10	1.0	ug/L		05/27/15 15:58	06/02/15 00:27	1
Dibenzofuran	10	U F1	10	0.79	ug/L		05/27/15 15:58	06/02/15 00:27	1
Di-n-butyl phthalate	10	U F1	10	0.83	ug/L		05/27/15 15:58	06/02/15 00:27	1
Diethyl phthalate	10	U F1	10	0.88	ug/L		05/27/15 15:58	06/02/15 00:27	1
Dimethyl phthalate	10	U	10	0.99	ug/L		05/27/15 15:58	06/02/15 00:27	1
Di-n-octyl phthalate	10	U F1	10	1.4	ug/L		05/27/15 15:58	06/02/15 00:27	1
Fluoranthene	10	U F1	10	0.74	ug/L		05/27/15 15:58	06/02/15 00:27	1
Fluorene	10	U F1	10	0.96	ug/L		05/27/15 15:58	06/02/15 00:27	1
Hexachlorobenzene	10	U F1	10	0.79	ug/L		05/27/15 15:58	06/02/15 00:27	1
Hexachlorobutadiene	10	U F1	10	0.62	ug/L		05/27/15 15:58	06/02/15 00:27	1
Hexachlorocyclopentadiene	10	U F1	10	2.5	ug/L		05/27/15 15:58	06/02/15 00:27	1
Hexachloroethane	10	U	10	0.76	ug/L		05/27/15 15:58	06/02/15 00:27	1
Indeno[1,2,3-cd]pyrene	10	U F1	10	1.0	ug/L		05/27/15 15:58	06/02/15 00:27	1
Isophorone	10	U	10	0.90	ug/L		05/27/15 15:58	06/02/15 00:27	1
Naphthalene	10	U	10	0.70	ug/L		05/27/15 15:58	06/02/15 00:27	1
Nitrobenzene	10	U	10	0.73	ug/L		05/27/15 15:58	06/02/15 00:27	1
N-Nitrosodiphenylamine	10	U	10	0.92	ug/L		05/27/15 15:58	06/02/15 00:27	1
N-Nitrosodi-n-propylamine	10	U	10	0.72	ug/L		05/27/15 15:58	06/02/15 00:27	1
Pentachlorophenol	50	U	50	2.0	ug/L		05/27/15 15:58	06/02/15 00:27	1
Phenanthrene	10	U F1	10	0.77	ug/L		05/27/15 15:58	06/02/15 00:27	1
Phenol	10	U	10	0.83	ug/L		05/27/15 15:58	06/02/15 00:27	1

Client Sample ID: PTP AST
Date Collected: 05/20/15 13:30
Date Received: 05/21/15 09:12

Lab Sample ID: 680-112745-1
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	10	U F1	10	0.63	ug/L		05/27/15 15:58	06/02/15 00:27	1
Butyl benzyl phthalate	10	U F1	10	1.2	ug/L		05/27/15 15:58	06/02/15 00:27	1
bis (2-chloroisopropyl) ether	10	U	10	0.78	ug/L		05/27/15 15:58	06/02/15 00:27	1
Carbazole	10	U	10	0.71	ug/L		05/27/15 15:58	06/02/15 00:27	1
2,6-Dinitrotoluene	10	U	10	1.1	ug/L		05/27/15 15:58	06/02/15 00:27	1
4-Nitrophenol	50	U	50	1.9	ug/L		05/27/15 15:58	06/02/15 00:27	1
Atrazine	10	U	10	1.2	ug/L		05/27/15 15:58	06/02/15 00:27	1
Benzaldehyde	10	U	10	1.1	ug/L		05/27/15 15:58	06/02/15 00:27	1
Caprolactam	10	U F2	10	0.79	ug/L		05/27/15 15:58	06/02/15 00:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*39 - 124*	*05/27/15 15:58*	*06/02/15 00:27*	*1*
2-Fluorobiphenyl	*49*		*32 - 113*	*05/27/15 15:58*	*06/02/15 00:27*	*1*
2-Fluorophenol (Surr)	*52*		*26 - 109*	*05/27/15 15:58*	*06/02/15 00:27*	*1*
Terphenyl-d14 (Surr)	*21*		*10 - 126*	*05/27/15 15:58*	*06/02/15 00:27*	*1*
Phenol-d5 (Surr)	*53*		*27 - 110*	*05/27/15 15:58*	*06/02/15 00:27*	*1*
Nitrobenzene-d5 (Surr)	*62*		*32 - 118*	*05/27/15 15:58*	*06/02/15 00:27*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**60000**		200	100	ug/L		05/26/15 10:40	05/27/15 15:23	1
Antimony	**53**		20	5.3	ug/L		05/26/15 10:40	05/27/15 15:23	1
Arsenic	**41**		20	4.6	ug/L		05/26/15 10:40	05/27/15 15:23	1
Barium	**5500**		10	2.3	ug/L		05/26/15 10:40	05/27/15 15:23	1
Beryllium	**1.8**	**J**	4.0	0.20	ug/L		05/26/15 10:40	05/27/15 15:23	1
Cadmium	**170**		5.0	2.0	ug/L		05/26/15 10:40	05/27/15 15:23	1
Calcium	**600000**		500	96	ug/L		05/26/15 10:40	05/27/15 15:23	1
Chromium	**12000**		10	1.2	ug/L		05/26/15 10:40	05/27/15 15:23	1
Cobalt	**150**		10	0.95	ug/L		05/26/15 10:40	05/27/15 15:23	1
Copper	**380**		20	1.9	ug/L		05/26/15 10:40	05/27/15 15:23	1
Iron	**230000**		100	50	ug/L		05/26/15 10:40	05/27/15 15:23	1
Lead	**1300**		10	4.0	ug/L		05/26/15 10:40	05/27/15 15:23	1
Magnesium	**35000**		500	9.9	ug/L		05/26/15 10:40	05/27/15 15:23	1
Manganese	**3400**		10	2.0	ug/L		05/26/15 10:40	05/27/15 15:23	1
Nickel	**560**		40	2.3	ug/L		05/26/15 10:40	05/27/15 15:23	1
Potassium	**9000**		1000	22	ug/L		05/26/15 10:40	05/27/15 15:23	1
Selenium	**12**	**J**	20	6.4	ug/L		05/26/15 10:40	05/27/15 15:23	1
Silver	**6.3**	**J**	10	0.89	ug/L		05/26/15 10:40	05/27/15 15:23	1
Sodium	**2400**		1000	500	ug/L		05/26/15 10:40	05/27/15 15:23	1
Thallium	25	U	25	8.8	ug/L		05/26/15 10:40	05/27/15 15:23	1
Vanadium	**3600**		10	2.4	ug/L		05/26/15 10:40	05/27/15 15:23	1
Zinc	**2100**		20	8.7	ug/L		05/26/15 10:40	05/27/15 15:23	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**12**		2.0	0.80	ug/L		05/27/15 13:49	05/28/15 09:34	10

General Chemistry

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.95**	**HF**			SU			05/23/15 07:56	1

Client: Ashland Inc
Project/Site: Hercules Glens Falls AST Waste Char.

TestAmerica Job ID: 680-112745-1

Client Sample ID: PTP AST
Date Collected: 05/20/15 13:30
Date Received: 05/21/15 09:12

Lab Sample ID: 680-112745-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.25	U	0.25	0.10	mg/L			05/21/15 14:22	1
Phenolics, Total Recoverable	0.050	U	0.050	0.025	mg/L		05/26/15 11:05	05/26/15 15:11	1
Chemical Oxygen Demand	**160**		20	10	mg/L			05/26/15 13:00	2
Chromium, hexavalent	0.010	U	0.010	0.0030	mg/L			05/21/15 12:14	1
Cyanide, Total	**0.040**		0.010	0.0050	mg/L		05/26/15 07:30	05/26/15 12:32	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint	**>200**		1.00	1.00	Degrees F			05/29/15 09:00	1
Total Suspended Solids	**2200**		42	42	mg/L			05/21/15 12:47	1
Sulfide	1.0	U	1.0	1.0	mg/L			05/22/15 11:15	1
Biochemical Oxygen Demand	**120**	*	2.0	2.0	mg/L			05/21/15 16:42	1
Biochemical Oxygen Demand	**47**	H	2.0	2.0	mg/L			05/28/15 18:46	1

Client Sample ID: Trip Blank
Lab Sample ID: 680-112745-2

Date Collected: 05/20/15 00:00
Matrix: Water
Date Received: 05/21/15 09:12

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	7.0	ug/L			06/01/15 15:00	1
Benzene	1.0	U	1.0	0.43	ug/L			06/01/15 15:00	1
Bromoform	1.0	U	1.0	0.43	ug/L			06/01/15 15:00	1
Bromomethane	5.0	U	5.0	2.5	ug/L			06/01/15 15:00	1
2-Butanone (MEK)	10	U	10	3.4	ug/L			06/01/15 15:00	1
Carbon disulfide	2.0	U	2.0	1.0	ug/L			06/01/15 15:00	1
Carbon tetrachloride	1.0	U	1.0	0.33	ug/L			06/01/15 15:00	1
Chlorobenzene	1.0	U	1.0	0.26	ug/L			06/01/15 15:00	1
Chlorodibromomethane	1.0	U	1.0	0.32	ug/L			06/01/15 15:00	1
Chloroethane	5.0	U	5.0	2.5	ug/L			06/01/15 15:00	1
Chloroform	1.0	U	1.0	0.50	ug/L			06/01/15 15:00	1
Chloromethane	1.0	U	1.0	0.40	ug/L			06/01/15 15:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.41	ug/L			06/01/15 15:00	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.40	ug/L			06/01/15 15:00	1
Dichlorobromomethane	1.0	U	1.0	0.44	ug/L			06/01/15 15:00	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			06/01/15 15:00	1
1,2-Dichloroethane	1.0	U	1.0	0.50	ug/L			06/01/15 15:00	1
1,1-Dichloroethene	1.0	U	1.0	0.36	ug/L			06/01/15 15:00	1
1,2-Dichloropropane	1.0	U	1.0	0.67	ug/L			06/01/15 15:00	1
Ethylbenzene	1.0	U	1.0	0.33	ug/L			06/01/15 15:00	1
2-Hexanone	10	U	10	2.0	ug/L			06/01/15 15:00	1
Methylene Chloride	5.0	U	5.0	2.5	ug/L			06/01/15 15:00	1
4-Methyl-2-pentanone (MIBK)	10	U	10	2.1	ug/L			06/01/15 15:00	1
Styrene	1.0	U	1.0	0.27	ug/L			06/01/15 15:00	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.62	ug/L			06/01/15 15:00	1
Tetrachloroethene	1.0	U	1.0	0.74	ug/L			06/01/15 15:00	1
Toluene	1.0	U	1.0	0.48	ug/L			06/01/15 15:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.37	ug/L			06/01/15 15:00	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.42	ug/L			06/01/15 15:00	1
1,1,1-Trichloroethane	1.0	U	1.0	0.37	ug/L			06/01/15 15:00	1
1,1,2-Trichloroethane	1.0	U	1.0	0.33	ug/L			06/01/15 15:00	1
Trichloroethene	1.0	U	1.0	0.48	ug/L			06/01/15 15:00	1
Vinyl chloride	1.0	U	1.0	0.50	ug/L			06/01/15 15:00	1
Xylenes, Total	1.0	U	1.0	0.23	ug/L			06/01/15 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*06/01/15 15:00*	*1*
Dibromofluoromethane (Surr)	*98*		*70 - 130*		*06/01/15 15:00*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 130*		*06/01/15 15:00*	*1*
Toluene-d8 (Surr)	*104*		*70 - 130*		*06/01/15 15:00*	*1*

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

Lab Sample ID: MB 680-385402/9
Matrix: Water
Analysis Batch: 385402

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	7.0	ug/L			06/01/15 10:25	1
Benzene	1.0	U	1.0	0.43	ug/L			06/01/15 10:25	1
Bromoform	1.0	U	1.0	0.43	ug/L			06/01/15 10:25	1
Bromomethane	5.0	U	5.0	2.5	ug/L			06/01/15 10:25	1
2-Butanone (MEK)	10	U	10	3.4	ug/L			06/01/15 10:25	1
Carbon disulfide	2.0	U	2.0	1.0	ug/L			06/01/15 10:25	1
Carbon tetrachloride	1.0	U	1.0	0.33	ug/L			06/01/15 10:25	1
Chlorobenzene	1.0	U	1.0	0.26	ug/L			06/01/15 10:25	1
Chlorodibromomethane	1.0	U	1.0	0.32	ug/L			06/01/15 10:25	1
Chloroethane	5.0	U	5.0	2.5	ug/L			06/01/15 10:25	1
Chloroform	1.0	U	1.0	0.50	ug/L			06/01/15 10:25	1
Chloromethane	1.0	U	1.0	0.40	ug/L			06/01/15 10:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.41	ug/L			06/01/15 10:25	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.40	ug/L			06/01/15 10:25	1
Dichlorobromomethane	1.0	U	1.0	0.44	ug/L			06/01/15 10:25	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			06/01/15 10:25	1
1,2-Dichloroethane	1.0	U	1.0	0.50	ug/L			06/01/15 10:25	1
1,1-Dichloroethene	1.0	U	1.0	0.36	ug/L			06/01/15 10:25	1
1,2-Dichloropropane	1.0	U	1.0	0.67	ug/L			06/01/15 10:25	1
Ethylbenzene	1.0	U	1.0	0.33	ug/L			06/01/15 10:25	1
2-Hexanone	10	U	10	2.0	ug/L			06/01/15 10:25	1
Methylene Chloride	5.0	U	5.0	2.5	ug/L			06/01/15 10:25	1
4-Methyl-2-pentanone (MIBK)	10	U	10	2.1	ug/L			06/01/15 10:25	1
Styrene	1.0	U	1.0	0.27	ug/L			06/01/15 10:25	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.62	ug/L			06/01/15 10:25	1
Tetrachloroethene	1.0	U	1.0	0.74	ug/L			06/01/15 10:25	1
Toluene	1.0	U	1.0	0.48	ug/L			06/01/15 10:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.37	ug/L			06/01/15 10:25	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.42	ug/L			06/01/15 10:25	1
1,1,1-Trichloroethane	1.0	U	1.0	0.37	ug/L			06/01/15 10:25	1
1,1,2-Trichloroethane	1.0	U	1.0	0.33	ug/L			06/01/15 10:25	1
Trichloroethene	1.0	U	1.0	0.48	ug/L			06/01/15 10:25	1
Vinyl chloride	1.0	U	1.0	0.50	ug/L			06/01/15 10:25	1
Xylenes, Total	1.0	U	1.0	0.23	ug/L			06/01/15 10:25	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*06/01/15 10:25*	*1*
Dibromofluoromethane (Surr)	*98*		*70 - 130*		*06/01/15 10:25*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 130*		*06/01/15 10:25*	*1*
Toluene-d8 (Surr)	*102*		*70 - 130*		*06/01/15 10:25*	*1*

Lab Sample ID: LCS 680-385402/4
Matrix: Water
Analysis Batch: 385402

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Acetone			250	280		ug/L		112	60 - 154		
Benzene			50.0	51.0		ug/L		102	73 - 131		

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

Lab Sample ID: LCS 680-385402/4
Matrix: Water
Analysis Batch: 385402

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	53.7		ug/L		107	69 - 135
Bromomethane	50.0	62.6		ug/L		125	20 - 180
2-Butanone (MEK)	250	308		ug/L		123	75 - 133
Carbon disulfide	50.0	47.9		ug/L		96	73 - 127
Carbon tetrachloride	50.0	49.1		ug/L		98	75 - 130
Chlorobenzene	50.0	50.7		ug/L		101	80 - 120
Chlorodibromomethane	50.0	54.2		ug/L		108	71 - 136
Chloroethane	50.0	64.3		ug/L		129	50 - 151
Chloroform	50.0	51.0		ug/L		102	79 - 122
Chloromethane	50.0	54.7		ug/L		109	63 - 126
cis-1,2-Dichloroethene	50.0	52.5		ug/L		105	80 - 122
cis-1,3-Dichloropropene	50.0	54.4		ug/L		109	80 - 133
Dichlorobromomethane	50.0	51.2		ug/L		102	77 - 129
1,1-Dichloroethane	50.0	51.1		ug/L		102	80 - 120
1,2-Dichloroethane	50.0	55.5		ug/L		111	75 - 130
1,1-Dichloroethene	50.0	50.0		ug/L		100	74 - 125
1,2-Dichloropropane	50.0	53.0		ug/L		106	80 - 123
Ethylbenzene	50.0	48.6		ug/L		97	80 - 120
2-Hexanone	250	299		ug/L		120	70 - 141
Methylene Chloride	50.0	47.8		ug/L		96	76 - 129
4-Methyl-2-pentanone (MIBK)	250	303		ug/L		121	75 - 135
Styrene	50.0	50.1		ug/L		100	80 - 122
1,1,2,2-Tetrachloroethane	50.0	54.1		ug/L		108	72 - 128
Tetrachloroethene	50.0	51.8		ug/L		104	77 - 123
Toluene	50.0	51.8		ug/L		104	80 - 122
trans-1,2-Dichloroethene	50.0	52.7		ug/L		105	78 - 123
trans-1,3-Dichloropropene	50.0	55.5		ug/L		111	74 - 140
1,1,1-Trichloroethane	50.0	49.6		ug/L		99	74 - 128
1,1,2-Trichloroethane	50.0	54.4		ug/L		109	79 - 125
Trichloroethene	50.0	51.3		ug/L		103	80 - 123
Vinyl chloride	50.0	49.9		ug/L		100	68 - 132
Xylenes, Total	100	98.7		ug/L		99	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*
Dibromofluoromethane (Surr)	*103*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*110*		*70 - 130*
Toluene-d8 (Surr)	*98*		*70 - 130*

Lab Sample ID: LCSD 680-385402/5
Matrix: Water
Analysis Batch: 385402

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	300		ug/L		120	60 - 154	7	40
Benzene	50.0	51.7		ug/L		103	73 - 131	1	30
Bromoform	50.0	53.4		ug/L		107	69 - 135	0	20
Bromomethane	50.0	65.5		ug/L		131	20 - 180	4	40

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

Lab Sample ID: LCSD 680-385402/5
Matrix: Water
Analysis Batch: 385402

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
2-Butanone (MEK)			250	319		ug/L		128	75 - 133	4	30
Carbon disulfide			50.0	47.5		ug/L		95	73 - 127	1	20
Carbon tetrachloride			50.0	47.8		ug/L		96	75 - 130	3	20
Chlorobenzene			50.0	50.4		ug/L		101	80 - 120	1	20
Chlorodibromomethane			50.0	55.5		ug/L		111	71 - 136	2	20
Chloroethane			50.0	64.6		ug/L		129	50 - 151	1	30
Chloroform			50.0	51.6		ug/L		103	79 - 122	1	20
Chloromethane			50.0	54.6		ug/L		109	63 - 126	0	30
cis-1,2-Dichloroethene			50.0	53.7		ug/L		107	80 - 122	2	20
cis-1,3-Dichloropropene			50.0	56.0		ug/L		112	80 - 133	3	20
Dichlorobromomethane			50.0	52.3		ug/L		105	77 - 129	2	20
1,1-Dichloroethane			50.0	52.4		ug/L		105	80 - 120	3	20
1,2-Dichloroethane			50.0	57.1		ug/L		114	75 - 130	3	20
1,1-Dichloroethene			50.0	49.7		ug/L		99	74 - 125	1	20
1,2-Dichloropropane			50.0	54.2		ug/L		108	80 - 123	2	20
Ethylbenzene			50.0	48.2		ug/L		96	80 - 120	1	20
2-Hexanone			250	311		ug/L		124	70 - 141	4	40
Methylene Chloride			50.0	49.2		ug/L		98	76 - 129	3	20
4-Methyl-2-pentanone (MIBK)			250	315		ug/L		126	75 - 135	4	30
Styrene			50.0	49.9		ug/L		100	80 - 122	0	20
1,1,2,2-Tetrachloroethane			50.0	54.8		ug/L		110	72 - 128	1	20
Tetrachloroethene			50.0	51.3		ug/L		103	77 - 123	1	20
Toluene			50.0	52.3		ug/L		105	80 - 122	1	20
trans-1,2-Dichloroethene			50.0	52.7		ug/L		105	78 - 123	0	20
trans-1,3-Dichloropropene			50.0	55.9		ug/L		112	74 - 140	1	20
1,1,1-Trichloroethane			50.0	49.4		ug/L		99	74 - 128	0	20
1,1,2-Trichloroethane			50.0	56.7		ug/L		113	79 - 125	4	20
Trichloroethene			50.0	51.5		ug/L		103	80 - 123	1	20
Vinyl chloride			50.0	49.2		ug/L		98	68 - 132	2	30
Xylenes, Total			100	97.2		ug/L		97	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*
Dibromofluoromethane (Surr)	*107*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*113*		*70 - 130*
Toluene-d8 (Surr)	*97*		*70 - 130*

Lab Sample ID: MB 680-385589/9
Matrix: Water
Analysis Batch: 385589

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	7.0	ug/L			06/02/15 14:12	1
Benzene	1.0	U	1.0	0.43	ug/L			06/02/15 14:12	1
Bromoform	1.0	U	1.0	0.43	ug/L			06/02/15 14:12	1
Bromomethane	5.0	U	5.0	2.5	ug/L			06/02/15 14:12	1
2-Butanone (MEK)	10	U	10	3.4	ug/L			06/02/15 14:12	1
Carbon disulfide	2.0	U	2.0	1.0	ug/L			06/02/15 14:12	1

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

Lab Sample ID: MB 680-385589/9
Matrix: Water
Analysis Batch: 385589

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	1.0	U	1.0	0.33	ug/L			06/02/15 14:12	1
Chlorobenzene	1.0	U	1.0	0.26	ug/L			06/02/15 14:12	1
Chlorodibromomethane	1.0	U	1.0	0.32	ug/L			06/02/15 14:12	1
Chloroethane	5.0	U	5.0	2.5	ug/L			06/02/15 14:12	1
Chloroform	1.0	U	1.0	0.50	ug/L			06/02/15 14:12	1
Chloromethane	1.0	U	1.0	0.40	ug/L			06/02/15 14:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.41	ug/L			06/02/15 14:12	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.40	ug/L			06/02/15 14:12	1
Dichlorobromomethane	1.0	U	1.0	0.44	ug/L			06/02/15 14:12	1
1,1-Dichloroethane	1.0	U	1.0	0.38	ug/L			06/02/15 14:12	1
1,2-Dichloroethane	1.0	U	1.0	0.50	ug/L			06/02/15 14:12	1
1,1-Dichloroethene	1.0	U	1.0	0.36	ug/L			06/02/15 14:12	1
1,2-Dichloropropane	1.0	U	1.0	0.67	ug/L			06/02/15 14:12	1
Ethylbenzene	1.0	U	1.0	0.33	ug/L			06/02/15 14:12	1
2-Hexanone	10	U	10	2.0	ug/L			06/02/15 14:12	1
Methylene Chloride	5.0	U	5.0	2.5	ug/L			06/02/15 14:12	1
4-Methyl-2-pentanone (MIBK)	10	U	10	2.1	ug/L			06/02/15 14:12	1
Styrene	1.0	U	1.0	0.27	ug/L			06/02/15 14:12	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.62	ug/L			06/02/15 14:12	1
Tetrachloroethene	1.0	U	1.0	0.74	ug/L			06/02/15 14:12	1
Toluene	1.0	U	1.0	0.48	ug/L			06/02/15 14:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.37	ug/L			06/02/15 14:12	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.42	ug/L			06/02/15 14:12	1
1,1,1-Trichloroethane	1.0	U	1.0	0.37	ug/L			06/02/15 14:12	1
1,1,2-Trichloroethane	1.0	U	1.0	0.33	ug/L			06/02/15 14:12	1
Trichloroethene	1.0	U	1.0	0.48	ug/L			06/02/15 14:12	1
Vinyl chloride	1.0	U	1.0	0.50	ug/L			06/02/15 14:12	1
Xylenes, Total	1.0	U	1.0	0.23	ug/L			06/02/15 14:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*		*06/02/15 14:12*	*1*
Dibromofluoromethane (Surr)	*101*		*70 - 130*		*06/02/15 14:12*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 130*		*06/02/15 14:12*	*1*
Toluene-d8 (Surr)	*103*		*70 - 130*		*06/02/15 14:12*	*1*

Lab Sample ID: LCS 680-385589/4
Matrix: Water
Analysis Batch: 385589

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	243		ug/L		97	60 - 154
Benzene	50.0	51.4		ug/L		103	73 - 131
Bromoform	50.0	46.7		ug/L		93	69 - 135
Bromomethane	50.0	54.6		ug/L		109	20 - 180
2-Butanone (MEK)	250	260		ug/L		104	75 - 133
Carbon disulfide	50.0	49.6		ug/L		99	73 - 127
Carbon tetrachloride	50.0	48.5		ug/L		97	75 - 130
Chlorobenzene	50.0	50.7		ug/L		101	80 - 120

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

Lab Sample ID: LCS 680-385589/4
Matrix: Water
Analysis Batch: 385589

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chlorodibromomethane	50.0	49.6		ug/L		99	71 - 136
Chloroethane	50.0	64.5		ug/L		129	50 - 151
Chloroform	50.0	50.6		ug/L		101	79 - 122
Chloromethane	50.0	54.8		ug/L		110	63 - 126
cis-1,2-Dichloroethene	50.0	51.7		ug/L		103	80 - 122
cis-1,3-Dichloropropene	50.0	51.5		ug/L		103	80 - 133
Dichlorobromomethane	50.0	49.9		ug/L		100	77 - 129
1,1-Dichloroethane	50.0	51.7		ug/L		103	80 - 120
1,2-Dichloroethane	50.0	53.0		ug/L		106	75 - 130
1,1-Dichloroethene	50.0	51.5		ug/L		103	74 - 125
1,2-Dichloropropane	50.0	51.6		ug/L		103	80 - 123
Ethylbenzene	50.0	49.7		ug/L		99	80 - 120
2-Hexanone	250	252		ug/L		101	70 - 141
Methylene Chloride	50.0	47.5		ug/L		95	76 - 129
4-Methyl-2-pentanone (MIBK)	250	260		ug/L		104	75 - 135
Styrene	50.0	49.8		ug/L		100	80 - 122
1,1,2,2-Tetrachloroethane	50.0	48.9		ug/L		98	72 - 128
Tetrachloroethene	50.0	52.2		ug/L		104	77 - 123
Toluene	50.0	51.6		ug/L		103	80 - 122
trans-1,2-Dichloroethene	50.0	53.9		ug/L		108	78 - 123
trans-1,3-Dichloropropene	50.0	50.6		ug/L		101	74 - 140
1,1,1-Trichloroethane	50.0	51.0		ug/L		102	74 - 128
1,1,2-Trichloroethane	50.0	51.8		ug/L		104	79 - 125
Trichloroethene	50.0	52.6		ug/L		105	80 - 123
Vinyl chloride	50.0	52.7		ug/L		105	68 - 132
Xylenes, Total	100	99.6		ug/L		100	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*
Dibromofluoromethane (Surr)	*102*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 130*
Toluene-d8 (Surr)	*99*		*70 - 130*

Lab Sample ID: LCSD 680-385589/5
Matrix: Water
Analysis Batch: 385589

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	243		ug/L		97	60 - 154	0	40
Benzene	50.0	52.2		ug/L		104	73 - 131	2	30
Bromoform	50.0	48.2		ug/L		96	69 - 135	3	20
Bromomethane	50.0	56.0		ug/L		112	20 - 180	3	40
2-Butanone (MEK)	250	265		ug/L		106	75 - 133	2	30
Carbon disulfide	50.0	49.5		ug/L		99	73 - 127	0	20
Carbon tetrachloride	50.0	48.8		ug/L		98	75 - 130	1	20
Chlorobenzene	50.0	51.4		ug/L		103	80 - 120	1	20
Chlorodibromomethane	50.0	50.6		ug/L		101	71 - 136	2	20
Chloroethane	50.0	64.2		ug/L		128	50 - 151	0	30

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

Lab Sample ID: LCSD 680-385589/5
Matrix: Water
Analysis Batch: 385589

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
Chloroform			50.0	51.5		ug/L		103	79 - 122	2	20
Chloromethane			50.0	54.2		ug/L		108	63 - 126	1	30
cis-1,2-Dichloroethene			50.0	52.6		ug/L		105	80 - 122	2	20
cis-1,3-Dichloropropene			50.0	51.9		ug/L		104	80 - 133	1	20
Dichlorobromomethane			50.0	50.5		ug/L		101	77 - 129	1	20
1,1-Dichloroethane			50.0	52.6		ug/L		105	80 - 120	2	20
1,2-Dichloroethane			50.0	54.0		ug/L		108	75 - 130	2	20
1,1-Dichloroethene			50.0	51.9		ug/L		104	74 - 125	1	20
1,2-Dichloropropane			50.0	52.6		ug/L		105	80 - 123	2	20
Ethylbenzene			50.0	50.1		ug/L		100	80 - 120	1	20
2-Hexanone			250	259		ug/L		104	70 - 141	3	40
Methylene Chloride			50.0	47.9		ug/L		96	76 - 129	1	20
4-Methyl-2-pentanone (MIBK)			250	266		ug/L		106	75 - 135	2	30
Styrene			50.0	50.5		ug/L		101	80 - 122	1	20
1,1,2,2-Tetrachloroethane			50.0	49.9		ug/L		100	72 - 128	2	20
Tetrachloroethene			50.0	52.5		ug/L		105	77 - 123	0	20
Toluene			50.0	52.4		ug/L		105	80 - 122	2	20
trans-1,2-Dichloroethene			50.0	54.0		ug/L		108	78 - 123	0	20
trans-1,3-Dichloropropene			50.0	51.3		ug/L		103	74 - 140	1	20
1,1,1-Trichloroethane			50.0	51.4		ug/L		103	74 - 128	1	20
1,1,2-Trichloroethane			50.0	52.8		ug/L		106	79 - 125	2	20
Trichloroethene			50.0	53.4		ug/L		107	80 - 123	1	20
Vinyl chloride			50.0	52.4		ug/L		105	68 - 132	1	30
Xylenes, Total			100	100		ug/L		100	80 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*
Dibromofluoromethane (Surr)	*103*		*70 - 130*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 130*
Toluene-d8 (Surr)	*101*		*70 - 130*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-384796/6-A
Matrix: Water
Analysis Batch: 385257

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384796

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	10	U	10	0.58	ug/L		05/27/15 15:58	05/29/15 20:59	1
2,4,5-Trichlorophenol	10	U	10	1.2	ug/L		05/27/15 15:58	05/29/15 20:59	1
2,4,6-Trichlorophenol	10	U	10	0.85	ug/L		05/27/15 15:58	05/29/15 20:59	1
2,4-Dichlorophenol	10	U	10	1.1	ug/L		05/27/15 15:58	05/29/15 20:59	1
2,4-Dimethylphenol	10	U	10	4.0	ug/L		05/27/15 15:58	05/29/15 20:59	1
2,4-Dinitrophenol	50	U	50	10	ug/L		05/27/15 15:58	05/29/15 20:59	1
2,4-Dinitrotoluene	10	U	10	1.2	ug/L		05/27/15 15:58	05/29/15 20:59	1
2-Chlorophenol	10	U	10	0.87	ug/L		05/27/15 15:58	05/29/15 20:59	1
2-Chloronaphthalene	10	U	10	0.80	ug/L		05/27/15 15:58	05/29/15 20:59	1
2-Methylnaphthalene	10	U	10	0.78	ug/L		05/27/15 15:58	05/29/15 20:59	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-384796/6-A
Matrix: Water
Analysis Batch: 385257

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384796

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylphenol	10	U	10	0.89	ug/L		05/27/15 15:58	05/29/15 20:59	1
2-Nitroaniline	50	U	50	1.3	ug/L		05/27/15 15:58	05/29/15 20:59	1
2-Nitrophenol	10	U	10	0.76	ug/L		05/27/15 15:58	05/29/15 20:59	1
3 & 4 Methylphenol	10	U	10	1.3	ug/L		05/27/15 15:58	05/29/15 20:59	1
3,3'-Dichlorobenzidine	60	U	60	30	ug/L		05/27/15 15:58	05/29/15 20:59	1
3-Nitroaniline	50	U	50	5.0	ug/L		05/27/15 15:58	05/29/15 20:59	1
4,6-Dinitro-2-methylphenol	50	U	50	10	ug/L		05/27/15 15:58	05/29/15 20:59	1
4-Bromophenyl phenyl ether	10	U	10	0.77	ug/L		05/27/15 15:58	05/29/15 20:59	1
4-Chloro-3-methylphenol	10	U	10	1.0	ug/L		05/27/15 15:58	05/29/15 20:59	1
4-Chloroaniline	20	U	20	2.2	ug/L		05/27/15 15:58	05/29/15 20:59	1
4-Chlorophenyl phenyl ether	10	U	10	0.84	ug/L		05/27/15 15:58	05/29/15 20:59	1
4-Nitroaniline	50	U	50	5.0	ug/L		05/27/15 15:58	05/29/15 20:59	1
Acenaphthene	10	U	10	0.76	ug/L		05/27/15 15:58	05/29/15 20:59	1
Acenaphthylene	10	U	10	0.85	ug/L		05/27/15 15:58	05/29/15 20:59	1
Acetophenone	10	U	10	0.57	ug/L		05/27/15 15:58	05/29/15 20:59	1
Anthracene	10	U	10	0.69	ug/L		05/27/15 15:58	05/29/15 20:59	1
Benzo[a]anthracene	10	U	10	0.55	ug/L		05/27/15 15:58	05/29/15 20:59	1
Benzo[a]pyrene	10	U	10	0.71	ug/L		05/27/15 15:58	05/29/15 20:59	1
Benzo[b]fluoranthene	10	U	10	2.6	ug/L		05/27/15 15:58	05/29/15 20:59	1
Benzo[g,h,i]perylene	10	U	10	0.87	ug/L		05/27/15 15:58	05/29/15 20:59	1
Benzo[k]fluoranthene	10	U	10	1.2	ug/L		05/27/15 15:58	05/29/15 20:59	1
Bis(2-chloroethoxy)methane	10	U	10	0.94	ug/L		05/27/15 15:58	05/29/15 20:59	1
Bis(2-chloroethyl)ether	10	U	10	1.1	ug/L		05/27/15 15:58	05/29/15 20:59	1
Bis(2-ethylhexyl) phthalate	10	U	10	1.6	ug/L		05/27/15 15:58	05/29/15 20:59	1
Chrysene	10	U	10	0.51	ug/L		05/27/15 15:58	05/29/15 20:59	1
Dibenz(a,h)anthracene	10	U	10	1.0	ug/L		05/27/15 15:58	05/29/15 20:59	1
Dibenzofuran	10	U	10	0.79	ug/L		05/27/15 15:58	05/29/15 20:59	1
Di-n-butyl phthalate	10	U	10	0.83	ug/L		05/27/15 15:58	05/29/15 20:59	1
Diethyl phthalate	10	U	10	0.88	ug/L		05/27/15 15:58	05/29/15 20:59	1
Dimethyl phthalate	10	U	10	0.99	ug/L		05/27/15 15:58	05/29/15 20:59	1
Di-n-octyl phthalate	10	U	10	1.4	ug/L		05/27/15 15:58	05/29/15 20:59	1
Fluoranthene	10	U	10	0.74	ug/L		05/27/15 15:58	05/29/15 20:59	1
Fluorene	10	U	10	0.96	ug/L		05/27/15 15:58	05/29/15 20:59	1
Hexachlorobenzene	10	U	10	0.79	ug/L		05/27/15 15:58	05/29/15 20:59	1
Hexachlorobutadiene	10	U	10	0.62	ug/L		05/27/15 15:58	05/29/15 20:59	1
Hexachlorocyclopentadiene	10	U	10	2.5	ug/L		05/27/15 15:58	05/29/15 20:59	1
Hexachloroethane	10	U	10	0.76	ug/L		05/27/15 15:58	05/29/15 20:59	1
Indeno[1,2,3-cd]pyrene	10	U	10	1.0	ug/L		05/27/15 15:58	05/29/15 20:59	1
Isophorone	10	U	10	0.90	ug/L		05/27/15 15:58	05/29/15 20:59	1
Naphthalene	10	U	10	0.70	ug/L		05/27/15 15:58	05/29/15 20:59	1
Nitrobenzene	10	U	10	0.73	ug/L		05/27/15 15:58	05/29/15 20:59	1
N-Nitrosodiphenylamine	10	U	10	0.92	ug/L		05/27/15 15:58	05/29/15 20:59	1
N-Nitrosodi-n-propylamine	10	U	10	0.72	ug/L		05/27/15 15:58	05/29/15 20:59	1
Pentachlorophenol	50	U	50	2.0	ug/L		05/27/15 15:58	05/29/15 20:59	1
Phenanthrene	10	U	10	0.77	ug/L		05/27/15 15:58	05/29/15 20:59	1
Phenol	10	U	10	0.83	ug/L		05/27/15 15:58	05/29/15 20:59	1
Pyrene	10	U	10	0.63	ug/L		05/27/15 15:58	05/29/15 20:59	1
Butyl benzyl phthalate	10	U	10	1.2	ug/L		05/27/15 15:58	05/29/15 20:59	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-384796/6-A
Matrix: Water
Analysis Batch: 385257

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384796

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
bis (2-chloroisopropyl) ether	10	U	10	0.78	ug/L		05/27/15 15:58	05/29/15 20:59	1
Carbazole	10	U	10	0.71	ug/L		05/27/15 15:58	05/29/15 20:59	1
2,6-Dinitrotoluene	10	U	10	1.1	ug/L		05/27/15 15:58	05/29/15 20:59	1
4-Nitrophenol	50	U	50	1.9	ug/L		05/27/15 15:58	05/29/15 20:59	1
Atrazine	10	U	10	1.2	ug/L		05/27/15 15:58	05/29/15 20:59	1
Benzaldehyde	10	U	10	1.1	ug/L		05/27/15 15:58	05/29/15 20:59	1
Caprolactam	10	U	10	0.79	ug/L		05/27/15 15:58	05/29/15 20:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*81*		*39 - 124*	*05/27/15 15:58*	*05/29/15 20:59*	*1*
2-Fluorobiphenyl	*64*		*32 - 113*	*05/27/15 15:58*	*05/29/15 20:59*	*1*
2-Fluorophenol (Surr)	*60*		*26 - 109*	*05/27/15 15:58*	*05/29/15 20:59*	*1*
Terphenyl-d14 (Surr)	*63*		*10 - 126*	*05/27/15 15:58*	*05/29/15 20:59*	*1*
Phenol-d5 (Surr)	*62*		*27 - 110*	*05/27/15 15:58*	*05/29/15 20:59*	*1*
Nitrobenzene-d5 (Surr)	*60*		*32 - 118*	*05/27/15 15:58*	*05/29/15 20:59*	*1*

Lab Sample ID: LCS 680-384796/7-A
Matrix: Water
Analysis Batch: 385257

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384796

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	100	67.6		ug/L		68	46 - 97
2,4,5-Trichlorophenol	100	77.3		ug/L		77	53 - 114
2,4,6-Trichlorophenol	100	74.5		ug/L		74	49 - 113
2,4-Dichlorophenol	100	75.5		ug/L		76	48 - 107
2,4-Dimethylphenol	100	70.1		ug/L		70	34 - 96
2,4-Dinitrophenol	200	140		ug/L		70	33 - 128
2,4-Dinitrotoluene	100	73.7		ug/L		74	53 - 109
2-Chlorophenol	100	66.8		ug/L		67	45 - 100
2-Chloronaphthalene	100	65.8		ug/L		66	47 - 97
2-Methylnaphthalene	100	67.0		ug/L		67	43 - 95
2-Methylphenol	100	68.6		ug/L		69	46 - 102
2-Nitroaniline	100	67.7		ug/L		68	49 - 116
2-Nitrophenol	100	72.4		ug/L		72	43 - 112
3 & 4 Methylphenol	100	65.2		ug/L		65	47 - 104
3,3'-Dichlorobenzidine	100	70.8		ug/L		71	10 - 130
3-Nitroaniline	100	66.9		ug/L		67	25 - 109
4,6-Dinitro-2-methylphenol	200	151		ug/L		75	44 - 128
4-Bromophenyl phenyl ether	100	76.2		ug/L		76	50 - 110
4-Chloro-3-methylphenol	100	75.3		ug/L		75	48 - 113
4-Chloroaniline	100	55.2		ug/L		55	10 - 130
4-Chlorophenyl phenyl ether	100	71.5		ug/L		71	49 - 109
4-Nitroaniline	100	69.5		ug/L		69	44 - 119
Acenaphthene	100	69.2		ug/L		69	41 - 102
Acenaphthylene	100	70.1		ug/L		70	47 - 109
Acetophenone	100	66.5		ug/L		66	43 - 96
Anthracene	100	72.1		ug/L		72	47 - 101
Benzo[a]anthracene	100	66.2		ug/L		66	44 - 109

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-384796/7-A
Matrix: Water
Analysis Batch: 385257

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384796

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[a]pyrene	100	64.9		ug/L		65	41 - 103
Benzo[b]fluoranthene	100	67.6		ug/L		68	44 - 108
Benzo[g,h,i]perylene	100	67.2		ug/L		67	42 - 110
Benzo[k]fluoranthene	100	66.6		ug/L		67	43 - 109
Bis(2-chloroethoxy)methane	100	66.9		ug/L		67	46 - 110
Bis(2-chloroethyl)ether	100	64.9		ug/L		65	37 - 105
Bis(2-ethylhexyl) phthalate	100	59.0		ug/L		59	48 - 119
Chrysene	100	69.3		ug/L		69	44 - 112
Dibenz(a,h)anthracene	100	66.4		ug/L		66	44 - 106
Dibenzofuran	100	72.1		ug/L		72	49 - 103
Di-n-butyl phthalate	100	70.5		ug/L		71	52 - 114
Diethyl phthalate	100	73.1		ug/L		73	53 - 115
Dimethyl phthalate	100	73.7		ug/L		74	52 - 111
Di-n-octyl phthalate	100	57.6		ug/L		58	45 - 122
Fluoranthene	100	72.2		ug/L		72	46 - 104
Fluorene	100	68.6		ug/L		69	51 - 104
Hexachlorobenzene	100	72.7		ug/L		73	42 - 108
Hexachlorobutadiene	100	54.2		ug/L		54	34 - 93
Hexachlorocyclopentadiene	100	33.3		ug/L		33	10 - 130
Hexachloroethane	100	46.2		ug/L		46	31 - 81
Indeno[1,2,3-cd]pyrene	100	66.2		ug/L		66	40 - 106
Isophorone	100	69.7		ug/L		70	43 - 106
Naphthalene	100	62.6		ug/L		63	37 - 97
Nitrobenzene	100	66.3		ug/L		66	41 - 105
N-Nitrosodiphenylamine	200	140		ug/L		70	42 - 116
N-Nitrosodi-n-propylamine	100	65.6		ug/L		66	46 - 109
Pentachlorophenol	200	156		ug/L		78	36 - 143
Phenanthrene	100	71.5		ug/L		72	48 - 106
Phenol	100	57.4		ug/L		57	35 - 101
Pyrene	100	70.3		ug/L		70	46 - 108
Butyl benzyl phthalate	100	62.0		ug/L		62	53 - 117
bis (2-chloroisopropyl) ether	100	63.6		ug/L		64	36 - 113
Carbazole	100	75.1		ug/L		75	51 - 116
2,6-Dinitrotoluene	100	77.3		ug/L		77	50 - 107
4-Nitrophenol	200	120		ug/L		60	41 - 118
Atrazine	100	98.6		ug/L		99	10 - 130
Benzaldehyde	100	86.1	E	ug/L		86	10 - 152
Caprolactam	100	47.6		ug/L		48	30 - 111

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*88*		*39 - 124*
2-Fluorobiphenyl	*70*		*32 - 113*
2-Fluorophenol (Surr)	*59*		*26 - 109*
Terphenyl-d14 (Surr)	*67*		*10 - 126*
Phenol-d5 (Surr)	*58*		*27 - 110*
Nitrobenzene-d5 (Surr)	*66*		*32 - 118*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-112745-1 MS
Matrix: Water
Analysis Batch: 385515

Client Sample ID: PTP AST
Prep Type: Total/NA
Prep Batch: 384796

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1'-Biphenyl	10	U F1	99.9	37.5	F1	ug/L		38	46 - 97
2,4,5-Trichlorophenol	10	U F1	99.9	56.2		ug/L		56	53 - 114
2,4,6-Trichlorophenol	10	U	99.9	59.5		ug/L		60	49 - 113
2,4-Dichlorophenol	10	U	99.9	64.4		ug/L		64	48 - 107
2,4-Dimethylphenol	10	U	99.9	57.8		ug/L		58	34 - 96
2,4-Dinitrophenol	50	U	200	114		ug/L		57	33 - 128
2,4-Dinitrotoluene	10	U	99.9	55.9		ug/L		56	53 - 109
2-Chlorophenol	10	U	99.9	58.4		ug/L		58	45 - 100
2-Chloronaphthalene	10	U F1	99.9	37.2	F1	ug/L		37	47 - 97
2-Methylnaphthalene	10	U F1	99.9	43.9		ug/L		44	43 - 95
2-Methylphenol	10	U	99.9	58.5		ug/L		59	46 - 102
2-Nitroaniline	50	U	99.9	57.9		ug/L		58	49 - 116
2-Nitrophenol	10	U	99.9	65.2		ug/L		65	43 - 112
3 & 4 Methylphenol	10	U	99.9	58.7		ug/L		59	47 - 104
3,3'-Dichlorobenzidine	60	U F1	99.9	60	U F1	ug/L		0	10 - 130
3-Nitroaniline	50	U	99.9	49.2	J	ug/L		49	25 - 109
4,6-Dinitro-2-methylphenol	50	U	200	129		ug/L		65	44 - 128
4-Bromophenyl phenyl ether	10	U F1	99.9	39.3	F1	ug/L		39	50 - 110
4-Chloro-3-methylphenol	10	U	99.9	64.6		ug/L		65	48 - 113
4-Chloroaniline	20	U	99.9	48.2		ug/L		48	10 - 130
4-Chlorophenyl phenyl ether	10	U F1	99.9	34.1	F1	ug/L		34	49 - 109
4-Nitroaniline	50	U	99.9	50.1		ug/L		50	44 - 119
Acenaphthene	10	U F1	99.9	41.7		ug/L		42	41 - 102
Acenaphthylene	10	U F1	99.9	39.3	F1	ug/L		39	47 - 109
Acetophenone	10	U	99.9	59.4		ug/L		59	43 - 96
Anthracene	10	U F1	99.9	37.2	F1	ug/L		37	47 - 101
Benzo[a]anthracene	10	U F1	99.9	34.3	F1	ug/L		34	44 - 109
Benzo[a]pyrene	10	U F1	99.9	33.2	F1	ug/L		33	41 - 103
Benzo[b]fluoranthene	10	U F1	99.9	34.9	F1	ug/L		35	44 - 108
Benzo[g,h,i]perylene	10	U F1	99.9	34.5	F1	ug/L		35	42 - 110
Benzo[k]fluoranthene	10	U F1	99.9	33.6	F1	ug/L		34	43 - 109
Bis(2-chloroethoxy)methane	10	U	99.9	58.3		ug/L		58	46 - 110
Bis(2-chloroethyl)ether	10	U	99.9	58.8		ug/L		59	37 - 105
Bis(2-ethylhexyl) phthalate	10	U F1	99.9	35.3	F1	ug/L		35	48 - 119
Chrysene	10	U F1	99.9	33.2	F1	ug/L		33	44 - 112
Dibenz(a,h)anthracene	10	U F1	99.9	34.6	F1	ug/L		35	44 - 106
Dibenzofuran	10	U F1	99.9	38.3	F1	ug/L		38	49 - 103
Di-n-butyl phthalate	10	U F1	99.9	38.3	F1	ug/L		38	52 - 114
Diethyl phthalate	10	U F1	99.9	54.2		ug/L		54	53 - 115
Dimethyl phthalate	10	U	99.9	57.0		ug/L		57	52 - 111
Di-n-octyl phthalate	10	U F1	99.9	31.0	F1	ug/L		31	45 - 122
Fluoranthene	10	U F1	99.9	35.5	F1	ug/L		36	46 - 104
Fluorene	10	U F1	99.9	37.1	F1	ug/L		37	51 - 104
Hexachlorobenzene	10	U F1	99.9	35.7	F1	ug/L		36	42 - 108
Hexachlorobutadiene	10	U F1	99.9	24.0	F1	ug/L		24	34 - 93
Hexachlorocyclopentadiene	10	U F1	99.9	10.8		ug/L		11	10 - 130
Hexachloroethane	10	U	99.9	34.3		ug/L		34	31 - 81
Indeno[1,2,3-cd]pyrene	10	U F1	99.9	35.3	F1	ug/L		35	40 - 106

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-112745-1 MS
Matrix: Water
Analysis Batch: 385515

Client Sample ID: PTP AST
Prep Type: Total/NA
Prep Batch: 384796

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Isophorone	10	U	99.9	60.8		ug/L		61	43 - 106
Naphthalene	10	U	99.9	50.2		ug/L		50	37 - 97
Nitrobenzene	10	U	99.9	60.5		ug/L		61	41 - 105
N-Nitrosodiphenylamine	10	U	200	103		ug/L		52	42 - 116
N-Nitrosodi-n-propylamine	10	U	99.9	57.6		ug/L		58	46 - 109
Pentachlorophenol	50	U	200	106		ug/L		53	36 - 143
Phenanthrene	10	U F1	99.9	38.6	F1	ug/L		39	48 - 106
Phenol	10	U	99.9	53.7		ug/L		54	35 - 101
Pyrene	10	U F1	99.9	33.4	F1	ug/L		33	46 - 108
Butyl benzyl phthalate	10	U F1	99.9	36.9	F1	ug/L		37	53 - 117
bis (2-chloroisopropyl) ether	10	U	99.9	56.4		ug/L		56	36 - 113
Carbazole	10	U	99.9	56.9		ug/L		57	51 - 116
2,6-Dinitrotoluene	10	U	99.9	55.3		ug/L		55	50 - 107
4-Nitrophenol	50	U	200	110		ug/L		55	41 - 118
Atrazine	10	U	99.9	80.4		ug/L		81	10 - 130
Benzaldehyde	10	U	99.9	67.4		ug/L		67	10 - 152
Caprolactam	10	U F2	99.9	57.0		ug/L		57	30 - 111

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*59*		*39 - 124*
2-Fluorobiphenyl	*45*		*32 - 113*
2-Fluorophenol (Surr)	*55*		*26 - 109*
Terphenyl-d14 (Surr)	*33*		*10 - 126*
Phenol-d5 (Surr)	*52*		*27 - 110*
Nitrobenzene-d5 (Surr)	*60*		*32 - 118*

Lab Sample ID: 680-112745-1 MSD
Matrix: Water
Analysis Batch: 385515

Client Sample ID: PTP AST
Prep Type: Total/NA
Prep Batch: 384796

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1'-Biphenyl	10	U F1	89.9	30.5	F1	ug/L		34	46 - 97	20	50
2,4,5-Trichlorophenol	10	U F1	89.9	46.3	F1	ug/L		51	53 - 114	19	50
2,4,6-Trichlorophenol	10	U	89.9	49.7		ug/L		55	49 - 113	18	50
2,4-Dichlorophenol	10	U	89.9	52.8		ug/L		59	48 - 107	20	50
2,4-Dimethylphenol	10	U	89.9	48.0		ug/L		53	34 - 96	19	50
2,4-Dinitrophenol	50	U	180	99.2		ug/L		55	33 - 128	14	50
2,4-Dinitrotoluene	10	U	89.9	48.1		ug/L		53	53 - 109	15	50
2-Chlorophenol	10	U	89.9	50.1		ug/L		56	45 - 100	15	50
2-Chloronaphthalene	10	U F1	89.9	30.2	F1	ug/L		34	47 - 97	21	50
2-Methylnaphthalene	10	U F1	89.9	35.7	F1	ug/L		40	43 - 95	21	50
2-Methylphenol	10	U	89.9	47.5		ug/L		53	46 - 102	21	50
2-Nitroaniline	50	U	89.9	49.3		ug/L		55	49 - 116	16	50
2-Nitrophenol	10	U	89.9	55.5		ug/L		62	43 - 112	16	50
3 & 4 Methylphenol	10	U	89.9	48.2		ug/L		54	47 - 104	20	50
3,3'-Dichlorobenzidine	60	U F1	89.9	54	U F1	ug/L		0	10 - 130	NC	50
3-Nitroaniline	50	U	89.9	42.4	J	ug/L		47	25 - 109	15	50
4,6-Dinitro-2-methylphenol	50	U	180	106		ug/L		59	44 - 128	19	50

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-112745-1 MSD
Matrix: Water
Analysis Batch: 385515

Client Sample ID: PTP AST
Prep Type: Total/NA
Prep Batch: 384796

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4-Bromophenyl phenyl ether	10	U F1	89.9	29.2	F1	ug/L		32	50 - 110	29	50
4-Chloro-3-methylphenol	10	U	89.9	54.9		ug/L		61	48 - 113	16	50
4-Chloroaniline	20	U	89.9	37.2		ug/L		41	10 - 130	26	50
4-Chlorophenyl phenyl ether	10	U F1	89.9	26.8	F1	ug/L		30	49 - 109	24	50
4-Nitroaniline	50	U	89.9	45.9		ug/L		51	44 - 119	9	50
Acenaphthene	10	U F1	89.9	34.5	F1	ug/L		38	41 - 102	19	50
Acenaphthylene	10	U F1	89.9	31.5	F1	ug/L		35	47 - 109	22	50
Acetophenone	10	U	89.9	50.5		ug/L		56	43 - 96	16	50
Anthracene	10	U F1	89.9	28.9	F1	ug/L		32	47 - 101	25	50
Benzo[a]anthracene	10	U F1	89.9	23.6	F1	ug/L		26	44 - 109	37	50
Benzo[a]pyrene	10	U F1	89.9	22.5	F1	ug/L		25	41 - 103	38	50
Benzo[b]fluoranthene	10	U F1	89.9	23.5	F1	ug/L		26	44 - 108	39	50
Benzo[g,h,i]perylene	10	U F1	89.9	22.1	F1	ug/L		25	42 - 110	44	50
Benzo[k]fluoranthene	10	U F1	89.9	22.0	F1	ug/L		24	43 - 109	42	50
Bis(2-chloroethoxy)methane	10	U	89.9	49.8		ug/L		55	46 - 110	16	50
Bis(2-chloroethyl)ether	10	U	89.9	50.5		ug/L		56	37 - 105	15	50
Bis(2-ethylhexyl) phthalate	10	U F1	89.9	24.4	F1	ug/L		27	48 - 119	37	50
Chrysene	10	U F1	89.9	22.9	F1	ug/L		25	44 - 112	37	50
Dibenz(a,h)anthracene	10	U F1	89.9	23.8	F1	ug/L		26	44 - 106	37	50
Dibenzofuran	10	U F1	89.9	30.7	F1	ug/L		34	49 - 103	22	50
Di-n-butyl phthalate	10	U F1	89.9	29.9	F1	ug/L		33	52 - 114	24	50
Diethyl phthalate	10	U F1	89.9	45.3	F1	ug/L		50	53 - 115	18	50
Dimethyl phthalate	10	U	89.9	50.6		ug/L		56	52 - 111	12	50
Di-n-octyl phthalate	10	U F1	89.9	20.2	F1	ug/L		22	45 - 122	42	50
Fluoranthene	10	U F1	89.9	27.3	F1	ug/L		30	46 - 104	26	50
Fluorene	10	U F1	89.9	29.9	F1	ug/L		33	51 - 104	21	50
Hexachlorobenzene	10	U F1	89.9	24.9	F1	ug/L		28	42 - 108	36	50
Hexachlorobutadiene	10	U F1	89.9	16.8	F1	ug/L		19	34 - 93	35	50
Hexachlorocyclopentadiene	10	U F1	89.9	7.13	J F1	ug/L		8	10 - 130	41	50
Hexachloroethane	10	U	89.9	28.2		ug/L		31	31 - 81	20	50
Indeno[1,2,3-cd]pyrene	10	U F1	89.9	23.4	F1	ug/L		26	40 - 106	40	50
Isophorone	10	U	89.9	49.8		ug/L		55	43 - 106	20	50
Naphthalene	10	U	89.9	42.6		ug/L		47	37 - 97	16	50
Nitrobenzene	10	U	89.9	51.7		ug/L		58	41 - 105	16	50
N-Nitrosodiphenylamine	10	U	180	83.0		ug/L		46	42 - 116	22	50
N-Nitrosodi-n-propylamine	10	U	89.9	48.8		ug/L		54	46 - 109	17	50
Pentachlorophenol	50	U	180	78.6		ug/L		44	36 - 143	30	50
Phenanthrene	10	U F1	89.9	30.2	F1	ug/L		34	48 - 106	25	50
Phenol	10	U	89.9	43.0		ug/L		48	35 - 101	22	50
Pyrene	10	U F1	89.9	25.0	F1	ug/L		28	46 - 108	29	50
Butyl benzyl phthalate	10	U F1	89.9	28.2	F1	ug/L		31	53 - 117	27	50
bis (2-chloroisopropyl) ether	10	U	89.9	48.3		ug/L		54	36 - 113	15	50
Carbazole	10	U	89.9	47.2		ug/L		52	51 - 116	19	50
2,6-Dinitrotoluene	10	U	89.9	49.4		ug/L		55	50 - 107	11	50
4-Nitrophenol	50	U	180	82.2		ug/L		46	41 - 118	29	50
Atrazine	10	U	89.9	65.0		ug/L		72	10 - 130	21	50
Benzaldehyde	10	U	89.9	54.0		ug/L		60	10 - 152	22	50
Caprolactam	10	U F2	89.9	33.1	F2	ug/L		37	30 - 111	53	50

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 680-112745-1 MSD
Matrix: Water
Analysis Batch: 385515

Client Sample ID: PTP AST
Prep Type: Total/NA
Prep Batch: 384796

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*56*		*39 - 124*
2-Fluorobiphenyl	*43*		*32 - 113*
2-Fluorophenol (Surr)	*51*		*26 - 109*
Terphenyl-d14 (Surr)	*16*		*10 - 126*
Phenol-d5 (Surr)	*48*		*27 - 110*
Nitrobenzene-d5 (Surr)	*59*		*32 - 118*

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 680-384639/1-A
Matrix: Water
Analysis Batch: 384988

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384639

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	200	U	200	100	ug/L		05/26/15 10:40	05/27/15 13:27	1
Antimony	20	U	20	5.3	ug/L		05/26/15 10:40	05/27/15 13:27	1
Arsenic	20	U	20	4.6	ug/L		05/26/15 10:40	05/27/15 13:27	1
Barium	10	U	10	2.3	ug/L		05/26/15 10:40	05/27/15 13:27	1
Beryllium	4.0	U	4.0	0.20	ug/L		05/26/15 10:40	05/27/15 13:27	1
Cadmium	5.0	U	5.0	2.0	ug/L		05/26/15 10:40	05/27/15 13:27	1
Calcium	500	U	500	96	ug/L		05/26/15 10:40	05/27/15 13:27	1
Chromium	10	U	10	1.2	ug/L		05/26/15 10:40	05/27/15 13:27	1
Cobalt	10	U	10	0.95	ug/L		05/26/15 10:40	05/27/15 13:27	1
Copper	20	U	20	1.9	ug/L		05/26/15 10:40	05/27/15 13:27	1
Iron	100	U	100	50	ug/L		05/26/15 10:40	05/27/15 13:27	1
Lead	10	U	10	4.0	ug/L		05/26/15 10:40	05/27/15 13:27	1
Magnesium	500	U	500	9.9	ug/L		05/26/15 10:40	05/27/15 13:27	1
Manganese	10	U	10	2.0	ug/L		05/26/15 10:40	05/27/15 13:27	1
Nickel	40	U	40	2.3	ug/L		05/26/15 10:40	05/27/15 13:27	1
Potassium	1000	U	1000	22	ug/L		05/26/15 10:40	05/27/15 13:27	1
Selenium	20	U	20	6.4	ug/L		05/26/15 10:40	05/27/15 13:27	1
Silver	10	U	10	0.89	ug/L		05/26/15 10:40	05/27/15 13:27	1
Sodium	1000	U	1000	500	ug/L		05/26/15 10:40	05/27/15 13:27	1
Thallium	25	U	25	8.8	ug/L		05/26/15 10:40	05/27/15 13:27	1
Vanadium	10	U	10	2.4	ug/L		05/26/15 10:40	05/27/15 13:27	1
Zinc	20	U	20	8.7	ug/L		05/26/15 10:40	05/27/15 13:27	1

Lab Sample ID: LCS 680-384639/2-A
Matrix: Water
Analysis Batch: 384988

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384639

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	5010		ug/L		100	80 - 120
Antimony	50.0	51.0		ug/L		102	80 - 120
Arsenic	100	99.6		ug/L		100	80 - 120
Barium	100	99.7		ug/L		100	80 - 120
Beryllium	50.0	51.7		ug/L		103	80 - 120
Cadmium	50.0	51.9		ug/L		104	80 - 120

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

Lab Sample ID: LCS 680-384639/2-A
Matrix: Water
Analysis Batch: 384988

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384639

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	5000	5270		ug/L		105	80 - 120
Chromium	100	105		ug/L		105	80 - 120
Cobalt	50.0	52.3		ug/L		105	80 - 120
Copper	100	100		ug/L		100	80 - 120
Iron	5000	5090		ug/L		102	80 - 120
Lead	500	509		ug/L		102	80 - 120
Magnesium	5000	4970		ug/L		99	80 - 120
Manganese	500	523		ug/L		105	80 - 120
Nickel	100	103		ug/L		103	80 - 120
Potassium	5000	4660		ug/L		93	80 - 120
Selenium	100	99.5		ug/L		99	80 - 120
Silver	50.0	52.2		ug/L		104	80 - 120
Sodium	5000	5050		ug/L		101	80 - 120
Thallium	40.0	40.3		ug/L		101	80 - 120
Vanadium	100	102		ug/L		102	80 - 120
Zinc	100	104		ug/L		104	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 680-384862/1-A
Matrix: Water
Analysis Batch: 385115

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384862

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.080	ug/L		05/27/15 13:49	05/28/15 07:39	1

Lab Sample ID: LCS 680-384862/2-A
Matrix: Water
Analysis Batch: 385115

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384862

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.38		ug/L		95	80 - 120

Method: 1010A - Ignitability, Pensky-Martens Closed Cup Method

Lab Sample ID: LCS 240-182950/1
Matrix: Water
Analysis Batch: 182950

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Flashpoint	81.0	81.00		Degrees F		100	97 - 103

Method: 2540 D-2011 - Total Suspended Solids Dried at 103-105°C

Lab Sample ID: MB 680-384172/1
Matrix: Water
Analysis Batch: 384172

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	1.0	U	1.0	1.0	mg/L			05/21/15 11:49	1

Lab Sample ID: LCS 680-384172/2
Matrix: Water
Analysis Batch: 384172

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	20.0	18.5		mg/L		93	80 - 120

Lab Sample ID: LCSD 680-384172/3
Matrix: Water
Analysis Batch: 384172

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
Total Suspended Solids	20.0	21.0		mg/L		105	80 - 120	13	25

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 680-384226/7
Matrix: Water
Analysis Batch: 384226

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.25	U	0.25	0.10	mg/L			05/21/15 14:22	1

Lab Sample ID: LCS 680-384226/1
Matrix: Water
Analysis Batch: 384226

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.01		mg/L		101	90 - 110

Method: 420.1 - Phenolics, Total Recoverable

Lab Sample ID: MB 680-384649/1-A
Matrix: Water
Analysis Batch: 384783

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	0.050	U	0.050	0.025	mg/L		05/26/15 11:05	05/26/15 16:04	1

Lab Sample ID: LCS 680-384649/2-A
Matrix: Water
Analysis Batch: 384783

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phenolics, Total Recoverable	0.100	0.0815		mg/L		82	75 - 125

Method: 420.1 - Phenolics, Total Recoverable (Continued)

Lab Sample ID: LCSD 680-384649/3-A
Matrix: Water
Analysis Batch: 384783

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 384649

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenolics, Total Recoverable	0.100	0.0761		mg/L		76	75 - 125	7	30

Method: 4500 H+ B-2011 - pH

Lab Sample ID: LCS 680-384489/7
Matrix: Water
Analysis Batch: 384489

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.080		SU		101	63 - 158

Method: 4500 S2 F-2011 - Sulfide, Total

Lab Sample ID: MB 680-384370/1
Matrix: Water
Analysis Batch: 384370

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	1.0	mg/L			05/22/15 11:15	1

Lab Sample ID: LCS 680-384370/2
Matrix: Water
Analysis Batch: 384370

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	10.0	11.8		mg/L		118	75 - 125

Lab Sample ID: LCSD 680-384370/3
Matrix: Water
Analysis Batch: 384370

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
Sulfide	10.0	11.8		mg/L		118	75 - 125	0	30

Lab Sample ID: 680-112745-1 DU
Matrix: Water
Analysis Batch: 384370

Client Sample ID: PTP AST
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide	1.0	U	1.35		mg/L		NC	30

Method: 5210B-2011 - BOD, 5-Day

Lab Sample ID: USB 680-384258/1
Matrix: Water
Analysis Batch: 384258

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	USB Result	USB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Biochemical Oxygen Demand	2.0	U	2.0	2.0	mg/L			05/21/15 09:11	1

Lab Sample ID: LCS 680-384258/2
Matrix: Water
Analysis Batch: 384258

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Biochemical Oxygen Demand	198	2.0	U *	mg/L		-9	85 - 115

Lab Sample ID: LCSD 680-384258/3
Matrix: Water
Analysis Batch: 384258

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
Biochemical Oxygen Demand	198	2.0	U *	mg/L		-8	85 - 115	13	30

Lab Sample ID: USB 680-385295/1
Matrix: Water
Analysis Batch: 385295

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	USB Result	USB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Biochemical Oxygen Demand	2.0	U	2.0	2.0	mg/L			05/28/15 13:56	1

Lab Sample ID: LCS 680-385295/2
Matrix: Water
Analysis Batch: 385295

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Biochemical Oxygen Demand	198	205		mg/L		103	85 - 115

Lab Sample ID: LCSD 680-385295/3
Matrix: Water
Analysis Batch: 385295

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
Biochemical Oxygen Demand	198	202		mg/L		102	85 - 115	1	30

Method: 5220D-2011 - Chemical Oxygen Demand

Lab Sample ID: MB 680-384679/3
Matrix: Water
Analysis Batch: 384679

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	10	U	10	5.0	mg/L			05/26/15 13:00	1

Method: 5220D-2011 - Chemical Oxygen Demand (Continued)

Lab Sample ID: LCS 680-384679/4
Matrix: Water
Analysis Batch: 384679

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chemical Oxygen Demand	50.0	48.6		mg/L		97	90 - 110

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 680-384246/2
Matrix: Water
Analysis Batch: 384246

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	0.010	U	0.010	0.0030	mg/L			05/21/15 12:14	1

Lab Sample ID: LCS 680-384246/1
Matrix: Water
Analysis Batch: 384246

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	0.200	0.188		mg/L		94	85 - 115

Lab Sample ID: 680-112745-1 MS
Matrix: Water
Analysis Batch: 384246

Client Sample ID: PTP AST
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	0.010	U	0.200	0.189		mg/L		94	85 - 115

Lab Sample ID: 680-112745-1 MSD
Matrix: Water
Analysis Batch: 384246

Client Sample ID: PTP AST
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium, hexavalent	0.010	U	0.200	0.188		mg/L		94	85 - 115	0	20

Method: 9012B - Cyanide, Total andor Amenable

Lab Sample ID: MB 680-384598/1-A
Matrix: Water
Analysis Batch: 384675

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384598

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.010	U	0.010	0.0050	mg/L		05/26/15 07:30	05/26/15 12:23	1

Lab Sample ID: LCS 680-384598/2-A
Matrix: Water
Analysis Batch: 384675

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384598

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.0500	0.0528		mg/L		106	85 - 115

QC Association Summary

Client: Ashland Inc
Project/Site: Hercules Glens Falls AST Waste Char.

TestAmerica Job ID: 680-112745-1

GC/MS VOA

Analysis Batch: 385402

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-2	Trip Blank	Total/NA	Water	8260B	
LCS 680-385402/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-385402/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-385402/9	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 385589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	8260B	
LCS 680-385589/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-385589/5	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 680-385589/9	Method Blank	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 384796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	3520C	
680-112745-1 MS	PTP AST	Total/NA	Water	3520C	
680-112745-1 MSD	PTP AST	Total/NA	Water	3520C	
LCS 680-384796/7-A	Lab Control Sample	Total/NA	Water	3520C	
MB 680-384796/6-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 385257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-384796/7-A	Lab Control Sample	Total/NA	Water	8270D	384796
MB 680-384796/6-A	Method Blank	Total/NA	Water	8270D	384796

Analysis Batch: 385515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	8270D	384796
680-112745-1 MS	PTP AST	Total/NA	Water	8270D	384796
680-112745-1 MSD	PTP AST	Total/NA	Water	8270D	384796

Metals

Prep Batch: 384639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	3010A	
LCS 680-384639/2-A	Lab Control Sample	Total/NA	Water	3010A	
MB 680-384639/1-A	Method Blank	Total/NA	Water	3010A	

Prep Batch: 384862

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	7470A	
LCS 680-384862/2-A	Lab Control Sample	Total/NA	Water	7470A	
MB 680-384862/1-A	Method Blank	Total/NA	Water	7470A	

Analysis Batch: 384988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	6010C	384639

Metals (Continued)

Analysis Batch: 384988 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 680-384639/2-A	Lab Control Sample	Total/NA	Water	6010C	384639
MB 680-384639/1-A	Method Blank	Total/NA	Water	6010C	384639

Analysis Batch: 385115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	7470A	384862
LCS 680-384862/2-A	Lab Control Sample	Total/NA	Water	7470A	384862
MB 680-384862/1-A	Method Blank	Total/NA	Water	7470A	384862

General Chemistry

Analysis Batch: 182950

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	1010A	
LCS 240-182950/1	Lab Control Sample	Total/NA	Water	1010A	

Analysis Batch: 384172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	2540 D-2011	
LCS 680-384172/2	Lab Control Sample	Total/NA	Water	2540 D-2011	
LCSD 680-384172/3	Lab Control Sample Dup	Total/NA	Water	2540 D-2011	
MB 680-384172/1	Method Blank	Total/NA	Water	2540 D-2011	

Analysis Batch: 384226

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	350.1	
LCS 680-384226/1	Lab Control Sample	Total/NA	Water	350.1	
MB 680-384226/7	Method Blank	Total/NA	Water	350.1	

Analysis Batch: 384246

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	7196A	
680-112745-1 MS	PTP AST	Total/NA	Water	7196A	
680-112745-1 MSD	PTP AST	Total/NA	Water	7196A	
LCS 680-384246/1	Lab Control Sample	Total/NA	Water	7196A	
MB 680-384246/2	Method Blank	Total/NA	Water	7196A	

Analysis Batch: 384258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	5210B-2011	
LCS 680-384258/2	Lab Control Sample	Total/NA	Water	5210B-2011	
LCSD 680-384258/3	Lab Control Sample Dup	Total/NA	Water	5210B-2011	
USB 680-384258/1	Method Blank	Total/NA	Water	5210B-2011	

Analysis Batch: 384370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	4500 S2 F-2011	
680-112745-1 DU	PTP AST	Total/NA	Water	4500 S2 F-2011	
LCS 680-384370/2	Lab Control Sample	Total/NA	Water	4500 S2 F-2011	
LCSD 680-384370/3	Lab Control Sample Dup	Total/NA	Water	4500 S2 F-2011	

General Chemistry (Continued)

Analysis Batch: 384370 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 680-384370/1	Method Blank	Total/NA	Water	4500 S2 F-2011	

Analysis Batch: 384489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	4500 H+ B-2011	
LCS 680-384489/7	Lab Control Sample	Total/NA	Water	4500 H+ B-2011	

Prep Batch: 384598

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	9012B	
LCS 680-384598/2-A	Lab Control Sample	Total/NA	Water	9012B	
MB 680-384598/1-A	Method Blank	Total/NA	Water	9012B	

Prep Batch: 384649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	Distill/Phenol	
LCS 680-384649/2-A	Lab Control Sample	Total/NA	Water	Distill/Phenol	
LCSD 680-384649/3-A	Lab Control Sample Dup	Total/NA	Water	Distill/Phenol	
MB 680-384649/1-A	Method Blank	Total/NA	Water	Distill/Phenol	

Analysis Batch: 384675

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	9012B	384598
LCS 680-384598/2-A	Lab Control Sample	Total/NA	Water	9012B	384598
MB 680-384598/1-A	Method Blank	Total/NA	Water	9012B	384598

Analysis Batch: 384679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	5220D-2011	
LCS 680-384679/4	Lab Control Sample	Total/NA	Water	5220D-2011	
MB 680-384679/3	Method Blank	Total/NA	Water	5220D-2011	

Analysis Batch: 384783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	420.1	384649
LCS 680-384649/2-A	Lab Control Sample	Total/NA	Water	420.1	384649
LCSD 680-384649/3-A	Lab Control Sample Dup	Total/NA	Water	420.1	384649
MB 680-384649/1-A	Method Blank	Total/NA	Water	420.1	384649

Analysis Batch: 385295

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-112745-1	PTP AST	Total/NA	Water	5210B-2011	
LCS 680-385295/2	Lab Control Sample	Total/NA	Water	5210B-2011	
LCSD 680-385295/3	Lab Control Sample Dup	Total/NA	Water	5210B-2011	
USB 680-385295/1	Method Blank	Total/NA	Water	5210B-2011	

Lab Chronicle

Client: Ashland Inc
Project/Site: Hercules Glens Falls AST Waste Char.

TestAmerica Job ID: 680-112745-1

Client Sample ID: PTP AST

Date Collected: 05/20/15 13:30
Date Received: 05/21/15 09:12

Lab Sample ID: 680-112745-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	385589	06/02/15 17:47	RWB	TAL SAV
Total/NA	Prep	3520C			384796	05/27/15 15:58	RBS	TAL SAV
Total/NA	Analysis	8270D		1	385515	06/02/15 00:27	RAM	TAL SAV
Total/NA	Prep	3010A			384639	05/26/15 10:40	CRW	TAL SAV
Total/NA	Analysis	6010C		1	384988	05/27/15 15:23	BCB	TAL SAV
Total/NA	Prep	7470A			384862	05/27/15 13:49	JKL	TAL SAV
Total/NA	Analysis	7470A		10	385115	05/28/15 09:34	JKL	TAL SAV
Total/NA	Analysis	1010A		1	182950	05/29/15 09:00	BLW	TAL CAN
Total/NA	Analysis	2540 D-2011		1	384172	05/21/15 12:47	LBH	TAL SAV
Total/NA	Analysis	350.1		1	384226	05/21/15 14:22	JME	TAL SAV
Total/NA	Prep	Distill/Phenol			384649	05/26/15 11:05	JME	TAL SAV
Total/NA	Analysis	420.1		1	384783	05/26/15 15:11	JME	TAL SAV
Total/NA	Analysis	4500 H+ B-2011		1	384489	05/23/15 07:56	OLB	TAL SAV
Total/NA	Analysis	4500 S2 F-2011		1	384370	05/22/15 11:15	JRJ	TAL SAV
Total/NA	Analysis	5210B-2011		1	384258	05/21/15 16:42	LBH	TAL SAV
Total/NA	Analysis	5210B-2011		1	385295	05/28/15 18:46	OLB	TAL SAV
Total/NA	Analysis	5220D-2011		2	384679	05/26/15 13:00	JRJ	TAL SAV
Total/NA	Analysis	7196A		1	384246	05/21/15 12:14	GRX	TAL SAV
Total/NA	Prep	9012B			384598	05/26/15 07:30	DAM	TAL SAV
Total/NA	Analysis	9012B		1	384675	05/26/15 12:32	DAM	TAL SAV

Client Sample ID: Trip Blank

Date Collected: 05/20/15 00:00
Date Received: 05/21/15 09:12

Lab Sample ID: 680-112745-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	385402	06/01/15 15:00	JD1	TAL SAV

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

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

Certification Summary

Client: Ashland Inc
TestAmerica Job ID: 680-112745-1
Project/Site: Hercules Glens Falls AST Waste Char.

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	02-28-17
A2LA	ISO/IEC 17025		399.01	02-28-17
Alabama	State Program	4	41450	06-30-15 *
Arkansas DEQ	State Program	6	88-0692	01-31-16
California	State Program	9	2939	07-31-15
Colorado	State Program	8	N/A	12-31-15
Connecticut	State Program	1	PH-0161	03-31-17
Florida	NELAP	4	E87052	06-30-15 *
GA Dept. of Agriculture	State Program	4	N/A	06-12-17
Georgia	State Program	4	N/A	06-30-15 *
Georgia	State Program	4	803	06-30-15 *
Guam	State Program	9	14-004r	04-16-15 *
Hawaii	State Program	9	N/A	06-30-15 *
Illinois	NELAP	5	200022	11-30-15
Indiana	State Program	5	N/A	06-30-15 *
Iowa	State Program	7	353	07-01-15 *
Kentucky (DW)	State Program	4	90084	12-31-15
Kentucky (UST)	State Program	4	18	06-30-15 *
Kentucky (WW)	State Program	4	90084	12-31-15
Louisiana	NELAP	6	30690	06-30-15 *
Louisiana (DW)	NELAP	6	LA150014	12-31-15
Maine	State Program	1	GA00006	09-24-16
Maryland	State Program	3	250	12-31-15
Massachusetts	State Program	1	M-GA006	06-30-15 *
Michigan	State Program	5	9925	06-30-15 *
Mississippi	State Program	4	N/A	06-30-15 *
Montana	State Program	8	CERT0081	12-31-15
Nebraska	State Program	7	TestAmerica-Savannah	06-30-15 *
New Jersey	NELAP	2	GA769	06-30-15 *
New Mexico	State Program	6	N/A	06-30-15 *
New York	NELAP	2	10842	03-31-16
North Carolina (DW)	State Program	4	13701	07-31-15
North Carolina (WW/SW)	State Program	4	269	12-31-15
Oklahoma	State Program	6	9984	08-31-15
Pennsylvania	NELAP	3	68-00474	06-30-15 *
Puerto Rico	State Program	2	GA00006	12-31-15
South Carolina	State Program	4	98001	06-30-15 *
Tennessee	State Program	4	TN02961	06-30-15 *
Texas	NELAP	6	T104704185-14-7	11-30-15
USDA	Federal		SAV 3-04	06-11-17
Virginia	NELAP	3	460161	06-14-15 *
Washington	State Program	10	C805	06-10-15 *
West Virginia (DW)	State Program	3	9950C	12-31-15
West Virginia DEP	State Program	3	094	06-30-15 *
Wisconsin	State Program	5	999819810	08-31-15
Wyoming	State Program	8	8TMS-L	06-30-15 *

Laboratory: TestAmerica Canton

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

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Ashland Inc
TestAmerica Job ID: 680-112745-1
Project/Site: Hercules Glens Falls AST Waste Char.

Laboratory: TestAmerica Canton (Continued)

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-15
Florida	NELAP	4	E87225	06-30-15 *
Georgia	State Program	4	N/A	06-30-15 *
Illinois	NELAP	5	200004	07-31-15
Kansas	NELAP	7	E-10336	05-31-15 *
Kentucky (UST)	State Program	4	58	06-30-15 *
Kentucky (WW)	State Program	4	98016	12-31-15
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-15
Nevada	State Program	9	OH-000482008A	07-31-15
New Jersey	NELAP	2	OH001	06-30-15 *
New York	NELAP	2	10975	03-31-16 *
Ohio VAP	State Program	5	CL0024	10-31-15
Oregon	NELAP	10	4062	02-23-16
Pennsylvania	NELAP	3	68-00340	08-31-15
Texas	NELAP	6		08-31-15
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-15
Washington	State Program	10	C971	01-12-16
West Virginia DEP	State Program	3	210	12-31-15
Wisconsin	State Program	5	999518190	08-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Ashland Inc
Project/Site: Hercules Glens Falls AST Waste Char.

TestAmerica Job ID: 680-112745-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL SAV
6010C	Metals (ICP)	SW846	TAL SAV
7470A	Mercury (CVAA)	SW846	TAL SAV
1010A	Ignitability, Pensky-Martens Closed Cup Method	SW846	TAL CAN
2540 D-2011	Total Suspended Solids Dried at 103-105°C	SM	TAL SAV
350.1	Nitrogen, Ammonia	MCAWW	TAL SAV
420.1	Phenolics, Total Recoverable	MCAWW	TAL SAV
4500 H+ B-2011	pH	SM	TAL SAV
4500 S2 F-2011	Sulfide, Total	SM	TAL SAV
5210B-2011	BOD, 5-Day	SM	TAL SAV
5220D-2011	Chemical Oxygen Demand	SM	TAL SAV
7196A	Chromium, Hexavalent	SW846	TAL SAV
9012B	Cyanide, Total andor Amenable	SW846	TAL SAV

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
SM = "Standard Methods For The Examination Of Water And Wastewater",
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396
TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TestAmerica 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

Client Information	Sampler: Luke Gradue	Lab PM: Smith, Kathryn E	Carrier Tracking No(s):	COC No: 680-64849-27909.1
Client Contact: Ms. Katrina Hamilton	Phone: 518-788-8399	E-Mail: kathy.smith@testamericainc.com		Page: Page 1 of 1
Company: Ashland Inc				Job #:
Address: EHS & PR Suite 102 2000 Ashland Drive	Due Date Requested:			
City: Ashland	TAT Requested (days):			
State, Zip: KY, 41101				
Phone: 614-790-6146(Tel)	PO #: 4502471936			
Email: klhamilton@ashland.com	WO #:			
Project Name: Hercules Glens Falls AST Waste Char.	Project #: 68000956			
Site: GLENSFALLS	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1010A - Flashpoint	350.1 - Ammonia	6010C, 7470A	420.1 - Phenolics, Total Recoverable	8260B - TCL Sublist	5210B - Biochemical Oxygen Demand	2540D - Total Suspended Solids	SM4500_S2_F - Local Method	9012B - Local Method	5220D - Chemical Oxygen Demand	7196A, SM4500_H+	SVOCs	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	D	S	A	N	N	CB	B	S	N			
PTP AST	5/20/15	13:30	G	Water	N	N	1	1	1	1	3	1	1	2	1	1	2	2		
Trip Blank				Water	N	N					2									

680-112745 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements: 2.8 3.2

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		5/20/15 1525	TA	Tim Kroller	5-20-15 1525	TA
2	Tim Kroller	5-20-15 1800	TA		5-21-15 9:12	TA
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

6/4/2015

Login Sample Receipt Checklist

Client: Ashland Inc

Job Number: 680-112745-1

Login Number: 112745
List Number: 1
Creator: White, Menica R

List Source: TestAmerica Savannah

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	

Appendix G

Photo Record of T-110 and former filter vessels

Photo 1: PTP building, western end.

Photo 2: 500,000 gallon AST and aboveground piping, view east.

Photo 3: 500,000.gallon AST access port and drain valve in PTP building.

Photo 4: Skid mounted sand vessels in PTP.