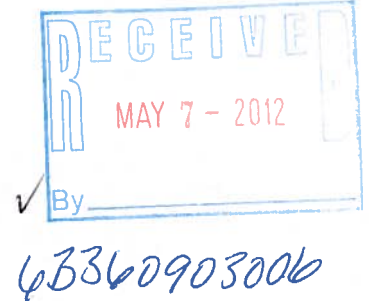


2 May 2012

SMR

Mr. Chris Seney  
Nursery Products, LLC  
12277 Apple Valley Road, Suite 131  
Apple Valley, California 92308



**Subject: Monitoring and Reporting Plan & Sampling and Analysis Plan  
Nursery Products Hawes Composting Facility  
San Bernardino County, California**


Dear Mr. Seney:


Geosyntec Consultants Inc., (Geosyntec) has reviewed and revised the attached Monitoring and Reporting Plan & Sampling and Analysis Plan (MRPSAP). This document was revised in response to comments made by the Lahontan Regional Water Quality Control.

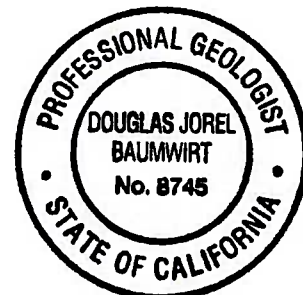
I certify under penalty of perjury that I have personally examined and am familiar with the information submitted in this MRPSAP for the Nursery Products Hawes Composting Facility and all attachments and, based on my inquiry of those individuals immediately responsible for obtaining the information; I believe the information is true, accurate, and complete. Our seals as a registered professional engineer/geologist licensed in the State of California is affixed below.

Please contact me at (858) 705-5273 if you have any questions.

Sincerely,

  
Jennifer L. Nevius, R.C.E. 64932  
Project Engineer

  
Douglas J. Baumwirt, P.G. 8745  
Project Geologist



**NURSERY PRODUCTS  
HAWES COMPOST FACILITY  
WDID No. 6B3609903006**



**Monitoring and Reporting Plan & Sampling and  
Analysis Plan**

Prepared by:  
Nursery Products  
Suite 131  
12277 Apple Valley Road  
Apple Valley, CA 92308

May 2012

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APPENDIX A – Background Native Soils Evaluation

Table A-1: Summary of Analytical Results

Table A-2: Summary of Statistical Analysis Results

Figure A-1: Compost Pad Sampling Grid

Attachment A-1: Field Notes

Attachment A-2: Laboratory Analytical Report

Attachment A-3: Statistical Analysis Output Sheets



# **1. INTRODUCTION**

## **1.1 Terms of Reference**

Nursery Products has prepared this Monitoring and Reporting Plan & Sampling and Analysis Plan (MRPSAP) for the Nursery Products Hawes Composting Facility (Facility) (WDID No. 6B360~~9~~903006).

## **1.2 Overview and Purpose**

This document was updated in support of the Report of Waste Discharge (ROWD) for the Facility. This MRPSAP has been prepared in accordance with California Code of Regulations (CCR) Title 27 and Board Order No. R6V-2010-0010.

## **2. FACILITY OVERVIEW**

The Facility is a biosolids and green material composting facility located on approximately 80 acres of a 160-acre parcel located within an unincorporated area of San Bernardino County. The Facility will compost biosolids and green material to produce agricultural grade compost in compliance with U.S. Environmental Protection Agency (EPA) Code of Federal Regulations (CFR) Title 40, Chapter I, Part 503 and the CCR Title 14.

There are two surface impoundments located on the northern end of the Facility that will collect storm water. The surface impoundments are designed to collect all storm water from the 100-year, 24-hour storm event over the entire Facility and the 1,000-year, 24-hour storm event that falls directly on the surface impoundments.

The waste pile (engineered pad for composting operations) consists of prepared subgrade of no less than 12 inches of engineered fill derived from native material. The engineered pad is sloped to prevent ponding such that all storm water will flow toward the surface impoundments. The exterior berm of the Facility is designed so that the Facility will contain all storm water from the 1,000-year, 24-hour storm event that falls on the site.

### **3. ENVIRONMENTAL CONTROL AND MONITORING SYSTEMS**

This section describes the environmental control and monitoring systems at the Facility in accordance with CCR Title 27. Monitoring frequency of each system will be performed in accordance with the Lahontan Regional Water Quality Control Board (RWQCB) Monitoring and Reporting Program No. R6V-2010-0010 (MRP) for the Facility. Quarterly monitoring events will occur during the first week of the second month of the quarter, and annual monitoring events will occur concurrently with the second quarter sampling event each year.

Nursery Products employees responsible for monitoring will be properly trained to use monitoring equipment, and will be familiar with the monitoring system, appropriate corrective action and reporting procedures.

#### **3.1 Groundwater Monitoring**

Monitoring well locations were identified so that groundwater data can be collected upgradient (MW-1) and downgradient (MW-2 and MW-3) of the two surface impoundments and waste pile. The proposed monitoring well locations are shown on the figures provided in the Facility Design Plan [Geosyntec, 2011]. The specific locations of the wells were selected because groundwater is expected to flow northward (see ROWD). Additional groundwater wells may be necessary if the three well locations are insufficient to characterize the groundwater beneath the Facility. Following installation of the monitoring wells, site-specific groundwater flow direction will be assessed using groundwater elevation data from the on-site wells. The list of groundwater monitoring parameters can be found in Board Order No. R6V-2010-0010. The samples, with the exception of field parameters, will be analyzed by a California state-certified laboratory. Initially, these wells will be sampled quarterly for at least eight quarters to characterize background water quality, flow conditions, and seasonal variation.

##### **3.1.1 Monitoring Well Installation**

Prior to drilling, Underground Service Alert (USA) will be contacted at least 48 hours in advance of drilling to notify operators of subsurface utilities of our intention to drill as required by law. The utility companies will conduct a mark-out of their utilities that are in the vicinity of the proposed drilling. In addition, well permits will be obtained from the San Bernardino County Department of Environmental Health.

The monitoring wells will be installed by a state-licensed drilling contractor. Installation methods and materials will comply with the California State Department of Water Resources (DWR) Well Standards for monitoring wells (DWR Bulletin Nos. 74-81 and 74-90) that are described in the sections below. The proposed groundwater monitoring well design was provided in the Facility Design Plan [Geosyntec, 2011].

The field engineer/geologist will inventory the well construction materials prior to the start of well construction. Drill cuttings will be stockpiled on plastic sheeting and development water will be containerized onsite pending laboratory analysis to determine the proper disposal method. Samples of investigative-derived wastes will be collected in pre-cleaned, properly preserved, laboratory-provided containers and analyzed. For soil disposal characterization purposes, a minimum of one composite soil sample comprised of approximately equal portions of material from each stockpile will be collected and analyzed for Title 22 metals, Total Petroleum Hydrocarbons (TPH), and Volatile Organic Compounds (VOCs) by EPA Methods 6010, 8015, and 8260, respectively. The results of analytical testing from the first sampling event will be used for liquid disposal characterization purposes. Soil, fluids, and water determined to be impacted will be disposed of at an appropriate landfill or water treatment facility. Wastes determined not to be impacted will be discharged to the ground surface near each well without impact to site design.

Monitoring wells will be constructed from new and clean materials. The well casing will consist of threaded, Schedule 80 polyvinyl chloride (PVC), four-inch-diameter pipe. The well screen will consist of threaded, machine-slotted Schedule 80 PVC pipe (0.020-inch slots) with a threaded PVC end-cap. Stainless steel centralizers will be used at 30-foot intervals. The screened interval is proposed to be the bottom 25 feet of each well. The annular space will be backfilled with a Monterey #3 sand (or equivalent) filter pack to a minimum of 2 feet above the top of the well screen using a tremie pipe. The level of the sand will be periodically sounded to identify its depth and the water in the well will be surged during placement to settle the filter pack.

A minimum 5-foot transition seal will be tremied into place through the conductor casing and will consist of bentonite chips or pellets, placed in 6-inch lifts followed by hydration using approximately 1 gallon of potable water. The completed bentonite transition seal will be allowed to hydrate for at least 30 minutes prior to placing the grout. The depth to the top of the transition seal will be verified by measuring using a weighted tape.

The annular seal above the transition seal will consist of a high-solids bentonite grout (or bentonite chips placed and hydrated in accordance with the above procedure) which

will be pumped and placed using a tremie pipe or equivalent to fill the annular space to approximately 5 feet below ground surface. Concrete will be tremied to complete the backfilling of the annular space and be continuous with the minimum 3-foot-diameter surface completion.

Upon completion of the well, the riser pipe will be cut cleanly so that the top of the well is level, and a mark or notch made on the top of the riser pipe identifying a measuring point for water level measurements. A locking cap will be placed at the top of the casing to secure the well from unauthorized entry. A steel monument-style well enclosure with a locking cap will be installed as part of the concrete surface completion, and will extend above grade.

After completion of well installation, the drilling contractor will perform well development by airlifting/swabbing, and pumping or other methods to remove residual drilling solids. Water will be pumped from the well until the discharge is relatively free of fine-grained sediment prior to collecting groundwater field parameters including temperature, pH, and conductivity. To facilitate groundwater parameter data collection, a groundwater quality meter (such as YSI 556 or equivalent) and flow-through cell will be fitted to a valve on the effluent of the pump so as to allow non-turbulent flow through the cell. Groundwater quality meters will be calibrated prior to use.

To ensure representative data is collected, the volume and rate of flow through the cell will be determined to confirm the minimum frequency of data collection. For example, if the flow-through cell holds 500 milliliters (mL), and flow through the cell (not from the pump) is 100 mL per minute, groundwater data collection can be performed a minimum of once every 5 minutes. Monitoring wells will be considered developed when temperature stabilizes to within  $\pm 1$  degree Celsius, when pH stabilizes to within  $\pm 0.1$  pH unit, and when conductivity stabilizes to within  $\pm 3$  percent for three consecutive readings. Additionally, depth to water data will be collected using an electronic water-level indicator.

A boring log showing the well construction/completion for each well will be completed in the field by the field geologist/engineer under the supervision of a California-certified Professional Geologist or Engineer, and submitted in the monitoring systems installation report.

Following the completion of well installation, wells will be surveyed by a professional land surveyor licensed in the state of California, and in accordance with the California State Plane coordinate system and appropriate vertical datum. Groundwater levels will be measured post-installation to evaluate the groundwater flow direction.

### 3.1.2 Groundwater Monitoring and Sampling

Groundwater monitoring, sampling, and analysis will be conducted on a quarterly basis for the first two years of operation. Thereafter, and assuming constant and consistent results, Nursery Products will submit a request for less frequent monitoring for the duration of operation. Prior to purging, the water level in each well will be measured using an electronic water-level indicator to the nearest 0.01 foot. Each well will be purged and sampled using the "purge to stabilization" groundwater sampling technique in general accordance with the Guidance Manual for Groundwater Investigations prepared by the California EPA (CalEPA), Department of Toxic Substances Control (DTSC), dated July 1995 (revised February 2008). Groundwater purging will be performed using either a dedicated or non-dedicated variable-speed pump set within the screened interval with a pump rate set such that drawdown is minimized. During purging, water level measurements will be taken regularly at 3-minute intervals to document the amount of drawdown during purging. After a minimum of one tubing volume (including pump and flow-through-cell volume) has been purged from the well, field parameters (including temperature, pH, and conductivity) will be monitored at a minimum frequency of every 3 minutes during purging to document the stability of these parameters before sampling. Well water will be considered stabilized when temperature stabilizes to within  $\pm 1$  degree Celsius, when pH stabilizes to within  $\pm 0.1$  pH unit, and when conductivity stabilizes to within  $\pm 3$  percent for three consecutive readings. To facilitate groundwater field parameter data collection, a groundwater quality meter (such as YSI 556 or equivalent) and flow-through cell will be fitted to a valve on the effluent of the pump so as to allow non-turbulent flow through the cell. Groundwater quality meters will be calibrated prior to use. Subsequent to documentation of stabilization of field parameters, groundwater shall be sampled directly from the discharge by slowing the pumping rate to a thin, slowly flowing stream and filling the appropriate sample containers. The sample containers will be pre-cleaned, pre-labeled, properly preserved laboratory-supplied containers appropriate for each analyte.

Purge water will be containerized onsite pending laboratory analysis of groundwater samples. One purge water sample will be analyzed for VOCs by EPA Method 8260 and Title 22 Metals by EPA Method 6010 for disposal characterization purposes. Soil, fluids, and water determined to be impacted will be disposed of at an appropriate landfill or water treatment facility. Wastes determined not to be impacted will be discharged to the ground surface near each well upon written receipt of approval from the RWQCB.

Water samples will be collected using disposable or dedicated tubing. Therefore, no equipment rinsate blank will be collected for analysis when sampling the wells. However, when samples are collected for analysis of VOCs, a quality control trip blank (QCTB) provided by the laboratory will be used to evaluate if VOC contamination occurred during sample transport or storage. A trip blank consists of a deionized water sample transported to the field by sampling personnel, shipped along with the groundwater samples to the laboratory, and analyzed for the same VOCs as the groundwater samples. One QCTB will be analyzed with each sample shipment to the laboratory. The laboratory will be notified that samples are going to be collected, and the laboratory will pick up the samples and transport them to the laboratory for analysis using proper sample preservation, containers, handling and storage per standard chain-of-custody protocols. Analyses listed in Board Order No. R6V-2010-0010 will be performed in accordance with recommended holding times, containers, and preservatives by a state-certified laboratory.

### **3.2 Vadose (Unsaturated) Zone Monitoring – Surface Impoundments**

The vadose zone monitoring system beneath each surface impoundment will consist of a permanent lysimeter (See Design Plan). The lysimeter liner will consist of 60-mil high-density polyethylene (HDPE). The dimensions of each lysimeter sump will be 25 feet square, 2 feet deep and be filled with crushed rock. Each lysimeter sump will be located with the top being 5 feet below the bottom of the surface impoundment. Access to the lysimeter is through a 6-inch riser pipe that will have a locking cover. The particular locations of the monitoring points were selected below the lowest point of each surface impoundment.

Each lysimeter will be inspected weekly for the presence of liquids using an electronic moisture detector. If liquid is detected in a previously dry lysimeter, the RWQCB will be notified, and the liquid analyzed for the parameters in Attachment B of Board Order No. R6V-2010-0010 provided the amount of liquid is sufficient for testing. If a smaller quantity of liquid is present a proposed priority for testing will be submitted to the RWQCB.

In such an event, the following procedures will be implemented. The laboratory will be notified that samples are planned for collection, and the laboratory courier will pick up the samples and transport them to the laboratory for analysis using standard chain-of-custody protocols. The samples will be collected using pre-cleaned portable pumping equipment. Re-usable sampling equipment will be decontaminated using an Alconox wash followed by a potable water rinse, followed by a distilled water final rinse (the 3-bucket wash method). The samples will be collected in pre-cleaned, pre-labeled,

properly preserved, laboratory-supplied containers appropriate for each analyte. In addition to the surface impoundment vadose zone samples, a quality control equipment blank (QCEB) will be prepared and collected by the sampling personnel to be used to evaluate whether contamination was introduced as a result of improper decontamination of reusable sampling equipment. A QCEB consists of deionized water either poured over or through reusable sampling equipment after decontamination procedures. The QCEB will be collected in appropriately preserved and labeled containers and will be shipped along with the groundwater samples to the laboratory, and analyzed for the same constituents as the leachate samples. One QCEB will be analyzed for each day that reusable groundwater sampling equipment is utilized at the site to facilitate sample collection.

Where samples are collected for analysis of VOCs, a QCTB provided by the laboratory will be used to evaluate whether VOC contamination occurred during sample transport or storage. A trip blank consists of a deionized water sample transported to the field by sampling personnel, shipped along with the groundwater samples to the laboratory, and analyzed for the same VOCs as the groundwater samples. One QCTB will be analyzed with each sample shipment to the laboratory.

### **3.3 Vadose (Unsaturated) Zone Monitoring – Waste Pile (Compost Pad)**

#### **3.3.1 Annual Soil Monitoring**

The proposed vadose zone monitoring for the waste pile consists of annual soil sampling and comparison of results to background threshold values (BTVs) established prior to Facility construction as described in Appendix A. The purpose for this sampling protocol is to assess the effectiveness of the composting pad engineered fill liner and provide cumulative assessment of the condition thereof. Monitoring Parameters are tested annually, and Constituents of Concern are tested on a five-year cycle as presented in Table 3 in Board Order No. R6V-2010-0010. Ten soil samples will be collected from random locations at six-inch intervals to a depth of 1.5 feet within the waste pile area. A probability-based “simple random sampling” plan will be implemented based on the December 2002 EPA Guidance on Choosing a Sampling Design for Environmental Data Collection [EPA, 2002]. Soil samples, with the exception of field parameters, will be analyzed by a California-certified laboratory.

#### **3.3.2 Soil Sampling Procedures**

To determine random sampling locations, the footprint of the compost pad will be divided into a 100-unit by 100-unit grid over the entire waste pile area. Using a random number generator, “x” and “y” sample location coordinates will be determined for each



of the 10 random soil boring locations. Each of the soil borings will be advanced to a depth of 18 inches, with samples retained from 6 to 12-inch and 12 to 18-inch intervals. A clean hand-auger or sample tube will be used to retrieve the representative samples. The hand-augered samples will be placed into pre-cleaned, pre-labeled, properly preserved laboratory-supplied containers. Soil samples retrieved with sampling tubes will be sealed and will not be transferred into other containers. Following sample collection, the borings will be backfilled with bentonite and hydrated.

The laboratory will be notified that samples are planned for collection, and the laboratory will pick up the samples and transport them to the laboratory for analysis using standard chain-of-custody protocols.

Initially, the 10 samples collected from the 6 to 12-inch interval will be analyzed by the laboratory, and the 10 samples collected from the 12 to 18-inch interval will be archived by the laboratory pending results of the shallow samples. Laboratory analysis will include those constituents listed in Table 3 (Unsaturated Zone – Waste Pile, Monitoring Parameters and Constituents of Concern) of Attachment C in Board Order No. R6V-2010-0010. Annual monitoring events will include analysis of the listed Monitoring Parameters, and each fifth annual monitoring event will included analysis of the listed Monitoring Parameters and Constituents of Concern. During each sampling event the sampler will visually evaluate soil conditions for physical evidence of a significant release as specified in Section III.C of Board Order No. R6V-2010-0010, including unexplained volumetric changes, unexplained stress in biological communities, unexplained changes in soil characteristics or moisture content, visible signs of leachate migration, and/or any other change in the environment that could reasonably be expected to be the result of a measurably significant release from the Facility.

### **3.3.3 Determination of a Measurably Significant Release**

Within 45 days of sampling, determination of whether a measurably significant release has occurred from the Facility will be performed. To reduce the false-positive rate and to address outliers, naturally-occurring constituents that were not detected, general uncertainty associated with unbiased statistical methodology, and considering a depth to groundwater approximately 360 feet below ground surface, determination of a potential significant release from the Facility will initially be defined as the reported detection of five or more constituents at concentrations exceeding respective BTVs (Appendix A) in a given sample, and/or physical evidence of a significant release observed during sampling. If five or more constituents in a single sample collected from the 6 to 12-inch interval exceed respective BTVs, then the archived sample collected from the

underlying 12 to 18-inch interval will be analyzed for only those constituents that exceeded the BTVs in the sample collected from the 6 to 12-inch interval.

If five or more constituents exceed respective BTVs in a single sample collected from the 12 to 18-inch interval, then the RWQCB will be immediately notified by electronic mail and the verification process will be initiated as outlined in Section III.D of Board Order No. R6V-2010-0010. The verification procedure will include a discrete retest within three feet of the location(s) which yielded the elevated results for five or more constituents. Retesting will include collection and analysis of samples collected from the 6 to 12-inch and 12 to 18-inch intervals for those constituents that exceed respective BTVs. Sample collection procedures will be performed in accordance with Section 3.3.2 of this MRPSAP. Results of verification testing will be reported by electronic mail to the RWQCB within 7 days of the last laboratory analysis. Reporting a measurably significant release from the compost pad at the Facility will be reported in accordance with Section IV.G (Unscheduled Reports to be Filed with the Water Board) of Board Order No. R6V-2010-0010. If retesting confirms evidence of a measurably significant release from the Facility, then a workplan will be developed which proposes either mitigation of the release or further investigation and submitted to the RWQCB.

#### **3.4 Impoundment Monitoring – Solid**

Annually, in the last quarter of each year, individual grab samples of the bottom sludge from each surface impoundment, if present, will be collected, and each sample will be analyzed for the constituents listed in Board Order No. R6V-2010-0010 MRP.II.A.4. A pre-cleaned shovel, trowel, or scoop will be used to collect a representative sample of the sludge in the bottom of each surface impoundment. Re-usable sampling equipment will be decontaminated using an Alconox wash followed by a potable water rinse, followed by a distilled water final rinse (the 3-bucket wash method). The representative samples will be placed into the pre-labeled container provided by the laboratory and transported to the laboratory for analysis using standard chain-of-custody protocols.

#### **3.5 Impoundment Monitoring – Liquid**

Quarterly, a minimum of three grab samples of liquid, if present, from each of the surface impoundments will be collected from a depth of approximately one foot, opposite the inlet, in a quiescent surface area. The grab samples from each surface impoundment will be composited in the field into two samples, one for each surface impoundment. The samples will be analyzed for the constituents presented in Table 1 of Attachment A of Board Order No. R6V-2010-0010. If the surface impoundment is dry at the time of monitoring, this condition will be noted in the monitoring report.

The laboratory will be notified that samples are going to be collected, and the laboratory will pick up the samples and transport them to the laboratory for analysis using standard chain-of-custody protocols. A pre-cleaned pond sampler that consists of an arm or handle with a clamp to attach a sampling container will be used to collect the representative samples of wastewater. Re-usable sampling equipment will be decontaminated using an Alconox wash followed by a potable water rinse, followed by a distilled water final rinse (the 3-bucket wash method). The pond sampler will be slowly submerged and retrieve the samples with minimal surface disturbance. The samples will be collected in pre-cleaned, pre-labeled, properly preserved laboratory-supplied containers provided by the laboratory. The laboratory will composite the three discrete samples for each surface impoundment.

Where samples are collected for analysis of VOCs, a QCTB will be provided by the laboratory to evaluate whether VOC contamination occurred during sample transport or storage. A trip blank consists of a deionized water sample transported to the field by sampling personnel, shipped along with the groundwater samples to the laboratory, and analyzed for the same VOCs as the groundwater samples. One QCTB will be analyzed with each sample shipment to the laboratory.

### **3.6 Leak Detection Monitoring Sump**

Weekly inspection for liquid in each of the two LDMSs will be conducted using a moisture detector. Access to the LDMS is through a 6-inch riser pipe that will have a locking cover. The result of these inspections will be recorded in a permanent logbook kept onsite. If liquid is detected in a LDMS, the RWQCB will be notified immediately. Any volume of liquid pumped out of the LDMS will be recorded along with date, time, and discharge location, in a permanent logbook kept onsite.

Upon detection of liquid in a previously dry LDMS, a grab sample will be collected and tested for the parameters listed in Table 2 in Attachment B of Board Order No. R6V-2010-0010 provided the required amount of liquid is present for testing. If a smaller quantity of liquid is present a proposed priority for testing will be submitted to the RWQCB.

The laboratory will be notified that samples are going to be collected, and the laboratory will pick up the samples and transport them to the laboratory for analysis using standard chain-of-custody protocols. The samples will be collected using pre-cleaned onsite portable pumping equipment. The samples will be collected in pre-cleaned, pre-labeled, properly preserved laboratory-supplied containers appropriate for each analyte.

Re-usable sampling equipment will be decontaminated using an Alconox wash followed by a potable water rinse, followed by a distilled water final rinse (the 3-bucket wash method). In addition to the surface impoundment vadose zone samples, a QCEB will be prepared and collected by the sampling personnel to be used to evaluate whether contamination was introduced as a result of improper decontamination of reusable groundwater sampling equipment. A QCEB consists of deionized water either poured over or through reusable sampling equipment after decontamination procedures or collected in appropriately preserved and labeled containers. The QCEB is shipped along with the groundwater samples to the laboratory, and analyzed for the same constituents as the leachate samples. One QCEB will be analyzed for each day that reusable groundwater sampling equipment is utilized at the site to facilitate sample collection.

Where samples are collected for analysis of VOCs, a QCTB provided by the laboratory will be used to evaluate whether VOC contamination occurred during sample transport or storage. A trip blank consists of a deionized water sample transported to the field by sampling personnel, shipped along with the groundwater samples to the laboratory, and analyzed for the same VOCs as the groundwater samples. One QCTB will be analyzed with each sample shipment to the laboratory.

### **3.7 Impoundment Inspections – Dikes and Liners**

Monthly, each of the surface impoundment dikes and liners will be visually inspected to determine if there are any indications of loss of integrity. Should the inspection indicate that any unauthorized discharge has occurred, or may occur, the RWQCB will be notified within 48 hours, followed by confirmation in writing within 7 days.

Daily, measure and record the freeboard, as measured from the top of the lowest part of the dike to the wastewater surface in each surface impoundment. Observations and measurements will be recorded in a permanent log book kept onsite. If the surface impoundment is dry, it will be indicated as such in the log book and monitoring report.

The weather forecasts will be monitored daily and whenever rain is forecast. Each surface impoundment will be inspected and documented prior to each predicted event.

### **3.8 Facility Berm Inspections**

Monthly, and before, during, and after any storm event that produces precipitation at the Facility, the berm around the Facility must be visually inspected to determine if there are any indications of loss of integrity. Inspections, inspection results, and activities performed to correct deficiencies must be documented. Should the inspection indicate

that any unauthorized discharge of stormwater has occurred, or may occur; the RWQCB must be notified by electronic mail within 48 hours, followed by confirmation in writing within 7 days.

### **3.9 Facility Odor Monitoring**

An Odor Impact Minimization Plan will be developed. Daily, the discharger will assess the site conditions and evaluate potential sources of objectionable odors and document these inspections. Documentation will include a description of any odors detected. Wind speed and direction will be checked and logged daily and just prior to any activities at the Facility that may produce nuisance dust. Odor control measures include odor screening and load checking procedures, feedstock storage and processing measures, windrow management measures, good housekeeping procedures, and an odor complaint response system. Odor control activities at the Facility must be documented daily in a permanent log book kept onsite.

### **3.10 Operation and Maintenance**

A brief summary of any operational problems and maintenance activities must be submitted to the RWQCB with each monitoring report.

### **3.11 Dust Control**

The following mitigation measures must be implemented and monitored to ensure dust is controlled:

- Unpaved roads will be watered, as necessary, to minimize visible dust. Alternatively, roads may be paved;
- During episodes of high winds (>30 miles per hour), activities that may create nuisance dust may not be performed;
- Daily, monitor moisture content of windrows using a standard field test for moisture. Moisture will be determined by taking a representative sample of the windrow materials and forming the material into a ball by hand; the materials should hold together without crumbling. If material crumbles, water will be added. Moisture monitoring activities must be documented daily in a permanent log book onsite.

## **4. DATA ANALYSIS**

### **4.1 Groundwater Quality Monitoring**

The objective of groundwater quality monitoring is to determine whether a monitoring parameter (MPar) has exhibited a new measurably significant increase in monitor wells. The purpose of the selected statistical analysis is to detect the potential arrival of a MPar in a well at a concentration high enough to be considered a measurably significant indication using an appropriate statistical or non-statistical data analysis method.

In accordance with the EPA's Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, dated March 2009 (Unified Guidance), the statistical groundwater detection monitoring program should be designed to suit site-specific conditions, including hydrogeologic heterogeneity and the nature of naturally-occurring constituents. Furthermore, the Unified Guidance recommends a comprehensive detection monitoring program design based on two key performance characteristics: adequate statistical power and a low predetermined site-wide false positive rate. Therefore, to address the significance of selecting the appropriate statistical design, development of a background data set comprised of a minimum of 8 independent background observations will be completed prior to selecting an appropriate statistical design. The initial background data set for each MPar) for each monitoring well (well/MPar pair), shall include all validated data obtained from the eight quarterly background sample events described in Section 3.1.

The background study shall select the constituents deemed appropriate for detection monitoring, identify distributional characteristics, and evaluate the constituent data for trends, stationarity, and mean spatial variability among wells. A combination of background statistical tests including T-tests, analysis of variance (ANOVA), and trend tests will be performed in accordance with the Unified Guidance to determine appropriate compliance evaluation statistical methods. The selected statistical method will be determined based on its ability to minimize the site-wide false positive rate, and ensure sufficient statistical power for detecting contaminated groundwater.

Following development of the minimum 8-point background data set ( $n \geq 8$ ) and statistical evaluation, a proposed Detection Monitoring Program (DMP) will be submitted to the RWQCB in accordance with CCR Title-27 Section 20415 for review and approval prior to implementation. During the interim period prior to determination and RWQCB approval of a statistical DMP, background groundwater will be compared to conservative primary and secondary Maximum Contaminant Levels for drinking

water (MCLs), and Basin Plan objectives for other inorganic parameters such as TDS, chloride, and sulfate.

#### **4.2 Surface Impoundment Vadose Zone Monitoring**

Vadose zone surface impoundment liquid sample analytical results will be compared to concentration limits for site groundwater wells to determine the significance of the observed concentrations of constituents of concern reported for the collected samples. During the interim period prior to determination and RWQCB approval of a statistical DMP, background groundwater will be compared to conservative primary and secondary MCLs, and Basin Plan objectives for other inorganic parameters such as TDS, chloride, and sulfate.

#### **4.3 Compost Pad Monitoring**

Compost pad monitoring will be performed to obtain random sampling analytical results of Monitoring Parameters (annually) and Constituents of Concern (five-yearly) for soil samples collected from the compost pad. Background soil sampling was performed to develop BTVs for the compost pad for use in comparison to annual compost pad sampling results. The EPA ProUCL 4.0 software was used to perform the statistical analysis of the background data [EPA, 2007]. For constituents with at least two detected results, BTVs were calculated using the 95 percent Chebyshev upper prediction limit (UPL). This method was selected because it is a non-parametric method and can be used on data sets regardless of their distribution. If the data contain non-detect measurements, the Kaplan-Meier method will be used to estimate the mean and standard deviation. The equation for calculating the Chebyshev UPL is given below:

$$UPL = \bar{x} + \left[ \sqrt{((1/\alpha) - 1) * (1 + 1/n)} \right] S_x$$

Where  $\bar{x}$  is the mean and  $S_x$  is the standard deviation.

Compost Pad sampling procedures are described in Section 3.3 of this MRPSAP. Results of background soil sampling and presentation of site-specific BTVs are presented in Appendix A.

## 5. REPORTING

### 5.1 Monitoring Reports

Monitoring reports will be submitted quarterly on the 30<sup>th</sup> day of the month following each quarter. Annual monitoring reports will be submitted no later than April 30 of each year. Every five years, sampling for non-monitoring parameter Constituents of Concern (COCs) will be performed with successive alternating direct monitoring efforts being carried out during January 1 through June 30 of one five-year sampling event and July 1 through December 31 of the next five-year sampling event, and every fifth year thereafter. In accordance with Board Order No. R6V-2010-0010, the first five-year non-monitoring parameter COC sampling event must take place during January 1 through June 30 of the second year of operation, and reported no later than 45 days following the monitoring period.

The quarterly monitoring reports, at a minimum, will contain the following components:

- Results of sampling and laboratory analyses for each groundwater monitoring point, including statistical limits for each monitoring parameter and an identification of each sample that exceeds its respective statistical limit at any given monitoring point in accordance with Section III "Data Analyses" of the MRP;
- A description and graphical representation of the velocity and direction of groundwater flow under/around the Facility, based on water-level elevations taken during the collection of the water quality data submitted in the report;
- A map and/or aerial photograph showing the locations of the observation stations, monitoring points, background monitoring points, and the Points of Compliance (POCs) along the downgradient boundary of the Facility;
- Surface impoundments monitoring results, including an evaluation of the effectiveness of the leachate monitoring and control facilities. Monitoring will include a summary of surface impoundment pumping activities for dust control mitigation measures;
- If the Storm Contingency Plan is implemented during a quarter, the volume of liquid removed and the location the liquid was taken to for disposal will be provided, and documentation will include the beginning and ending freeboard levels;



- Monitoring of the Facility berms including an evaluation of the effectiveness of the run on/runoff control facilities;
- Data collected in accordance with this MRPSAP, and the MRP for the surface impoundments' unsaturated zone monitoring system and groundwater monitoring wells;
- An assessment of odor impacts in accordance with the approved Odor Impact Minimization Plan, and mitigation measures implemented for nuisance odor control;
- A summary of all daily wind monitoring data in tabular form, with wind speeds in excess of 30 miles per hour highlighted in the table;
- A summary of moisture monitoring measures for windrows, including any instances where water had to be added to the windrow;
- A letter transmitting the essential points of each report, including a discussion of any violations found since the last such monitoring report was submitted, and describing actions taken or planned for correcting these violations; and
- A reference to any previously submitted time schedule for correcting identified violations. If no violations occurred since the last report submittal, this will also be stated in the transmittal letter.

Annual Monitoring Reports will include, at a minimum, the following components:

- A list of all monitoring point/monitoring parameter (MPt/MPar) pairs, by medium, that have exhibited a verified measurably significant increase, together with the respective date (for each) when that increase occurred. Any MPt/MPar pairs that have shown an increase within that (prior) year will be bolded and underlined. In addition, by medium, list any non-monitoring parameter COCs that, during the testing year (tested every 5 years), have exceeded their respective statistical limit and, as a result, have become monitoring parameters, together with the date when the transition occurred;
- Time-series data plots of groundwater and soil moisture analysis. Time series plots will include appropriate MCL or concentration thresholds established for each respective constituent that has shown a verified increase. For a pair that has a verified measurably significant release indication, these plots must also include the cleanup goal;

- Four maps, one for each quarter of the last reporting year, showing the groundwater elevation iso-contours determined for that quarter, and showing the waste pile and surface impoundments perimeters and the groundwater monitoring point and background monitoring point locations for each waste management unit, and including the surface trace of the Facility's point of compliance;
- Graphical and tabular data for the monitoring data obtained for the previous calendar year (January through December). Each table will summarize the historical and most recently detected constituents concentrations for all locations sampled, and compare these data to both the given monitoring point/COC pair's respective statistical limit and (if applicable) MCL, and be labeled appropriately. Each such graph will be plotted using raw data, and at a scale appropriate to show trends or variations in water quality. For graphs showing trends of similar constituents (e.g., VOCs), the scale must be the same;
- Calibration methods and any discrepancies of any meters used for field parameter evaluations after calibration is performed;
- The compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the discharge requirements;
- Evidence that adequate financial assurance for closure and corrective actions for all known or reasonably foreseeable releases is still in effect. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument. Evidence of adequate financial assurance must be signed by the Corporate Officer;
- Evidence that the financial assurance amount is adequate, or increase the amount of financial assurance by an appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events; and
- Any known or reasonably foreseeable releases causing significant changes in the operation of the Facility will prompt the review of the preliminary closure plan and corrective action plan to evaluate whether updates to the plans are warranted. Any changes to these plans will be submitted to the RWQCB in the annual report.

## **5.2 Technical Reports**

### **5.2.1 Final Construction Quality Assurance Report**

Following the completing of construction of the Facility, and at least 60 days prior to discharge the final construction quality assurance (CQA) report must be submitted to the RWQCB for review and acceptance. This report must be submitted to the RWQCB no later than 180 days after completion of construction.

### **5.2.2 Monitoring Systems Installation Report**

No later than 180 days following completion of construction and at least 60 days prior to discharge, a technical report must be submitted summarizing the installation of the monitoring systems. The report shall summarize all work activities associated with the installation of the monitoring systems.

### **5.2.3 Completion of Construction Report**

No later than 90 days following completion of construction, a technical report will be submitted discussing the installation of the monitoring system.

### **5.2.4 Water Quality Protection Standard Report**

No later than 760 days following the beginning of operations, a proposed data analysis method and a proposed concentration limit (background data set) consisting of eight data points from an appropriate groundwater background data source for each COC at each monitoring point will be submitted.

### **5.2.5 Five-Year Non-Monitoring Parameter Constituent of Concern Monitoring Report**

Sample for non-monitoring parameter COCs every five years with successive direct monitoring efforts being carried out alternatively during January 1 through June 30 of one five-year sampling event and July 1 through December 31 of the next five-year sampling event, and every fifth year, thereafter. The first five-year non-monitoring sampling event must take place during January 1 through June 30 of the second year of operation of the Facility, and reported no later than 45 days following the monitoring period.

## 6. REFERENCES

- DWR, 1981. Bulletin 74-81, California Well Standards. Department of Water Resources, 1981.
- DWR, 1990. Bulletin 74-81, Water Well Standards. Department of Water Resources, 1990.
- EPA, 2002. Guidance on Choosing a Sampling Design for Environmental Data Collection, EPA QA/G-5S. United States Environmental Protection Agency, December 2002.
- EPA, 2007. ProUCL Version 4.0 Technical Guide, EPA/600/R-07/041. United States Environmental Protection Agency, April 2007.
- EPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530/R-09-007. United States Environmental Protection Agency, Office of Resource Conservation and Recovery. March 2009.
- Geosyntec, 2011. Final Design Plan, Construction Quality Assurance Plan & Technical Specifications, Hawes Composting Facility. May 2011.
- RWQCB, 2010. Board Order No. R6V-2010-0010, WDID No. 6B360903006, Waste Discharge Requirements and Monitoring and Reporting Program for Hawes Composting Facility. Adopted March 2010.
- RWQCB, 2011a. Revised Monitoring and Reporting Plan and Sampling and Analysis Plan, Nursery Products Hawes Composting Facility, San Bernardino County. RWQCB letter dated 28 January.
- RWQCB, 2011b. Background Native Soils Report, Nursery Products Hawes Composting Facility, San Bernardino County. RWQCB letter dated 4 February.
- URS, 2009. Report of Waste Discharge, Nursery Products Hawes Composting Facility, San Bernardino County, California. April, Revised July 2009.

## **APPENDIX A - Background Native Soils Evaluation**

### **A.1 Background Native Soils Sampling**

Prior to construction of the Facility, background data (including Monitoring Parameters and Constituents of Concern) were obtained for the native engineered fill material of the waste pile. Ten representative locations were sampled from the native materials in the planned waste pile area. A probability-based “simple random sampling” plan was implemented as outlined in the December 2002 Environmental Protection Agency (EPA) Guidance on Choosing a Sampling Design for Environmental Data Collection [EPA, 2002]. The footprint of the proposed waste pile composting pad was divided into a 100-unit by 100-unit grid (Figure A-1). Using a random number generator, “x” and “y” sample location coordinates were determined for each of the background soil boring locations (Attachment A-1).

Background native soil sampling was performed on 9 February 2012 by a California-licensed Professional Geologist in accordance with Section A.1 described above. Ten (10) soil borings were hand-augered to depths of 1.5 feet (ft) below grade (bg) to facilitate collection of two soil samples per boring (one from 0.5 to 1 ft bg and another from 1 to 1.5 ft bg). Field notes are included in Attachment A-1. A clean hand-auger was used to retrieve each of the samples. The samples were placed in pre-cleaned, pre-labeled, properly preserved laboratory-supplied containers. Following sample collection, the boring was backfilled with the native material soil cuttings and compacted.

Soil samples were transported under chain-of-custody to Calscience Environmental Laboratory in Garden Grove, California, a California-certified laboratory. The laboratory was notified that samples were being collected, and the laboratory picked up the samples and transported them to the laboratory for analysis using standard chain-of-custody protocols. Initially, 10 samples (5 from the upper interval and 5 from the deeper interval) were analyzed for the naturally-occurring constituents specified in Board Order No. R6V-2010-0010, Attachment C Table 3 (Unsaturated Zone – Waste Pile). For those constituents that are not typically naturally-occurring (e.g., organochlorine pesticides, organophosphorous pesticides, chlorinated herbicides, volatile organic compounds, semi-volatile organic compounds, and methylene blue active substances), two random samples were analyzed. If the results of the initial 10 samples indicated that the background data set was statistically valid, no additional analysis would have been performed. The determination of a statistically-valid background data set was performed in accordance with the EPA ProUCL Technical Guide [EPA, 2007]. Additional analysis was required for some metals analytes to develop a statistically-valid background data set. Background Threshold Values

(BTVs) for the native-derived engineered fill materials were developed in accordance with Section 4.3 of the Monitoring and Reporting Plan & Sampling and Analysis Plan (MRPSAP).

## **A.2 Background Native Soils Evaluation Results**

A summary of analytical results for background native soil sampling is provided as Table A-1 and the laboratory analytical report is included as Attachment A-2. Results of statistical analysis for analytical results are summarized in Table A-2, including the number of outliers and non-detectable results, minimum and maximum values, and ProUCL-calculated BTVs for each constituent specified in Board Order No. R6V-2010-0010. Detailed statistical analysis output sheets are included in Attachment A-3.

Preliminary results were screened for outliers and distribution using the EPA's ProUCL 4.0 software package. In general, results indicated a statistically-valid data set with the exception of several metals with one to two outliers in the 10-sample dataset ( $n < 10$ ). Additionally, results indicated four parameters (antimony, selenium, thallium, and silver) that were not detected in the initial 10 samples at reportable concentrations. To address outliers and non-detectable results, the 10 archived samples not previously tested were analyzed for metals by the laboratory.

## **APPENDIX A TABLES**

**Table A-2**  
 Summary of Statistical Analysis  
 Baseline Compost Pad Sampling  
 Hawes Composting Facility  
 Hinkley, CA

Constituent	Number of Outliers	Number of Detects	Number of Non-Detects	Minimum	Maximum	Maximum with Outliers	BTV
<b>Monitoring Parameters – Annual Monitoring Frequency</b>							
Aluminum	0	20	0	3,870	20,300	20,300	18,787
Antimony	0	0	20	ND<0.75	ND<0.75	ND<0.75	ND<0.75
Arsenic	0	20	0	1.58	9.96	9.96	12.59
Copper	0	20	0	4.47	22.8	22.8	20.72
Iron	0	20	0	5,680	20,300	20,300	19,483
Manganese	0	20	0	97.2	405	405	401.6
MBAS <sup>1</sup>	-	1	1	ND<1.0	1	1	1
Nickel	0	20	0	4.02	22.5	22.5	22.4
Nitrate (as N)	0	9	1	1.6	25	25	28.71
Sulfate	1	6	3	14	750	6,700	857.3
TDS	0	10	0	164	4,900	4,900	6,135
<b>Constituents of Concern – Five-Yearly Monitoring Frequency</b>							
Barium	1	19	0	36	177	333	162.3
Beryllium	0	19	1	0.255	1.42	1.42	1.543
Bicarbonate	1	9	0	45	510	13,000	631.5
Boron	0	20	0	1.84	38.8	38.8	40.98
Bromide	0	1	9	ND<1.0	1	1	ND<1.0
Cadmium	0	5	15	0.509	0.633	0.633	0.616
Calcium	0	20	0	1,740	43,300	43,300	68,089
Carbonate	1	5	4	24	430	1,100	624.3
Chloride	0	6	4	10	1,100	1,100	1,674
Chromium, Hexavalent	0	0	10	ND<0.8	ND<0.8	ND<0.8	ND<0.8
Chromium, Total	0	20	0	4.75	22	22	20.87
Cobalt	1	19	0	2.49	9.36	17.6	10.97
Fluoride	0	5	5	1.4	14	14	19.95
TKN	0	10	0	70	600	600	727.1
Lead	1	9	0	2	9.52	76.8	11.17
Magnesium	0	20	0	1,950	9,910	9,910	9,573
Mercury	0	10	0	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835
Molybdenum	0	17	3	0.323	3.37	3.37	5.007
Nitrite (as N)	0	6	4	1	1.6	1.6	1.87
o-Phosphate (as P)	1	6	3	1.1	2.5	8	2.915
Phosphorus, Total	0	9	1	0.84	380	380	555.4
Potassium	2	18	0	1,160	3,080	6,320	3,207
Selenium	0	0	20	ND<0.75	ND<0.75	ND<0.75	ND<0.75
Silver	0	0	20	ND<0.25	ND<0.25	ND<0.25	ND<0.25
Sodium	0	20	0	65.3	4,190	4,190	8,010
Thallium	0	0	20	ND<0.75	ND<0.75	ND<0.75	ND<0.75
Alkalinity	1	9	0	45	860	15,000	1,080
Total Anions <sup>2</sup>	1	9	0	6	1,727	7,431	2,159
Total Cations <sup>3</sup>	0	10	0	11,135	71,600	71,600	83,253
Total Phosphate	0	9	1	2.6	1,200	1,200	1,771
Vanadium	0	20	0	9.82	45.5	45.5	40.5
Zinc	0	19	1	13.5	55.8	55.8	55.45
VOCs <sup>1</sup>	-	0	2	ND<5.0	ND<120	ND<120	PQL
SVOCs <sup>1</sup>	-	0	2	ND<0.50	ND<10	ND<10	PQL
OCPs <sup>1</sup>	-	0	2	ND<5.0	ND<100	ND<100	PQL
OPPs <sup>1</sup>	-	0	2	ND<0.50	ND<4.0	ND<4.0	PQL
Chlorinated Herbicides <sup>1</sup>	-	0	2	ND<10	ND<10,000	ND<10,000	PQL

*Notes:*

- 1 – Constituent is not naturally-occurring and was analyzed in two samples; statistical analysis not performed.
  - 2 – Total anions were calculated using the sum of fluoride, chloride, nitrite (as N), bromide, nitrate (as N), o-phosphate (as P), and sulfate.
  - 3 – Total cations were calculated using calcium, iron, magnesium, potassium, and sodium.
- BTV – Background Threshold Value  
 PQL – Laboratory Practical Quantification Limit  
 Analytical units reported in milligrams per kilogram, except VOCs, OCPs, and chlorinated herbicides reported in micrograms per kilogram



**APPENDIX A FIGURE**

**ATTACHMENT A-1**  
**FIELD NOTES**

**DAILY FIELD REPORT**

Project No.: SC0554 Task No.: 07A-01  
 Site Name: HAWES COMPOSTING Weather: CLEAR - COOL

- 05:15 → DEPART SAN DIEGO
- 07:30 → ARRIVE DEPOT FOR SUPPLIES & FUEL
- 08:30 → ARRIVE ONSITE, MEET w/ CHRIS SAUNDY; TORTOISE TRAINING
- 08:50 → SURVEY SITE & CONDUCT HEALTH & SAFETY TALK
- 09:15 → BEGIN SAMPLING
- PG1: 0.5 @ 9:00 1.0 @ 9:15 → 1 JAR EACH (16oz)  
 LOOSE, MOIST, 10% 1/4 DE YELLOW, SILTY SAND w/ GRAVEL
- PG2: 0.5 @ 9:30 1.0 @ 9:35 → 1 JAR EACH (16oz)  
 LOOSE MOIST 10% 1/4, SILTY SAND w/ GRAVEL
- PG3: 0.5 @ 9:40 1.0 @ 9:45 → 1 JAR EACH (16oz)  
 LOOSE, MOIST, 10% 1/4, PG MED SAND TO 6"; THEN SILTY SAND
- PG4: 0.5 @ 9:50 1.0 @ 9:55 → 1 JAR EACH  
 LOOSE, MOIST, 10% 2/3 22W, PG SILTY SAND w/ GRAVEL
- PG5: 0.5 @ 10:00 1.0 @ 10:05 → 1 JAR EACH (16oz)  
 LOOSE MOIST, 10% 1/4, PG SILTY SAND w/ GRAVEL TO 1"; THEN BECOMES  
 REDISH
- PG6: 0.5 @ 10:15 1.0 @ 10:20 → 1 JAR EACH (16oz)  
 LOOSE, MOIST, 10% 1/4, PG SILTY SAND w/ TRACES GRAVEL
- PG7: 0.5 @ 10:25 1.0 @ 10:30 → 1 JAR EACH (16oz)  
 LOOSE, MOIST, 10% 1/4, PG SILTY SAND w/ 1" w/ GYPSUM
- PG8: 0.5 @ 10:35 1.0 @ 10:40 → 1 JAR EACH (16oz)  
 LOOSE, MOIST, 10% 1/4, PG SILTY SAND w/ GRAVEL
- PG9: 0.5 @ 10:45 1.0 @ 10:50 → 2 JARS FROM 1.0  
 LOOSE, MOIST, PG COARSE SAND TO 0.5 THEN SILTY MED SAND 10% 1/4
- PG10: 0.5 @ 11:00 1.0 @ 11:05 → 2 JARS FROM 0.5  
 LOOSE, MOIST, 10% 1/4, PG SAND w/ SHT & TRAC GLASS FRAGMENTS
- 11:15 → SAMPLING COMPLETE; WAITING FOR CALLS TO FINISH AND GO BACK
- 12:00 → OFFSITE
- 3:30 → RETURN HOME

Signature: \_\_\_\_\_ Date: 2/9/2012

Hours: 3.5 on-site 6.75 travel 10.25 total

Random Number Generator Results  
 Compost Pad Sampling  
 Hawes Composting Facility

Point Number	X-Axis Random Numbers	Y-Axis Random Numbers
1	33	21
<del>2</del>	<del>19</del>	<del>2</del>
3	69	88
4	47	71
5	80	78
<del>6</del>	<del>7</del>	<del>62</del>
7	94	51
<del>8</del>	<del>48</del>	<del>2</del>
9	67	4
10	77	15
11	79	54
12	78	36
13	24	79
14	9	100
15	26	42
16	12	69
17	24	99
18	88	56
19	87	65
20	2	54
21	23	65
22	24	55
23	26	36
24	25	59
25	98	15
26	59	78
27	92	16
28	85	68
29	5	69
30	68	2

✓ 34.912922° -117.349220  
 O.B.  
 ✓ 34.910352° -117.352879  
 ✓ 34.911913° -117.351974  
 ✓ 34.909577° -117.352344  
 O.B.  
 ✓ 34.908565° -117.350901  
 O.B.  
 ✓ 34.910487° -117.348415  
 ✓ 34.909767° -117.348995  
 ✓ 34.909632° -117.351070  
 ✓ 34.909695° -117.350115  
 ✓ 34.913562° -117.352401

Note:  
 Random numbers are automatically regenerated each time the worksheet is "calculated."

**Table A-1**  
Summary of Analytical Results  
Baseline Compost Pad Soil Sampling  
Hawes Composting Facility, Hinkley, CA

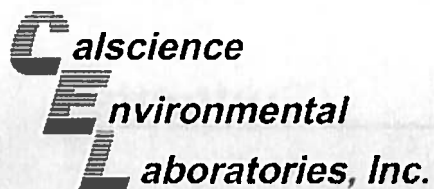
Constituent	Units	Sample IDs																			
		BG1-0.5	BG1-1.0	BG2-0.5	BG2-1.0	BG3-0.5	BG3-1.0	BG4-0.5	BG4-1.0	BG5-0.5	BG5-1.0	BG6-0.5	BG6-1.0	BG7-0.5	BG7-1.0	BG8-0.5	BG8-1.0	BG9-0.5	BG9-1.0	BG10-0.5	BG10-1.0
Monitoring Parameters – Annual Monitoring Frequency																					
Aluminum	mg/kg	4050	14400	20300	9260	3870	4450	16500	15800	4560	14000	7100	9810	4570	13000	4670	10800	8090	4730	9310	7920
Antimony	mg/kg	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750
Arsenic	mg/kg	1.58	9.58	7.84	4.24	1.94	1.76	4.85	8.88	1.73	4.03	2.17	3.72	1.75	9.96	1.83	6.52	6.11	3.67	4.04	3.88
Copper	mg/kg	4.47	15.2	22.8	8.41	4.61	5.24	19.6	16.9	5.84	15.4	8.31	10.9	5.17	12.8	5.87	12.4	8.9	4.5	10.7	9.13
Iron	mg/kg	6070	14700	20300	12000	5680	6280	17900	17300	6840	14200	8950	11500	6740	15200	6990	12600	9870	7230	10200	9650
Manganese	mg/kg	133	229	359	186	122	113	405	258	155	379	179	176	145	230	155	241	175	97.2	163	176
MBAS	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	4.22	11.6	18.6	7.35	4.12	4.37	17.1	15.2	5.47	22.5	7.16	9.15	5.07	10.6	5.10	10.5	7.47	4.02	8.04	7.70
Nitrate (as N)	mg/kg	2.7	-	-	25	-	1.7	21	-	-	8.3	6.0	-	-	2.4	13	-	-	ND<1.0	1.6	-
Sulfate	mg/kg	10	-	-	310	-	14	86	-	-	240	10	-	-	750	37	-	-	6700	10	-
TDS	mg/kg	576	-	-	2350	-	164	817	-	-	4730	1230	-	-	3290	784	-	-	4900	559	-
Constituents of Concern – Five-Yearly Monitoring Frequency																					
Barium	mg/kg	36.0	104	130	74.5	39.7	43.4	104	123	37.5	333	51.4	66.2	42.1	177	43.2	47.8	72.3	45.3	73.3	-
Beryllium	mg/kg	ND<0.250	1.21	1.26	1.09	0.270	0.369	1.05	1.42	0.255	1.39	0.442	0.622	0.291	1.26	0.300	0.821	0.583	0.525	0.776	0.572
Bicarbonate	mg/kg	45	-	-	120	-	190	510	-	-	380	180	-	-	13000	360	-	-	160	370	-
Boron	mg/kg	1.84	18.7	16.1	16.7	4.78	2.96	6.84	38.8	5.51	38.1	4.42	8.84	4.42	20.3	3.5	12.5	7.72	7.39	4.14	8.24
Bromide	mg/kg	ND<1.0	-	-	ND<1.0	-	ND<1.0	ND<1.0	-	-	ND<1.0	ND<1.0	-	-	ND<1.0	ND<1.0	-	-	ND<1.0	ND<1.0	-
Cadmium	mg/kg	ND<0.500	0.509	0.619	ND<0.500	ND<0.500	ND<0.500	0.633	0.569	ND<0.500	ND<0.500	ND<0.500	ND<0.500	ND<0.500	0.559	ND<0.500	ND<0.500	ND<0.500	ND<0.500	ND<0.500	ND<0.500
Calcium	mg/kg	1760	34800	6940	42500	2960	7620	12700	39800	1740	6150	3100	3170	1870	43300	2740	15000	9130	18700	17800	7680
Carbonate	mg/kg	ND<5.0	-	-	70	-	24	350	-	-	430	ND<5.0	-	-	1100	ND<5.0	-	-	ND<5.0	120	-
Chloride	mg/kg	ND<10	-	-	1100	-	ND<10	ND<10	-	-	580	ND<10	-	-	960	350	-	-	730	ND<10	-
Chromium, Hexavalent	mg/kg	ND<0.80	-	-	ND<0.80	-	ND<0.80	ND<0.80	-	-	ND<0.80	ND<0.80	-	-	ND<0.80	ND<0.80	-	-	ND<0.80	ND<0.80	-
Chromium, Total	mg/kg	4.97	15	22	10.1	4.75	5.17	17.3	20.3	5.85	15.6	7.91	11.2	5.48	14.3	5.97	13.2	9.53	6.19	9.81	9.17
Cobalt	mg/kg	2.73	6.66	9.36	5.61	2.49	2.80	9.19	8.72	3.30	17.6	4.36	5.18	3.16	7.38	2.99	6.63	4.88	3.14	4.43	4.60
Fluoride	mg/kg	ND<1.0	-	-	4.0	-	ND<1.0	1.4	-	-	13	ND<1.0	-	-	14	ND<1.0	-	-	ND<1.0	2.7	-
Total Kjeldahl Nitrogen (TKN)	mg/kg	180	-	-	70	-	180	200	-	-	130	320	-	-	150	600	-	-	84	130	-
Lead	mg/kg	3.07	4.82	9.16	2.83	4.71	2.75	9.52	5.68	3.03	7.30	4.88	4.80	3.23	4.39	7.08	5.18	3.72	2.00	76.8	13.4
Magnesium	mg/kg	1950	7370	9910	6160	2050	2330	8700	8310	2510	6690	3570	4710	2350	7040	2670	5170	3920	2710	4220	3660
Mercury	mg/kg	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835	ND<0.0835
Molybdenum	mg/kg	0.25	2.19	0.639	2.76	0.323	0.594	1.00	3.37	0.25	1.47	0.394	0.374	0.25	3.06	0.415	0.988	0.678	1.27	1.17	0.619
Nitrite (as N)	mg/kg	1.6	-	-	ND<1.0	-	1.5	ND<1.0	-	-	1.4	1.1	-	-	ND<1.0	ND<1.0	-	-	ND<1.0	1.2	-
o-Phosphate (as P)	mg/kg	1.7	-	-	ND<1.0	-	1.1	2.5	-	-	1.3	1.9	-	-	ND<1.0	8.0	-	-	ND<1.0	1.2	-
Phosphorus, Total	mg/kg	340	-	-	ND<0.5	-	280	ND<1.0	-	-	280	2.0	-	-	360	380	-	-	0.84	2	-
Potassium	mg/kg	1290	2540	6320	2040	1350	1250	5100	3080	1610	2890	2380	2460	1400	2370	1740	2770	1920	1160	2150	1990
Selenium	mg/kg	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750
Silver	mg/kg	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250	ND<0.250
Sodium	mg/kg	65.3	1960	1290	1580	67.2	93.4	1540	4190	155	29	187	578	185	3690	499	1560	877	1590	401	539
Thallium	mg/kg	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750	ND<0.750
Alkalinity	mg/kg	45	-	-	200	-	210	860	-	-	800	180	-	-	15000	360	-	-	160	480	-
Anions	mg/kg	6.0	-	-	1439	-	28	111	-	-	844	9.0	-	-	1727	408	-	-	7431	6.7	-
Cations	mg/kg	11135	-	-	64280	-	17573	45940	-	-	32850	18187	-	-	71600	14639	-	-	31390	34771	-
Total Phosphate	mg/kg	1000	-	-	ND<1.5	-	870	3.0	-	-	840	6.2	-	-	1100	1200	-	-	0.84	6.0	-
Vanadium	mg/kg	10.1	31.5	28.0	29.1	9.82	11.7	27.5	38.5	10.8	23.9	13.8	18.3	10.7	45.5	11.9	27.1	19.8	18.0	18.5	16.4
Zinc	mg/kg	16.4	32.8	55.8	24.5	14.6	13.5	54.9	39.0	19.4	33.9	25.6	29.3	16.8	32.8	22.6	31.6	23.2	14.7	23.9	23.7
VOCS	µg/kg	ND	-	-	ND	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-
SVOCS	mg/kg	ND	-	-	ND	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-
OCPs	µg/kg	ND	-	-	ND	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-
OPPs	mg/kg	ND	-	-	ND	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-
Chlorinated Herbicides	µg/kg	ND	-	-	ND	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-	-	ND	ND	-

Notes

“-” - Not analyzed  
 ND < - Non detect below indicated reporting limit  
 Total anions were calculated using the sum of fluoride, chloride (as N), bromide, nitrate (as N), o-phosphate (as P), and sulfate.  
 Total cations were calculated using calcium, iron, magnesium, potassium, and sodium.

**ATTACHMENT A-2**  
**LABORATORY ANALYTICAL REPORT**





# CALSCIENCE

## WORK ORDER NUMBER: 12-02-0735

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

### Analytical Report For

**Client:** Geosyntec Consultants

**Client Project Name:** Hawes Composting / SC0554

**Attention:** Doug Baumwirt

10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Approved for release on 02/23/2012 by:  
Stephen Nowak  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.





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Work Order Number: 12-02-0735

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Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG1-0.5</b>						
Arsenic	1.58		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	36.0		0.500	mg/kg	EPA 6010B	EPA 3050B
Chromium	4.97		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	2.73		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	4.47		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	3.07		0.500	mg/kg	EPA 6010B	EPA 3050B
Nickel	4.22		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	10.1		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	16.4		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	4050		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	1760		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	6070		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	1950		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	133		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1290		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	65.3		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	1.84		1.00	mg/kg	EPA 6010B	EPA 3050B
Nitrite (as N)	1.6		1.0	mg/kg	EPA 300.0	N/A
Nitrate (as N)	2.7		1.0	mg/kg	EPA 300.0	N/A
o-Phosphate (as P)	1.7		1.0	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	45		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	45		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	1000		380	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	340		120	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	180		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	576		1.00	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.

Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

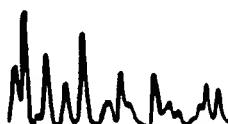
Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG2-1.0						
Arsenic	4.24		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	74.5		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	1.09		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	10.1		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	5.61		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	8.41		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	2.83		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	2.76		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	7.35		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	29.1		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	24.5		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	9260		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	42500		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	12000		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	6160		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	186		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2040		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	1580		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	16.7		1.00	mg/kg	EPA 6010B	EPA 3050B
Fluoride	4.0		1.0	mg/kg	EPA 300.0	N/A
Chloride	1100		20	mg/kg	EPA 300.0	N/A
Nitrate (as N)	25		1.0	mg/kg	EPA 300.0	N/A
Sulfate	310		10	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	200		5.0	mg/kg	SM 2320B M	N/A
Carbonate (as CaCO3)	70		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	120		5.0	mg/kg	SM 2320B M	N/A
Total Kjeldahl Nitrogen	70		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	2350		10.0	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.



Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG3-1.0</b>						
Arsenic	1.76		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	43.4		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.369		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	5.17		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	2.80		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	5.24		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	2.75		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.594		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	4.37		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	11.7		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	13.5		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	4450		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	7620		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	6280		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	2330		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	113		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1250		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	93.4		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	2.96		1.00	mg/kg	EPA 6010B	EPA 3050B
Chloride	10		10	mg/kg	EPA 300.0	N/A
Nitrite (as N)	1.5		1.0	mg/kg	EPA 300.0	N/A
Nitrate (as N)	1.7		1.0	mg/kg	EPA 300.0	N/A
o-Phosphate (as P)	1.1		1.0	mg/kg	EPA 300.0	N/A
Sulfate	14		10	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	210		5.0	mg/kg	SM 2320B M	N/A
Carbonate (as CaCO3)	24		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	190		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	870		380	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	280		120	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	180		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	164		1.00	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.

Client: Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116  
Attn: Doug Baumwirt

Work Order: 12-02-0735  
Project Name: Hawes Composting / SC0554  
Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG4-0.5						
Arsenic	4.85		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	104		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	1.05		0.250	mg/kg	EPA 6010B	EPA 3050B
Cadmium	0.633		0.500	mg/kg	EPA 6010B	EPA 3050B
Chromium	17.3		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	9.19		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	19.6		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	9.52		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	1.00		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	17.1		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	27.5		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	54.9		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	16500		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	12700		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	17900		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	8700		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	405		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	5100		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	1540		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	6.84		1.00	mg/kg	EPA 6010B	EPA 3050B
Fluoride	1.4		1.0	mg/kg	EPA 300.0	N/A
Nitrate (as N)	21		1.0	mg/kg	EPA 300.0	N/A
o-Phosphate (as P)	2.5		1.0	mg/kg	EPA 300.0	N/A
Sulfate	86		10	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	860		5.0	mg/kg	SM 2320B M	N/A
Carbonate (as CaCO3)	350		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	510		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	3.0		1.5	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	1.0		0.50	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	200		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	817		1.00	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.

Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG5-1.0</b>						
Arsenic	4.03		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	333		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	1.39		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	15.6		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	17.6		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	15.4		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	7.30		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	1.47		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	22.5		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	23.9		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	33.9		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	14000		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	6150		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	14200		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	6690		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	379		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2890		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	2920		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	38.1		1.00	mg/kg	EPA 6010B	EPA 3050B
Fluoride	13		1.0	mg/kg	EPA 300.0	N/A
Chloride	580		10	mg/kg	EPA 300.0	N/A
Nitrite (as N)	1.4		1.0	mg/kg	EPA 300.0	N/A
Nitrate (as N)	8.3		1.0	mg/kg	EPA 300.0	N/A
o-Phosphate (as P)	1.3		1.0	mg/kg	EPA 300.0	N/A
Sulfate	240		10	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO <sub>3</sub> )	800		5.0	mg/kg	SM 2320B M	N/A
Carbonate (as CaCO <sub>3</sub> )	430		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO <sub>3</sub> )	380		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	840		380	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	280		120	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	130		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	4730		10.0	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.

Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

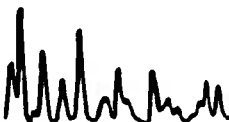
Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG6-0.5						
Arsenic	2.17		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	51.4		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.442		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	7.91		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	4.36		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	8.31		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	4.88		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.394		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	7.16		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	13.8		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	25.6		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	7100		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	3100		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	8950		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	3570		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	179		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2380		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	187		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	4.42		1.00	mg/kg	EPA 6010B	EPA 3050B
Nitrite (as N)	1.1		1.0	mg/kg	EPA 300.0	N/A
Nitrate (as N)	6.0		1.0	mg/kg	EPA 300.0	N/A
o-Phosphate (as P)	1.9		1.0	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	180		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	180		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	6.2		1.5	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	2.0		0.50	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	320		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	1230		10.0	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.



Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG7-1.0</b>						
Arsenic	9.96		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	177		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	1.26		0.250	mg/kg	EPA 6010B	EPA 3050B
Cadmium	0.559		0.500	mg/kg	EPA 6010B	EPA 3050B
Chromium	14.3		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	7.38		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	12.8		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	4.39		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	3.06		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	10.6		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	45.5		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	32.8		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	13000		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	43300		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	15200		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	7040		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	230		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2370		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	3690		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	20.3		1.00	mg/kg	EPA 6010B	EPA 3050B
Fluoride	14		1.0	mg/kg	EPA 300.0	N/A
Chloride	960		10	mg/kg	EPA 300.0	N/A
Bromide	1.0		1.0	mg/kg	EPA 300.0	N/A
Nitrate (as N)	2.4		1.0	mg/kg	EPA 300.0	N/A
Sulfate	750		10	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	15000		100	mg/kg	SM 2320B M	N/A
Carbonate (as CaCO3)	1100		10	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	13000		100	mg/kg	SM 2320B M	N/A
Total Phosphate	1100		380	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	360		120	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	150		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	3290		10.0	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.



Client: Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116  
Attn: Doug Baumwirt

Work Order: 12-02-0735  
Project Name: Hawes Composting / SC0554  
Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG8-0.5						
Arsenic	1.83		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	43.2		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.300		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	5.97		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	2.99		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	5.87		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	7.08		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.415		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	5.10		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	11.9		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	22.6		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	4670		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	2740		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	6990		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	2670		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	155		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1740		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	499		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	3.50		1.00	mg/kg	EPA 6010B	EPA 3050B
Chloride	350		10	mg/kg	EPA 300.0	N/A
Nitrate (as N)	13		1.0	mg/kg	EPA 300.0	N/A
o-Phosphate (as P)	8.0		1.0	mg/kg	EPA 300.0	N/A
Sulfate	37		10	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO <sub>3</sub> )	360		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO <sub>3</sub> )	360		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	1200		380	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	380		120	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	600		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	784		1.00	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.



Client: Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116  
Attn: Doug Baumwirt

Work Order: 12-02-0735  
Project Name: Hawes Composting / SC0554  
Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG9-1.0						
Arsenic	3.67		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	45.3		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.525		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	6.19		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	3.14		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	4.50		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	2.00		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	1.27		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	4.02		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	18.0		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	14.7		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	4730		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	18700		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	7230		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	2710		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	97.2		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1160		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	1590		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	7.39		1.00	mg/kg	EPA 6010B	EPA 3050B
Chloride	730		10	mg/kg	EPA 300.0	N/A
Nitrite (as N)	1.0		1.0	mg/kg	EPA 300.0	N/A
Sulfate	6700		100	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	160		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	160		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	2.6		1.5	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	0.84		0.50	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	84		50	mg/kg	SM 4500 N Org B (	N/A
MBAS	1.0		1.0	mg/kg	SM 5540C (M)	N/A
Solids, Total Dissolved	4900		10.0	mg/kg	SM 2540 C (M)	N/A

\*MDL is shown.

Client: Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116  
Attn: Doug Baumwirt

Work Order: 12-02-0735  
Project Name: Hawes Composting / SC0554  
Received: 02/10/12 19:00

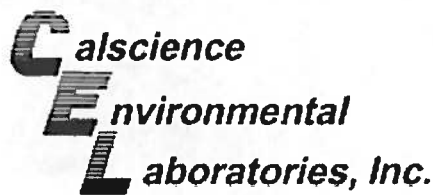
**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG10-0.5</b>						
Arsenic	4.04		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	73.3		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.776		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	9.81		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	4.43		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	10.7		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	76.8		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	1.17		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	8.04		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	18.5		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	23.9		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	9310		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	17800		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	10200		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	4220		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	163		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2150		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	401		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	4.14		1.00	mg/kg	EPA 6010B	EPA 3050B
Fluoride	2.7		1.0	mg/kg	EPA 300.0	N/A
Nitrite (as N)	1.2		1.0	mg/kg	EPA 300.0	N/A
Nitrate (as N)	1.6		1.0	mg/kg	EPA 300.0	N/A
o-Phosphate (as P)	1.2		1.0	mg/kg	EPA 300.0	N/A
Alkalinity, Total (as CaCO3)	480		5.0	mg/kg	SM 2320B M	N/A
Carbonate (as CaCO3)	120		5.0	mg/kg	SM 2320B M	N/A
Bicarbonate (as CaCO3)	370		5.0	mg/kg	SM 2320B M	N/A
Total Phosphate	6.0		1.5	mg/kg	SM 4500 P B/E (M)	N/A
Phosphorus, Total	2.0		0.50	mg/kg	SM 4500 P B/E (M)	N/A
Total Kjeldahl Nitrogen	130		50	mg/kg	SM 4500 N Org B (	N/A
Solids, Total Dissolved	559		1.00	mg/kg	SM 2540 C (M)	N/A

Subcontracted analyses, if any, are not included in this summary.

\*MDL is shown.



Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8081A  
 Units: ug/kg

Project: Hawes Composting / SC0554

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG9-1.0	12-02-0735-18-A	02/09/12 10:50	Solid	GC 51	02/13/12	02/16/12 12:43	120213L09

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Aldrin	ND	5.0	1		Endosulfan II	ND	5.0	1	
Alpha-BHC	ND	5.0	1		Endosulfan Sulfate	ND	5.0	1	
Beta-BHC	ND	5.0	1		Endrin	ND	5.0	1	
Chlordane	ND	50	1		Endrin Aldehyde	ND	5.0	1	
4,4'-DDD	ND	5.0	1		Endrin Ketone	ND	5.0	1	
4,4'-DDE	ND	5.0	1		Gamma-BHC	ND	5.0	1	
4,4'-DDT	ND	5.0	1		Heptachlor	ND	5.0	1	
Delta-BHC	ND	5.0	1		Heptachlor Epoxide	ND	5.0	1	
Dieldrin	ND	5.0	1		Methoxychlor	ND	5.0	1	
Endosulfan I	ND	5.0	1		Toxaphene	ND	100	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
Decachlorobiphenyl	71	50-135			2,4,5,6-Tetrachloro-m-Xylene	78	50-135		

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG10-0.5	12-02-0735-19-A	02/09/12 11:00	Solid	GC 51	02/13/12	02/16/12 12:57	120213L09

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Aldrin	ND	5.0	1		Endosulfan II	ND	5.0	1	
Alpha-BHC	ND	5.0	1		Endosulfan Sulfate	ND	5.0	1	
Beta-BHC	ND	5.0	1		Endrin	ND	5.0	1	
Chlordane	ND	50	1		Endrin Aldehyde	ND	5.0	1	
4,4'-DDD	ND	5.0	1		Endrin Ketone	ND	5.0	1	
4,4'-DDE	ND	5.0	1		Gamma-BHC	ND	5.0	1	
4,4'-DDT	ND	5.0	1		Heptachlor	ND	5.0	1	
Delta-BHC	ND	5.0	1		Heptachlor Epoxide	ND	5.0	1	
Dieldrin	ND	5.0	1		Methoxychlor	ND	5.0	1	
Endosulfan I	ND	5.0	1		Toxaphene	ND	100	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
Decachlorobiphenyl	89	50-135			2,4,5,6-Tetrachloro-m-Xylene	91	50-135		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8081A  
Units: ug/kg

Project: Hawes Composting / SC0554

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-537-1,150	N/A	Solid	GC 51	02/13/12	02/14/12 15:25	120213L09

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Aldrin	ND	5.0	1		Endosulfan II	ND	5.0	1	
Alpha-BHC	ND	5.0	1		Endosulfan Sulfate	ND	5.0	1	
Beta-BHC	ND	5.0	1		Endrin	ND	5.0	1	
Chlordane	ND	50	1		Endrin Aldehyde	ND	5.0	1	
4,4'-DDD	ND	5.0	1		Endrin Ketone	ND	5.0	1	
4,4'-DDE	ND	5.0	1		Gamma-BHC	ND	5.0	1	
4,4'-DDT	ND	5.0	1		Heptachlor	ND	5.0	1	
Delta-BHC	ND	5.0	1		Heptachlor Epoxide	ND	5.0	1	
Dieldrin	ND	5.0	1		Methoxychlor	ND	5.0	1	
Endosulfan I	ND	5.0	1		Toxaphene	ND	100	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
Decachlorobiphenyl	96	50-135			2,4,5,6-Tetrachloro-m-Xylene	92	50-135		

## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8141B  
 Units: mg/kg

Project: Hawes Composting / SC0554

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG9-1.0	12-02-0735-18-A	02/09/12 10:50	Solid	GC 35	02/14/12	02/16/12 19:16	120214L09

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Demeton-o/s	ND	0.50	1		Fenthion	ND	0.50	1	
Azinphos Methyl	ND	0.50	1		Merphos	ND	0.50	1	
Bolstar	ND	0.50	1		Methyl Parathion	ND	0.50	1	
Chlorpyrifos	ND	0.50	1		Mevinphos	ND	0.50	1	
Coumaphos	ND	0.50	1		Naled	ND	4.0	1	
Diazinon	ND	0.50	1		Phorate	ND	0.50	1	
Dichlorvos	ND	0.50	1		Ronnel	ND	0.50	1	
Disulfoton	ND	0.50	1		Stirophos	ND	2.0	1	
Ethoprop	ND	0.50	1		Tokuthion	ND	0.50	1	
Fensulfothion	ND	0.50	1		Trichloronate	ND	0.50	1	

Surrogates: REC (%) Control Limits Qual

Tributylphosphate 102 30-130

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG10-0.5	12-02-0735-19-A	02/09/12 11:00	Solid	GC 35	02/14/12	02/16/12 20:02	120214L09

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Demeton-o/s	ND	0.50	1		Fenthion	ND	0.50	1	
Azinphos Methyl	ND	0.50	1		Merphos	ND	0.50	1	
Bolstar	ND	0.50	1		Methyl Parathion	ND	0.50	1	
Chlorpyrifos	ND	0.50	1		Mevinphos	ND	0.50	1	
Coumaphos	ND	0.50	1		Naled	ND	4.0	1	
Diazinon	ND	0.50	1		Phorate	ND	0.50	1	
Dichlorvos	ND	0.50	1		Ronnel	ND	0.50	1	
Disulfoton	ND	0.50	1		Stirophos	ND	2.0	1	
Ethoprop	ND	0.50	1		Tokuthion	ND	0.50	1	
Fensulfothion	ND	0.50	1		Trichloronate	ND	0.50	1	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8141B  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-465-107	N/A	Solid	GC 35	02/14/12	02/16/12 16:13	120214L09

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Demeton-o/s	ND	0.50	1		Fenthion	ND	0.50	1	
Azinphos Methyl	ND	0.50	1		Merphos	ND	0.50	1	
Bolstar	ND	0.50	1		Methyl Parathion	ND	0.50	1	
Chlorpyrifos	ND	0.50	1		Mevinphos	ND	0.50	1	
Coumaphos	ND	0.50	1		Naled	ND	4.0	1	
Diazinon	ND	0.50	1		Phorate	ND	0.50	1	
Dichlorvos	ND	0.50	1		Ronnel	ND	0.50	1	
Disulfoton	ND	0.50	1		Stirophos	ND	2.0	1	
Ethoprop	ND	0.50	1		Tokuthion	ND	0.50	1	
Fensulfothion	ND	0.50	1		Trichloronate	ND	0.50	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>						
Tributylphosphate	120	30-130							

## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 8151A  
 Method: EPA 8151A  
 Units: ug/kg

Project: Hawes Composting / SC0554

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG9-1.0	12-02-0735-18-B	02/09/12 10:50	Solid	GC 40	02/17/12	02/22/12 10:57	120217L16

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Dalapon	ND	250	1		2,4-D	ND	100	1	
Dicamba	ND	10	1		2,4,5-TP (Silvex)	ND	10	1	
MCPP	ND	10000	1		2,4,5-T	ND	10	1	
MCPA	ND	10000	1		2,4-DB	ND	100	1	
Dichlorprop	ND	100	1		Dinoseb	ND	50	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>						
2,4-Dichlorophenylacetic acid	35	30-130							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG10-0.5	12-02-0735-19-B	02/09/12 11:00	Solid	GC 40	02/17/12	02/22/12 11:29	120217L16

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Dalapon	ND	250	1		2,4-D	ND	100	1	
Dicamba	ND	10	1		2,4,5-TP (Silvex)	ND	10	1	
MCPP	ND	10000	1		2,4,5-T	ND	10	1	
MCPA	ND	10000	1		2,4-DB	ND	100	1	
Dichlorprop	ND	100	1		Dinoseb	ND	50	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>						
2,4-Dichlorophenylacetic acid	35	30-130							

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	095-01-033-991	N/A	Solid	GC 40	02/17/12	02/21/12 15:04	120217L16

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Dalapon	ND	250	1		2,4-D	ND	100	1	
Dicamba	ND	10	1		2,4,5-TP (Silvex)	ND	10	1	
MCPP	ND	10000	1		2,4,5-T	ND	10	1	
MCPA	ND	10000	1		2,4-DB	ND	100	1	
Dichlorprop	ND	100	1		Dinoseb	ND	50	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>						
2,4-Dichlorophenylacetic acid	48	30-130							

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8270C  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG9-1.0	12-02-0735-18-A	02/09/12 10:50	Solid	GC/MS CCC	02/13/12	02/15/12 18:09	120213L12

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
N-Nitrosodimethylamine	ND	0.50	1		2,4-Dinitrophenol	ND	2.5	1	
Phenol	ND	0.50	1		4-Nitrophenol	ND	0.50	1	
Bis(2-Chloroethyl) Ether	ND	2.5	1		Dibenzofuran	ND	0.50	1	
2-Chlorophenol	ND	0.50	1		2,4-Dinitrotoluene	ND	0.50	1	
1,3-Dichlorobenzene	ND	0.50	1		2,6-Dinitrotoluene	ND	0.50	1	
1,4-Dichlorobenzene	ND	0.50	1		Diethyl Phthalate	ND	0.50	1	
Benzyl Alcohol	ND	0.50	1		4-Chlorophenyl-Phenyl Ether	ND	0.50	1	
1,2-Dichlorobenzene	ND	0.50	1		Fluorene	ND	0.50	1	
2-Methylphenol	ND	0.50	1		4-Nitroaniline	ND	0.50	1	
Bis(2-Chloroisopropyl) Ether	ND	0.50	1		4,6-Dinitro-2-Methylphenol	ND	2.5	1	
3/4-Methylphenol	ND	0.50	1		N-Nitrosodiphenylamine	ND	0.50	1	
N-Nitroso-di-n-propylamine	ND	0.50	1		2,4,6-Trichlorophenol	ND	0.50	1	
Hexachloroethane	ND	0.50	1		4-Bromophenyl-Phenyl Ether	ND	0.50	1	
Nitrobenzene	ND	2.5	1		Hexachlorobenzene	ND	0.50	1	
Isophorone	ND	0.50	1		Pentachlorophenol	ND	2.5	1	
2-Nitrophenol	ND	0.50	1		Phenanthrene	ND	0.50	1	
2,4-Dimethylphenol	ND	0.50	1		Anthracene	ND	0.50	1	
Benzoic Acid	ND	2.5	1		Di-n-Butyl Phthalate	ND	0.50	1	
Bis(2-Chloroethoxy) Methane	ND	0.50	1		Fluoranthene	ND	0.50	1	
2,4-Dichlorophenol	ND	0.50	1		Benzidine	ND	10	1	
1,2,4-Trichlorobenzene	ND	0.50	1		Pyrene	ND	0.50	1	
Naphthalene	ND	0.50	1		Butyl Benzyl Phthalate	ND	0.50	1	
4-Chloroaniline	ND	0.50	1		3,3'-Dichlorobenzidine	ND	0.50	1	
Hexachloro-1,3-Butadiene	ND	0.50	1		Benzo (a) Anthracene	ND	0.50	1	
4-Chloro-3-Methylphenol	ND	0.50	1		Bis(2-Ethylhexyl) Phthalate	ND	0.50	1	
2-Methylnaphthalene	ND	0.50	1		Chrysene	ND	0.50	1	
2,4,5-Trichlorophenol	ND	0.50	1		Di-n-Octyl Phthalate	ND	0.50	1	
2-Chloronaphthalene	ND	0.50	1		Benzo (k) Fluoranthene	ND	0.50	1	
2-Nitroaniline	ND	0.50	1		Benzo (b) Fluoranthene	ND	0.50	1	
Dimethyl Phthalate	ND	0.50	1		Benzo (a) Pyrene	ND	0.50	1	
Acenaphthylene	ND	0.50	1		Indeno (1,2,3-c,d) Pyrene	ND	0.50	1	
3-Nitroaniline	ND	0.50	1		Dibenz (a,h) Anthracene	ND	0.50	1	
Acenaphthene	ND	0.50	1		Benzo (g,h,i) Perylene	ND	0.50	1	
<b>Surrogates:</b>	<b>REC (%)</b>	<b>Control Limits</b>	<b>DF</b>	<b>Qual</b>	<b>Surrogates:</b>	<b>REC (%)</b>	<b>Control Limits</b>	<b>DF</b>	<b>Qual</b>
2-Fluorophenol	99	53-113			Phenol-d6	99	60-114		
Nitrobenzene-d5	96	57-135			2-Fluorobiphenyl	90	54-120		
2,4,6-Tribromophenol	97	46-124			p-Terphenyl-d14	108	30-168		

RL - Reporting Limit    DF - Dilution Factor    Qual - Qualifiers

## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8270C  
 Units: mg/kg

Project: Hawes Composting / SC0554

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG10-0.5	12-02-0735-19-A	02/09/12 11:00	Solid	GC/MS CCC	02/13/12	02/15/12 18:35	120213L12

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
N-Nitrosodimethylamine	ND	0.50	1		2,4-Dinitrophenol	ND	2.5	1	
Phenol	ND	0.50	1		4-Nitrophenol	ND	0.50	1	
Bis(2-Chloroethyl) Ether	ND	2.5	1		Dibenzofuran	ND	0.50	1	
2-Chlorophenol	ND	0.50	1		2,4-Dinitrotoluene	ND	0.50	1	
1,3-Dichlorobenzene	ND	0.50	1		2,6-Dinitrotoluene	ND	0.50	1	
1,4-Dichlorobenzene	ND	0.50	1		Diethyl Phthalate	ND	0.50	1	
Benzyl Alcohol	ND	0.50	1		4-Chlorophenyl-Phenyl Ether	ND	0.50	1	
1,2-Dichlorobenzene	ND	0.50	1		Fluorene	ND	0.50	1	
2-Methylphenol	ND	0.50	1		4-Nitroaniline	ND	0.50	1	
Bis(2-Chloroisopropyl) Ether	ND	0.50	1		4,6-Dinitro-2-Methylphenol	ND	2.5	1	
3/4-Methylphenol	ND	0.50	1		N-Nitrosodiphenylamine	ND	0.50	1	
N-Nitroso-di-n-propylamine	ND	0.50	1		2,4,6-Trichlorophenol	ND	0.50	1	
Hexachloroethane	ND	0.50	1		4-Bromophenyl-Phenyl Ether	ND	0.50	1	
Nitrobenzene	ND	2.5	1		Hexachlorobenzene	ND	0.50	1	
Isophorone	ND	0.50	1		Pentachlorophenol	ND	2.5	1	
2-Nitrophenol	ND	0.50	1		Phenanthrene	ND	0.50	1	
2,4-Dimethylphenol	ND	0.50	1		Anthracene	ND	0.50	1	
Benzoic Acid	ND	2.5	1		Di-n-Butyl Phthalate	ND	0.50	1	
Bis(2-Chloroethoxy) Methane	ND	0.50	1		Fluoranthene	ND	0.50	1	
2,4-Dichlorophenol	ND	0.50	1		Benzidine	ND	10	1	
1,2,4-Trichlorobenzene	ND	0.50	1		Pyrene	ND	0.50	1	
Naphthalene	ND	0.50	1		Butyl Benzyl Phthalate	ND	0.50	1	
4-Chloroaniline	ND	0.50	1		3,3'-Dichlorobenzidine	ND	0.50	1	
Hexachloro-1,3-Butadiene	ND	0.50	1		Benzo (a) Anthracene	ND	0.50	1	
4-Chloro-3-Methylphenol	ND	0.50	1		Bis(2-Ethylhexyl) Phthalate	ND	0.50	1	
2-Methylnaphthalene	ND	0.50	1		Chrysene	ND	0.50	1	
2,4,5-Trichlorophenol	ND	0.50	1		Di-n-Octyl Phthalate	ND	0.50	1	
2-Chloronaphthalene	ND	0.50	1		Benzo (k) Fluoranthene	ND	0.50	1	
2-Nitroaniline	ND	0.50	1		Benzo (b) Fluoranthene	ND	0.50	1	
Dimethyl Phthalate	ND	0.50	1		Benzo (a) Pyrene	ND	0.50	1	
Acenaphthylene	ND	0.50	1		Indeno (1,2,3-c,d) Pyrene	ND	0.50	1	
3-Nitroaniline	ND	0.50	1		Dibenz (a,h) Anthracene	ND	0.50	1	
Acenaphthene	ND	0.50	1		Benzo (g,h,i) Perylene	ND	0.50	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
2-Fluorophenol	95	53-113			Phenol-d6	94	60-114		
Nitrobenzene-d5	90	57-135			2-Fluorobiphenyl	86	54-120		
2,4,6-Tribromophenol	94	46-124			p-Terphenyl-d14	105	30-168		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8270C  
Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-555-76	N/A	Solid	GC/MS CCC	02/13/12	02/15/12 17:15	120213L12

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
N-Nitrosodimethylamine	ND	0.50	1		2,4-Dinitrophenol	ND	2.5	1	
Phenol	ND	0.50	1		4-Nitrophenol	ND	0.50	1	
Bis(2-Chloroethyl) Ether	ND	2.5	1		Dibenzofuran	ND	0.50	1	
2-Chlorophenol	ND	0.50	1		2,4-Dinitrotoluene	ND	0.50	1	
1,3-Dichlorobenzene	ND	0.50	1		2,6-Dinitrotoluene	ND	0.50	1	
1,4-Dichlorobenzene	ND	0.50	1		Diethyl Phthalate	ND	0.50	1	
Benzyl Alcohol	ND	0.50	1		4-Chlorophenyl-Phenyl Ether	ND	0.50	1	
1,2-Dichlorobenzene	ND	0.50	1		Fluorene	ND	0.50	1	
2-Methylphenol	ND	0.50	1		4-Nitroaniline	ND	0.50	1	
Bis(2-Chloroisopropyl) Ether	ND	0.50	1		4,6-Dinitro-2-Methylphenol	ND	2.5	1	
3/4-Methylphenol	ND	0.50	1		N-Nitrosodiphenylamine	ND	0.50	1	
N-Nitroso-di-n-propylamine	ND	0.50	1		2,4,6-Trichlorophenol	ND	0.50	1	
Hexachloroethane	ND	0.50	1		4-Bromophenyl-Phenyl Ether	ND	0.50	1	
Nitrobenzene	ND	2.5	1		Hexachlorobenzene	ND	0.50	1	
Isophorone	ND	0.50	1		Pentachlorophenol	ND	2.5	1	
2-Nitrophenol	ND	0.50	1		Phenanthrene	ND	0.50	1	
2,4-Dimethylphenol	ND	0.50	1		Anthracene	ND	0.50	1	
Benzoic Acid	ND	2.5	1		Di-n-Butyl Phthalate	ND	0.50	1	
Bis(2-Chloroethoxy) Methane	ND	0.50	1		Fluoranthene	ND	0.50	1	
2,4-Dichlorophenol	ND	0.50	1		Benzidine	ND	10	1	
1,2,4-Trichlorobenzene	ND	0.50	1		Pyrene	ND	0.50	1	
Naphthalene	ND	0.50	1		Butyl Benzyl Phthalate	ND	0.50	1	
4-Chloroaniline	ND	0.50	1		3,3'-Dichlorobenzidine	ND	0.50	1	
Hexachloro-1,3-Butadiene	ND	0.50	1		Benzo (a) Anthracene	ND	0.50	1	
4-Chloro-3-Methylphenol	ND	0.50	1		Bis(2-Ethylhexyl) Phthalate	ND	0.50	1	
2-Methylnaphthalene	ND	0.50	1		Chrysene	ND	0.50	1	
2,4,5-Trichlorophenol	ND	0.50	1		Di-n-Octyl Phthalate	ND	0.50	1	
2-Chloronaphthalene	ND	0.50	1		Benzo (k) Fluoranthene	ND	0.50	1	
2-Nitroaniline	ND	0.50	1		Benzo (b) Fluoranthene	ND	0.50	1	
Dimethyl Phthalate	ND	0.50	1		Benzo (a) Pyrene	ND	0.50	1	
Acenaphthylene	ND	0.50	1		Indeno (1,2,3-c,d) Pyrene	ND	0.50	1	
3-Nitroaniline	ND	0.50	1		Dibenz (a,h) Anthracene	ND	0.50	1	
Acenaphthene	ND	0.50	1		Benzo (g,h,i) Perylene	ND	0.50	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
2-Fluorophenol	98	53-113			Phenol-d6	103	60-114		
Nitrobenzene-d5	96	57-135			2-Fluorobiphenyl	91	54-120		
2,4,6-Tribromophenol	85	46-124			p-Terphenyl-d14	105	30-168		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 5030C  
 Method: EPA 8260B  
 Units: ug/kg

Project: Hawes Composting / SC0554

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG9-1.0	12-02-0735-18-B	02/09/12 10:50	Solid	GC/MS XX	02/11/12	02/13/12 15:01	120213L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Acelone	ND	120	1		1,3-Dichloropropane	ND	5.0	1	
Benzene	ND	5.0	1		2,2-Dichloropropane	ND	5.0	1	
Bromobenzene	ND	5.0	1		1,1-Dichloropropene	ND	5.0	1	
Bromochloromethane	ND	5.0	1		c-1,3-Dichloropropene	ND	5.0	1	
Bromodichloromethane	ND	5.0	1		t-1,3-Dichloropropene	ND	5.0	1	
Bromoform	ND	5.0	1		Ethylbenzene	ND	5.0	1	
Bromomethane	ND	25	1		2-Hexanone	ND	50	1	
2-Butanone	ND	50	1		Isopropylbenzene	ND	5.0	1	
n-Butylbenzene	ND	5.0	1		p-Isopropyltoluene	ND	5.0	1	
sec-Butylbenzene	ND	5.0	1		Methylene Chloride	ND	50	1	
tert-Butylbenzene	ND	5.0	1		4-Methyl-2-Pentanone	ND	50	1	
Carbon Disulfide	ND	50	1		Naphthalene	ND	50	1	
Carbon Tetrachloride	ND	5.0	1		n-Propylbenzene	ND	5.0	1	
Chlorobenzene	ND	5.0	1		Styrene	ND	5.0	1	
Chloroethane	ND	5.0	1		1,1,1,2-Tetrachloroethane	ND	5.0	1	
Chloroform	ND	5.0	1		1,1,2,2-Tetrachloroethane	ND	5.0	1	
Chloromethane	ND	25	1		Tetrachloroethene	ND	5.0	1	
2-Chlorotoluene	ND	5.0	1		Toluene	ND	5.0	1	
4-Chlorotoluene	ND	5.0	1		1,2,3-Trichlorobenzene	ND	10	1	
Dibromochloromethane	ND	5.0	1		1,2,4-Trichlorobenzene	ND	5.0	1	
1,2-Dibromo-3-Chloropropane	ND	10	1		1,1,1-Trichloroethane	ND	5.0	1	
1,2-Dibromoethane	ND	5.0	1		1,1,2-Trichloroethane	ND	5.0	1	
Dibromomethane	ND	5.0	1		1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	50	1	
1,2-Dichlorobenzene	ND	5.0	1		Trichloroethene	ND	5.0	1	
1,3-Dichlorobenzene	ND	5.0	1		1,2,3-Trichloropropane	ND	5.0	1	
1,4-Dichlorobenzene	ND	5.0	1		1,2,4-Trimethylbenzene	ND	5.0	1	
Dichlorodifluoromethane	ND	5.0	1		Trichlorofluoromethane	ND	50	1	
1,1-Dichloroethane	ND	5.0	1		1,3,5-Trimethylbenzene	ND	5.0	1	
1,2-Dichloroethane	ND	5.0	1		Vinyl Acetate	ND	50	1	
1,1-Dichloroethene	ND	5.0	1		Vinyl Chloride	ND	5.0	1	
c-1,2-Dichloroethene	ND	5.0	1		p/m-Xylene	ND	5.0	1	
t-1,2-Dichloroethene	ND	5.0	1		o-Xylene	ND	5.0	1	
1,2-Dichloropropane	ND	5.0	1		Methyl-t-Butyl Ether (MTBE)	ND	5.0	1	
<b>Surrogates:</b>	<b>REC (%)</b>	<b>Control Limits</b>	<b>Qual</b>		<b>Surrogates:</b>	<b>REC (%)</b>	<b>Control Limits</b>	<b>Qual</b>	
1,4-Bromofluorobenzene	91	60-132			Dibromofluoromethane	114	63-141		
1,2-Dichloroethane-d4	118	62-146			Toluene-d8	94	70-130		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/kg

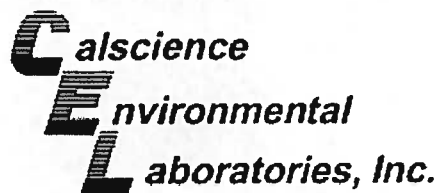
Project: Hawes Composting / SC0554

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG10-0.5	12-02-0735-19-B	02/09/12 11:00	Solid	GC/MS XX	02/11/12	02/13/12 17:49	120213L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Acetone	ND	120	1		1,3-Dichloropropane	ND	5.0	1	
Benzene	ND	5.0	1		2,2-Dichloropropane	ND	5.0	1	
Bromobenzene	ND	5.0	1		1,1-Dichloropropene	ND	5.0	1	
Bromochloromethane	ND	5.0	1		c-1,3-Dichloropropene	ND	5.0	1	
Bromodichloromethane	ND	5.0	1		t-1,3-Dichloropropene	ND	5.0	1	
Bromoform	ND	5.0	1		Ethylbenzene	ND	5.0	1	
Bromomethane	ND	25	1		2-Hexanone	ND	50	1	
2-Butanone	ND	50	1		Isopropylbenzene	ND	5.0	1	
n-Butylbenzene	ND	5.0	1		p-Isopropyltoluene	ND	5.0	1	
sec-Butylbenzene	ND	5.0	1		Methylene Chloride	ND	50	1	
tert-Butylbenzene	ND	5.0	1		4-Methyl-2-Pentanone	ND	50	1	
Carbon Disulfide	ND	50	1		Naphthalene	ND	50	1	
Carbon Tetrachloride	ND	5.0	1		n-Propylbenzene	ND	5.0	1	
Chlorobenzene	ND	5.0	1		Styrene	ND	5.0	1	
Chloroethane	ND	5.0	1		1,1,1,2-Tetrachloroethane	ND	5.0	1	
Chloroform	ND	5.0	1		1,1,2,2-Tetrachloroethane	ND	5.0	1	
Chloromethane	ND	25	1		Tetrachloroethene	ND	5.0	1	
2-Chlorotoluene	ND	5.0	1		Toluene	ND	5.0	1	
4-Chlorotoluene	ND	5.0	1		1,2,3-Trichlorobenzene	ND	10	1	
Dibromochloromethane	ND	5.0	1		1,2,4-Trichlorobenzene	ND	5.0	1	
1,2-Dibromo-3-Chloropropane	ND	10	1		1,1,1-Trichloroethane	ND	5.0	1	
1,2-Dibromoethane	ND	5.0	1		1,1,2-Trichloroethane	ND	5.0	1	
Dibromomethane	ND	5.0	1		1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	50	1	
1,2-Dichlorobenzene	ND	5.0	1		Trichloroethene	ND	5.0	1	
1,3-Dichlorobenzene	ND	5.0	1		1,2,3-Trichloropropane	ND	5.0	1	
1,4-Dichlorobenzene	ND	5.0	1		1,2,4-Trimethylbenzene	ND	5.0	1	
Dichlorodifluoromethane	ND	5.0	1		Trichlorofluoromethane	ND	50	1	
1,1-Dichloroethane	ND	5.0	1		1,3,5-Trimethylbenzene	ND	5.0	1	
1,2-Dichloroethane	ND	5.0	1		Vinyl Acetate	ND	50	1	
1,1-Dichloroethene	ND	5.0	1		Vinyl Chloride	ND	5.0	1	
c-1,2-Dichloroethene	ND	5.0	1		p/m-Xylene	ND	5.0	1	
t-1,2-Dichloroethene	ND	5.0	1		o-Xylene	ND	5.0	1	
1,2-Dichloropropane	ND	5.0	1		Methyl-t-Butyl Ether (MTBE)	ND	5.0	1	
<b>Surrogates:</b>	<b>REC (%)</b>	<b>Control Limits</b>	<b>Qual</b>		<b>Surrogates:</b>	<b>REC (%)</b>	<b>Control Limits</b>	<b>Qual</b>	
1,4-Bromofluorobenzene	93	60-132			Dibromofluoromethane	110	63-141		
1,2-Dichloroethane-d4	113	62-146			Toluene-d8	94	70-130		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-14-314-161	N/A	Solid	GC/MS XX	02/13/12	02/13/12 13:38	120213L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Acetone	ND	120	1		1,3-Dichloropropane	ND	5.0	1	
Benzene	ND	5.0	1		2,2-Dichloropropane	ND	5.0	1	
Bromobenzene	ND	5.0	1		1,1-Dichloropropene	ND	5.0	1	
Bromochloromethane	ND	5.0	1		c-1,3-Dichloropropene	ND	5.0	1	
Bromodichloromethane	ND	5.0	1		t-1,3-Dichloropropene	ND	5.0	1	
Bromoform	ND	5.0	1		Ethylbenzene	ND	5.0	1	
Bromomethane	ND	25	1		2-Hexanone	ND	50	1	
2-Butanone	ND	50	1		Isopropylbenzene	ND	5.0	1	
n-Butylbenzene	ND	5.0	1		p-Isopropyltoluene	ND	5.0	1	
sec-Butylbenzene	ND	5.0	1		Methylene Chloride	ND	50	1	
tert-Butylbenzene	ND	5.0	1		4-Methyl-2-Pentanone	ND	50	1	
Carbon Disulfide	ND	50	1		Naphthalene	ND	50	1	
Carbon Tetrachloride	ND	5.0	1		n-Propylbenzene	ND	5.0	1	
Chlorobenzene	ND	5.0	1		Styrene	ND	5.0	1	
Chloroethane	ND	5.0	1		1,1,1,2-Tetrachloroethane	ND	5.0	1	
Chloroform	ND	5.0	1		1,1,2,2-Tetrachloroethane	ND	5.0	1	
Chloromethane	ND	25	1		Tetrachloroethene	ND	5.0	1	
2-Chlorotoluene	ND	5.0	1		Toluene	ND	5.0	1	
4-Chlorotoluene	ND	5.0	1		1,2,3-Trichlorobenzene	ND	10	1	
Dibromochloromethane	ND	5.0	1		1,2,4-Trichlorobenzene	ND	5.0	1	
1,2-Dibromo-3-Chloropropane	ND	10	1		1,1,1-Trichloroethane	ND	5.0	1	
1,2-Dibromoethane	ND	5.0	1		1,1,2-Trichloroethane	ND	5.0	1	
Dibromomethane	ND	5.0	1		1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	50	1	
1,2-Dichlorobenzene	ND	5.0	1		Trichloroethene	ND	5.0	1	
1,3-Dichlorobenzene	ND	5.0	1		1,2,3-Trichloropropane	ND	5.0	1	
1,4-Dichlorobenzene	ND	5.0	1		1,2,4-Trimethylbenzene	ND	5.0	1	
Dichlorodifluoromethane	ND	5.0	1		Trichlorofluoromethane	ND	50	1	
1,1-Dichloroethane	ND	5.0	1		1,3,5-Trimethylbenzene	ND	5.0	1	
1,2-Dichloroethane	ND	5.0	1		Vinyl Acetate	ND	50	1	
1,1-Dichloroethene	ND	5.0	1		Vinyl Chloride	ND	5.0	1	
c-1,2-Dichloroethene	ND	5.0	1		p/m-Xylene	ND	5.0	1	
t-1,2-Dichloroethene	ND	5.0	1		o-Xylene	ND	5.0	1	
1,2-Dichloropropane	ND	5.0	1		Methyl-t-Butyl Ether (MTBE)	ND	5.0	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>		<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>	<u>Qual</u>	
1,4-Bromofluorobenzene	94	60-132			Dibromofluoromethane	112	63-141		
1,2-Dichloroethane-d4	108	62-146			Toluene-d8	96	70-130		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

**Analytical Report**



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B / EPA 7471A Total  
 Method: EPA 6010B / EPA 7471A  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG1-0.5	12-02-0735-1-A	02/09/12 09:20	Solid	ICP 5300	02/13/12	02/13/12 15:27	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 12:50 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	1.58	0.750	1		Thallium	ND	0.750	1	
Barium	36.0	0.500	1		Vanadium	10.1	0.250	1	
Beryllium	ND	0.250	1		Zinc	16.4	1.00	1	
Cadmium	ND	0.500	1		Aluminum	4050	2.50	1	
Chromium	4.97	0.250	1		Calcium	1760	5.00	1	
Cobalt	2.73	0.250	1		Iron	6070	5.00	1	
Copper	4.47	0.500	1		Magnesium	1950	5.00	1	
Lead	3.07	0.500	1		Manganese	133	0.250	1	
Mercury	ND	0.0835	1		Potassium	1290	25.0	1	
Molybdenum	ND	0.250	1		Sodium	65.3	25.0	1	
Nickel	4.22	0.250	1		Boron	1.84	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG2-1.0	12-02-0735-4-A	02/09/12 09:35	Solid	ICP 5300	02/13/12	02/14/12 14:39	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 12:53 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	4.24	0.750	1		Thallium	ND	0.750	1	
Barium	74.5	0.500	1		Vanadium	29.1	0.250	1	
Beryllium	1.09	0.250	1		Zinc	24.5	1.00	1	
Cadmium	ND	0.500	1		Aluminum	9260	2.50	1	
Chromium	10.1	0.250	1		Calcium	42500	5.00	1	
Cobalt	5.61	0.250	1		Iron	12000	5.00	1	
Copper	8.41	0.500	1		Magnesium	6160	5.00	1	
Lead	2.83	0.500	1		Manganese	186	0.250	1	
Mercury	ND	0.0835	1		Potassium	2040	25.0	1	
Molybdenum	2.76	0.250	1		Sodium	1580	25.0	1	
Nickel	7.35	0.250	1		Boron	16.7	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B / EPA 7471A Total  
 Method: EPA 6010B / EPA 7471A  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG3-1.0	12-02-0735-6-A	02/09/12 09:45	Solid	ICP 5300	02/13/12	02/14/12 14:41	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 12:55 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	1.76	0.750	1		Thallium	ND	0.750	1	
Barium	43.4	0.500	1		Vanadium	11.7	0.250	1	
Beryllium	0.369	0.250	1		Zinc	13.5	1.00	1	
Cadmium	ND	0.500	1		Aluminum	4450	2.50	1	
Chromium	5.17	0.250	1		Calcium	7620	5.00	1	
Cobalt	2.80	0.250	1		Iron	6280	5.00	1	
Copper	5.24	0.500	1		Magnesium	2330	5.00	1	
Lead	2.75	0.500	1		Manganese	113	0.250	1	
Mercury	ND	0.0835	1		Potassium	1250	25.0	1	
Molybdenum	0.594	0.250	1		Sodium	93.4	25.0	1	
Nickel	4.37	0.250	1		Boron	2.96	1.00	1	
Selenium	ND	0.750	1						

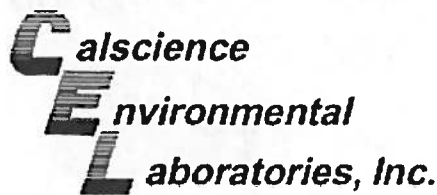
Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG4-0.5	12-02-0735-7-A	02/09/12 09:50	Solid	ICP 5300	02/13/12	02/14/12 14:42	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 12:57 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	4.85	0.750	1		Thallium	ND	0.750	1	
Barium	104	0.500	1		Vanadium	27.5	0.250	1	
Beryllium	1.05	0.250	1		Zinc	54.9	1.00	1	
Cadmium	0.633	0.500	1		Aluminum	16500	2.50	1	
Chromium	17.3	0.250	1		Calcium	12700	5.00	1	
Cobalt	9.19	0.250	1		Iron	17900	5.00	1	
Copper	19.6	0.500	1		Magnesium	8700	5.00	1	
Lead	9.52	0.500	1		Manganese	405	0.250	1	
Mercury	ND	0.0835	1		Potassium	5100	25.0	1	
Molybdenum	1.00	0.250	1		Sodium	1540	25.0	1	
Nickel	17.1	0.250	1		Boron	6.84	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B / EPA 7471A Total  
 Method: EPA 6010B / EPA 7471A  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG5-1.0	12-02-0735-10-A	02/09/12 10:05	Solid	ICP 5300	02/13/12	02/14/12 14:44	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 12:59 with batch 120213L02.

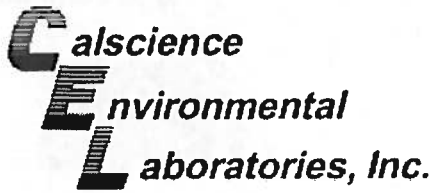
Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	4.03	0.750	1		Thallium	ND	0.750	1	
Barium	333	0.500	1		Vanadium	23.9	0.250	1	
Beryllium	1.39	0.250	1		Zinc	33.9	1.00	1	
Cadmium	ND	0.500	1		Aluminum	14000	2.50	1	
Chromium	15.6	0.250	1		Calcium	6150	5.00	1	
Cobalt	17.6	0.250	1		Iron	14200	5.00	1	
Copper	15.4	0.500	1		Magnesium	6690	5.00	1	
Lead	7.30	0.500	1		Manganese	379	0.250	1	
Mercury	ND	0.0835	1		Potassium	2890	25.0	1	
Molybdenum	1.47	0.250	1		Sodium	2920	25.0	1	
Nickel	22.5	0.250	1		Boron	38.1	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG6-0.5	12-02-0735-11-A	02/09/12 10:15	Solid	ICP 5300	02/13/12	02/14/12 14:48	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 13:06 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	2.17	0.750	1		Thallium	ND	0.750	1	
Barium	51.4	0.500	1		Vanadium	13.8	0.250	1	
Beryllium	0.442	0.250	1		Zinc	25.6	1.00	1	
Cadmium	ND	0.500	1		Aluminum	7100	2.50	1	
Chromium	7.91	0.250	1		Calcium	3100	5.00	1	
Cobalt	4.36	0.250	1		Iron	8950	5.00	1	
Copper	8.31	0.500	1		Magnesium	3570	5.00	1	
Lead	4.88	0.500	1		Manganese	179	0.250	1	
Mercury	ND	0.0835	1		Potassium	2380	25.0	1	
Molybdenum	0.394	0.250	1		Sodium	187	25.0	1	
Nickel	7.16	0.250	1		Boron	4.42	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B / EPA 7471A Total  
 Method: EPA 6010B / EPA 7471A  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG7-1.0	12-02-0735-14-A	02/09/12 10:30	Solid	ICP 5300	02/13/12	02/14/12 14:50	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 13:08 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	9.96	0.750	1		Thallium	ND	0.750	1	
Barium	177	0.500	1		Vanadium	45.5	0.250	1	
Beryllium	1.26	0.250	1		Zinc	32.8	1.00	1	
Cadmium	0.559	0.500	1		Aluminum	13000	2.50	1	
Chromium	14.3	0.250	1		Calcium	43300	5.00	1	
Cobalt	7.38	0.250	1		Iron	15200	5.00	1	
Copper	12.8	0.500	1		Magnesium	7040	5.00	1	
Lead	4.39	0.500	1		Manganese	230	0.250	1	
Mercury	ND	0.0835	1		Potassium	2370	25.0	1	
Molybdenum	3.06	0.250	1		Sodium	3690	25.0	1	
Nickel	10.6	0.250	1		Boron	20.3	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG8-0.5	12-02-0735-15-A	02/09/12 10:35	Solid	ICP 5300	02/13/12	02/14/12 14:51	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 13:10 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	1.83	0.750	1		Thallium	ND	0.750	1	
Barium	43.2	0.500	1		Vanadium	11.9	0.250	1	
Beryllium	0.300	0.250	1		Zinc	22.6	1.00	1	
Cadmium	ND	0.500	1		Aluminum	4670	2.50	1	
Chromium	5.97	0.250	1		Calcium	2740	5.00	1	
Cobalt	2.99	0.250	1		Iron	6990	5.00	1	
Copper	5.87	0.500	1		Magnesium	2670	5.00	1	
Lead	7.08	0.500	1		Manganese	155	0.250	1	
Mercury	ND	0.0835	1		Potassium	1740	25.0	1	
Molybdenum	0.415	0.250	1		Sodium	499	25.0	1	
Nickel	5.10	0.250	1		Boron	3.50	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3050B / EPA 7471A Total  
Method: EPA 6010B / EPA 7471A  
Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date / Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG9-1.0	12-02-0735-18-A	02/09/12 10:50	Solid	ICP 5300	02/13/12	02/14/12 14:53	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 13:13 with batch 120213L02.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	3.67	0.750	1		Thallium	ND	0.750	1	
Barium	45.3	0.500	1		Vanadium	18.0	0.250	1	
Beryllium	0.525	0.250	1		Zinc	14.7	1.00	1	
Cadmium	ND	0.500	1		Aluminum	4730	2.50	1	
Chromium	6.19	0.250	1		Calcium	18700	5.00	1	
Cobalt	3.14	0.250	1		Iron	7230	5.00	1	
Copper	4.50	0.500	1		Magnesium	2710	5.00	1	
Lead	2.00	0.500	1		Manganese	97.2	0.250	1	
Mercury	ND	0.0835	1		Potassium	1160	25.0	1	
Molybdenum	1.27	0.250	1		Sodium	1590	25.0	1	
Nickel	4.02	0.250	1		Boron	7.39	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date / Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG10-0.5	12-02-0735-19-A	02/09/12 11:00	Solid	ICP 5300	02/13/12	02/14/12 14:54	120213L02A

Comment(s): -Mercury analysis was performed on 02/13/12 13:15 with batch 120213L02.

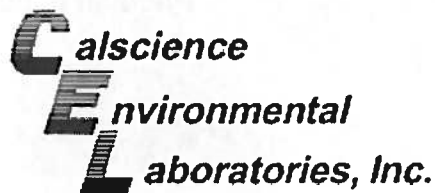
Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	4.04	0.750	1		Thallium	ND	0.750	1	
Barium	73.3	0.500	1		Vanadium	18.5	0.250	1	
Beryllium	0.776	0.250	1		Zinc	23.9	1.00	1	
Cadmium	ND	0.500	1		Aluminum	9310	2.50	1	
Chromium	9.81	0.250	1		Calcium	17800	5.00	1	
Cobalt	4.43	0.250	1		Iron	10200	5.00	1	
Copper	10.7	0.500	1		Magnesium	4220	5.00	1	
Lead	76.8	0.500	1		Manganese	163	0.250	1	
Mercury	ND	0.0835	1		Potassium	2150	25.0	1	
Molybdenum	1.17	0.250	1		Sodium	401	25.0	1	
Nickel	8.04	0.250	1		Boron	4.14	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date / Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-04-007-8,504	N/A	Solid	Mercury	02/13/12	02/13/12 12:39	120213L02

Comment(s): -Preparation/analysis for Mercury was performed by EPA 7471A.

Parameter	Result	RL	DF	Qual
Mercury	ND	0.0835	1	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B / EPA 7471A Total  
 Method: EPA 6010B / EPA 7471A  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	097-01-002-15,651	N/A	Solid	ICP 5300	02/13/12	02/14/12 14:19	120213L02A

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	ND	0.750	1		Thallium	ND	0.750	1	
Barium	ND	0.500	1		Vanadium	ND	0.250	1	
Beryllium	ND	0.250	1		Zinc	ND	1.00	1	
Cadmium	ND	0.500	1		Aluminum	ND	2.50	1	
Chromium	ND	0.250	1		Calcium	ND	5.00	1	
Cobalt	ND	0.250	1		Iron	ND	5.00	1	
Copper	ND	0.500	1		Magnesium	ND	5.00	1	
Lead	ND	0.500	1		Manganese	ND	0.250	1	
Molybdenum	ND	0.250	1		Potassium	ND	25.0	1	
Nickel	ND	0.250	1		Sodium	ND	25.0	1	
Selenium	ND	0.750	1		Boron	ND	1.00	1	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Geosyntec Consultants  
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 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date Collected	Matrix
BG1-0.5	12-02-0735-1	02/09/12	Solid

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	ND	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrite (as N)	1.6	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	2.7	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	1.7	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	ND	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO3)	45	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO3)	ND	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO3)	45	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	576	1.00	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	180	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	1000	380	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	340	120	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

BG2-1.0	12-02-0735-4	02/09/12	Solid
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	4.0	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	1100	20	2		mg/kg	02/13/12	02/16/12	EPA 300.0
Nitrite (as N)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	25	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	310	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO3)	200	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO3)	70	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO3)	120	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	2350	10.0	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	70	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	ND	1.5	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	ND	0.50	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735

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Client Sample Number	Lab Sample Number	Date Collected	Matrix
BG3-1.0	12-02-0735-6	02/09/12	Solid

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	10	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrite (as N)	1.5	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	1.7	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	1.1	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	14	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO <sub>3</sub> )	210	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO <sub>3</sub> )	24	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO <sub>3</sub> )	190	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	164	1.00	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	180	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	870	380	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	280	120	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

BG4-0.5	12-02-0735-7	02/09/12	Solid
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	1.4	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	ND	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrite (as N)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	21	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	2.5	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	86	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO <sub>3</sub> )	860	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO <sub>3</sub> )	350	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO <sub>3</sub> )	510	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	817	1.00	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	200	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	3.0	1.5	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	1.0	0.50	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Geosyntec Consultants  
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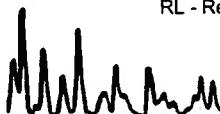
Client Sample Number	Lab Sample Number	Date Collected	Matrix
BG5-1.0	12-02-0735-10	02/09/12	Solid

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	13	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	580	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrite (as N)	1.4	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	8.3	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	1.3	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	240	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO3)	800	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO3)	430	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO3)	380	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	4730	10.0	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	130	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	840	380	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	280	120	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

BG6-0.5	12-02-0735-11	02/09/12	Solid
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	ND	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrite (as N)	1.1	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	6.0	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	1.9	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	ND	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO3)	180	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO3)	ND	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO3)	180	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	1230	10.0	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	320	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	6.2	1.5	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	2.0	0.50	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



## Analytical Report



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
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Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date Collected	Matrix
BG7-1.0	12-02-0735-14	02/09/12	Solid

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	14	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	960	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrite (as N)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	1.0	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	2.4	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	750	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO <sub>3</sub> )	15000	100	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO <sub>3</sub> )	1100	10	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO <sub>3</sub> )	13000	100	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	3290	10.0	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	150	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	1100	380	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	360	120	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

BG8-0.5	12-02-0735-15	02/09/12	Solid
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Chloride	350	10	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Nitrite (as N)	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Nitrate (as N)	13	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
o-Phosphate (as P)	8.0	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Sulfate	37	10	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO <sub>3</sub> )	360	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO <sub>3</sub> )	ND	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO <sub>3</sub> )	360	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	784	1.00	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	600	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	1200	380	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	380	120	250		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



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 Work Order No: 12-02-0735

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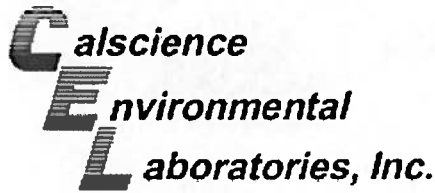
Client Sample Number	Lab Sample Number	Date Collected	Matrix
BG9-1.0	12-02-0735-18	02/09/12	Solid

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Chloride	730	10	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Nitrite (as N)	1.0	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Nitrate (as N)	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
o-Phosphate (as P)	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Sulfate	6700	100	10		mg/kg	02/13/12	02/16/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO3)	160	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO3)	ND	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO3)	160	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	4900	10.0	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	84	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	2.6	1.5	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	0.84	0.50	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
MBAS	1.0	1.0	1		mg/kg	02/11/12	02/11/12	SM 5540C (M)

BG10-0.5	12-02-0735-19	02/09/12	Solid
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Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	2.7	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Chloride	ND	10	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Nitrite (as N)	1.2	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Nitrate (as N)	1.6	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
o-Phosphate (as P)	1.2	1.0	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Sulfate	ND	10	1		mg/kg	02/13/12	02/14/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO3)	480	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO3)	120	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO3)	370	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	559	1.00	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	130	50	5		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	6.0	1.5	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	2.0	0.50	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
MBAS	ND	1.0	1		mg/kg	02/11/12	02/11/12	SM 5540C (M)

RL - Reporting Limit    DF - Dilution Factor    Qual - Qualifiers



Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735

Project: Hawes Composting / SC0554

Page 6 of 6

Client Sample Number	Lab Sample Number	Date Collected	Matrix
Method Blank		N/A	Solid

Parameter	Results	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Fluoride	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Chloride	ND	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrite (as N)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Nitrate (as N)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
o-Phosphate (as P)	ND	1.0	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Sulfate	ND	10	1		mg/kg	02/13/12	02/13/12	EPA 300.0
Fluoride	ND	1.0	1		mg/kg	02/15/12	02/16/12	EPA 300.0
Chloride	ND	10	1		mg/kg	02/15/12	02/16/12	EPA 300.0
Nitrite (as N)	ND	1.0	1		mg/kg	02/15/12	02/16/12	EPA 300.0
Bromide	ND	1.0	1		mg/kg	02/15/12	02/16/12	EPA 300.0
Nitrate (as N)	ND	1.0	1		mg/kg	02/15/12	02/16/12	EPA 300.0
o-Phosphate (as P)	ND	1.0	1		mg/kg	02/15/12	02/16/12	EPA 300.0
Sulfate	ND	10	1		mg/kg	02/15/12	02/16/12	EPA 300.0
Chromium, Hexavalent	ND	0.80	1		mg/kg	02/14/12	02/14/12	EPA 7196A
Alkalinity, Total (as CaCO3)	ND	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Carbonate (as CaCO3)	ND	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Bicarbonate (as CaCO3)	ND	5.0	1		mg/kg	02/17/12	02/17/12	SM 2320B M
Solids, Total Dissolved	ND	1.0	1		mg/kg	02/15/12	02/15/12	SM 2540 C (M)
Total Kjeldahl Nitrogen	ND	10	1		mg/kg	02/18/12	02/18/12	SM 4500 N Org B (M)
Total Phosphate	ND	1.5	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
Phosphorus, Total	ND	0.50	1		mg/kg	02/17/12	02/17/12	SM 4500 P B/E (M)
MBAS	ND	1.0	1		mg/kg	02/11/12	02/11/12	SM 5540C (M)

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



**Analytical Report**

**LABORATORY ID: 12-02-0735**

**Method: Total Cations/Anions (Calculation)**  
**Matrix: Solid**

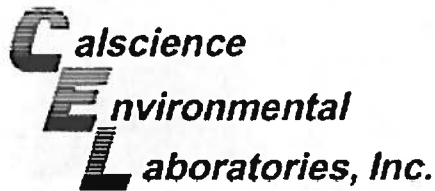
**CLIENT: Geosyntec Consultants**  
**PROJECT: Hawes Composting / SC0554**  
**DATE COLLECTED: 02/09/12**

**Results**

Sample ID	Total Cations mg/kg	Total Anions mg/kg
BG1-0.5	11135	6.0
BG2-1.0	64280	1439
BG3-1.0	17573	28
BG4-0.5	45940	111
BG5-1.0	32850	844
BG6-0.5	18187	9.0
BG7-1.0	71600	1727
BG8-0.5	14639	408
BG9-1.0	31390	7431
BG10-0.5	34771	6.7

**Laboratory Notes**

Total Cations is the sum of Calcium, Iron, Magnesium, Potassium, and Sodium.  
 Total Anions is the sum of Fluoride, Chloride, Nitrite (as N), Bromide, Nitrate (as N), o-Phosphate (as P), and Sulfate.



## Quality Control - Spike/Spike Duplicate



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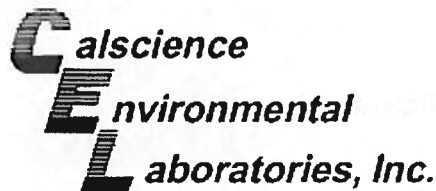
Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3050B  
Method: EPA 6010B

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG1-0.5	Solid	ICP 5300	02/13/12	02/13/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Antimony	25.00	35	33	50-115	4	0-20	3
Arsenic	25.00	106	104	75-125	1	0-20	
Barium	25.00	104	110	75-125	3	0-20	
Beryllium	25.00	110	112	75-125	2	0-20	
Cadmium	25.00	106	107	75-125	2	0-20	
Chromium	25.00	105	108	75-125	2	0-20	
Cobalt	25.00	113	113	75-125	0	0-20	
Copper	25.00	106	108	75-125	2	0-20	
Lead	25.00	107	108	75-125	1	0-20	
Molybdenum	25.00	94	92	75-125	2	0-20	
Nickel	25.00	111	111	75-125	0	0-20	
Selenium	25.00	99	100	75-125	1	0-20	
Silver	12.50	99	101	75-125	2	0-20	
Thallium	25.00	104	103	75-125	1	0-20	
Vanadium	25.00	99	101	75-125	2	0-20	
Zinc	25.00	104	108	75-125	2	0-20	
Aluminum	25.00	4X	4X	75-125	4X	0-20	Q
Calcium	25.00	4X	4X	75-125	4X	0-20	Q
Iron	25.00	4X	4X	75-125	4X	0-20	Q
Magnesium	25.00	4X	4X	75-125	4X	0-20	Q
Manganese	25.00	4X	4X	75-125	4X	0-20	Q
Potassium	250.0	4X	4X	75-125	4X	0-20	Q
Sodium	250.0	121	119	75-125	1	0-20	
Boron	25.00	99	96	75-125	2	0-20	

RPD - Relative Percent Difference, CL - Control Limit



## Quality Control - PDS / PSD



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San Diego, CA 92127-2116

Date Received 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3050B  
Method: EPA 6010B

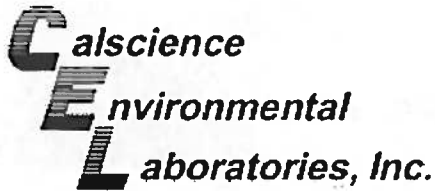
Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PSD Batch Number
BG1-0.5	Solid	ICP 5300	02/13/12	02/13/12	120213S02

Analysis Comment: \* - Analyzed 2/14/2012 2:27:00 PM

Parameter	SPIKE ADDED	PDS %REC	PSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Antimony	25.00	90	92	75-125	2	0-20	
Arsenic	25.00	94	97	75-125	3	0-20	
Barium	25.00	106	108	75-125	1	0-20	
Beryllium	25.00	106	107	75-125	1	0-20	
Cadmium	25.00	102	103	75-125	1	0-20	
Chromium	25.00	102	103	75-125	1	0-20	
Cobalt	25.00	106	108	75-125	2	0-20	
Copper	25.00	101	101	75-125	0	0-20	
Lead	25.00	103	105	75-125	2	0-20	
Molybdenum	25.00	101	103	75-125	2	0-20	
Nickel	25.00	103	105	75-125	2	0-20	
Selenium	25.00	100	102	75-125	2	0-20	
Silver	12.50	97	98	75-125	1	0-20	
Thallium	25.00	100	103	75-125	3	0-20	
Vanadium	25.00	100	101	75-125	1	0-20	
Zinc	25.00	101	102	75-125	0	0-20	
Aluminum	25.00	4X	4X	75-125	4X	0-20	Q
Calcium	25.00	4X	4X	75-125	4X	0-20	Q
Iron	25.00	4X	4X	75-125	4X	0-20	Q
Magnesium	25.00	4X	4X	75-125	4X	0-20	Q
Manganese	25.00	4X	4X	75-125	4X	0-20	Q
Potassium	250.0	4X	4X	75-125	4X	0-20	Q
Sodium	250.0	99	101	75-125	1	0-20	
Boron	25.00	98	100	75-125	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Geosyntec Consultants  
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 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 7471A Total  
 Method: EPA 7471A

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG1-0.5	Solid	Mercury	02/13/12	02/13/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	0.8350	109	110	71-137	1	0-14	

RPD - Relative Percent Difference , CL - Control Limit

## Quality Control - Spike/Spike Duplicate



Geosyntec Consultants  
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Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 8151A  
 Method: EPA 8151A

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
12-02-0827-2	Solid	GC 40	02/17/12	02/21/12	120217S16

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
2,4-D	400.0	71	66	30-130	7	0-30	
2,4,5-T	40.00	58	56	30-130	5	0-30	
2,4-DB	400.0	35	34	30-130	4	0-30	

RPD - Relative Percent Difference , CL - Control Limit

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 Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8081A

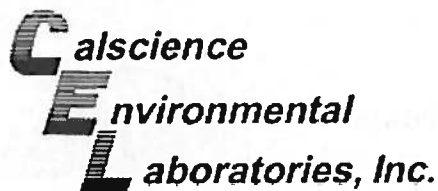
Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
12-02-0732-4	Solid	GC 51	02/13/12	02/14/12	120213S09

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aldrin	25.00	87	87	50-135	0	0-25	
Alpha-BHC	25.00	87	86	50-135	2	0-25	
Beta-BHC	25.00	89	91	50-135	2	0-25	
4,4'-DDD	25.00	91	92	50-135	1	0-25	
4,4'-DDE	25.00	92	92	50-135	0	0-25	
4,4'-DDT	25.00	90	89	50-135	1	0-25	
Delta-BHC	25.00	85	83	50-135	2	0-25	
Dieldrin	25.00	88	88	50-135	0	0-25	
Endosulfan I	25.00	88	88	50-135	0	0-25	
Endosulfan II	25.00	88	88	50-135	0	0-25	
Endosulfan Sulfate	25.00	87	87	50-135	0	0-25	
Endrin	25.00	88	87	50-135	1	0-25	
Endrin Aldehyde	25.00	86	87	50-135	1	0-25	
Gamma-BHC	25.00	89	88	50-135	2	0-25	
Heptachlor	25.00	90	89	50-135	1	0-25	
Heptachlor Epoxide	25.00	86	86	50-135	0	0-25	
Methoxychlor	25.00	89	88	50-135	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



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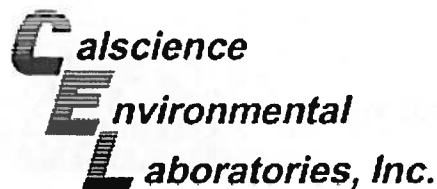
Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8270C

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG9-1.0	Solid	GC/MS CCC	02/13/12	02/15/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
N-Nitrosodimethylamine	10.00	99	93	53-119	6	0-18	
Phenol	10.00	100	97	54-126	4	0-18	
Bis(2-Chloroethyl) Ether	10.00	101	97	55-115	3	0-18	
2-Chlorophenol	10.00	95	92	56-116	3	0-18	
1,3-Dichlorobenzene	10.00	90	86	54-114	4	0-18	
1,4-Dichlorobenzene	10.00	90	86	50-110	5	0-18	
Benzyl Alcohol	10.00	103	99	54-150	4	0-18	
1,2-Dichlorobenzene	10.00	89	85	51-117	4	0-18	
2-Methylphenol	10.00	98	95	52-124	3	0-19	
Bis(2-Chloroisopropyl) Ether	10.00	92	90	33-153	3	0-18	
3/4-Methylphenol	20.00	105	102	33-129	3	0-20	
N-Nitroso-di-n-propylamine	10.00	101	98	47-143	3	0-18	
Hexachloroethane	10.00	92	88	48-114	4	0-17	
Nitrobenzene	10.00	96	93	46-136	4	0-17	
Isophorone	10.00	94	92	51-117	3	0-16	
2-Nitrophenol	10.00	93	89	55-139	4	0-17	
2,4-Dimethylphenol	10.00	96	92	45-135	4	0-22	
Benzoic Acid	10.00	7	6	0-28	25	0-81	
Bis(2-Chloroethoxy) Methane	10.00	95	91	49-127	4	0-16	
2,4-Dichlorophenol	10.00	94	89	55-121	5	0-18	
1,2,4-Trichlorobenzene	10.00	88	85	52-118	3	0-17	
Naphthalene	10.00	92	89	51-123	3	0-23	
4-Chloroaniline	10.00	73	77	25-133	5	0-22	
Hexachloro-1,3-Butadiene	10.00	84	80	43-127	4	0-17	
4-Chloro-3-Methylphenol	10.00	97	93	57-123	4	0-20	
2-Methylnaphthalene	10.00	88	84	51-123	4	0-19	
2,4,5-Trichlorophenol	10.00	95	90	48-120	6	0-18	
2-Chloronaphthalene	10.00	87	84	51-123	3	0-17	
2-Nitroaniline	10.00	101	95	43-157	6	0-17	
Dimethyl Phthalate	10.00	93	89	55-115	5	0-17	
Acenaphthylene	10.00	90	87	51-123	4	0-17	
3-Nitroaniline	10.00	77	79	30-144	2	0-18	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8270C

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG9-1.0	Solid	GC/MS CCC	02/13/12	02/15/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Acenaphthene	10.00	91	87	51-129	4	0-18	
2,4-Dinitrophenol	10.00	78	64	15-99	19	0-33	
4-Nitrophenol	10.00	116	105	45-141	10	0-23	
Dibenzofuran	10.00	93	89	48-126	5	0-18	
2,4-Dinitrotoluene	10.00	96	90	39-177	5	0-18	
2,6-Dinitrotoluene	10.00	96	92	49-139	5	0-17	
Diethyl Phthalate	10.00	91	86	52-124	6	0-16	
4-Chlorophenyl-Phenyl Ether	10.00	91	86	47-131	6	0-18	
Fluorene	10.00	94	89	49-127	5	0-18	
4-Nitroaniline	10.00	92	85	50-140	8	0-18	
4,6-Dinitro-2-Methylphenol	10.00	89	82	26-146	8	0-18	
N-Nitrosodiphenylamine	10.00	110	105	57-159	5	0-20	
2,4,6-Trichlorophenol	10.00	95	91	53-119	4	0-18	
4-Bromophenyl-Phenyl Ether	10.00	95	91	45-129	5	0-17	
Hexachlorobenzene	10.00	87	84	43-133	4	0-17	
Pentachlorophenol	10.00	92	84	30-114	9	0-21	
Phenanthrene	10.00	92	87	46-130	5	0-17	
Anthracene	10.00	85	80	45-123	6	0-17	
Di-n-Butyl Phthalate	10.00	90	85	49-127	6	0-17	
Fluoranthene	10.00	90	84	45-123	7	0-18	
Benzidine	10.00	67	61	0-78	8	0-54	
Pyrene	10.00	94	89	52-124	5	0-15	
Butyl Benzyl Phthalate	10.00	97	93	51-123	5	0-15	
3,3'-Dichlorobenzidine	10.00	98	98	15-225	0	0-22	
Benzo (a) Anthracene	10.00	93	88	44-122	6	0-14	
Bis(2-Ethylhexyl) Phthalate	10.00	96	91	55-121	5	0-15	
Chrysene	10.00	92	88	42-120	5	0-16	
Di-n-Octyl Phthalate	10.00	102	96	43-163	6	0-19	
Benzo (k) Fluoranthene	10.00	82	79	52-130	4	0-18	
Benzo (b) Fluoranthene	10.00	85	79	56-122	7	0-20	
Benzo (a) Pyrene	10.00	94	89	50-116	6	0-17	
Indeno (1,2,3-c,d) Pyrene	10.00	82	78	19-121	5	0-16	

RPD - Relative Percent Difference , CL - Control Limit

## Quality Control - Spike/Spike Duplicate



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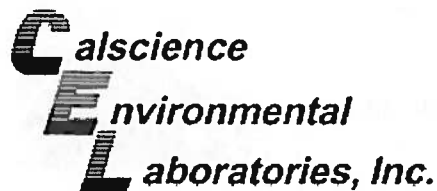
Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8270C

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG9-1.0	Solid	GC/MS CCC	02/13/12	02/15/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Dibenz (a,h) Anthracene	10.00	83	79	19-127	5	0-16	
Benzo (g,h,i) Perylene	10.00	79	74	9-123	7	0-18	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



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San Diego, CA 92127-2116

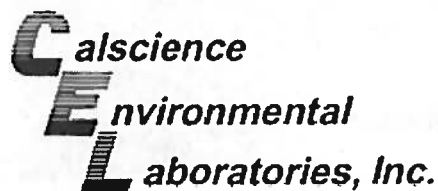
Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8141B

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG9-1.0	Solid	GC 35	02/14/12	02/16/12	120214S09

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Azinphos Methyl	4.000	89	90	30-130	2	0-30	
Bolstar	4.000	93	95	30-130	2	0-30	
Chlorpyrifos	4.000	85	87	30-130	2	0-30	
Coumaphos	4.000	93	95	30-130	2	0-30	
Diazinon	4.000	92	93	30-130	1	0-30	
Disulfoton	4.000	93	94	30-130	0	0-30	
Ethoprop	4.000	98	99	30-130	1	0-30	
Fensulfothion	4.000	89	92	30-130	3	0-30	
Fenthion	4.000	89	91	30-130	2	0-30	
Merphos	4.000	83	85	30-130	3	0-30	
Methyl Parathion	4.000	89	90	30-130	1	0-30	
Phorate	4.000	97	98	30-130	0	0-30	
Ronnel	4.000	85	87	30-130	2	0-30	
Stirophos	4.000	77	79	30-130	2	0-30	
Tokuthion	4.000	86	88	30-130	2	0-30	
Trichloronate	4.000	86	88	30-130	2	0-30	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



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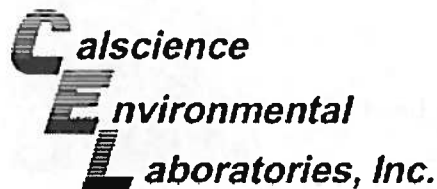
Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 5030C  
Method: EPA 8260B

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG9-1.0	Solid	GC/MS XX	02/11/12	02/13/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Acetone	50.00	77	72	70-130	7	0-20	
Benzene	50.00	99	96	61-127	3	0-20	
Bromobenzene	50.00	96	89	70-130	7	0-20	
Bromochloromethane	50.00	111	107	70-130	4	0-20	
Bromodichloromethane	50.00	100	96	70-130	4	0-20	
Bromoform	50.00	103	100	70-130	4	0-20	
Bromomethane	50.00	99	97	70-130	2	0-20	
2-Butanone	50.00	91	85	70-130	8	0-20	
n-Butylbenzene	50.00	98	92	77-123	6	0-25	
sec-Butylbenzene	50.00	100	97	70-130	3	0-20	
tert-Butylbenzene	50.00	99	95	70-130	4	0-20	
Carbon Disulfide	50.00	92	89	70-130	4	0-20	
Carbon Tetrachloride	50.00	107	104	51-135	3	0-29	
Chlorobenzene	50.00	100	95	57-123	6	0-20	
Chloroethane	50.00	86	86	70-130	0	0-20	
Chloroform	50.00	112	109	70-130	3	0-20	
Chloromethane	50.00	99	98	70-130	2	0-20	
2-Chlorotoluene	50.00	96	91	70-130	6	0-20	
4-Chlorotoluene	50.00	100	95	70-130	5	0-20	
Dibromochloromethane	50.00	107	101	70-130	6	0-20	
1,2-Dibromo-3-Chloropropane	50.00	98	89	70-130	9	0-20	
1,2-Dibromoethane	50.00	106	99	64-124	7	0-20	
Dibromomethane	50.00	102	98	70-130	4	0-20	
1,2-Dichlorobenzene	50.00	98	93	35-131	6	0-25	
1,3-Dichlorobenzene	50.00	96	90	70-130	7	0-20	
1,4-Dichlorobenzene	50.00	94	88	70-130	7	0-20	
Dichlorodifluoromethane	50.00	112	111	70-130	1	0-20	
1,1-Dichloroethane	50.00	105	102	70-130	4	0-20	
1,2-Dichloroethane	50.00	103	99	70-130	4	0-20	
1,1-Dichloroethene	50.00	89	86	47-143	4	0-25	
c-1,2-Dichloroethene	50.00	113	108	70-130	4	0-20	
t-1,2-Dichloroethene	50.00	108	105	70-130	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



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Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 5030C  
Method: EPA 8260B

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG9-1.0	Solid	GC/MS XX	02/11/12	02/13/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
1,2-Dichloropropane	50.00	94	91	79-115	3	0-25	
1,3-Dichloropropane	50.00	104	98	70-130	5	0-20	
2,2-Dichloropropane	50.00	106	102	70-130	3	0-20	
1,1-Dichloropropene	50.00	102	98	70-130	3	0-20	
c-1,3-Dichloropropene	50.00	101	97	70-130	4	0-20	
t-1,3-Dichloropropene	50.00	111	104	70-130	6	0-20	
Ethylbenzene	50.00	102	97	57-129	5	0-22	
2-Hexanone	50.00	90	81	70-130	11	0-20	
Isopropylbenzene	50.00	100	95	70-130	5	0-20	
p-Isopropyltoluene	50.00	99	94	70-130	5	0-20	
Methylene Chloride	50.00	106	104	70-130	2	0-20	
4-Methyl-2-Pentanone	50.00	94	87	70-130	8	0-20	
Naphthalene	50.00	89	83	70-130	7	0-20	
n-Propylbenzene	50.00	99	93	70-130	6	0-20	
Styrene	50.00	101	96	70-130	5	0-20	
1,1,1,2-Tetrachloroethane	50.00	107	101	70-130	5	0-20	
1,1,2,2-Tetrachloroethane	50.00	102	96	70-130	6	0-20	
Tetrachloroethene	50.00	115	113	70-130	2	0-20	
Toluene	50.00	96	92	63-123	4	0-20	
1,2,3-Trichlorobenzene	50.00	81	74	70-130	10	0-20	
1,2,4-Trichlorobenzene	50.00	83	75	70-130	10	0-20	
1,1,1-Trichloroethane	50.00	106	104	70-130	2	0-20	
1,1,2-Trichloroethane	50.00	104	97	70-130	6	0-20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	50.00	91	88	70-130	4	0-20	
Trichloroethene	50.00	100	96	44-158	4	0-20	
1,2,3-Trichloropropane	50.00	98	92	70-130	6	0-20	
1,2,4-Trimethylbenzene	50.00	100	96	70-130	5	0-20	
Trichlorofluoromethane	50.00	103	102	70-130	1	0-20	
1,3,5-Trimethylbenzene	50.00	99	93	70-130	7	0-20	
Vinyl Acetate	50.00	24	23	70-130	6	0-20	3
Vinyl Chloride	50.00	100	99	49-139	1	0-47	
p/m-Xylene	100.0	101	96	70-130	6	0-20	

RPD - Relative Percent Difference , CL - Control Limit



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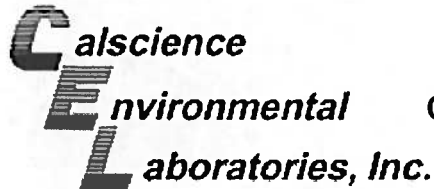
Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 5030C  
 Method: EPA 8260B

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG9-1.0	Solid	GC/MS XX	02/11/12	02/13/12	120213S02

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
o-Xylene	50.00	102	97	70-130	5	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	108	104	57-123	4	0-21	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



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Date Received:  
Work Order No:

N/A  
12-02-0735

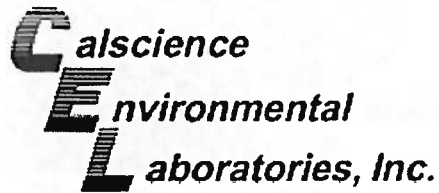
Project: Hawes Composting / SC0554

Matrix: Aqueous or Solid

Parameter	Method	Quality Control Sample ID	Date Analyzed	Date Extracted	MS% REC	MSD % REC	%REC CL	RPD	RPD CL	Qualifiers
Phosphorus, Total	SM 4500 P B/E (M)	BG2-1.0	02/17/12	2/17/12	94	94	70-130	0	0-25	
Fluoride	EPA 300.0	BG1-0.5	02/14/12	2/13/12	82	81	80-120	1	0-20	
Chloride	EPA 300.0	BG1-0.5	02/14/12	2/13/12	101	101	80-120	0	0-20	
Nitrite (as N)	EPA 300.0	BG1-0.5	02/14/12	2/13/12	87	87	80-120	1	0-20	
Bromide	EPA 300.0	BG1-0.5	02/14/12	2/13/12	101	100	80-120	1	0-20	
Nitrate (as N)	EPA 300.0	BG1-0.5	02/14/12	2/13/12	102	102	80-120	0	0-20	
o-Phosphate (as P)	EPA 300.0	BG1-0.5	02/14/12	2/13/12	89	87	80-120	1	0-20	
Sulfate	EPA 300.0	BG1-0.5	02/14/12	2/13/12	101	101	80-120	0	0-20	
Chloride	EPA 300.0	12-02-0310-2	02/16/12	2/15/12	106	106	80-120	0	0-20	
Sulfate	EPA 300.0	12-02-0310-2	02/16/12	2/15/12	72	75	80-120	2	0-20	3
Total Phosphate	SM 4500 P B/E (M)	BG2-1.0	02/17/12	2/17/12	94	94	70-130	0	0-25	
Chromium, Hexavalent	EPA 7196A	12-02-0383-30	02/14/12	2/14/12	76	78	75-125	3	0-25	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Duplicate



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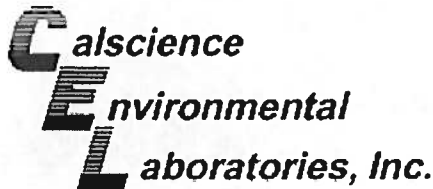
Date Received: N/A  
Work Order No: 12-02-0735

Project: Hawes Composting / SC0554

Matrix: Aqueous or Solid

Parameter	Method	QC Sample ID	Date Analyzed	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO <sub>3</sub> )	SM 2320B M	BG1-0.5	02/17/12	45	48	6	0-25	
Bicarbonate (as CaCO <sub>3</sub> )	SM 2320B M	BG1-0.5	02/17/12	45	48	6	0-25	
Hydroxide (as CaCO <sub>3</sub> )	SM 2320B M	BG1-0.5	02/17/12	ND	ND	NA	0-25	
Carbonate (as CaCO <sub>3</sub> )	SM 2320B M	BG1-0.5	02/17/12	ND	ND	NA	0-25	
Total Kjeldahl Nitrogen	SM 4500 N Org B (M)	BG1-0.5	02/18/12	180	200	7	0-25	
Solids, Total Dissolved	SM 2540 C (M)	BG10-0.5	02/15/12	559	525	6	0-10	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



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Date Received: N/A  
Work Order No: 12-02-0735  
Preparation: EPA 3050B  
Method: EPA 6010B

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
097-01-002-15,651	Solid	ICP 5300	02/13/12	02/14/12	120213L02A			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Antimony	25.00	97	98	80-120	73-127	1	0-20	
Arsenic	25.00	91	92	80-120	73-127	1	0-20	
Barium	25.00	103	103	80-120	73-127	0	0-20	
Beryllium	25.00	94	95	80-120	73-127	0	0-20	
Cadmium	25.00	96	97	80-120	73-127	0	0-20	
Chromium	25.00	95	95	80-120	73-127	1	0-20	
Cobalt	25.00	102	103	80-120	73-127	1	0-20	
Copper	25.00	96	96	80-120	73-127	0	0-20	
Lead	25.00	98	99	80-120	73-127	1	0-20	
Molybdenum	25.00	96	96	80-120	73-127	1	0-20	
Nickel	25.00	100	101	80-120	73-127	0	0-20	
Selenium	25.00	95	95	80-120	73-127	0	0-20	
Silver	12.50	95	95	80-120	73-127	0	0-20	
Thallium	25.00	93	93	80-120	73-127	0	0-20	
Vanadium	25.00	94	94	80-120	73-127	0	0-20	
Zinc	25.00	100	100	80-120	73-127	0	0-20	
Aluminum	25.00	92	91	80-120	73-127	1	0-20	
Calcium	25.00	101	99	80-120	73-127	2	0-20	
Iron	25.00	99	100	80-120	73-127	1	0-20	
Magnesium	25.00	95	96	80-120	73-127	0	0-20	
Manganese	25.00	96	97	80-120	73-127	0	0-20	
Potassium	250.0	98	99	80-120	73-127	2	0-20	
Sodium	250.0	101	102	80-120	73-127	2	0-20	
Boron	25.00	93	94	80-120	73-127	1	0-20	

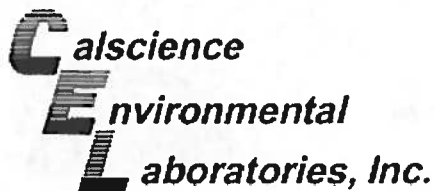
Total number of LCS compounds : 24

Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



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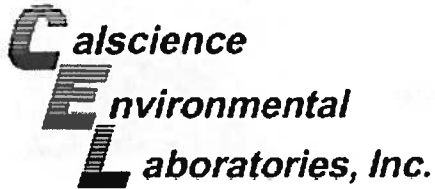
Date Received: N/A  
 Work Order No: 12-02-0735  
 Preparation: EPA 7471A Total  
 Method: EPA 7471A

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-04-007-8,504	Solid	Mercury	02/13/12	02/13/12	120213L02

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	0.8350	99	99	85-121	0	0-10	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



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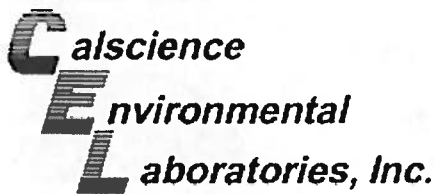
Date Received: N/A  
 Work Order No: 12-02-0735  
 Preparation: EPA 8151A  
 Method: EPA 8151A

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-033-991	Solid	GC 40	02/17/12	02/21/12	120217L16

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
2,4-D	400.0	64	75	30-130	16	0-30	
2,4,5-T	40.00	54	71	30-130	27	0-30	
2,4-DB	400.0	30	31	30-130	4	0-30	

RPD - Relative Percent Difference, CL - Control Limit



Quality Control - LCS/LCS Duplicate



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Date Received: N/A  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8081A

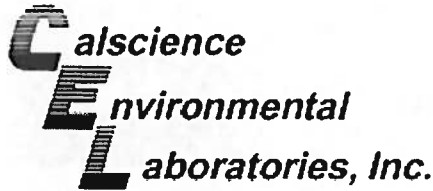
Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-537-1,150	Solid	GC 51	02/13/12	02/14/12	120213L09

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Aldrin	25.00	101	103	50-135	36-149	2	0-25	
Alpha-BHC	25.00	97	99	50-135	36-149	1	0-25	
Beta-BHC	25.00	90	92	50-135	36-149	1	0-25	
4,4'-DDD	25.00	103	104	50-135	36-149	1	0-25	
4,4'-DDE	25.00	105	108	50-135	36-149	2	0-25	
4,4'-DDT	25.00	101	103	50-135	36-149	2	0-25	
Delta-BHC	25.00	94	95	50-135	36-149	1	0-25	
Dieldrin	25.00	102	104	50-135	36-149	2	0-25	
Endosulfan I	25.00	101	103	50-135	36-149	2	0-25	
Endosulfan II	25.00	102	104	50-135	36-149	2	0-25	
Endosulfan Sulfate	25.00	97	99	50-135	36-149	2	0-25	
Endrin	25.00	97	100	50-135	36-149	3	0-25	
Endrin Aldehyde	25.00	100	102	50-135	36-149	2	0-25	
Gamma-BHC	25.00	100	101	50-135	36-149	1	0-25	
Heptachlor	25.00	97	98	50-135	36-149	1	0-25	
Heptachlor Epoxide	25.00	101	103	50-135	36-149	1	0-25	
Methoxychlor	25.00	97	99	50-135	36-149	2	0-25	

Total number of LCS compounds : 17  
 Total number of ME compounds : 0  
 Total number of ME compounds allowed : 1  
 LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



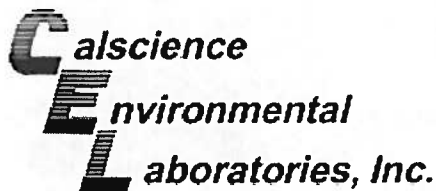
Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: N/A  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8270C

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-12-555-76	Solid	GC/MS CCC	02/13/12	02/15/12	120213L12			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
N-Nitrosodimethylamine	10.00	81	82	45-129	31-143	0	0-18	
Phenol	10.00	79	78	49-127	36-140	1	0-13	
Bis(2-Chloroethyl) Ether	10.00	103	104	46-124	33-137	1	0-21	
2-Chlorophenol	10.00	98	99	49-121	37-133	1	0-13	
1,3-Dichlorobenzene	10.00	79	80	45-123	32-136	1	0-15	
1,4-Dichlorobenzene	10.00	80	80	41-119	28-132	1	0-15	
Benzyl Alcohol	10.00	99	97	46-150	29-167	1	0-16	
1,2-Dichlorobenzene	10.00	81	81	45-123	32-136	1	0-14	
2-Methylphenol	10.00	98	98	45-129	31-143	1	0-13	
Bis(2-Chloroisopropyl) Ether	10.00	95	96	27-147	7-167	1	0-12	
3/4-Methylphenol	20.00	102	101	37-127	22-142	1	0-13	
N-Nitroso-di-n-propylamine	10.00	108	108	42-144	25-161	1	0-16	
Hexachloroethane	10.00	80	80	40-124	26-138	1	0-16	
Nitrobenzene	10.00	98	97	41-137	25-153	1	0-13	
Isophorone	10.00	99	98	43-127	29-141	1	0-12	
2-Nitrophenol	10.00	94	94	50-140	35-155	0	0-13	
2,4-Dimethylphenol	10.00	99	98	45-147	28-164	1	0-12	
Benzoic Acid	10.00	29	28	18-150	0-172	2	0-16	
Bis(2-Chloroethoxy) Methane	10.00	97	97	43-133	28-148	0	0-13	
2,4-Dichlorophenol	10.00	95	94	49-127	36-140	2	0-11	
1,2,4-Trichlorobenzene	10.00	86	86	47-125	34-138	0	0-13	
Naphthalene	10.00	92	90	45-129	31-143	1	0-13	
4-Chloroaniline	10.00	65	66	16-124	0-142	2	0-29	
Hexachloro-1,3-Butadiene	10.00	78	79	40-136	24-152	1	0-15	
4-Chloro-3-Methylphenol	10.00	101	99	49-133	35-147	2	0-13	
2-Methylnaphthalene	10.00	89	89	42-132	27-147	0	0-13	
2,4,5-Trichlorophenol	10.00	94	94	43-127	29-141	0	0-13	
2-Chloronaphthalene	10.00	87	88	45-129	31-143	1	0-13	
2-Nitroaniline	10.00	100	99	35-150	16-169	1	0-13	
Dimethyl Phthalate	10.00	92	93	48-126	35-139	1	0-12	
Acenaphthylene	10.00	92	93	45-129	31-143	1	0-12	
3-Nitroaniline	10.00	75	75	24-120	8-136	1	0-19	
Acenaphthene	10.00	93	93	44-134	29-149	0	0-13	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



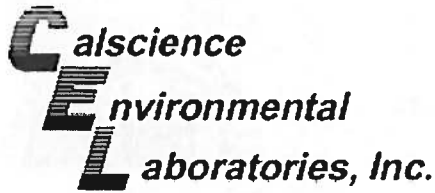
Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: N/A  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8270C

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-12-555-76	Solid	GC/MS CCC	02/13/12	02/15/12	120213L12			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
2,4-Dinitrophenol	10.00	83	79	18-138	0-158	5	0-19	
4-Nitrophenol	10.00	91	88	36-150	17-169	3	0-22	
Dibenzofuran	10.00	94	94	46-130	32-144	0	0-14	
2,4-Dinitrotoluene	10.00	98	97	39-150	20-168	0	0-13	
2,6-Dinitrotoluene	10.00	98	98	44-140	28-156	1	0-13	
Diethyl Phthalate	10.00	93	94	44-134	29-149	2	0-13	
4-Chlorophenyl-Phenyl Ether	10.00	92	93	45-135	30-150	0	0-13	
Fluorene	10.00	95	95	43-133	28-148	0	0-12	
4-Nitroaniline	10.00	91	88	47-137	32-152	4	0-12	
4,6-Dinitro-2-Methylphenol	10.00	89	87	36-138	19-155	2	0-17	
N-Nitrosodiphenylamine	10.00	112	112	51-150	34-166	0	0-11	
2,4,6-Trichlorophenol	10.00	94	95	48-126	35-139	1	0-12	
4-Bromophenyl-Phenyl Ether	10.00	97	97	39-135	23-151	1	0-13	
Hexachlorobenzene	10.00	90	91	40-136	24-152	2	0-11	
Pentachlorophenol	10.00	98	97	34-118	20-132	1	0-14	
Phenanthrene	10.00	93	94	38-140	21-157	1	0-11	
Anthracene	10.00	85	85	41-125	27-139	0	0-11	
Di-n-Butyl Phthalate	10.00	90	92	44-134	29-149	2	0-11	
Fluoranthene	10.00	88	88	39-129	24-144	0	0-12	
Benzidine	10.00	24	24	20-92	8-104	1	0-24	
Pyrene	10.00	100	100	55-121	44-132	1	0-12	
Butyl Benzyl Phthalate	10.00	102	102	54-120	43-131	0	0-12	
3,3'-Dichlorobenzidine	10.00	94	97	20-150	0-172	3	0-20	
Benzo (a) Anthracene	10.00	95	94	45-117	33-129	1	0-12	
Bis(2-Ethylhexyl) Phthalate	10.00	98	99	55-121	44-132	1	0-10	
Chrysene	10.00	95	94	45-117	33-129	1	0-12	
Di-n-Octyl Phthalate	10.00	102	104	18-150	0-172	2	0-13	
Benzo (k) Fluoranthene	10.00	81	86	42-144	25-161	5	0-15	
Benzo (b) Fluoranthene	10.00	77	84	41-137	25-153	9	0-15	
Benzo (a) Pyrene	10.00	92	96	41-125	27-139	4	0-13	
Indeno (1,2,3-c,d) Pyrene	10.00	95	97	22-124	5-141	2	0-15	
Dibenz (a,h) Anthracene	10.00	96	97	21-129	3-147	1	0-15	
Benzo (g,h,i) Perylene	10.00	96	98	16-124	0-142	2	0-18	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: N/A  
 Work Order No: 12-02-0735  
 Preparation: EPA 3545  
 Method: EPA 8270C

Project: Hawes Composting / SC0554

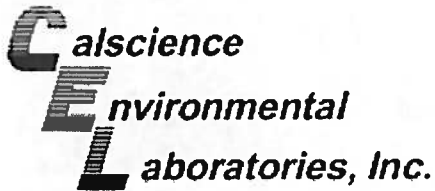
Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-555-76	Solid	GC/MS CCC	02/13/12	02/15/12	120213L12

Parameter                      SPIKE ADDED LCS %REC LCSD %REC    %REC CL    ME CL    RPD    RPD CL    Qualifiers

Total number of LCS compounds : 66  
 Total number of ME compounds : 0  
 Total number of ME compounds allowed : 3  
 LCS ME CL validation result : Pass

RPD - Relative Percent Difference ,    CL - Control Limit





## Quality Control - LCS/LCS Duplicate



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: N/A  
Work Order No: 12-02-0735  
Preparation: EPA 3545  
Method: EPA 8141B

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-12-465-107	Solid	GC 35	02/14/12	02/16/12	120214L09			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Azinphos Methyl	4.000	97	97	30-130	13-147	0	0-30	
Bolstar	4.000	101	101	30-130	13-147	0	0-30	
Chlorpyrifos	4.000	93	96	30-130	13-147	3	0-30	
Coumaphos	4.000	98	98	30-130	13-147	0	0-30	
Diazinon	4.000	105	104	30-130	13-147	1	0-30	
Disulfoton	4.000	106	108	30-130	13-147	1	0-30	
Ethoprop	4.000	112	108	30-130	13-147	3	0-30	
Fensulfothion	4.000	101	101	30-130	13-147	1	0-30	
Fenthion	4.000	100	103	30-130	13-147	3	0-30	
Merphos	4.000	89	89	30-130	13-147	0	0-30	
Methyl Parathion	4.000	100	102	30-130	13-147	2	0-30	
Phorate	4.000	117	112	30-130	13-147	4	0-30	
Ronnel	4.000	96	97	30-130	13-147	1	0-30	
Stirophos	4.000	72	73	30-130	13-147	1	0-30	
Tokuthion	4.000	94	94	30-130	13-147	0	0-30	
Trichloronate	4.000	96	98	30-130	13-147	2	0-30	

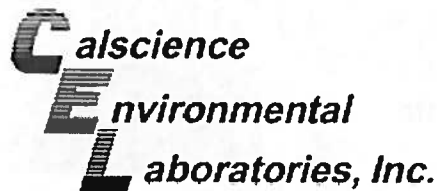
Total number of LCS compounds : 16

Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: N/A  
Work Order No: 12-02-0735  
Preparation: EPA 5030C  
Method: EPA 8260B

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-14-314-161	Solid	GC/MS XX	02/13/12	02/13/12	120213L01			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	50.00	66	67	70-130	60-140	1	0-20	ME
Benzene	50.00	98	95	78-120	71-127	3	0-20	
Bromobenzene	50.00	93	87	70-130	60-140	7	0-20	
Bromochloromethane	50.00	106	105	70-130	60-140	1	0-20	
Bromodichloromethane	50.00	93	101	70-130	60-140	9	0-20	
Bromoform	50.00	102	100	70-130	60-140	2	0-20	
Bromomethane	50.00	98	72	70-130	60-140	31	0-20	X
2-Butanone	50.00	84	85	70-130	60-140	0	0-20	
n-Butylbenzene	50.00	96	97	77-123	69-131	1	0-25	
sec-Butylbenzene	50.00	101	104	70-130	60-140	2	0-20	
tert-Butylbenzene	50.00	102	99	70-130	60-140	3	0-20	
Carbon Disulfide	50.00	94	94	70-130	60-140	0	0-20	
Carbon Tetrachloride	50.00	103	102	49-139	34-154	2	0-20	
Chlorobenzene	50.00	99	99	79-120	72-127	0	0-20	
Chloroethane	50.00	88	86	70-130	60-140	2	0-20	
Chloroform	50.00	108	105	70-130	60-140	3	0-20	
Chloromethane	50.00	102	101	70-130	60-140	1	0-20	
2-Chlorotoluene	50.00	95	88	70-130	60-140	8	0-20	
4-Chlorotoluene	50.00	103	94	70-130	60-140	10	0-20	
Dibromochloromethane	50.00	97	98	70-130	60-140	1	0-20	
1,2-Dibromo-3-Chloropropane	50.00	89	93	70-130	60-140	4	0-20	
1,2-Dibromoethane	50.00	98	91	70-130	60-140	7	0-20	
Dibromomethane	50.00	95	100	70-130	60-140	5	0-20	
1,2-Dichlorobenzene	50.00	97	93	75-120	68-128	3	0-20	
1,3-Dichlorobenzene	50.00	97	94	70-130	60-140	2	0-20	
1,4-Dichlorobenzene	50.00	91	89	70-130	60-140	2	0-20	
Dichlorodifluoromethane	50.00	115	111	70-130	60-140	3	0-20	
1,1-Dichloroethane	50.00	103	102	70-130	60-140	2	0-20	
1,2-Dichloroethane	50.00	99	102	70-130	60-140	3	0-20	
1,1-Dichloroethene	50.00	88	89	74-122	66-130	1	0-20	
c-1,2-Dichloroethene	50.00	107	105	70-130	60-140	2	0-20	
t-1,2-Dichloroethene	50.00	108	105	70-130	60-140	3	0-20	
1,2-Dichloropropane	50.00	90	92	79-115	73-121	3	0-25	

RPD - Relative Percent Difference , CL - Control Limit

## Quality Control - LCS/LCS Duplicate



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

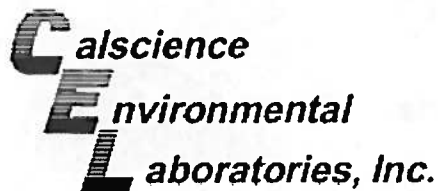
Date Received: N/A  
 Work Order No: 12-02-0735  
 Preparation: EPA 5030C  
 Method: EPA 8260B

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-14-314-161	Solid	GC/MS XX	02/13/12	02/13/12	120213L01			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
1,3-Dichloropropane	50.00	94	94	70-130	60-140	1	0-20	
2,2-Dichloropropane	50.00	102	100	70-130	60-140	2	0-20	
1,1-Dichloropropene	50.00	98	95	70-130	60-140	3	0-20	
c-1,3-Dichloropropene	50.00	93	97	70-130	60-140	4	0-20	
t-1,3-Dichloropropene	50.00	100	96	70-130	60-140	4	0-20	
Ethylbenzene	50.00	101	95	76-120	69-127	6	0-20	
2-Hexanone	50.00	79	78	70-130	60-140	1	0-20	
Isopropylbenzene	50.00	99	95	70-130	60-140	4	0-20	
p-Isopropyltoluene	50.00	99	98	70-130	60-140	1	0-20	
Methylene Chloride	50.00	105	104	70-130	60-140	0	0-20	
4-Methyl-2-Pentanone	50.00	81	83	70-130	60-140	2	0-20	
Naphthalene	50.00	87	89	70-130	60-140	2	0-20	
n-Propylbenzene	50.00	98	91	70-130	60-140	6	0-20	
Styrene	50.00	100	97	70-130	60-140	3	0-20	
1,1,1,2-Tetrachloroethane	50.00	103	98	70-130	60-140	4	0-20	
1,1,2,2-Tetrachloroethane	50.00	100	89	70-130	60-140	11	0-20	
Tetrachloroethene	50.00	99	97	70-130	60-140	3	0-20	
Toluene	50.00	92	93	77-120	70-127	0	0-20	
1,2,3-Trichlorobenzene	50.00	85	87	70-130	60-140	2	0-20	
1,2,4-Trichlorobenzene	50.00	85	88	70-130	60-140	4	0-20	
1,1,1-Trichloroethane	50.00	102	99	70-130	60-140	3	0-20	
1,1,2-Trichloroethane	50.00	91	92	70-130	60-140	1	0-20	
1,1,2-Trichloro-1,2,2-Trifluoroethane	50.00	92	91	70-130	60-140	1	0-20	
Trichloroethene	50.00	94	95	70-130	60-140	1	0-20	
1,2,3-Trichloropropane	50.00	92	85	70-130	60-140	7	0-20	
1,2,4-Trimethylbenzene	50.00	101	99	70-130	60-140	2	0-20	
Trichlorofluoromethane	50.00	104	103	70-130	60-140	1	0-20	
1,3,5-Trimethylbenzene	50.00	99	94	70-130	60-140	5	0-20	
Vinyl Acetate	50.00	100	100	70-130	60-140	1	0-20	
Vinyl Chloride	50.00	102	99	68-122	59-131	3	0-20	
p/m-Xylene	100.0	101	96	70-130	60-140	5	0-20	
o-Xylene	50.00	100	97	70-130	60-140	3	0-20	
Methyl-t-Butyl Ether (MTBE)	50.00	98	99	77-120	70-127	0	0-20	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: N/A  
Work Order No: 12-02-0735

Project: Hawes Composting / SC0554

Matrix: Aqueous or Solid

Parameter	Method	Quality Control Sample ID	Date Extracted	Date Analyzed	LCS % REC	LCSD % REC	%REC CL	RPD	RPD CL	Qual
Phosphorus, Total	SM 4500 P B/E (	099-05-001-4,312	02/17/12	02/17/12	96	96	80-120	0	0-20	
Fluoride	EPA 300.0	099-12-922-142	02/13/12	02/13/12	92	95	90-110	3	0-15	
Chloride	EPA 300.0	099-12-922-142	02/13/12	02/13/12	99	99	90-110	0	0-15	
Nitrite (as N)	EPA 300.0	099-12-922-142	02/13/12	02/13/12	95	94	90-110	1	0-15	
Bromide	EPA 300.0	099-12-922-142	02/13/12	02/13/12	99	99	90-110	0	0-15	
Nitrate (as N)	EPA 300.0	099-12-922-142	02/13/12	02/13/12	100	100	90-110	0	0-15	
o-Phosphate (as P)	EPA 300.0	099-12-922-142	02/13/12	02/13/12	101	104	90-110	3	0-15	
Sulfate	EPA 300.0	099-12-922-142	02/13/12	02/13/12	98	98	90-110	0	0-15	
Fluoride	EPA 300.0	099-12-922-140	02/15/12	02/16/12	96	102	90-110	6	0-15	
Chloride	EPA 300.0	099-12-922-140	02/15/12	02/16/12	101	101	90-110	0	0-15	
Nitrite (as N)	EPA 300.0	099-12-922-140	02/15/12	02/16/12	96	97	90-110	1	0-15	
Bromide	EPA 300.0	099-12-922-140	02/15/12	02/16/12	101	102	90-110	0	0-15	
Nitrate (as N)	EPA 300.0	099-12-922-140	02/15/12	02/16/12	100	101	90-110	0	0-15	
o-Phosphate (as P)	EPA 300.0	099-12-922-140	02/15/12	02/16/12	104	107	90-110	3	0-15	
Sulfate	EPA 300.0	099-12-922-140	02/15/12	02/16/12	100	101	90-110	0	0-15	
Total Phosphate	SM 4500 P B/E (	099-14-274-3	02/17/12	02/17/12	96	96	80-120	0	0-20	
MBAS	SM 5540C (M)	099-05-027-28	02/11/12	02/11/12	93	94	80-120	1	0-20	
Chromium, Hexavalent	EPA 7196A	099-05-001-4,311	02/14/12	02/14/12	86	82	80-120	5	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Work Order Number: 12-02-0735

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

MPN - Most Probable Number

# Analysis Request and Chain of Custody Record

Project Name: **HAWES COMPOSTING**  
 Project Number: **SC0554**  
 Samplers Names: **DOUG SAMMINGS**  
 Laboratory Name: **CALSCIENCE**  
 Lab Address: **7440 LINCOLN WAY, CARLETON GROVE, CA**

Project Number: **SC0554**  
 Project Contact: **DOUG SAMMINGS**  
 Lab Contact: **S. NOWAK**  
 Lab Phone: **714 895-5444**  
 Carrier/Waybill No.

Required Analyses:  
 VOCs by: \_\_\_\_\_  
 Metals: \_\_\_\_\_  
 SVOCs by 8270: **ATTACHED LIST**

White copy: to accompany samples  
 Yellow copy: field copy

Page 1 of 2  
**12-02-0735**

Sample Name	Date	Time	Sample Type	Bottle Type and Volume/Preservative				Number of Containers	Comments	Lab Use Only	Condition of Bottles
				15%	10%	5%	0%				
BG1 - 0.5'	2/1/2002	9:20	SOIL	/	/	/	/	X			
BG1 - 1.0'		9:25		/	/	/	/				
BG2 - 0.5'		9:30		/	/	/	/	X			
BG2 - 1.0'		9:35		/	/	/	/	X			
BG3 - 0.5'		9:40		/	/	/	/	X			
BG3 - 1.0'		9:45		/	/	/	/	X			
BG4 - 0.5'		9:50		/	/	/	/	X			
BG4 - 1.0'		9:55		/	/	/	/	X			
BG5 - 0.5'		10:00		/	/	/	/	X			
BG5 - 1.0'		10:05		/	/	/	/	X			
BG6 - 0.5'		10:15		/	/	/	/	X			
BG6 - 1.0'		10:20		/	/	/	/	X			

Special Instructions:  
 Turn-around Time:  Normal  Rush:  
 Date: 02/10/12  
 Time: 16:30  
 Signature: *W. Murray*

1. Relinquished by *W. Murray* Date: 2/10/12  
 (Signature/Affiliation) Time: 16:30  
 Received by: *[Signature]* Date: 02/10/12  
 (Signature/Affiliation) Time: 19:00

2. Relinquished by *[Signature]* Date: 2/10/12  
 (Signature/Affiliation) Time: 19:00  
 Received by: *[Signature]* Date: 2/10/12  
 (Signature/Affiliation) Time: 19:00

3. Relinquished by *[Signature]* Date: \_\_\_\_\_  
 (Signature/Affiliation) Time: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Date: \_\_\_\_\_  
 (Signature/Affiliation) Time: \_\_\_\_\_

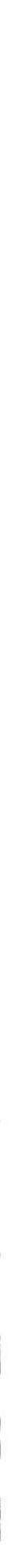






Table 3- UNSATURATED ZONE - WASTE PILE  
Monitoring Parameters and Constituents of Concern

0735 1/2

Field Parameters	Units	Monitoring Frequency
Composting Pad Thickness	Inches	Annually
Sample Locations	Northing and Easting	Annually
Monitoring Parameters	Units	Monitoring Frequency
Aluminum	mg/kg	Annually
Antimony	mg/kg	Annually
Arsenic	mg/kg	Annually
Copper	mg/kg	Annually
Iron	mg/kg	Annually
Manganese	mg/kg	Annually
MBAS	mg/kg	Annually
Nickel	mg/kg	Annually
Nitrate as Nitrogen	mg/kg	Annually
Sulfate	mg/kg	Annually
TDS	mg/kg	Annually
Constituents of Concern	Units	Monitoring Frequency
Barium	mg/kg	Five Year
Beryllium	mg/kg	Five Year
Bicarbonate	mg/kg	Five Year
Boron	mg/kg	Five Year
Bromide	mg/kg	Five Year
Cadmium	mg/kg	Five Year
Calcium	mg/kg	Five Year
Carbonate	mg/kg	Five Year
Chloride	mg/kg	Five Year
Chromium (hexavalent)	µg/kg	Five Year
Chromium (total)	µg/kg	Five Year
Cobalt	mg/kg	Five Year
Fluoride	mg/kg	Five Year
Total Kjeldahl Nitrogen	mg/kg	Five Year
Lead	mg/kg	Five Year
Magnesium	mg/kg	Five Year
Mercury	mg/kg	Five Year
Molybdenum	mg/kg	Five Year
Nitrite (as Nitrogen)	mg/kg	Five Year
Orthophosphate Phosphorous	mg/kg	Five Year
Phosphate	mg/kg	Five Year
Potassium	mg/kg	Five Year
Selenium	mg/kg	Five Year
Silver	mg/kg	Five Year
Sodium	mg/kg	Five Year
Thallium	mg/kg	Five Year
Total Alkalinity	mg/kg	Five Year
Total Anions	mg/kg	Five Year
Total Cations	mg/kg	Five Year

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Table 3- UNSATURATED ZONE - WASTE PILE, Continued

Constituents of Concern	Units	Monitoring Frequency
Total Phosphorus	mg/kg	Five Year
Vanadium	mg/kg	Five Year
Zinc	mg/kg	Five Year
<del>VOCs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>SVOCs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organochlorine Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organophosphorus Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Chlorinated Herbicides</del>	<del>µg/kg</del>	<del>Five Year</del>
CCR, Title 22 Metals	mg/kg	Five Year

CCR = California Code of Regulations  
MBAS = Methylene Blue Active Substances  
µg/kg = Micrograms per kilogram  
mg/L = Milligrams per kilogram  
SVOC = Semi-Volatile Organic Compound  
TDS = Total Dissolved Solids  
VOC = Volatile Organic Compound

0735 2/2

Table 3- UNSATURATED ZONE - WASTE PILE, Continued

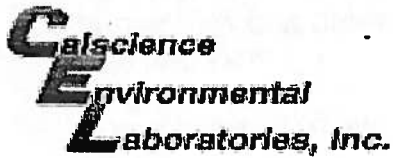
Constituents of Concern	Units	Monitoring Frequency
Total Phosphorus	mg/kg	Five Year
Vanadium	mg/kg	Five Year
Zinc	mg/kg	Five Year
<del>VOGs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>SVOCs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organochlorine Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organophosphorus Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Chlorinated Herbicides</del>	<del>µg/kg</del>	<del>Five Year</del>
CCR, Title 22 Metals	mg/kg	Five Year

CCR = California Code of Regulations  
 MBAS = Methylene Blue Active Substances  
 µg/kg = Micrograms per kilogram  
 mg/L = Milligrams per kilogram  
 SVOC = Semi-Volatile Organic Compound  
 TDS = Total Dissolved Solids  
 VOC = Volatile Organic Compound

Table 3- UNSATURATED ZONE - WASTE PILE  
Monitoring Parameters and Constituents of Concern

0735 1/2

Field Parameters	Units	Monitoring Frequency
Composting Pad Thickness	Inches	Annually
Sample Locations	Northing and Easting	Annually
Monitoring Parameters	Units	Monitoring Frequency
Aluminum	mg/kg	Annually
Antimony	mg/kg	Annually
Arsenic	mg/kg	Annually
Copper	mg/kg	Annually
Iron	mg/kg	Annually
Manganese	mg/kg	Annually
MBAS	mg/kg	Annually
Nickel	mg/kg	Annually
Nitrate as Nitrogen	mg/kg	Annually
Sulfate	mg/kg	Annually
TDS	mg/kg	Annually
Constituents of Concern	Units	Monitoring Frequency
Barium	mg/kg	Five Year
Beryllium	mg/kg	Five Year
Bicarbonate	mg/kg	Five Year
Boron	mg/kg	Five Year
Bromide	mg/kg	Five Year
Cadmium	mg/kg	Five Year
Calcium	mg/kg	Five Year
Carbonate	mg/kg	Five Year
Chloride	mg/kg	Five Year
Chromium (hexavalent)	µg/kg	Five Year
Chromium (total)	µg/kg	Five Year
Cobalt	mg/kg	Five Year
Fluoride	mg/kg	Five Year
Total Kjeldahl Nitrogen	mg/kg	Five Year
Lead	mg/kg	Five Year
Magnesium	mg/kg	Five Year
Mercury	mg/kg	Five Year
Molybdenum	mg/kg	Five Year
Nitrite (as Nitrogen)	mg/kg	Five Year
Orthophosphate Phosphorous	mg/kg	Five Year
Phosphate	mg/kg	Five Year
Potassium	mg/kg	Five Year
Selenium	mg/kg	Five Year
Silver	mg/kg	Five Year
Sodium	mg/kg	Five Year
Thallium	mg/kg	Five Year
Total Alkalinity	mg/kg	Five Year
Total Anions	mg/kg	Five Year
Total Cations	mg/kg	Five Year



WORK ORDER #: 12-02-0735

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Geosyntec

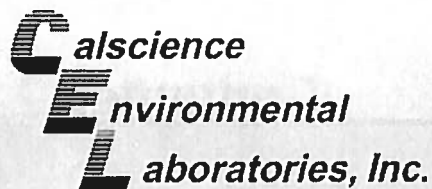
DATE: 02/10/12

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0 °C - 6.0 °C, not frozen)
Temperature 1.8 °C - 0.3 °C (CF) = 1.5 °C
Blank Sample
Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).
Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.
Received at ambient temperature, placed on ice for transport by Courier.
Ambient Temperature: Air Filter
Initial: [Signature]

CUSTODY SEALS INTACT:
Cooler No (Not Intact) Not Present N/A
Sample No (Not Intact) Not Present
Initial: [Signature]

SAMPLE CONDITION:
Chain-Of-Custody (COC) document(s) received with samples...
COC document(s) received complete...
Collection date/time, matrix, and/or # of containers logged in based on sample labels.
No analysis requested. Not relinquished. No date/time relinquished.
Sampler's name indicated on COC...
Sample container label(s) consistent with COC...
Sample container(s) intact and good condition...
Proper containers and sufficient volume for analyses requested...
Analyses received within holding time...
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours...
Proper preservation noted on COC or sample container...
Unpreserved vials received for Volatiles analysis
Volatile analysis container(s) free of headspace...
Tedlar bag(s) free of condensation...

CONTAINER TYPE:
Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve ( ) EnCores TerraCores
Water: VOA VOAh VOAna2 125AGB 125AGBh 125AGBp 1AGB 1AGBna2 1AGBs
500AGB 500AGJ 500AGJs 250AGB 250CGB 250CGBs 1PB 1PBna 500PB
250PB 250PBn 125PB 125PBzanna 100PJ 100PJna2
Air: Tedlar Summa Other: Trip Blank Lot#: Labeled/Checked by:
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by:
Preservative: h: HCL n: HNO3 na2:Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure zanna: ZnAc2+NaOH f: Filtered Scanned by:



Supplemental Report 1

Additional requested analyses are reported as a stand-alone report.



# CALSCIENCE

## WORK ORDER NUMBER: 12-02-0735

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

### Analytical Report For

**Client:** Geosyntec Consultants

**Client Project Name:** Hawes Composting / SC0554

**Attention:** Doug Baumwirt

10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Approved for release on 03/2/2012 by:  
Stephen Nowak  
Project Manager

ResultLink ▶

Email your PM ▶



Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.

**Contents**

Client Project Name: Hawes Composting / SC0554

Work Order Number: 12-02-0735

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Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG1-1.0						
Arsenic	9.58		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	104		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	1.21		0.250	mg/kg	EPA 6010B	EPA 3050B
Cadmium	0.509		0.500	mg/kg	EPA 6010B	EPA 3050B
Chromium	15.0		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	6.66		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	15.2		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	4.82		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	2.19		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	11.6		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	31.5		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	32.8		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	14400		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	34800		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	14700		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	7370		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	229		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2540		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	1960		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	18.7		1.00	mg/kg	EPA 6010B	EPA 3050B

\*MDL is shown.



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 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

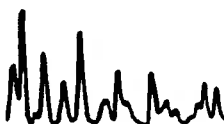
Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG2-0.5						
Arsenic	7.84		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	130		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	1.26		0.250	mg/kg	EPA 6010B	EPA 3050B
Cadmium	0.619		0.500	mg/kg	EPA 6010B	EPA 3050B
Chromium	22.0		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	9.36		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	22.8		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	9.16		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.639		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	18.6		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	28.0		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	55.8		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	20300		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	6940		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	20300		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	9910		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	359		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	6320		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	1290		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	16.1		1.00	mg/kg	EPA 6010B	EPA 3050B

\*MDL is shown.



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Work Order: 12-02-0735  
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 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG3-0.5						
Arsenic	1.94		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	39.7		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.270		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	4.75		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	2.49		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	4.61		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	4.71		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.323		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	4.12		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	9.82		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	14.6		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	3870		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	2960		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	5680		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	2050		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	122		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1350		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	67.2		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	4.78		1.00	mg/kg	EPA 6010B	EPA 3050B

\*MDL is shown.

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 Attn: Doug Baumwirt


Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
BG4-1.0						
Arsenic	8.88		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	123		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	1.42		0.250	mg/kg	EPA 6010B	EPA 3050B
Cadmium	0.569		0.500	mg/kg	EPA 6010B	EPA 3050B
Chromium	20.3		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	8.72		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	16.9		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	5.68		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	3.37		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	15.2		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	38.5		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	39.0		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	15800		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	39800		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	17300		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	8310		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	258		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	3080		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	4190		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	38.8		1.00	mg/kg	EPA 6010B	EPA 3050B

\*MDL is shown.



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Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG5-0.5</b>						
Arsenic	1.73		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	37.5		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.255		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	5.85		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	3.30		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	5.84		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	3.03		0.500	mg/kg	EPA 6010B	EPA 3050B
Nickel	5.47		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	10.8		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	19.4		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	4560		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	1740		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	6840		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	2510		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	155		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1610		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	155		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	5.51		1.00	mg/kg	EPA 6010B	EPA 3050B
<b>BG6-1.0</b>						
Arsenic	3.72		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	66.2		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.622		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	11.2		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	5.18		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	10.9		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	4.80		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.374		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	9.15		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	18.3		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	29.3		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	9810		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	3170		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	11500		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	4710		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	176		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2460		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	578		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	8.84		1.00	mg/kg	EPA 6010B	EPA 3050B

\*MDL is shown.

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 Attn: Doug Baumwirt

Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG7-0.5</b>						
Arsenic	1.75		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	42.1		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.291		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	5.48		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	3.16		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	5.17		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	3.23		0.500	mg/kg	EPA 6010B	EPA 3050B
Nickel	5.07		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	10.7		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	16.8		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	4570		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	1870		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	6740		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	2350		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	145		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1400		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	185		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	4.42		1.00	mg/kg	EPA 6010B	EPA 3050B
<b>BG8-1.0</b>						
Arsenic	6.52		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	47.8		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.821		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	13.2		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	6.63		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	12.4		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	5.18		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.988		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	10.5		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	27.1		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	31.6		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	10800		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	15000		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	12600		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	5170		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	241		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	2770		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	1560		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	12.5		1.00	mg/kg	EPA 6010B	EPA 3050B

\*MDL is shown.



Client: Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116  
 Attn: Doug Baumwirt

Work Order: 12-02-0735  
 Project Name: Hawes Composting / SC0554  
 Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG9-0.5</b>						
Arsenic	6.11		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	72.3		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.583		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	9.53		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	4.88		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	8.90		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	3.72		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.678		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	7.47		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	19.8		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	23.2		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	8090		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	9130		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	9870		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	3920		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	175		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1920		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	877		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	7.72		1.00	mg/kg	EPA 6010B	EPA 3050B

\*MDL is shown.

Client: Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116  
Attn: Doug Baumwirt

Work Order: 12-02-0735  
Project Name: Hawes Composting / SC0554  
Received: 02/10/12 19:00

**DETECTIONS SUMMARY**

Client Sample ID

Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
<b>BG10-1.0</b>						
Arsenic	3.88		0.750	mg/kg	EPA 6010B	EPA 3050B
Barium	57.4		0.500	mg/kg	EPA 6010B	EPA 3050B
Beryllium	0.572		0.250	mg/kg	EPA 6010B	EPA 3050B
Chromium	9.17		0.250	mg/kg	EPA 6010B	EPA 3050B
Cobalt	4.60		0.250	mg/kg	EPA 6010B	EPA 3050B
Copper	9.13		0.500	mg/kg	EPA 6010B	EPA 3050B
Lead	13.4		0.500	mg/kg	EPA 6010B	EPA 3050B
Molybdenum	0.619		0.250	mg/kg	EPA 6010B	EPA 3050B
Nickel	7.70		0.250	mg/kg	EPA 6010B	EPA 3050B
Vanadium	16.4		0.250	mg/kg	EPA 6010B	EPA 3050B
Zinc	23.7		1.00	mg/kg	EPA 6010B	EPA 3050B
Aluminum	7920		2.50	mg/kg	EPA 6010B	EPA 3050B
Calcium	7680		5.00	mg/kg	EPA 6010B	EPA 3050B
Iron	9650		5.00	mg/kg	EPA 6010B	EPA 3050B
Magnesium	3660		5.00	mg/kg	EPA 6010B	EPA 3050B
Manganese	176		0.250	mg/kg	EPA 6010B	EPA 3050B
Potassium	1990		25.0	mg/kg	EPA 6010B	EPA 3050B
Sodium	539		25.0	mg/kg	EPA 6010B	EPA 3050B
Boron	8.24		1.00	mg/kg	EPA 6010B	EPA 3050B

Subcontracted analyses, if any, are not included in this summary.

\*MDL is shown.

## Analytical Report



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B / EPA 7471A Total  
 Method: EPA 6010B / EPA 7471A  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG1-1.0	12-02-0735-2-A	02/09/12 09:25	Solid	ICP 5300	02/28/12	02/29/12 19:04	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:29 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	9.58	0.750	1		Thallium	ND	0.750	1	
Barium	104	0.500	1		Vanadium	31.5	0.250	1	
Beryllium	1.21	0.250	1		Zinc	32.8	1.00	1	
Cadmium	0.509	0.500	1		Aluminum	14400	2.50	1	
Chromium	15.0	0.250	1		Calcium	34800	5.00	1	
Cobalt	6.66	0.250	1		Iron	14700	5.00	1	
Copper	15.2	0.500	1		Magnesium	7370	5.00	1	
Lead	4.82	0.500	1		Manganese	229	0.250	1	
Mercury	ND	0.0835	1		Potassium	2540	25.0	1	
Molybdenum	2.19	0.250	1		Sodium	1960	25.0	1	
Nickel	11.6	0.250	1		Boron	18.7	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG2-0.5	12-02-0735-3-A	02/09/12 09:30	Solid	ICP 5300	02/28/12	02/29/12 19:06	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:31 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	7.84	0.750	1		Thallium	ND	0.750	1	
Barium	130	0.500	1		Vanadium	28.0	0.250	1	
Beryllium	1.26	0.250	1		Zinc	55.8	1.00	1	
Cadmium	0.619	0.500	1		Aluminum	20300	2.50	1	
Chromium	22.0	0.250	1		Calcium	6940	5.00	1	
Cobalt	9.36	0.250	1		Iron	20300	5.00	1	
Copper	22.8	0.500	1		Magnesium	9910	5.00	1	
Lead	9.16	0.500	1		Manganese	359	0.250	1	
Mercury	ND	0.0835	1		Potassium	6320	25.0	1	
Molybdenum	0.639	0.250	1		Sodium	1290	25.0	1	
Nickel	18.6	0.250	1		Boron	16.1	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3050B / EPA 7471A Total  
Method: EPA 6010B / EPA 7471A  
Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG3-0.5	12-02-0735-5-A	02/09/12 09:40	Solid	ICP 5300	02/28/12	02/29/12 19:39	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:33 with batch 120228L05.

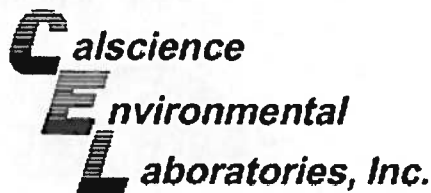
Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	1.94	0.750	1		Thallium	ND	0.750	1	
Barium	39.7	0.500	1		Vanadium	9.82	0.250	1	
Beryllium	0.270	0.250	1		Zinc	14.6	1.00	1	
Cadmium	ND	0.500	1		Aluminum	3870	2.50	1	
Chromium	4.75	0.250	1		Calcium	2960	5.00	1	
Cobalt	2.49	0.250	1		Iron	5680	5.00	1	
Copper	4.61	0.500	1		Magnesium	2050	5.00	1	
Lead	4.71	0.500	1		Manganese	122	0.250	1	
Mercury	ND	0.0835	1		Potassium	1350	25.0	1	
Molybdenum	0.323	0.250	1		Sodium	67.2	25.0	1	
Nickel	4.12	0.250	1		Boron	4.78	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG4-1.0	12-02-0735-8-A	02/09/12 09:55	Solid	ICP 5300	02/28/12	02/29/12 19:40	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:35 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	8.88	0.750	1		Thallium	ND	0.750	1	
Barium	123	0.500	1		Vanadium	38.5	0.250	1	
Beryllium	1.42	0.250	1		Zinc	39.0	1.00	1	
Cadmium	0.569	0.500	1		Aluminum	15800	2.50	1	
Chromium	20.3	0.250	1		Calcium	39800	5.00	1	
Cobalt	8.72	0.250	1		Iron	17300	5.00	1	
Copper	16.9	0.500	1		Magnesium	8310	5.00	1	
Lead	5.68	0.500	1		Manganese	258	0.250	1	
Mercury	ND	0.0835	1		Potassium	3080	25.0	1	
Molybdenum	3.37	0.250	1		Sodium	4190	25.0	1	
Nickel	15.2	0.250	1		Boron	38.8	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Analytical Report



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3050B / EPA 7471A Total  
Method: EPA 6010B / EPA 7471A  
Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG5-0.5	12-02-0735-9-A	02/09/12 10:00	Solid	ICP 5300	02/28/12	02/28/12 13:29	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:38 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	1.73	0.750	1		Thallium	ND	0.750	1	
Barium	37.5	0.500	1		Vanadium	10.8	0.250	1	
Beryllium	0.255	0.250	1		Zinc	19.4	1.00	1	
Cadmium	ND	0.500	1		Aluminum	4560	2.50	1	
Chromium	5.85	0.250	1		Calcium	1740	5.00	1	
Cobalt	3.30	0.250	1		Iron	6840	5.00	1	
Copper	5.84	0.500	1		Magnesium	2510	5.00	1	
Lead	3.03	0.500	1		Manganese	155	0.250	1	
Mercury	ND	0.0835	1		Potassium	1610	25.0	1	
Molybdenum	ND	0.250	1		Sodium	155	25.0	1	
Nickel	5.47	0.250	1		Boron	5.51	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG6-1.0	12-02-0735-12-A	02/09/12 10:20	Solid	ICP 5300	02/28/12	02/29/12 19:41	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:40 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	3.72	0.750	1		Thallium	ND	0.750	1	
Barium	66.2	0.500	1		Vanadium	18.3	0.250	1	
Beryllium	0.622	0.250	1		Zinc	29.3	1.00	1	
Cadmium	ND	0.500	1		Aluminum	9810	2.50	1	
Chromium	11.2	0.250	1		Calcium	3170	5.00	1	
Cobalt	5.18	0.250	1		Iron	11500	5.00	1	
Copper	10.9	0.500	1		Magnesium	4710	5.00	1	
Lead	4.80	0.500	1		Manganese	176	0.250	1	
Mercury	ND	0.0835	1		Potassium	2460	25.0	1	
Molybdenum	0.374	0.250	1		Sodium	578	25.0	1	
Nickel	9.15	0.250	1		Boron	8.84	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3050B / EPA 7471A Total  
Method: EPA 6010B / EPA 7471A  
Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG7-0.5	12-02-0735-13-A	02/09/12 10:25	Solid	ICP 5300	02/28/12	02/29/12 19:43	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:46 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	1.75	0.750	1		Thallium	ND	0.750	1	
Barium	42.1	0.500	1		Vanadium	10.7	0.250	1	
Beryllium	0.291	0.250	1		Zinc	16.8	1.00	1	
Cadmium	ND	0.500	1		Aluminum	4570	2.50	1	
Chromium	5.48	0.250	1		Calcium	1870	5.00	1	
Cobalt	3.16	0.250	1		Iron	6740	5.00	1	
Copper	5.17	0.500	1		Magnesium	2350	5.00	1	
Lead	3.23	0.500	1		Manganese	145	0.250	1	
Mercury	ND	0.0835	1		Potassium	1400	25.0	1	
Molybdenum	ND	0.250	1		Sodium	185	25.0	1	
Nickel	5.07	0.250	1		Boron	4.42	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG8-1.0	12-02-0735-16-A	02/09/12 10:40	Solid	ICP 5300	02/28/12	02/29/12 19:44	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:49 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	6.52	0.750	1		Thallium	ND	0.750	1	
Barium	47.8	0.500	1		Vanadium	27.1	0.250	1	
Beryllium	0.821	0.250	1		Zinc	31.6	1.00	1	
Cadmium	ND	0.500	1		Aluminum	10800	2.50	1	
Chromium	13.2	0.250	1		Calcium	15000	5.00	1	
Cobalt	6.63	0.250	1		Iron	12600	5.00	1	
Copper	12.4	0.500	1		Magnesium	5170	5.00	1	
Lead	5.18	0.500	1		Manganese	241	0.250	1	
Mercury	ND	0.0835	1		Potassium	2770	25.0	1	
Molybdenum	0.988	0.250	1		Sodium	1560	25.0	1	
Nickel	10.5	0.250	1		Boron	12.5	1.00	1	
Selenium	ND	0.750	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: 02/10/12  
Work Order No: 12-02-0735  
Preparation: EPA 3050B / EPA 7471A Total  
Method: EPA 6010B / EPA 7471A  
Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG9-0.5	12-02-0735-17-A	02/09/12 10:45	Solid	ICP 5300	02/28/12	02/29/12 19:46	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:51 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	6.11	0.750	1		Thallium	ND	0.750	1	
Barium	72.3	0.500	1		Vanadium	19.8	0.250	1	
Beryllium	0.583	0.250	1		Zinc	23.2	1.00	1	
Cadmium	ND	0.500	1		Aluminum	8090	2.50	1	
Chromium	9.53	0.250	1		Calcium	9130	5.00	1	
Cobalt	4.88	0.250	1		Iron	9870	5.00	1	
Copper	8.90	0.500	1		Magnesium	3920	5.00	1	
Lead	3.72	0.500	1		Manganese	175	0.250	1	
Mercury	ND	0.0835	1		Potassium	1920	25.0	1	
Molybdenum	0.678	0.250	1		Sodium	877	25.0	1	
Nickel	7.47	0.250	1		Boron	7.72	1.00	1	
Selenium	ND	0.750	1						

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BG10-1.0	12-02-0735-20-A	02/09/12 11:05	Solid	ICP 5300	02/28/12	02/29/12 19:47	120228L01A

Comment(s): -Mercury analysis was performed on 02/28/12 14:53 with batch 120228L05.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	3.88	0.750	1		Thallium	ND	0.750	1	
Barium	57.4	0.500	1		Vanadium	16.4	0.250	1	
Beryllium	0.572	0.250	1		Zinc	23.7	1.00	1	
Cadmium	ND	0.500	1		Aluminum	7920	2.50	1	
Chromium	9.17	0.250	1		Calcium	7680	5.00	1	
Cobalt	4.60	0.250	1		Iron	9650	5.00	1	
Copper	9.13	0.500	1		Magnesium	3660	5.00	1	
Lead	13.4	0.500	1		Manganese	176	0.250	1	
Mercury	ND	0.0835	1		Potassium	1990	25.0	1	
Molybdenum	0.619	0.250	1		Sodium	539	25.0	1	
Nickel	7.70	0.250	1		Boron	8.24	1.00	1	
Selenium	ND	0.750	1						

Method Blank	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-04-007-8,523	N/A	Solid	Mercury	02/28/12	02/28/12 14:04	120228L05

Comment(s): -Preparation/analysis for Mercury was performed by EPA 7471A.

Parameter	Result	RL	DF	Qual
Mercury	ND	0.0835	1	

RL - Reporting Limit    DF - Dilution Factor    Qual - Qualifiers



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B / EPA 7471A Total  
 Method: EPA 6010B / EPA 7471A  
 Units: mg/kg

Project: Hawes Composting / SC0554

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Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	097-01-002-15,687	N/A	Solid	ICP 5300	02/28/12	02/29/12 18:54	120228L01A

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Antimony	ND	0.750	1		Silver	ND	0.250	1	
Arsenic	ND	0.750	1		Thallium	ND	0.750	1	
Barium	ND	0.500	1		Vanadium	ND	0.250	1	
Beryllium	ND	0.250	1		Zinc	ND	1.00	1	
Cadmium	ND	0.500	1		Aluminum	ND	2.50	1	
Chromium	ND	0.250	1		Calcium	ND	5.00	1	
Cobalt	ND	0.250	1		Iron	ND	5.00	1	
Copper	ND	0.500	1		Magnesium	ND	5.00	1	
Lead	ND	0.500	1		Manganese	ND	0.250	1	
Molybdenum	ND	0.250	1		Potassium	ND	25.0	1	
Nickel	ND	0.250	1		Sodium	ND	25.0	1	
Selenium	ND	0.750	1		Boron	ND	1.00	1	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Quality Control - Spike/Spike Duplicate



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

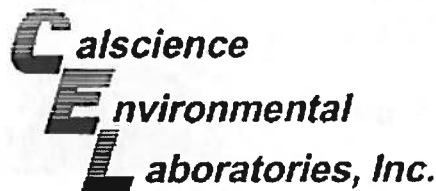
Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B  
 Method: EPA 6010B

Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
BG5-0.5	Solid	ICP 5300	02/28/12	02/28/12	120228S01

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Antimony	25.00	18	22	50-115	19	0-20	3
Arsenic	25.00	89	95	75-125	6	0-20	
Barium	25.00	97	97	75-125	0	0-20	
Beryllium	25.00	93	102	75-125	8	0-20	
Cadmium	25.00	90	99	75-125	9	0-20	
Chromium	25.00	91	97	75-125	5	0-20	
Cobalt	25.00	94	100	75-125	6	0-20	
Copper	25.00	94	101	75-125	6	0-20	
Lead	25.00	86	93	75-125	6	0-20	
Molybdenum	25.00	82	89	75-125	8	0-20	
Nickel	25.00	92	98	75-125	5	0-20	
Selenium	25.00	82	91	75-125	11	0-20	
Silver	12.50	94	97	75-125	4	0-20	
Thallium	25.00	50	66	75-125	28	0-20	3,4
Vanadium	25.00	87	91	75-125	2	0-20	
Zinc	25.00	89	92	75-125	2	0-20	
Aluminum	25.00	4X	4X	75-125	4X	0-20	Q
Calcium	25.00	4X	4X	75-125	4X	0-20	Q
Iron	25.00	4X	4X	75-125	4X	0-20	Q
Magnesium	25.00	4X	4X	75-125	4X	0-20	Q
Manganese	25.00	4X	4X	75-125	4X	0-20	Q
Potassium	250.0	4X	4X	75-125	4X	0-20	Q
Sodium	250.0	110	102	75-125	4	0-20	
Boron	25.00	101	99	75-125	2	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - PDS / PSD



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 3050B  
 Method: EPA 6010B

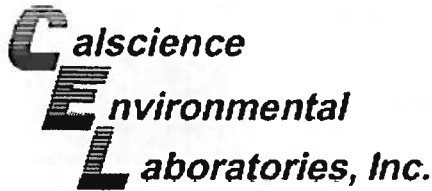
Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PSD Batch Number
BG5-0.5	Solid	ICP 5300	02/28/12	02/28/12	120228S01

Analysis Comment: \* - Analyzed 2/29/2012 7:02:00 PM

Parameter	SPIKE ADDED	PDS %REC	PSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Antimony	25.00	80	81	75-125	1	0-20	
Arsenic	25.00	96	96	75-125	0	0-20	
Barium	25.00	105	101	75-125	1	0-20	
Beryllium	25.00	103	103	75-125	1	0-20	
Cadmium	25.00	100	100	75-125	0	0-20	
Chromium	25.00	100	98	75-125	1	0-20	
Cobalt	25.00	104	103	75-125	1	0-20	
Copper	25.00	104	105	75-125	1	0-20	
Lead	25.00	97	96	75-125	1	0-20	
Molybdenum	25.00	101	101	75-125	0	0-20	
Nickel	25.00	101	101	75-125	0	0-20	
Selenium	25.00	98	99	75-125	1	0-20	
Silver	12.50	93	92	75-125	1	0-20	
Thallium	25.00	94	94	75-125	0	0-20	
Vanadium	25.00	100	99	75-125	1	0-20	
Zinc	25.00	97	99	75-125	1	0-20	
Aluminum	25.00	4X	4X	75-125	4X	0-20	Q
Calcium	25.00	4X	4X	75-125	4X	0-20	Q
Iron	25.00	4X	4X	75-125	4X	0-20	Q
Magnesium	25.00	4X	4X	75-125	4X	0-20	Q
Manganese	25.00	4X	4X	75-125	4X	0-20	Q
Potassium	250.0	4X	4X	75-125	4X	0-20	Q
Sodium	250.0	105	101	75-125	2	0-20	
Boron	25.00	101	102	75-125	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - Spike/Spike Duplicate



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: 02/10/12  
 Work Order No: 12-02-0735  
 Preparation: EPA 7471A Total  
 Method: EPA 7471A

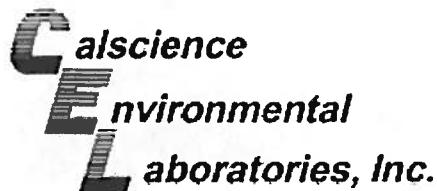
Project Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
12-02-1512-2	Sediment	Mercury	02/28/12	02/28/12	120228S05

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	0.8350	89	84	76-136	5	0-16	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - LCS/LCS Duplicate



Geosyntec Consultants  
10875 Rancho Bernardo Road, Suite 200  
San Diego, CA 92127-2116

Date Received: N/A  
Work Order No: 12-02-0735  
Preparation: EPA 3050B  
Method: EPA 6010B

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
097-01-002-15,687	Solid	ICP 5300	02/28/12	02/29/12	120228L01A			
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Antimony	25.00	93	97	80-120	73-127	4	0-20	
Arsenic	25.00	100	105	80-120	73-127	4	0-20	
Barium	25.00	95	95	80-120	73-127	0	0-20	
Beryllium	25.00	101	106	80-120	73-127	5	0-20	
Cadmium	25.00	105	110	80-120	73-127	5	0-20	
Chromium	25.00	104	110	80-120	73-127	5	0-20	
Cobalt	25.00	112	118	80-120	73-127	5	0-20	
Copper	25.00	101	106	80-120	73-127	5	0-20	
Lead	25.00	104	108	80-120	73-127	4	0-20	
Molybdenum	25.00	102	107	80-120	73-127	4	0-20	
Nickel	25.00	110	115	80-120	73-127	5	0-20	
Selenium	25.00	104	109	80-120	73-127	5	0-20	
Silver	12.50	80	80	80-120	73-127	0	0-20	
Thallium	25.00	110	115	80-120	73-127	4	0-20	
Vanadium	25.00	101	106	80-120	73-127	5	0-20	
Zinc	25.00	105	109	80-120	73-127	4	0-20	
Aluminum	25.00	84	83	80-120	73-127	0	0-20	
Calcium	25.00	102	110	80-120	73-127	7	0-20	
Iron	25.00	105	109	80-120	73-127	4	0-20	
Magnesium	25.00	98	102	80-120	73-127	4	0-20	
Manganese	25.00	103	108	80-120	73-127	4	0-20	
Potassium	250.0	86	87	80-120	73-127	2	0-20	
Sodium	250.0	94	95	80-120	73-127	1	0-20	
Boron	25.00	82	81	80-120	73-127	1	0-20	

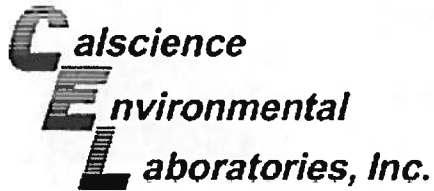
Total number of LCS compounds : 24

Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



Quality Control - LCS/LCS Duplicate



Geosyntec Consultants  
 10875 Rancho Bernardo Road, Suite 200  
 San Diego, CA 92127-2116

Date Received: N/A  
 Work Order No: 12-02-0735  
 Preparation: EPA 7471A Total  
 Method: EPA 7471A

Project: Hawes Composting / SC0554

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-04-007-8,523	Solid	Mercury	02/28/12	02/28/12	120228L05

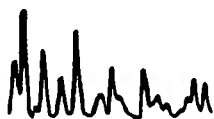
Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	0.8350	99	99	85-121	0	0-10	

RPD - Relative Percent Difference , CL - Control Limit

Work Order Number: 12-02-0735

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.  
 MPN - Most Probable Number



# Analysis Request and Chain of Custody Record

Project Name: **HAWES COMPOSTING**  
 Project Number: **SLOSS4**  
 Project Contact: **DOUG SAMMUELT**  
 Laboratory Name: **CALS SCIENCE**  
 Lab Address: **7440 LINCOLN WAY, CAMDEN GROVE, CA**  
 Lab Phone: **714 895 5444**  
 Carrier/Waybill No.:

Required Analyses:  
 VOCs by: **Metals**  
 SVOCs by 8270: **ATTACHED LIST**

Page 1 of 2  
**12-02-0735**  
 White copy: to accompany samples  
 Yellow copy: field copy

Sample Name	Date	Time	Sample Type	Bottle Type and Volume/Preservative				Number of Containers	Comments	Lab Use Only	Condition of Bottles
				100	500	1000	2000				
BG1 - 0.5'	2/10/12	9:20	SOIL	/	/	/	/	X			
BG1 - 1.0'		9:25		/	/	/	/		HOLD		
BG2 - 0.5'		9:30		/	/	/	/	X			
BG2 - 1.0'		9:35		/	/	/	/		HOLD		
BG3 - 0.5'		9:40		/	/	/	/	X			
BG3 - 1.0'		9:45		/	/	/	/		HOLD		
BG4 - 0.5'		9:50		/	/	/	/	X			
BG4 - 1.0'		9:55		/	/	/	/		HOLD		
BG5 - 0.5'		10:00		/	/	/	/	X			
BG5 - 1.0'		10:05		/	/	/	/	X			
BG6 - 0.5'		10:15		/	/	/	/				
BG6 - 1.0'		10:20		/	/	/	/		HOLD		

Special Instructions:

Turn-around Time:  Normal  Rush:

1. Relinquished by: *Debi Murray* Date: 2/10/12 Time: 16:30  
 (Signature/Affiliation)  
 2. Relinquished by: *[Signature]* Date: 02/10/12 Time: 19:00  
 (Signature/Affiliation)  
 3. Relinquished by: *[Signature]* Date:   
 (Signature/Affiliation)

Received by: *[Signature]* Date: 02/10/12 Time: 16:30  
 (Signature/Affiliation)  
 Received by: *[Signature]* Date: 2/10/12 Time: 19:00  
 (Signature/Affiliation)  
 Received by: *[Signature]* Date:   
 (Signature/Affiliation)

PLACED IN SECURE REFRIGERATOR AT 1PM 2/10/2012



Document Number: 2725

2/24/2012

# Analysis Request and Chain of Custody Record

Page 1 of 2  
**12-02-0735**  
 White copy: to accompany samples  
 Yellow copy: field copy

Project Name <b>HAWES COMPOSTING</b>	Project Number <b>SC054</b>	Required Analyses			Bottle Type and Volume/Preservative	Number of Containers	Sample Type	Date	Time	Comments	Lab Use Only	Condition of Bottles
		VOCs by	Metals Extended	SVOCs by 8270								
Samplers Names <b>DOUG SAUMWITZ</b>	Project Contact <b>DOUG SAUMWITZ</b>											
Laboratory Name <b>CALS SCIENCE</b>	Lab Contact <b>S. ADWAK</b>											
Lab Address <b>7440 LINCOLN WAY CANDLER GROVE, CA</b>	Lab Phone <b>714 895-5444</b>											
	Carrier/Waybill No.											
<b>BG1 - 0.5'</b>	<b>2/9/2012</b>	<b>9:20</b>	<b>SOIL</b>		X							
<b>BG1 - 1.0'</b>		<b>9:25</b>			X							
<b>BG2 - 0.5'</b>		<b>9:30</b>			X							
<b>BG2 - 1.0'</b>		<b>9:35</b>			X							
<b>BG3 - 0.5'</b>		<b>9:40</b>			X							
<b>BG3 - 1.0'</b>		<b>9:45</b>			X							
<b>BG4 - 0.5'</b>		<b>9:50</b>			X							
<b>BG4 - 1.0'</b>		<b>9:55</b>			X							
<b>BG5 - 0.5'</b>		<b>10:00</b>			X							
<b>BG5 - 1.0'</b>		<b>10:05</b>			X							
<b>BG6 - 0.5'</b>		<b>10:15</b>			X							
<b>BG6 - 1.0'</b>		<b>10:20</b>			X							

Turn-around Time:  
 Normal  Rush:

1. Relinquished by <i>W. M. Murray</i> (Signature/Affiliation)	Date <b>2/10/12</b>	Time <b>16:30</b>	1. Received by <i>[Signature]</i> (Signature/Affiliation)	Date <b>02/10/12</b>	Time <b>16:30</b>
2. Relinquished by <i>[Signature]</i> (Signature/Affiliation)	Date <b>02/10/12</b>	Time <b>19:00</b>	2. Received by <i>[Signature]</i> (Signature/Affiliation)	Date <b>2/10/12</b>	Time <b>19:00</b>
3. Relinquished by <i>[Signature]</i> (Signature/Affiliation)	Date <b>02/10/12</b>	Time <b>19:00</b>	3. Received by <i>[Signature]</i> (Signature/Affiliation)	Date <b>2/10/12</b>	Time <b>19:00</b>

Special Instructions:

# Analysis Request and Chain of Custody Record

Page 2 of 2  
0735  
 White copy: to accompany samples  
 Yellow copy: field copy

Sample Name	Date	Time	Sample Type	Required Analyses							Number of Containers	Comments	Lab Use Only	Condition of Bottles		
				VOCs by 8260	Metals (ext. req.)	SVOCs by 8270	ATTACHED LIST	Organochlorine Pesticides	Organophosphorus Pesticides	Agricultural Herbicides					Bottle Type and Volume/Preservative	
															✓	✓
HAWES COMPOSTING	SC0554															
BG 7 - 0.5'	2/4/2012	10:25	SOIL	✓												
BG 7 - 1.0'		10:30					X									
BG 8 - 0.5'		10:35					X									
BG 8 - 1.0'		10:40					X									
BG 9 - 0.5'		10:45					X		X	X	X		HOLED			
BG 9 - 1.0'		10:50					X		X	X	X		2 JARS (32oz TOTAL)			
BG 10 - 0.5'		11:00					X		X	X	X		2 JARS (32oz TOTAL)			
BG 10 - 1.0'		11:05					X						HOLED			

Geosyntec consultants  
 10875 Rancho Bernardo Road, Suite 200, San Diego, CA 92127 (858) 674-6559 Fax: (858) 674-6586  
 0211012 14:00 rec'd; sample on 2/10/12 19:00

Table 3- UNSATURATED ZONE - WASTE PILE  
 Monitoring Parameters and Constituents of Concern

0735 1/2

Field Parameters	Units	Monitoring Frequency
Composting Pad Thickness	Inches	Annually
Sample Locations	Northing and Easting	Annually
Monitoring Parameters	Units	Monitoring Frequency
Aluminum	mg/kg	Annually
Antimony	mg/kg	Annually
Arsenic	mg/kg	Annually
Copper	mg/kg	Annually
Iron	mg/kg	Annually
Manganese	mg/kg	Annually
MBAS	mg/kg	Annually
Nickel	mg/kg	Annually
Nitrate as Nitrogen	mg/kg	Annually
Sulfate	mg/kg	Annually
TDS	mg/kg	Annually
Constituents of Concern	Units	Monitoring Frequency
Barium	mg/kg	Five Year
Beryllium	mg/kg	Five Year
Bicarbonate	mg/kg	Five Year
Boron	mg/kg	Five Year
Bromide	mg/kg	Five Year
Cadmium	mg/kg	Five Year
Calcium	mg/kg	Five Year
Carbonate	mg/kg	Five Year
Chloride	mg/kg	Five Year
Chromium (hexavalent)	µg/kg	Five Year
Chromium (total)	µg/kg	Five Year
Cobalt	mg/kg	Five Year
Fluoride	mg/kg	Five Year
Total Kjeldahl Nitrogen	mg/kg	Five Year
Lead	mg/kg	Five Year
Magnesium	mg/kg	Five Year
Mercury	mg/kg	Five Year
Molybdenum	mg/kg	Five Year
Nitrite (as Nitrogen)	mg/kg	Five Year
Orthophosphate Phosphorous	mg/kg	Five Year
Phosphate	mg/kg	Five Year
Potassium	mg/kg	Five Year
Selenium	mg/kg	Five Year
Silver	mg/kg	Five Year
Sodium	mg/kg	Five Year
Thallium	mg/kg	Five Year
Total Alkalinity	mg/kg	Five Year
Total Anions	mg/kg	Five Year
Total Cations	mg/kg	Five Year



0735 2/2

Table 3- UNSATURATED ZONE - WASTE PILE, Continued

Constituents of Concern	Units	Monitoring Frequency
Total Phosphorus	mg/kg	Five Year
Vanadium	mg/kg	Five Year
Zinc	mg/kg	Five Year
<del>VOCs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>SVOCs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organochlorine Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organophosphorus Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Chlorinated Herbicides</del>	<del>µg/kg</del>	<del>Five Year</del>
CCR, Title 22 Metals	mg/kg	Five Year

CCR = California Code of Regulations  
MBAS = Methylene Blue Active Substances  
µg/kg = Micrograms per kilogram  
mg/L = Milligrams per kilogram  
SVOC = Semi-Volatile Organic Compound  
TDS = Total Dissolved Solids  
VOC = Volatile Organic Compound

0735 2/2

Table 3- UNSATURATED ZONE - WASTE PILE, Continued

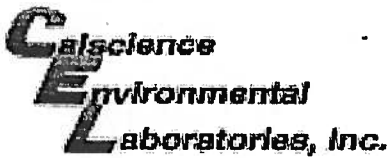
Constituents of Concern	Units	Monitoring Frequency
Total Phosphorus	mg/kg	Five Year
Vanadium	mg/kg	Five Year
Zinc	mg/kg	Five Year
<del>VOGs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>SVOCs</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organochlorine Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Organophosphorus Pesticides</del>	<del>µg/kg</del>	<del>Five Year</del>
<del>Chlorinated Herbicides</del>	<del>µg/kg</del>	<del>Five Year</del>
CCR, Title 22 Metals	mg/kg	Five Year

CCR = California Code of Regulations  
 MBAS = Methylene Blue Active Substances  
 µg/kg = Micrograms per kilogram  
 mg/L = Milligrams per kilogram  
 SVOC = Semi-Volatile Organic Compound  
 TDS = Total Dissolved Solids  
 VOC = Volatile Organic Compound

Table 3- UNSATURATED ZONE - WASTE PILE  
Monitoring Parameters and Constituents of Concern

0735 1/2

Field Parameters	Units	Monitoring Frequency
Composting Pad Thickness	Inches	Annually
Sample Locations	Northing and Easting	Annually
Monitoring Parameters	Units	Monitoring Frequency
Aluminum	mg/kg	Annually
Antimony	mg/kg	Annually
Arsenic	mg/kg	Annually
Copper	mg/kg	Annually
Iron	mg/kg	Annually
Manganese	mg/kg	Annually
MBAS	mg/kg	Annually
Nickel	mg/kg	Annually
Nitrate as Nitrogen	mg/kg	Annually
Sulfate	mg/kg	Annually
TDS	mg/kg	Annually
Constituents of Concern	Units	Monitoring Frequency
Barium	mg/kg	Five Year
Beryllium	mg/kg	Five Year
Bicarbonate	mg/kg	Five Year
Boron	mg/kg	Five Year
Bromide	mg/kg	Five Year
Cadmium	mg/kg	Five Year
Calcium	mg/kg	Five Year
Carbonate	mg/kg	Five Year
Chloride	mg/kg	Five Year
Chromium (hexavalent)	µg/kg	Five Year
Chromium (total)	µg/kg	Five Year
Cobalt	mg/kg	Five Year
Fluoride	mg/kg	Five Year
Total Kjeldahl Nitrogen	mg/kg	Five Year
Lead	mg/kg	Five Year
Magnesium	mg/kg	Five Year
Mercury	mg/kg	Five Year
Molybdenum	mg/kg	Five Year
Nitrite (as Nitrogen)	mg/kg	Five Year
Orthophosphate Phosphorous	mg/kg	Five Year
Phosphate	mg/kg	Five Year
Potassium	mg/kg	Five Year
Selenium	mg/kg	Five Year
Silver	mg/kg	Five Year
Sodium	mg/kg	Five Year
Thallium	mg/kg	Five Year
Total Alkalinity	mg/kg	Five Year
Total Anions	mg/kg	Five Year
Total Cations	mg/kg	Five Year



WORK ORDER #: 12-02-0735

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Geosyntec

DATE: 02/10/12

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0 °C - 6.0 °C, not frozen)

Temperature 1.8 °C - 0.3 °C (CF) = 1.5 °C [X] Blank [ ] Sample

- [ ] Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).
[ ] Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.
[ ] Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: [ ] Air [ ] Filter

Initial: [Signature]

CUSTODY SEALS INTACT:

- [ ] Cooler [ ] \_\_\_\_\_ [ ] No (Not Intact) [X] Not Present [ ] N/A
[ ] Sample [ ] \_\_\_\_\_ [ ] No (Not Intact) [X] Not Present

Initial: [Signature]
Initial: [Signature]

SAMPLE CONDITION:

Table with 4 columns: Item, Yes, No, N/A. Rows include Chain-Of-Custody (COC) document(s) received with samples, COC document(s) received complete, Sampler's name indicated on COC, etc.

CONTAINER TYPE:

- Solid: [ ] 4ozCGJ [ ] 8ozCGJ [X] 16ozCGJ [ ] Sleeve ( ) [ ] EnCores® [ ] TerraCores® [ ] \_\_\_\_\_
Water: [ ] VOA [ ] VOA h [ ] VOAn2 [ ] 125AGB [ ] 125AGBh [ ] 125AGBp [ ] 1AGB [ ] 1AGBna2 [ ] 1AGBs
[ ] 500AGB [ ] 500AGJ [ ] 500AGJs [ ] 250AGB [ ] 250CGB [ ] 250CGBs [ ] 1PB [ ] 1PBna [ ] 500PB
[ ] 250PB [ ] 250PBn [ ] 125PB [ ] 125PBz nna [ ] 100PJ [ ] 100PJna2 [ ] [ ] [ ] [ ]

Air: [ ] Tedlar® [ ] Summa® Other: [ ] \_\_\_\_\_ Trip Blank Lot#: \_\_\_\_\_ Labeled/Checked by: [Signature]
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope Reviewed by: [Signature]
Preservative: h: HCL n: HNO3 na2: Na2S2O3 na: NaOH p: H3PO4 s: H2SO4 u: Ultra-pure z nna: ZnAc2+NaOH f: Filtered Scanned by: [Signature]



**ATTACHMENT A-3**  
**STATISTICAL ANALYSIS OUTPUT SHEETS**



General Background Statistics for Data Sets with Non-Detects

User Selected Options

From File	Data.no outliers.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alkalinity

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Tolerance Factor	2.454	Number of Missing Values	1

Raw Statistics

Minimum	45
Maximum	860
Second Largest	800
First Quartile	180
Median	210
Third Quartile	480
Mean	366.1
Geometric Mean	265.1
SD	291
Coefficient of Variation	0.795
Skewness	0.958

Log-Transformed Statistics

Minimum	3.807
Maximum	6.757
Second Largest	6.685
First Quartile	5.193
Median	5.347
Third Quartile	6.174
Mean	5.58
SD	0.918

Warning: There are only 9 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.829

Data appear Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.829

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	1080
95% UPL (t)	936.5
90% Percentile (z)	739
95% Percentile (z)	844.7
99% Percentile (z)	1043

Assuming Lognormal Distribution

95% UTL with 90% Coverage	2519
95% UPL (t)	1601
90% Percentile (z)	859.2
95% Percentile (z)	1199
99% Percentile (z)	2241

Gamma Distribution Test

k star	1.205
Theta Star	303.8

Data Distribution Test

Data appear Normal at 5% Significance Level



MLE of Mean	366.1
MLE of Standard Deviation	333.5
nu star	21.69

A-D Test Statistic	0.329
5% A-D Critical Value	0.733
K-S Test Statistic	0.209
5% K-S Critical Value	0.283

**Nonparametric Statistics**

90% Percentile	812
95% Percentile	836
99% Percentile	855.2

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	805
95% Percentile	1027
99% Percentile	1537

95% UTL with 90% Coverage	860
95% Percentile Bootstrap UTL with 90% Coverage	860
95% BCA Bootstrap UTL with 90% Coverage	860
95% UPL	860
95% Chebyshev UPL	1703
Upper Threshold Limit Based upon IQR	930

95% WH Approx. Gamma UPL	1149
95% HW Approx. Gamma UPL	1216
95% WH Approx. Gamma UTL with 90% Coverage	1493
95% HW Approx. Gamma UTL with 90% Coverage	1629

**Aluminum**

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

**Raw Statistics**

Minimum	3870
Maximum	20300
Second Largest	16500
First Quartile	4645
Median	8675
Third Quartile	13250
Mean	9360
Geometric Mean	8191
SD	4895
Coefficient of Variation	0.523
Skewness	0.672

**Log-Transformed Statistics**

Minimum	8.261
Maximum	9.918
Second Largest	9.711
First Quartile	8.444
Median	9.066
Third Quartile	9.491
Mean	9.011
SD	0.536

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.905

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	18787
95% UPL (t)	18033
90% Percentile (z)	15633
95% Percentile (z)	17411

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	22998
95% UPL (t)	21174
90% Percentile (z)	16281
95% Percentile (z)	19781

99% Percentile (z) 20747

99% Percentile (z) 28502

**Gamma Distribution Test**

k star 3.357  
 Theta Star 2788  
 MLE of Mean 9360  
 MLE of Standard Deviation 5109  
 nu star 134.3

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic 0.587  
 5% A-D Critical Value 0.746  
 K-S Test Statistic 0.2  
 5% K-S Critical Value 0.195

**Nonparametric Statistics**

90% Percentile 15870  
 95% Percentile 16690  
 99% Percentile 19578

Data follow Appx. Gamma Distribution at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile 16210  
 95% Percentile 19028  
 99% Percentile 25100  
 95% WH Approx. Gamma UPL 19543  
 95% HW Approx. Gamma UPL 19868  
 95% WH Approx. Gamma UTL with 90% Coverage 20795  
 95% HW Approx. Gamma UTL with 90% Coverage 21228

95% UTL with 90% Coverage 20300  
 95% Percentile Bootstrap UTL with 90% Coverage 20300  
 95% BCA Bootstrap UTL with 90% Coverage 20300  
 95% UPL 20110  
 95% Chebyshev UPL 31223  
 Upper Threshold Limit Based upon IQR 26158

**Antimony**

**General Statistics**

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**  
 Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!  
 The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony was not processed!

**Arsenic**

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

**Raw Statistics**

Minimum 1.58  
 Maximum 9.96  
 Second Largest 9.58  
 First Quartile 1.913

**Log-Transformed Statistics**

Minimum 0.457  
 Maximum 2.299  
 Second Largest 2.26  
 First Quartile 0.648

Median	3.955	Median	1.375
Third Quartile	6.213	Third Quartile	1.826
Mean	4.504	Mean	1.322
Geometric Mean	3.751	SD	0.629
SD	2.766		
Coefficient of Variation	0.614		
Skewness	0.797		

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.872
Shapiro Wilk Critical Value	0.905

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	9.83
95% UPL (t)	9.404
90% Percentile (z)	8.048
95% Percentile (z)	9.053
99% Percentile (z)	10.94

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	12.59
95% UPL (t)	11.42
90% Percentile (z)	8.394
95% Percentile (z)	10.55
99% Percentile (z)	16.19

**Gamma Distribution Test**

k star	2.49
Theta Star	1.809
MLE of Mean	4.504
MLE of Standard Deviation	2.854
nu star	99.59

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.655
5% A-D Critical Value	0.748
K-S Test Statistic	0.166
5% K-S Critical Value	0.195

**Nonparametric Statistics**

90% Percentile	8.95
95% Percentile	9.599
99% Percentile	9.888

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	8.328
95% Percentile	9.985
99% Percentile	13.61
95% WH Approx. Gamma UPL	10.31
95% HW Approx. Gamma UPL	10.52
95% WH Approx. Gamma UTL with 90% Coverage	11.05
95% HW Approx. Gamma UTL with 90% Coverage	11.34

**95% UTL with 90% Coverage**

95% Percentile Bootstrap UTL with 90% Coverage	9.96
95% BCA Bootstrap UTL with 90% Coverage	9.96
95% UPL	9.941
95% Chebyshev UPL	16.86
Upper Threshold Limit Based upon IQR	12.66

**Barium**

**General Statistics**

Total Number of Observations	19	Number of Distinct Observations	18
Tolerance Factor	1.949	Number of Missing Values	1

**Raw Statistics**

Minimum	36
Maximum	177
Second Largest	130
First Quartile	43.3
Median	57.4
Third Quartile	89.25
Mean	72.01
Geometric Mean	64.14
SD	38.79
Coefficient of Variation	0.539
Skewness	1.393

**Log-Transformed Statistics**

Minimum	3.584
Maximum	5.176
Second Largest	4.868
First Quartile	3.768
Median	4.05
Third Quartile	4.478
Mean	4.161
SD	0.476

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.901

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	147.6
95% UPL (t)	141
90% Percentile (z)	121.7
95% Percentile (z)	135.8
99% Percentile (z)	162.2

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	162.3
95% UPL (t)	149.7
90% Percentile (z)	118.1
95% Percentile (z)	140.4
99% Percentile (z)	194.2

**Gamma Distribution Test**

k star	3.808
Theta Star	18.91
MLE of Mean	72.01
MLE of Standard Deviation	36.9
nu star	144.7

**Data Distribution Test**

Data Follow Appr. Gamma Distribution at 5% Significance Level

A-D Test Statistic	0.773
5% A-D Critical Value	0.744
K-S Test Statistic	0.17
5% K-S Critical Value	0.199

Data follow Appx. Gamma Distribution at 5% Significance Level

**Nonparametric Statistics**

90% Percentile	124.4
95% Percentile	134.7
99% Percentile	168.5

**Assuming Gamma Distribution**

90% Percentile	121.5
95% Percentile	141.4
99% Percentile	184.1
95% WH Approx. Gamma UPL	144.8
95% HW Approx. Gamma UPL	145.7
95% WH Approx. Gamma UTL with 90% Coverage	154.4
95% HW Approx. Gamma UTL with 90% Coverage	156

95% UTL with 90% Coverage	177
95% Percentile Bootstrap UTL with 90% Coverage	177
95% BCA Bootstrap UTL with 90% Coverage	177
95% UPL	177
95% Chebyshev UPL	245.5
Upper Threshold Limit Based upon IQR	158.2

General Statistics			
Number of Valid Data	20	Number of Detected Data	19
Number of Distinct Detected Data	18	Number of Non-Detect Data	1
Tolerance Factor	1.926	Percent Non-Detects	5.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.255	Minimum Detected	-1.366
Maximum Detected	1.42	Maximum Detected	0.351
Mean of Detected	0.763	Mean of Detected	-0.428
SD of Detected	0.412	SD of Detected	0.6
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.913
5% Shapiro Wilk Critical Value	0.901	5% Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.732	Mean (Log Scale)	-0.51
SD	0.426	SD (Log Scale)	0.691
95% UTL 90% Coverage	1.551	95% UTL 90% Coverage	2.27
95% UPL (t)	1.486	95% UPL (t)	2.041
90% Percentile (z)	1.277	90% Percentile (z)	1.454
95% Percentile (z)	1.432	95% Percentile (z)	1.869
99% Percentile (z)	1.722	99% Percentile (z)	2.993
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.727	Mean in Original Scale	0.733
SD	0.423	SD in Original Scale	0.424
95% UTL with 90% Coverage	1.543	95% UTL with 90% Coverage	2.197
		95% BCA UTL with 90% Coverage	1.393
		95% Bootstrap (%) UTL with 90% Coverage	1.42
95% UPL (t)	1.478	95% UPL (t)	1.981
90% Percentile (z)	1.27	90% Percentile (z)	1.428
95% Percentile (z)	1.424	95% Percentile (z)	1.82
99% Percentile (z)	1.712	99% Percentile (z)	2.871
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.834	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.269		
nu star	107.7		
A-D Test Statistic	0.546	Nonparametric Statistics	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.154	Mean	0.738
5% K-S Critical Value	0.2	SD	0.406
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0933

Assuming Gamma Distribution		95% KM UTL with 90% Coverage	1.52
Gamma ROS Statistics with Extrapolated Data		95% KM Chebyshev UPL	2.552
Mean	0.725	95% KM UPL (I)	1.458
Median	0.603	90% Percentile (z)	1.259
SD	0.436	95% Percentile (z)	1.406
k star	0.687	99% Percentile (z)	1.683
Theta star	1.056	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	27.47	95% Wilson Hilferty (WH) Approx. Gamma UPL	2.174
95% Percentile of Chisquare (2k)	4.708	95% Hawkins Wixley (HW) Approx. Gamma UPL	2.693
90% Percentile	1.829	95% WH Approx. Gamma UTL with 90% Coverage	2.38
95% Percentile	2.486	95% HW Approx. Gamma UTL with 90% Coverage	3.011
99% Percentile	4.056		

Note: DL/2 is not a recommended method

**Bicarbonate**

**General Statistics**

Total Number of Observations	9	Number of Distinct Observations	9
Tolerance Factor	2.454	Number of Missing Values	1

**Raw Statistics**

**Log-Transformed Statistics**

Minimum	45	Minimum	3.807
Maximum	510	Maximum	6.234
Second Largest	380	Second Largest	5.94
First Quartile	160	First Quartile	5.075
Median	190	Median	5.247
Third Quartile	370	Third Quartile	5.914
Mean	257.2	Mean	5.343
Geometric Mean	209.1	SD	0.754
SD	152.5		
Coefficient of Variation	0.593		
Skewness	0.303		

Warning. There are only 9 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

**Background Statistics**

**Normal Distribution Test**

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

**Assuming Normal Distribution**

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	631.5	95% UTL with 90% Coverage	1329
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95% UPL (t)	556.1
90% Percentile (z)	452.7
95% Percentile (z)	508.1
99% Percentile (z)	612

95% UPL (t)	915.9
90% Percentile (z)	549.2
95% Percentile (z)	722.2
99% Percentile (z)	1207

**Gamma Distribution Test**

k star	1.785
Theta Star	144.1
MLE of Mean	257.2
MLE of Standard Deviation	192.5
nu star	32.13

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.347
5% A-D Critical Value	0.728
K-S Test Statistic	0.225
5% K-S Critical Value	0.282

**Nonparametric Statistics**

90% Percentile	406
95% Percentile	458
99% Percentile	499.6

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	514
95% Percentile	632.8
99% Percentile	898.1
95% WH Approx. Gamma UPL	690.2
95% HW Approx. Gamma UPL	726.8
95% WH Approx. Gamma UTL with 90% Coverage	865.2
95% HW Approx. Gamma UTL with 90% Coverage	933.7

95% UTL with 90% Coverage 510

95% Percentile Bootstrap UTL with 90% Coverage	510
95% BCA Bootstrap UTL with 90% Coverage	510
95% UPL	510
95% Chebyshev UPL	957.9
Upper Threshold Limit Based upon IQR	685

**Boron**

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	19
Tolerance Factor	1.926		

**Raw Statistics**

Minimum	1.84
Maximum	38.8
Second Largest	38.1
First Quartile	4.42
Median	7.555
Third Quartile	16.25
Mean	11.59
Geometric Mean	8.258
SD	10.68
Coefficient of Variation	0.922
Skewness	1.725

**Log-Transformed Statistics**

Minimum	0.61
Maximum	3.658
Second Largest	3.64
First Quartile	1.486
Median	2.022
Third Quartile	2.788
Mean	2.111
SD	0.832

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.769
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**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.967
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Shapiro Wilk Critical Value 0.905  
 Data not Normal at 5% Significance Level

Shapiro Wilk Critical Value 0.905  
 Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage 32.16  
 95% UPL (t) 30.51  
 90% Percentile (z) 25.28  
 95% Percentile (z) 29.16  
 99% Percentile (z) 36.44

Assuming Lognormal Distribution

95% UTL with 90% Coverage 40.98  
 95% UPL (t) 36.05  
 90% Percentile (z) 23.98  
 95% Percentile (z) 32.44  
 99% Percentile (z) 57.18

Gamma Distribution Test

k star 1.412  
 Theta Star 8.209  
 MLE of Mean 11.59  
 MLE of Standard Deviation 9.754  
 nu star 56.48

Data Distribution Test

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic 0.592  
 5% A-D Critical Value 0.756  
 K-S Test Statistic 0.174  
 5% K-S Critical Value 0.197

Nonparametric Statistics

90% Percentile 22.08  
 95% Percentile 38.14  
 99% Percentile 38.67

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

90% Percentile 24.51  
 95% Percentile 30.81  
 99% Percentile 45.09

95% UTL with 90% Coverage 38.8

95% Percentile Bootstrap UTL with 90% Coverage 38.8

95% BCA Bootstrap UTL with 90% Coverage 38.8

95% UPL 38.77

95% Chebyshev UPL 59.3

Upper Threshold Limit Based upon IQR 34

95% WH Approx. Gamma UPL 31.9

95% HW Approx. Gamma UPL 32.54

95% WH Approx. Gamma UTL with 90% Coverage 34.8

95% HW Approx. Gamma UTL with 90% Coverage 35.77

Bromide

General Statistics

Number of Valid Data	10	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!  
 suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B)

The data set for variable Bromide was not processed!

Cadmium

General Statistics

Number of Valid Data	20	Number of Detected Data	5
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Number of Distinct Detected Data	5	Number of Non-Detect Data	15
Tolerance Factor	1.926	Percent Non-Detects	75.00%

**Raw Statistics**

Minimum Detected	0.509
Maximum Detected	0.633
Mean of Detected	0.578
SD of Detected	0.0498
Minimum Non-Detect	0.5
Maximum Non-Detect	0.5

**Log-transformed Statistics**

Minimum Detected	-0.675
Maximum Detected	-0.457
Mean of Detected	-0.552
SD of Detected	0.0872
Minimum Non-Detect	-0.693
Maximum Non-Detect	-0.693

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.947
5% Shapiro Wilk Critical Value	0.762

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.944
5% Shapiro Wilk Critical Value	0.762

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	0.332
SD	0.147
95% UTL 90% Coverage	0.616
95% UPL (t)	0.593
90% Percentile (z)	0.521
95% Percentile (z)	0.574
99% Percentile (z)	0.675

**Assuming Lognormal Distribution**

DL/2 Substitution Method	
Mean (Log Scale)	-1.178
SD (Log Scale)	0.373
95% UTL 90% Coverage	0.632
95% UPL (t)	0.596
90% Percentile (z)	0.497
95% Percentile (z)	0.569
99% Percentile (z)	0.734

**Maximum Likelihood Estimate(MLE) Method**

Mean	0.423
SD	0.118
95% UTL with 90% Coverage	0.651
95% UPL (t)	0.633
90% Percentile (z)	0.575
95% Percentile (z)	0.618
99% Percentile (z)	0.699

**Log ROS Method**

Mean in Original Scale	0.448
SD in Original Scale	0.0946
95% UTL with 90% Coverage	0.656
95% BCA UTL with 90% Coverage	0.633
95% Bootstrap (%) UTL with 90% Coverage	0.633
95% UPL (t)	0.636
90% Percentile (z)	0.573
95% Percentile (z)	0.619
99% Percentile (z)	0.714

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected)	66.49
Theta Star	0.00869
nu star	664.9

A-D Test Statistic 0.275

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

5% A-D Critical Value 0.678

K-S Test Statistic 0.222

5% K-S Critical Value 0.357

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics with Extrapolated Data

Mean 0.254

Median 0.229

SD 0.24

k star 0.201

Theta star 1.261

Nu star 8.055

95% Percentile of Chisquare (2k) 2.072

90% Percentile 0.768

95% Percentile 1.306

99% Percentile 2.785

Kaplan-Meier (KM) Method

Mean 0.526

SD 0.0372

SE of Mean 0.0093

95% KM UTL with 90% Coverage 0.598

95% KM Chebyshev UPL 0.692

95% KM UPL (t) 0.592

90% Percentile (z) 0.574

95% Percentile (z) 0.587

99% Percentile (z) 0.613

Gamma ROS Limits with Extrapolated Data

95% Wilson Hilferty (WH) Approx. Gamma UPL 1.297

95% Hawkins Wixley (HW) Approx. Gamma UPL 1.812

95% WH Approx. Gamma UTL with 90% Coverage 1.498

95% HW Approx. Gamma UTL with 90% Coverage 2.183

Note: DL/2 is not a recommended method

Calcium

General Statistics

Total Number of Observations 20

Number of Distinct Observations 20

Tolerance Factor 1.926

Raw Statistics

Minimum 1740

Maximum 43300

Second Largest 42500

First Quartile 3065

Median 7650

Third Quartile 18025

Mean 13973

Geometric Mean 8153

SD 14430

Coefficient of Variation 1.033

Skewness 1.22

Log-Transformed Statistics

Minimum 7.462

Maximum 10.68

Second Largest 10.66

First Quartile 8.028

Median 8.942

Third Quartile 9.799

Mean 9.006

SD 1.102

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic 0.78

Shapiro Wilk Critical Value 0.905

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic 0.926

Shapiro Wilk Critical Value 0.905

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage 41765

95% UPL (t) 39540

90% Percentile (z) 32465

95% Percentile (z) 37708

Assuming Lognormal Distribution

95% UTL with 90% Coverage 68089

95% UPL (t) 57450

90% Percentile (z) 33469

95% Percentile (z) 49948

99% Percentile (z) 47541

99% Percentile (z) 105848

**Gamma Distribution Test**

k star 0.937  
 Theta Star 14905  
 MLE of Mean 13973  
 MLE of Standard Deviation 14431  
 nu star 37.5

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic 0.654  
 5% A-D Critical Value 0.767  
 K-S Test Statistic 0.16  
 5% K-S Critical Value 0.199

**Nonparametric Statistics**

90% Percentile 40070  
 95% Percentile 42540  
 99% Percentile 43148

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile 32689  
 95% Percentile 42828  
 99% Percentile 66484

95% UTL with 90% Coverage 43300

95% Percentile Bootstrap UTL with 90% Coverage 43300

95% BCA Bootstrap UTL with 90% Coverage 43300

95% UPL 43260

95% Chebyshev UPL 78424

Upper Threshold Limit Based upon IQR 40465

95% WH Approx. Gamma UPL 44811

95% HW Approx. Gamma UPL 46680

95% WH Approx. Gamma UTL with 90% Coverage 49602

95% HW Approx. Gamma UTL with 90% Coverage 52272

**Carbonate**

**General Statistics**

Number of Valid Data	9	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	4
Tolerance Factor	2.454	Percent Non-Detects	44.44%
Number of Missing Values	1		

**Raw Statistics**

Minimum Detected	24
Maximum Detected	430
Mean of Detected	198.8
SD of Detected	180
Minimum Non-Detect	5
Maximum Non-Detect	5

**Log-transformed Statistics**

Minimum Detected	3.178
Maximum Detected	6.064
Mean of Detected	4.827
SD of Detected	1.188
Minimum Non-Detect	1.609
Maximum Non-Detect	1.609

**Warning: There are only 5 Detected Values in this data**

**Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions**

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

Normal Distribution Test with Detected Values Only			Lognormal Distribution Test with Detected Values Only		
Shapiro Wilk Test Statistic	0.878		Shapiro Wilk Test Statistic	0.942	
5% Shapiro Wilk Critical Value	0.762		5% Shapiro Wilk Critical Value	0.762	
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
DL/2 Substitution Method			DL/2 Substitution Method		
Mean	111.6		Mean (Log Scale)	3.089	
SD	164.1		SD (Log Scale)	2.226	
95% UTL 90% Coverage	514.1		95% UTL 90% Coverage	5173	
95% UPL (t)	433.1		95% UPL (t)	1723	
90% Percentile (z)	321.8		90% Percentile (z)	380.5	
95% Percentile (z)	381.4		95% Percentile (z)	854.3	
99% Percentile (z)	493.2		99% Percentile (z)	3894	
Maximum Likelihood Estimate(MLE) Method			Log ROS Method		
Mean	31		Mean in Original Scale	112.9	
SD	241.8		SD in Original Scale	163.1	
95% UTL with 90% Coverage	624.3		95% UTL with 90% Coverage	4563	
			95% BCA UTL with 90% Coverage	430	
			95% Bootstrap (%) UTL with 90% Coverage	430	
95% UPL (t)	504.9		95% UPL (t)	1625	
90% Percentile (z)	340.8		90% Percentile (z)	393.5	
95% Percentile (z)	428.7		95% Percentile (z)	840.8	
99% Percentile (z)	593.4		99% Percentile (z)	3494	
Gamma Distribution Test with Detected Values Only			Data Distribution Test with Detected Values Only		
k star (bias corrected)	0.619		Data appear Normal at 5% Significance Level		
Theta Star	321.1				
nu star	6.191				
A-D Test Statistic	0.284		Nonparametric Statistics		
5% A-D Critical Value	0.689		Kaplan-Meier (KM) Method		
K-S Test Statistic	0.236		Mean	121.1	
5% K-S Critical Value	0.363		SD	148.2	
Data appear Gamma Distributed at 5% Significance Level			SE of Mean	55.22	
Assuming Gamma Distribution			95% KM UTL with 90% Coverage	484.7	
Gamma ROS Statistics with Extrapolated Data			95% KM Chebyshev UPL	801.9	
Mean	110.4		95% KM UPL (t)	411.5	
Median	24		90% Percentile (z)	311	
SD	164.9		95% Percentile (z)	364.8	
k star	0.14		99% Percentile (z)	465.8	
Theta star	786.4		Gamma ROS Limits with Extrapolated Data		
Nu star	2.528		95% Wilson Hilferty (WH) Approx. Gamma UPL	745.1	
95% Percentile of Chisquare (2k)	1.565		95% Hawkins Wixley (HW) Approx. Gamma UPL	1077	
			95% WH Approx. Gamma UTL with 90% Coverage	1193	
90% Percentile	324.1		95% HW Approx. Gamma UTL with 90% Coverage	1995	
95% Percentile	615.3				
99% Percentile	1472				

Note: DL/2 is not a recommended method.

Chloride

General Statistics

Number of Valid Data	10	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	4
Tolerance Factor	2.355	Percent Non-Detects	40.00%

Raw Statistics

Minimum Detected	10
Maximum Detected	1100
Mean of Detected	621.7
SD of Detected	401.2
Minimum Non-Detect	10
Maximum Non-Detect	10

Log-transformed Statistics

Minimum Detected	2.303
Maximum Detected	7.003
Mean of Detected	5.831
SD of Detected	1.775
Minimum Non-Detect	2.303
Maximum Non-Detect	2.303

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.974
5% Shapiro Wilk Critical Value	0.788

Data appear Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.702
5% Shapiro Wilk Critical Value	0.788

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	375
SD	436.8
95% UTL 90% Coverage	1404
95% UPL (t)	1215
90% Percentile (z)	934.8
95% Percentile (z)	1094
99% Percentile (z)	1391

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean (Log Scale)	4.142
SD (Log Scale)	2.55
95% UTL 90% Coverage	25548
95% UPL (t)	8481
90% Percentile (z)	1654
95% Percentile (z)	4177
99% Percentile (z)	23748

Maximum Likelihood Estimate(MLE) Method

Mean	203.3
SD	624.5
95% UTL with 90% Coverage	1674

Log ROS Method

Mean in Original Scale	377.3
SD in Original Scale	434.7
95% UTL with 90% Coverage	23570
95% BCA UTL with 90% Coverage	1100
95% Bootstrap (%) UTL with 90% Coverage	1100
95% UPL (t)	8184
90% Percentile (z)	1706
95% Percentile (z)	4148
99% Percentile (z)	21975

95% UPL (t)	1404
90% Percentile (z)	1004
95% Percentile (z)	1231
99% Percentile (z)	1656

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected) 0.593  
 Theta Star 1048  
 nu star 7.118

A-D Test Statistic 0.669  
 5% A-D Critical Value 0.716  
 K-S Test Statistic 0.276  
 5% K-S Critical Value 0.341

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean 373  
 Median 180  
 SD 438.7  
 k star 0.138  
 Theta star 2703  
 Nu star 2.76  
 95% Percentile of Chisquare (2k) 1.543  
 90% Percentile 1091  
 95% Percentile 2084  
 99% Percentile 5018

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

**Kaplan-Meier (KM) Method**

Mean 377  
 SD 412.6  
 SE of Mean 142.9  
 95% KM UTL with 90% Coverage 1349  
 95% KM Chebyshev UPL 2263  
 95% KM UPL (t) 1170  
 90% Percentile (z) 905.8  
 95% Percentile (z) 1056  
 99% Percentile (z) 1337

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL 2467  
 95% Hawkins Wixley (HW) Approx. Gamma UPL 3618  
 95% WH Approx. Gamma UTL with 90% Coverage 3723  
 95% HW Approx. Gamma UTL with 90% Coverage 6212

Note: DL/2 is not a recommended method

**Chromium**

**General Statistics**

Total Number of Observations 20  
 Tolerance Factor 1.926  
 Number of Distinct Observations 20

**Raw Statistics**

Minimum 4.75  
 Maximum 22  
 Second Largest 20.3  
 First Quartile 5.94  
 Median 9.67  
 Third Quartile 14.48  
 Mean 10.69  
 Geometric Mean 9.526  
 SD 5.283  
 Coefficient of Variation 0.494  
 Skewness 0.73

**Log-Transformed Statistics**

Minimum 1.558  
 Maximum 3.091  
 Second Largest 3.011  
 First Quartile 1.782  
 Median 2.269  
 Third Quartile 2.672  
 Mean 2.254  
 SD 0.494

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic 0.909  
 Shapiro Wilk Critical Value 0.905

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic 0.937  
 Shapiro Wilk Critical Value 0.905

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	20.87
95% UPL (t)	20.05
90% Percentile (z)	17.46
95% Percentile (z)	19.38
99% Percentile (z)	22.98

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	24.69
95% UPL (t)	22.88
90% Percentile (z)	17.95
95% Percentile (z)	21.48
99% Percentile (z)	30.09

**Gamma Distribution Test**

k star	3.855
Theta Star	2.773
MLE of Mean	10.69
MLE of Standard Deviation	5.444
nu star	154.2

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.454
5% A-D Critical Value	0.745
K-S Test Statistic	0.165
5% K-S Critical Value	0.195

**Nonparametric Statistics**

90% Percentile	17.6
95% Percentile	20.39
99% Percentile	21.68

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	17.99
95% Percentile	20.93
99% Percentile	27.21
95% WH Approx. Gamma UPL	21.44
95% HW Approx. Gamma UPL	21.73
95% WH Approx. Gamma UTL with 90% Coverage	22.73
95% HW Approx. Gamma UTL with 90% Coverage	23.13

95% UTL with 90% Coverage 22

95% Percentile Bootstrap UTL with 90% Coverage	22
95% BCA Bootstrap UTL with 90% Coverage	22
95% UPL	21.92
95% Chebyshev UPL	34.29
Upper Threshold Limit Based upon IQR	27.28

**HexChrom**

**General Statistics**

Number of Valid Data	10	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable HexChrom was not processed!

**Cobalt**

**General Statistics**

Total Number of Observations	19	Number of Distinct Observations	19
Tolerance Factor	1.949	Number of Missing Values	1

**Raw Statistics**

Minimum	2.49
Maximum	9.36
Second Largest	9.19
First Quartile	3.15
Median	4.6
Third Quartile	6.645
Mean	5.137
Geometric Mean	4.694
SD	2.267
Coefficient of Variation	0.441
Skewness	0.682

**Log-Transformed Statistics**

Minimum	0.912
Maximum	2.236
Second Largest	2.218
First Quartile	1.147
Median	1.526
Third Quartile	1.894
Mean	1.546
SD	0.436

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.901

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	9.556
95% UPL (t)	9.171
90% Percentile (z)	8.043
95% Percentile (z)	8.866
99% Percentile (z)	10.41

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	10.97
95% UPL (t)	10.19
90% Percentile (z)	8.205
95% Percentile (z)	9.612
99% Percentile (z)	12.94

**Gamma Distribution Test**

k star	4.833
Theta Star	1.063
MLE of Mean	5.137
MLE of Standard Deviation	2.337
nu star	183.7

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.487
5% A-D Critical Value	0.742
K-S Test Statistic	0.168
5% K-S Critical Value	0.199

**Nonparametric Statistics**

90% Percentile	8.814
95% Percentile	9.207
99% Percentile	9.329

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	8.267
95% Percentile	9.485
99% Percentile	12.06
95% WH Approx. Gamma UPL	9.695
95% HW Approx. Gamma UPL	9.799
95% WH Approx. Gamma UTL with 90% Coverage	10.28
95% HW Approx. Gamma UTL with 90% Coverage	10.42

95% UTL with 90% Coverage	9.36
95% Percentile Bootstrap UTL with 90% Coverage	9.36
95% BCA Bootstrap UTL with 90% Coverage	9.36
95% UPL	9.36
95% Chebyshev UPL	15.28
Upper Threshold Limit Based upon IQR	11.89



**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

**Raw Statistics**

Minimum	4.47
Maximum	22.8
Second Largest	19.6
First Quartile	5.69
Median	9.015
Third Quartile	13.4
Mean	10.36
Geometric Mean	9.125
SD	5.379
Coefficient of Variation	0.519
Skewness	0.822

**Log-Transformed Statistics**

Minimum	1.497
Maximum	3.127
Second Largest	2.976
First Quartile	1.738
Median	2.199
Third Quartile	2.592
Mean	2.211
SD	0.519

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.905

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	20.72
95% UPL (t)	19.89
90% Percentile (z)	17.25
95% Percentile (z)	19.21
99% Percentile (z)	22.87

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	24.79
95% UPL (t)	22.89
90% Percentile (z)	17.75
95% Percentile (z)	21.43
99% Percentile (z)	30.52

**Gamma Distribution Test**

k star	3.522
Theta Star	2.941
MLE of Mean	10.36
MLE of Standard Deviation	5.519
nu star	140.9

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.407
5% A-D Critical Value	0.745
K-S Test Statistic	0.16
5% K-S Critical Value	0.195

Data appear Gamma Distributed at 5% Significance Level

**Nonparametric Statistics**

90% Percentile	17.17
95% Percentile	19.76
99% Percentile	22.19

**Assuming Gamma Distribution**

90% Percentile	17.76
95% Percentile	20.78
99% Percentile	27.27
95% WH Approx. Gamma UPL	21.31
95% HW Approx. Gamma UPL	21.63

95% UTL with 90% Coverage	22.8
95% Percentile Bootstrap UTL with 90% Coverage	22.8
95% BCA Bootstrap UTL with 90% Coverage	22.8
95% UPL	22.64
95% Chebyshev UPL	34.38
Upper Threshold Limit Based upon IQR	24.97

95% WH Approx. Gamma UTL with 90% Coverage 22.65  
 95% HW Approx. Gamma UTL with 90% Coverage 23.07

uride

**General Statistics**

Number of Valid Data	10	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	5
Tolerance Factor	2.355	Percent Non-Detects	50.00%

**Raw Statistics**

Minimum Detected	1.4
Maximum Detected	14
Mean of Detected	7.02
SD of Detected	5.997
Minimum Non-Detect	1
Maximum Non-Detect	1

**Log-transformed Statistics**

Minimum Detected	0.336
Maximum Detected	2.639
Mean of Detected	1.584
SD of Detected	1.002
Minimum Non-Detect	0
Maximum Non-Detect	0

**Warning: There are only 5 Detected Values in this data**

**Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions**

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.82
5% Shapiro Wilk Critical Value	0.762

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.907
5% Shapiro Wilk Critical Value	0.762

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

<b>DL/2 Substitution Method</b>	
Mean	3.76
SD	5.272
95% UTL 90% Coverage	16.18
95% UPL (t)	13.9
90% Percentile (z)	10.52
95% Percentile (z)	12.43
99% Percentile (z)	16.02

**Assuming Lognormal Distribution**

<b>DL/2 Substitution Method</b>	
Mean (Log Scale)	0.445
SD (Log Scale)	1.374
95% UTL 90% Coverage	39.67
95% UPL (t)	21.9
90% Percentile (z)	9.078
95% Percentile (z)	14.95
99% Percentile (z)	38.13

**Maximum Likelihood Estimate(MLE) Method**

Mean	0.691
SD	8.177
95% UTL with 90% Coverage	19.95

**Log ROS Method**

Mean in Original Scale	3.668
SD in Original Scale	5.338
95% UTL with 90% Coverage	83.47
95% BCA UTL with 90% Coverage	14
95% Bootstrap (%) UTL with 90% Coverage	14
95% UPL (t)	37.45
90% Percentile (z)	11.41

95% UPL (t)	16.41
90% Percentile (z)	11.17

95% Percentile (z)	14.14	95% Percentile (z)	22.38
99% Percentile (z)	19.71	99% Percentile (z)	79.15

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected)	0.74
Theta Star	9.49
nu star	7.397

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.416
5% A-D Critical Value	0.686
K-S Test Statistic	0.265
5% K-S Critical Value	0.362

**Nonparametric Statistics**

**Kaplan-Meier (KM) Method**

Mean	4.21
SD	4.72
SE of Mean	1.669

Data appear Gamma Distributed at 5% Significance Level

95% KM UTL with 90% Coverage	15.33
95% KM Chebyshev UPL	25.79
95% KM UPL (t)	13.29
90% Percentile (z)	10.26
95% Percentile (z)	11.97
99% Percentile (z)	15.19

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean	3.51
Median	0.7
SD	5.447
k star	0.143
Theta star	24.56
Nu star	2.859
95% Percentile of Chisquare (2k)	1.588
90% Percentile	10.33
95% Percentile	19.49
99% Percentile	46.35

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL	22.55
95% Hawkins Wixley (HW) Approx. Gamma UPL	31.27
95% WH Approx. Gamma UTL with 90% Coverage	34.66
95% HW Approx. Gamma UTL with 90% Coverage	54.87

Note: DL/2 is not a recommended method

Iron

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

**Raw Statistics**

**Log-Transformed Statistics**

Minimum	5680	Minimum	8.645
Maximum	20300	Maximum	9.918
Second Largest	17900	Second Largest	9.793
First Quartile	6953	First Quartile	8.847
Median	10035	Median	9.214
Third Quartile	14325	Third Quartile	9.57
Mean	11010	Mean	9.231
Geometric Mean	10212	SD	0.399
SD	4399		
Coefficient of Variation	0.4		
Skewness	0.603		

**Background Statistics**

Normal Distribution Test

Lognormal Distribution Test

Shapiro Wilk Test Statistic 0.925  
 Shapiro Wilk Critical Value 0.905

Data appear Normal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage 19483  
 95% UPL (t) 18805  
 90% Percentile (z) 16648  
 95% Percentile (z) 18246  
 99% Percentile (z) 21245

**Gamma Distribution Test**

k star 5.82  
 Theta Star 1892  
 MLE of Mean 11010  
 MLE of Standard Deviation 4564  
 nu star 232.8

A-D Test Statistic 0.419  
 5% A-D Critical Value 0.744  
 K-S Test Statistic 0.164  
 5% K-S Critical Value 0.194

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile 17113  
 95% Percentile 19430  
 99% Percentile 24293  
 95% WH Approx. Gamma UPL 19797  
 95% HW Approx. Gamma UPL 19986  
 95% WH Approx. Gamma UTL with 90% Coverage 20802  
 95% HW Approx. Gamma UTL with 90% Coverage 21054

Shapiro Wilk Test Statistic 0.944  
 Shapiro Wilk Critical Value 0.905

Data appear Lognormal at 5% Significance Level

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage 22002  
 95% UPL (t) 20691  
 90% Percentile (z) 17019  
 95% Percentile (z) 19670  
 99% Percentile (z) 25809

**Data Distribution Test**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

90% Percentile 17360  
 95% Percentile 18020  
 99% Percentile 19844

95% UTL with 90% Coverage 20300  
 95% Percentile Bootstrap UTL with 90% Coverage 20300  
 95% BCA Bootstrap UTL with 90% Coverage 20300  
 95% UPL 20180  
 95% Chebyshev UPL 30660  
 Upper Threshold Limit Based upon IQR 25384

Lead

**General Statistics**

Total Number of Observations 19  
 Tolerance Factor 1.949  
 Number of Distinct Observations 19  
 Number of Missing Values 1

**Raw Statistics**

Minimum 2  
 Maximum 13.4  
 Second Largest 9.52  
 First Quartile 3.15  
 Median 4.8  
 Third Quartile 6.38  
 Mean 5.345  
 Geometric Mean 4.751  
 SD 2.866

**Log-Transformed Statistics**

Minimum 0.693  
 Maximum 2.595  
 Second Largest 2.253  
 First Quartile 1.147  
 Median 1.569  
 Third Quartile 1.847  
 Mean 1.558  
 SD 0.489

Coefficient of Variation 0.536

Skewness 1.46

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic 0.865

Shapiro Wilk Critical Value 0.901

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic 0.973

Shapiro Wilk Critical Value 0.901

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage 10.93

95% UPL (t) 10.44

90% Percentile (z) 9.018

95% Percentile (z) 10.06

99% Percentile (z) 12.01

Assuming Lognormal Distribution

95% UTL with 90% Coverage 12.31

95% UPL (t) 11.33

90% Percentile (z) 8.886

95% Percentile (z) 10.61

99% Percentile (z) 14.8

Gamma Distribution Test

k star 3.743

Theta Star 1.428

MLE of Mean 5.345

MLE of Standard Deviation 2.763

nu star 142.2

Data Distribution Test

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic 0.409

5% A-D Critical Value 0.744

K-S Test Statistic 0.146

5% K-S Critical Value 0.199

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

90% Percentile 9.232

95% Percentile 9.908

99% Percentile 12.7

Assuming Gamma Distribution

90% Percentile 9.048

95% Percentile 10.55

99% Percentile 13.75

95% WH Approx. Gamma UPL 10.8

95% HW Approx. Gamma UPL 10.9

95% WH Approx. Gamma UTL with 90% Coverage 11.53

95% HW Approx. Gamma UTL with 90% Coverage 11.68

95% UTL with 90% Coverage 13.4

95% Percentile Bootstrap UTL with 90% Coverage 13.4

95% BCA Bootstrap UTL with 90% Coverage 13.4

95% UPL 13.4

95% Chebyshev UPL 18.16

Upper Threshold Limit Based upon IQR 11.23

Magnesium

General Statistics

Total Number of Observations 20

Number of Distinct Observations 20

Tolerance Factor 1.926

Raw Statistics

Minimum 1950

Maximum 9910

Second Largest 8700

First Quartile 2630

Log-Transformed Statistics

Minimum 7.576

Maximum 9.201

Second Largest 9.071

First Quartile 7.874

Median	4070	Median	8.311
Third Quartile	6778	Third Quartile	8.821
Mean	4800	Mean	8.348
Geometric Mean	4220	SD	0.525
SD	2478		
Coefficient of Variation	0.516		
Skewness	0.633		

### Background Statistics

#### Normal Distribution Test

Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.905

Data appear Normal at 5% Significance Level

#### Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

#### Assuming Normal Distribution

95% UTL with 90% Coverage	9573
95% UPL (t)	9191
90% Percentile (z)	7976
95% Percentile (z)	8876
99% Percentile (z)	10565

#### Assuming Lognormal Distribution

95% UTL with 90% Coverage	11597
95% UPL (t)	10696
90% Percentile (z)	8269
95% Percentile (z)	10006
99% Percentile (z)	14309

#### Gamma Distribution Test

k star	3.468
Theta Star	1384
MLE of Mean	4800
MLE of Standard Deviation	2578
nu star	138.7

Data appear Gamma Distributed at 5% Significance Level

#### Data Distribution Test

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.483
5% A-D Critical Value	0.746
K-S Test Statistic	0.159
5% K-S Critical Value	0.195

#### Nonparametric Statistics

90% Percentile	8349
95% Percentile	8761
99% Percentile	9680

#### Assuming Gamma Distribution

90% Percentile	8256
95% Percentile	9671
99% Percentile	12714
95% WH Approx. Gamma UPL	9927
95% HW Approx. Gamma UPL	10081
95% WH Approx. Gamma UTL with 90% Coverage	10554
95% HW Approx. Gamma UTL with 90% Coverage	10761

#### 95% UTL with 90% Coverage

95% UTL with 90% Coverage	9910
95% Percentile Bootstrap UTL with 90% Coverage	9910
95% BCA Bootstrap UTL with 90% Coverage	9910
95% UPL	9850
95% Chebyshev UPL	15869
Upper Threshold Limit Based upon IQR	12999

## Manganese

### General Statistics

Total Number of Observations	20	Number of Distinct Observations	18
Tolerance Factor	1.926		

**Raw Statistics**

Minimum	97.2
Maximum	405
Second Largest	379
First Quartile	152.5
Median	176
Third Quartile	232.8
Mean	203.8
Geometric Mean	188.8
SD	87.48
Coefficient of Variation	0.429
Skewness	1.227

**Log-Transformed Statistics**

Minimum	4.577
Maximum	6.004
Second Largest	5.938
First Quartile	5.027
Median	5.17
Third Quartile	5.45
Mean	5.24
SD	0.392

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.859
Shapiro Wilk Critical Value	0.905

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	372.3
95% UPL (t)	358.8
90% Percentile (z)	315.9
95% Percentile (z)	347.7
99% Percentile (z)	407.3

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	401.6
95% UPL (t)	378.1
90% Percentile (z)	311.9
95% Percentile (z)	359.7
99% Percentile (z)	469.9

**Gamma Distribution Test**

k star	5.71
Theta Star	35.7
MLE of Mean	203.8
MLE of Standard Deviation	85.29
nu star	228.4

Data appear Gamma Distributed at 5% Significance Level

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.605
5% A-D Critical Value	0.744
K-S Test Statistic	0.191
5% K-S Critical Value	0.194

**Nonparametric Statistics**

90% Percentile	361
95% Percentile	380.3
99% Percentile	400.1

**Assuming Gamma Distribution**

90% Percentile	317.9
95% Percentile	361.3
99% Percentile	452.5
95% WH Approx. Gamma UPL	367.7
95% HW Approx. Gamma UPL	369.8
95% WH Approx. Gamma UTL with 90% Coverage	386.5
95% HW Approx. Gamma UTL with 90% Coverage	389.6

**95% UTL with 90% Coverage**

95% UTL with 90% Coverage	405
95% Percentile Bootstrap UTL with 90% Coverage	405
95% BCA Bootstrap UTL with 90% Coverage	405
95% UPL	403.7
95% Chebyshev UPL	594.6
Upper Threshold Limit Based upon IQR	353.1

**General Statistics**

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!  
 Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!  
 The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mercury was not processed!

**Molybdenum**

**General Statistics**

Number of Valid Data	20	Number of Detected Data	17
Number of Distinct Detected Data	17	Number of Non-Detect Data	3
Tolerance Factor	1.926	Percent Non-Detects	15.00%

**Raw Statistics**

Minimum Detected	0.323
Maximum Detected	3.37
Mean of Detected	1.254
SD of Detected	0.991
Minimum Non-Detect	0.25
Maximum Non-Detect	0.25

**Log-transformed Statistics**

Minimum Detected	-1.13
Maximum Detected	1.215
Mean of Detected	-0.0506
SD of Detected	0.762
Minimum Non-Detect	-1.386
Maximum Non-Detect	-1.386

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.826
5% Shapiro Wilk Critical Value	0.892

Data not Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.938
5% Shapiro Wilk Critical Value	0.892

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

<b>DL/2 Substitution Method</b>	
Mean	1.084
SD	0.999
95% UTL 90% Coverage	3.008
95% UPL (t)	2.854
90% Percentile (z)	2.364
95% Percentile (z)	2.727
99% Percentile (z)	3.408

**Assuming Lognormal Distribution**

<b>DL/2 Substitution Method</b>	
Mean (Log Scale)	-0.355
SD (Log Scale)	1.021
95% UTL 90% Coverage	5.007
95% UPL (t)	4.278
90% Percentile (z)	2.594
95% Percentile (z)	3.758
99% Percentile (z)	7.535

**Maximum Likelihood Estimate(MLE) Method**

Mean	1.007
SD	1.082
95% UTL with 90% Coverage	3.092

**Log ROS Method**

Mean in Original Scale	1.09
SD in Original Scale	0.993
95% UTL with 90% Coverage	4.665
95% BCA UTL with 90% Coverage	3.37
95% Bootstrap (%) UTL with 90% Coverage	3.37
95% UPL (t)	4.02

95% UPL (t)	2.925
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90% Percentile (z)	2.394	90% Percentile (z)	2.503
95% Percentile (z)	2.787	95% Percentile (z)	3.556
99% Percentile (z)	3.525	99% Percentile (z)	6.868

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected)	1.651
Theta Star	0.759
nu star	56.13

**Data Distribution Test with Detected Values Only**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.554
5% A-D Critical Value	0.75
K-S Test Statistic	0.173
5% K-S Critical Value	0.212

**Nonparametric Statistics**

**Kaplan-Meier (KM) Method**

Mean	1.114
SD	0.946

Data appear Gamma Distributed at 5% Significance Level

SE of Mean 0.218

95% KM UTL with 90% Coverage 2.937

95% KM Chebyshev UPL 5.341

95% KM UPL (t) 2.791

90% Percentile (z) 2.327

95% Percentile (z) 2.671

99% Percentile (z) 3.316

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean	1.066
Median	0.659
SD	1.019
k star	0.3

Theta star 3.549

Nu star 12.01

95% Percentile of Chisquare (2k) 2.747

90% Percentile 3.143

95% Percentile 4.873

99% Percentile 9.37

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL 4.45

95% Hawkins Wixley (HW) Approx. Gamma UPL 6.015

95% WH Approx. Gamma UTL with 90% Coverage 5.025

95% HW Approx. Gamma UTL with 90% Coverage 7.017

Note: DL/2 is not a recommended method.

**Nickel**

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

**Raw Statistics**

**Log-Transformed Statistics**

Minimum	4.02	Minimum	1.391
Maximum	22.5	Maximum	3.114
Second Largest	18.6	Second Largest	2.923
First Quartile	5.093	First Quartile	1.628
Median	7.585	Median	2.026
Third Quartile	10.85	Third Quartile	2.383
Mean	9.267	Mean	2.087
Geometric Mean	8.064	SD	0.531
SD	5.31		
Coefficient of Variation	0.573		
Skewness	1.203		

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic 0.861  
 Shapiro Wilk Critical Value 0.905

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic 0.941  
 Shapiro Wilk Critical Value 0.905

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage 19.49  
 95% UPL (t) 18.68  
 90% Percentile (z) 16.07  
 95% Percentile (z) 18  
 99% Percentile (z) 21.62

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage 22.4  
 95% UPL (t) 20.64  
 90% Percentile (z) 15.92  
 95% Percentile (z) 19.3  
 99% Percentile (z) 27.7

**Gamma Distribution Test**

k star 3.224  
 Theta Star 2.875  
 MLE of Mean 9.267  
 MLE of Standard Deviation 5.161  
 nu star 128.9

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic 0.524  
 5% A-D Critical Value 0.746  
 K-S Test Statistic 0.137  
 5% K-S Critical Value 0.195

**Nonparametric Statistics**

90% Percentile 17.25  
 95% Percentile 18.8  
 99% Percentile 21.76

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile 16.19  
 95% Percentile 19.05  
 99% Percentile 25.24

**95% UTL with 90% Coverage**

95% Percentile Bootstrap UTL with 90% Coverage 22.5  
 95% BCA Bootstrap UTL with 90% Coverage 22.5  
 95% UPL 22.31  
 95% Chebyshev UPL 32.98  
 Upper Threshold Limit Based upon IQR 19.49

95% WH Approx. Gamma UPL 19.54  
 95% HW Approx. Gamma UPL 19.75  
 95% WH Approx. Gamma UTL with 90% Coverage 20.81  
 95% HW Approx. Gamma UTL with 90% Coverage 21.12

Nitrate (as N)

**General Statistics**

Number of Valid Data	10	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	1
Tolerance Factor	2.355	Percent Non-Detects	10.00%

**Raw Statistics**

Minimum Detected 1.6  
 Maximum Detected 25  
 Mean of Detected 9.078  
 SD of Detected 8.78  
 Minimum Non-Detect 1  
 Maximum Non-Detect 1

**Log-transformed Statistics**

Minimum Detected 0.47  
 Maximum Detected 3.219  
 Mean of Detected 1.734  
 SD of Detected 1.066  
 Minimum Non-Detect 0  
 Maximum Non-Detect 0

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.833  
5% Shapiro Wilk Critical Value 0.829

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.908  
5% Shapiro Wilk Critical Value 0.829

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

**DL/2 Substitution Method**

Mean 8.22  
SD 8.711  
95% UTL 90% Coverage 28.73  
95% UPL (t) 24.97  
90% Percentile (z) 19.38  
95% Percentile (z) 22.55  
99% Percentile (z) 28.49

**Assuming Lognormal Distribution**

**DL/2 Substitution Method**

Mean (Log Scale) 1.491  
SD (Log Scale) 1.265  
95% UTL 90% Coverage 87.33  
95% UPL (t) 50.54  
90% Percentile (z) 22.47  
95% Percentile (z) 35.57  
99% Percentile (z) 84.22

**Maximum Likelihood Estimate(MLE) Method**

Mean 7.757  
SD 8.899  
95% UTL with 90% Coverage 28.71  
95% UPL (t) 24.87  
90% Percentile (z) 19.16  
95% Percentile (z) 22.39  
99% Percentile (z) 28.46

**Log ROS Method**

Mean in Original Scale 8.211  
SD in Original Scale 8.72  
95% UTL with 90% Coverage 93.64  
95% BCA UTL with 90% Coverage 25  
95% Bootstrap (%) UTL with 90% Coverage 25  
95% UPL (t) 53.32  
90% Percentile (z) 23.13  
95% Percentile (z) 37.13  
99% Percentile (z) 90.21

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected) 0.873  
Theta Star 10.39  
nu star 15.72

A-D Test Statistic 0.418  
5% A-D Critical Value 0.74  
K-S Test Statistic 0.226  
5% K-S Critical Value 0.286

Data appear Gamma Distributed at 5% Significance Level

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

**Kaplan-Meier (KM) Method**

Mean 8.33  
SD 8.167  
SE of Mean 2.739  
95% KM UTL with 90% Coverage 27.56  
95% KM Chebyshev UPL 45.67  
95% KM UPL (t) 24.03  
90% Percentile (z) 18.8  
95% Percentile (z) 21.76  
99% Percentile (z) 27.33

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean 8.17  
Median 4.35  
SD 8.762  
k star 0.312

Theta star	26.22	Gamma ROS Limits with Extrapolated Data	
Nu star	6.233	95% Wilson Hilferty (WH) Approx. Gamma UPL	38.17
95% Percentile of Chisquare (2k)	2.816	95% Hawkins Wixley (HW) Approx. Gamma UPL	50.14
		95% WH Approx. Gamma UTL with 90% Coverage	52.41
90% Percentile	23.98	95% HW Approx. Gamma UTL with 90% Coverage	74.35
95% Percentile	36.92		
99% Percentile	70.37		

Note: DL/2 is not a recommended method

Write (as N)

#### General Statistics

Number of Valid Data	10	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	4
Tolerance Factor	2.355	Percent Non-Detects	40.00%

#### Raw Statistics

Minimum Detected	1
Maximum Detected	1.6
Mean of Detected	1.3
SD of Detected	0.237
Minimum Non-Detect	1
Maximum Non-Detect	1

#### Log-transformed Statistics

Minimum Detected	0
Maximum Detected	0.47
Mean of Detected	0.248
SD of Detected	0.185
Minimum Non-Detect	0
Maximum Non-Detect	0

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

#### Background Statistics

##### Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.949
5% Shapiro Wilk Critical Value	0.788

Data appear Normal at 5% Significance Level

##### Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.948
5% Shapiro Wilk Critical Value	0.788

Data appear Lognormal at 5% Significance Level

##### Assuming Normal Distribution

DL/2 Substitution Method	
Mean	0.98
SD	0.449
95% UTL 90% Coverage	2.038
95% UPL (t)	1.844
90% Percentile (z)	1.556
95% Percentile (z)	1.719
99% Percentile (z)	2.025

##### Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean (Log Scale)	-0.128
SD (Log Scale)	0.505
95% UTL 90% Coverage	2.891
95% UPL (t)	2.324
90% Percentile (z)	1.681
95% Percentile (z)	2.02
99% Percentile (z)	2.85

##### Maximum Likelihood Estimate(MLE) Method

Mean	1.085
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##### Log ROS Method

Mean in Original Scale	1.088
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SD	0.333	SD in Original Scale	0.331
95% UTL with 90% Coverage	1.87	95% UTL with 90% Coverage	2.169
		95% BCA UTL with 90% Coverage	1.6
		95% Bootstrap (%) UTL with 90% Coverage	1.6
95% UPL (t)	1.726	95% UPL (t)	1.896
90% Percentile (z)	1.512	90% Percentile (z)	1.553
95% Percentile (z)	1.633	95% Percentile (z)	1.739
99% Percentile (z)	1.861	99% Percentile (z)	2.149
<b>Gamma Distribution Test with Detected Values Only</b>		<b>Data Distribution Test with Detected Values Only</b>	
k star (bias corrected)	17.92	Data appear Normal at 5% Significance Level	
Theta Star	0.0725		
nu star	215.1		
A-D Test Statistic	0.259	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.697	<b>Kaplan-Meier (KM) Method</b>	
K-S Test Statistic	0.193	Mean	1.18
5% K-S Critical Value	0.332	SD	0.223
<b>Data appear Gamma Distributed at 5% Significance Level</b>		SE of Mean	0.0771
<b>Assuming Gamma Distribution</b>		95% KM UTL with 90% Coverage	1.704
<b>Gamma ROS Statistics with Extrapolated Data</b>		95% KM Chebyshev UPL	2.198
Mean	0.891	95% KM UPL (t)	1.608
Median	1.05	90% Percentile (z)	1.465
SD	0.58	95% Percentile (z)	1.546
k star	0.372	99% Percentile (z)	1.698
Theta star	2.393	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	7.446	95% Wilson Hilferty (WH) Approx. Gamma UPL	3.858
95% Percentile of Chisquare (2k)	3.171	95% Hawkins Wixley (HW) Approx. Gamma UPL	5.343
		95% WH Approx. Gamma UTL with 90% Coverage	5.159
90% Percentile	2.548	95% HW Approx. Gamma UTL with 90% Coverage	7.73
95% Percentile	3.794		
99% Percentile	6.953		

Note: DL/2 is not a recommended method.

**o-Phosphate (as P)**

<b>General Statistics</b>			
Number of Valid Data	9	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	3
Tolerance Factor	2.454	Percent Non-Detects	33.33%
Number of Missing Values	1		
<b>Raw Statistics</b>		<b>Log-transformed Statistics</b>	
Minimum Detected	1.1	Minimum Detected	0.0953
Maximum Detected	2.5	Maximum Detected	0.916
Mean of Detected	1.617	Mean of Detected	0.438
SD of Detected	0.531	SD of Detected	0.314
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results

Background Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic 0.91  
5% Shapiro Wilk Critical Value 0.788

Data appear Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic 0.94  
5% Shapiro Wilk Critical Value 0.788

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method  
Mean 1.244  
SD 0.698  
95% UTL 90% Coverage 2.958  
95% UPL (t) 2.613  
90% Percentile (z) 2.139  
95% Percentile (z) 2.393  
99% Percentile (z) 2.869

Assuming Lognormal Distribution

DL/2 Substitution Method  
Mean (Log Scale) 0.061  
SD (Log Scale) 0.618  
95% UTL 90% Coverage 4.839  
95% UPL (t) 3.567  
90% Percentile (z) 2.346  
95% Percentile (z) 2.936  
99% Percentile (z) 4.473

Maximum Likelihood Estimate(MLE) Method

Mean 1.26  
SD 0.674  
95% UTL with 90% Coverage 2.915  
95% UPL (t) 2.582  
90% Percentile (z) 2.124  
95% Percentile (z) 2.369  
99% Percentile (z) 2.829

Log ROS Method

Mean in Original Scale 1.301  
SD in Original Scale 0.636  
95% UTL with 90% Coverage 4.01  
95% BCA UTL with 90% Coverage 2.5  
95% Bootstrap (%) UTL with 90% Coverage 2.5  
95% UPL (t) 3.128  
90% Percentile (z) 2.223  
95% Percentile (z) 2.669  
99% Percentile (z) 3.76

Gamma Distribution Test with Detected Values Only

k star (bias corrected) 6.112  
Theta Star 0.265  
nu star 73.34

Data Distribution Test with Detected Values Only

Data appear Normal at 5% Significance Level

A-D Test Statistic 0.297  
5% A-D Critical Value 0.698  
K-S Test Statistic 0.236  
5% K-S Critical Value 0.332

Nonparametric Statistics

Kaplan-Meier (KM) Method  
Mean 1.444  
SD 0.465  
SE of Mean 0.17

Data appear Gamma Distributed at 5% Significance Level

95% KM UTL with 90% Coverage 2.584  
95% KM Chebyshev UPL 3.579  
95% KM UPL (t) 2.355  
90% Percentile (z) 2.04  
95% Percentile (z) 2.209  
99% Percentile (z) 2.525

Assuming Gamma Distribution

Gamma ROS Statistics with Extrapolated Data  
Mean 1.096  
Median 1.2  
SD 0.888

k star	0.23		
Theta star	4.766	Gamma ROS Limits with Extrapolated Data	
Nu star	4.139	95% Wilson Hilferty (WH) Approx. Gamma UPL	6.411
95% Percentile of Chisquare (2k)	2.281	95% Hawkins Wixley (HW) Approx. Gamma UPL	9.737
		95% WH Approx. Gamma UTL with 90% Coverage	9.456
90% Percentile	3.305	95% HW Approx. Gamma UTL with 90% Coverage	16.13
95% Percentile	5.436		
99% Percentile	11.18		

Note: DL/2 is not a recommended method

**Phosphorus, Total**

**General Statistics**

Number of Valid Data	10	Number of Detected Data	9
Number of Distinct Detected Data	7	Number of Non-Detect Data	1
Tolerance Factor	2.355	Percent Non-Detects	10.00%

**Raw Statistics**

**Log-transformed Statistics**

Minimum Detected	0.84	Minimum Detected	-0.174
Maximum Detected	380	Maximum Detected	5.94
Mean of Detected	182.9	Mean of Detected	3.349
SD of Detected	175.2	SD of Detected	2.904
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.763	Shapiro Wilk Test Statistic	0.725
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

**Assuming Normal Distribution**

**Assuming Lognormal Distribution**

DL/2 Substitution Method		DL/2 Substitution Method	
Mean	164.6	Mean (Log Scale)	2.875
SD	174.9	SD (Log Scale)	3.121
95% UTL 90% Coverage	576.6	95% UTL 90% Coverage	27583
95% UPL (t)	501	95% UPL (t)	7154
90% Percentile (z)	388.8	90% Percentile (z)	967.5
95% Percentile (z)	452.4	95% Percentile (z)	3007
99% Percentile (z)	571.6	99% Percentile (z)	25223

Maximum Likelihood Estimate(MLE) Method

Log ROS Method

Mean	154.6	Mean in Original Scale	164.6
SD	180.1	SD in Original Scale	175
95% UTL with 90% Coverage	578.7	95% UTL with 90% Coverage	45068
		95% BCA UTL with 90% Coverage	380
		95% Bootstrap (%) UTL with 90% Coverage	380
95% UPL (t)	500.8	95% UPL (t)	10366
90% Percentile (z)	385.4	90% Percentile (z)	1173
95% Percentile (z)	450.8	95% Percentile (z)	4033
99% Percentile (z)	573.5	99% Percentile (z)	40886

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected)	0.314
Theta Star	582.4
nu star	5.651

**Data Distribution Test with Detected Values Only**

Data do not follow a Discernable Distribution (0.05)

A-D Test Statistic	1.322
5% A-D Critical Value	0.796
K-S Test Statistic	0.348
5% K-S Critical Value	0.299

**Nonparametric Statistics**

**Kaplan-Meier (KM) Method**

Mean	164.7
SD	165.9
SE of Mean	55.65
95% KM UTL with 90% Coverage	555.4
95% KM Chebyshev UPL	923.1

Data not Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean	168.7
Median	160.7
SD	171.1
k star	0.333
Theta star	506.4
Nu star	6.663
95% Percentile of Chisquare (2k)	2.946
90% Percentile	490.8
95% Percentile	745.9
99% Percentile	1400

95% KM UPL (t)	483.6
90% Percentile (z)	377.3
95% Percentile (z)	437.6
99% Percentile (z)	550.6

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL	937.9
95% Hawkins Wixley (HW) Approx. Gamma UPL	1172
95% WH Approx. Gamma UTL with 90% Coverage	1345
95% HW Approx. Gamma UTL with 90% Coverage	1823

Note: DL/2 is not a recommended method.

**Potassium**

**General Statistics**

Total Number of Observations	18	Number of Distinct Observations	18
Tolerance Factor	1.974	Number of Missing Values	2

**Raw Statistics**

**Log-Transformed Statistics**

Minimum	1160	Minimum	7.056
Maximum	3080	Maximum	8.033
Second Largest	2890	Second Largest	7.969
First Quartile	1453	First Quartile	7.279
Median	2015	Median	7.608
Third Quartile	2440	Third Quartile	7.8
Mean	2022	Mean	7.568



Geometric Mean	1935	SD	0.31
SD	600.6		
Coefficient of Variation	0.297		
Skewness	0.136		

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.897

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.897

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	3207
95% UPL (1)	3095
90% Percentile (z)	2791
95% Percentile (z)	3010
99% Percentile (z)	3419

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	3567
95% UPL (1)	3366
90% Percentile (z)	2878
95% Percentile (z)	3221
99% Percentile (z)	3978

**Gamma Distribution Test**

k star	9.65
Theta Star	209.5
MLE of Mean	2022
MLE of Standard Deviation	650.8
nu star	347.4

Data appear Gamma Distributed at 5% Significance Level

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.349
5% A-D Critical Value	0.739
K-S Test Statistic	0.137
5% K-S Critical Value	0.203

**Nonparametric Statistics**

90% Percentile	2806
95% Percentile	2919
99% Percentile	3048

**Assuming Gamma Distribution**

90% Percentile	2888
95% Percentile	3197
99% Percentile	3834
95% WH Approx. Gamma UPL	3246
95% HW Approx. Gamma UPL	3273
95% WH Approx. Gamma UTL with 90% Coverage	3406
95% HW Approx. Gamma UTL with 90% Coverage	3441

95% UTL with 90% Coverage	3080
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95% Percentile Bootstrap UTL with 90% Coverage	3080
95% BCA Bootstrap UTL with 90% Coverage	3080
95% UPL	3080
95% Chebyshev UPL	4711
Upper Threshold Limit Based upon IQR	3921

**Selenium**

**General Statistics**

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**

**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**

**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**

The data set for variable Selenium was not processed!

Silver

General Statistics

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!  
 Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!  
 The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver was not processed!

Sodium

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

Raw Statistics

Log-Transformed Statistics

Minimum	65.3	Minimum	4.179
Maximum	4190	Maximum	8.34
Second Largest	3690	Second Largest	8.213
First Quartile	186.5	First Quartile	5.228
Median	727.5	Median	6.568
Third Quartile	1583	Third Quartile	7.367
Mean	1198	Mean	6.438
Geometric Mean	625	SD	1.324
SD	1219		
Coefficient of Variation	1.017		
Skewness	1.263		

Background Statistics

Normal Distribution Test

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution

Assuming Lognormal Distribution

95% UTL with 90% Coverage	3546	95% UTL with 90% Coverage	8010
95% UPL (t)	3358	95% UPL (t)	6531
90% Percentile (z)	2760	90% Percentile (z)	3412
95% Percentile (z)	3203	95% Percentile (z)	5520
99% Percentile (z)	4034	99% Percentile (z)	13612

Gamma Distribution Test

Data Distribution Test

k star	0.797	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1504		
MLE of Mean	1198		
MLE of Standard Deviation	1342		
nu star	31.88		
A-D Test Statistic	0.361	Nonparametric Statistics	
5% A-D Critical Value	0.773	90% Percentile	2997
K-S Test Statistic	0.133	95% Percentile	3715
5% K-S Critical Value	0.2	99% Percentile	4095

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	4190
90% Percentile	2917	95% Percentile Bootstrap UTL with 90% Coverage	4190
95% Percentile	3893	95% BCA Bootstrap UTL with 90% Coverage	4190
99% Percentile	6199	95% UPL	4165
		95% Chebyshev UPL	6643
95% WH Approx. Gamma UPL	4106	Upper Threshold Limit Based upon IQR	3677
95% HW Approx. Gamma UPL	4409		
95% WH Approx. Gamma UTL with 90% Coverage	4570		
95% HW Approx. Gamma UTL with 90% Coverage	4980		

TDS

General Statistics			
Total Number of Observations	10	Number of Distinct Observations	10
Tolerance Factor	2.355		

Raw Statistics		Log-Transformed Statistics	
Minimum	164	Minimum	5.1
Maximum	4900	Maximum	8.497
Second Largest	4730	Second Largest	8.462
First Quartile	628	First Quartile	6.433
Median	1024	Median	6.91
Third Quartile	3055	Third Quartile	8.015
Mean	1940	Mean	7.109
Geometric Mean	1222	SD	1.092
SD	1781		
Coefficient of Variation	0.918		
Skewness	0.887		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	6135	95% UTL with 90% Coverage	16012
95% UPL (t)	5365	95% UPL (t)	9984

90% Percentile (z) 4223  
 95% Percentile (z) 4870  
 99% Percentile (z) 6084

90% Percentile (z) 4957  
 95% Percentile (z) 7372  
 99% Percentile (z) 15519

**Gamma Distribution Test**

k star 0.922  
 Theta Star 2103  
 MLE of Mean 1940  
 MLE of Standard Deviation 2020  
 nu star 18.45

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic 0.382  
 5% A-D Critical Value 0.744  
 K-S Test Statistic 0.197  
 5% K-S Critical Value 0.273

**Nonparametric Statistics**

90% Percentile 4747  
 95% Percentile 4824  
 99% Percentile 4885

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile 4557  
 95% Percentile 5981  
 99% Percentile 9307

95% UTL with 90% Coverage 4900  
 95% Percentile Bootstrap UTL with 90% Coverage 4900  
 95% BCA Bootstrap UTL with 90% Coverage 4900  
 95% UPL 4900

95% WH Approx. Gamma UPL 6755  
 95% HW Approx. Gamma UPL 7204

95% Chebyshev UPL 10084  
 Upper Threshold Limit Based upon IQR 6696

95% WH Approx. Gamma UTL with 90% Coverage 8752  
 95% HW Approx. Gamma UTL with 90% Coverage 9647

**Sulfate**

**General Statistics**

Number of Valid Data	9	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	3
Tolerance Factor	2.454	Percent Non-Detects	33.33%

**Raw Statistics**

Minimum Detected	14
Maximum Detected	750
Mean of Detected	239.5
SD of Detected	276
Minimum Non-Detect	10
Maximum Non-Detect	10

**Log-transformed Statistics**

Minimum Detected	2.639
Maximum Detected	6.62
Mean of Detected	4.757
SD of Detected	1.473
Minimum Non-Detect	2.303
Maximum Non-Detect	2.303

**Warning: There are only 6 Detected Values in this data**

**Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions**

**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.833  
 5% Shapiro Wilk Critical Value 0.788

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.972  
 5% Shapiro Wilk Critical Value 0.788

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method  
 Mean 161.3  
 SD 247.7  
 95% UTL 90% Coverage 769.3  
 95% UPL (t) 646.9  
 90% Percentile (z) 478.8  
 95% Percentile (z) 568.8  
 99% Percentile (z) 737.7

**Assuming Lognormal Distribution**

DL/2 Substitution Method  
 Mean (Log Scale) 3.708  
 SD (Log Scale) 1.958  
 95% UTL 90% Coverage 4973  
 95% UPL (t) 1891  
 90% Percentile (z) 501  
 95% Percentile (z) 1020  
 99% Percentile (z) 3873

**Maximum Likelihood Estimate(MLE) Method**

Mean 88.5  
 SD 313.3  
 95% UTL with 90% Coverage 857.3  
 95% UPL (t) 702.6  
 90% Percentile (z) 490  
 95% Percentile (z) 603.8  
 99% Percentile (z) 817.3

**Log ROS Method**

Mean in Original Scale 160.7  
 SD in Original Scale 248.2  
 95% UTL with 90% Coverage 9618  
 95% BCA UTL with 90% Coverage 750  
 95% Bootstrap (%) UTL with 90% Coverage 750  
 95% UPL (t) 3038  
 90% Percentile (z) 623.7  
 95% Percentile (z) 1456  
 99% Percentile (z) 7140

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected) 0.521  
 Theta Star 459.7  
 nu star 6.252

A-D Test Statistic 0.195  
 5% A-D Critical Value 0.719  
 K-S Test Statistic 0.156  
 5% K-S Critical Value 0.343

Data appear Gamma Distributed at 5% Significance Level

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

Kaplan-Meier (KM) Method  
 Mean 164.3  
 SD 231.6  
 SE of Mean 84.56

95% KM UTL with 90% Coverage 732.7  
 95% KM Chebyshev UPL 1228  
 95% KM UPL (t) 618.3  
 90% Percentile (z) 461.1  
 95% Percentile (z) 545.3  
 99% Percentile (z) 703.1

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean 159.7  
 Median 37  
 SD 248.9  
 k star 0.155  
 Theta star 1029  
 Nu star 2.793  
 95% Percentile of Chisquare (2k) 1.697  
 90% Percentile 475.5  
 95% Percentile 872.9  
 99% Percentile 2018

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL 1023  
 95% Hawkins Wixley (HW) Approx. Gamma UPL 1461  
 95% WH Approx. Gamma UTL with 90% Coverage 1607  
 95% HW Approx. Gamma UTL with 90% Coverage 2621

Note: DL/2 is not a recommended method

Thallium

General Statistics

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Thallium was not processed!

KN

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
Tolerance Factor	2.355		

Raw Statistics

Log-Transformed Statistics

Minimum	70	Minimum	4.248
Maximum	600	Maximum	6.397
Second Largest	320	Second Largest	5.768
First Quartile	130	First Quartile	4.868
Median	165	Median	5.102
Third Quartile	195	Third Quartile	5.272
Mean	204.4	Mean	5.127
Geometric Mean	168.6	SD	0.621
SD	155.5		
Coefficient of Variation	0.761		
Skewness	2.152		

Background Statistics

Normal Distribution Test

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842

Data not Normal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

Assuming Lognormal Distribution

95% UTL with 90% Coverage	570.6	95% UTL with 90% Coverage	727.1
95% UPL (t)	503.4	95% UPL (t)	555.9
90% Percentile (z)	403.7	90% Percentile (z)	373.5
95% Percentile (z)	460.2	95% Percentile (z)	467.9
99% Percentile (z)	566.2	99% Percentile (z)	714.3

Gamma Distribution Test

Data Distribution Test

k star	1.992	Data appear Gamma Distributed at 5% Significance Level
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Theta Star	102.6
MLE of Mean	204.4
MLE of Standard Deviation	144.8
nu star	39.85

A-D Test Statistic	0.487
5% A-D Critical Value	0.733
K-S Test Statistic	0.234
5% K-S Critical Value	0.269

**Nonparametric Statistics**

90% Percentile	348
95% Percentile	474
99% Percentile	574.8

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	397.9
95% Percentile	485.4
99% Percentile	679.6

95% UTL with 90% Coverage	600
95% Percentile Bootstrap UTL with 90% Coverage	600
95% BCA Bootstrap UTL with 90% Coverage	600
95% UPL	600
95% Chebyshev UPL	915.4
Upper Threshold Limit Based upon IQR	292.5

95% WH Approx. Gamma UPL	517.8
95% HW Approx. Gamma UPL	524.1

95% WH Approx. Gamma UTL with 90% Coverage	629
95% HW Approx. Gamma UTL with 90% Coverage	645.9

**Total Phosphate**

**General Statistics**

Number of Valid Data	10	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	1
Tolerance Factor	2.355	Percent Non-Detects	10.00%

**Raw Statistics**

Minimum Detected	2.6
Maximum Detected	1200
Mean of Detected	558.6
SD of Detected	536.6
Minimum Non-Detect	1.5
Maximum Non-Detect	1.5

**Log-transformed Statistics**

Minimum Detected	0.956
Maximum Detected	7.09
Mean of Detected	4.464
SD of Detected	2.905
Minimum Non-Detect	0.405
Maximum Non-Detect	0.405

**Warning: There are only 9 Detected Values in this data**

**Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions**

**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.778
5% Shapiro Wilk Critical Value	0.829

**Data not Normal at 5% Significance Level**

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.727
5% Shapiro Wilk Critical Value	0.829

**Data not Lognormal at 5% Significance Level**

**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	502.9
SD	535.8
95% UTL 90% Coverage	1765
95% UPL (t)	1533
90% Percentile (z)	1190
95% Percentile (z)	1384
99% Percentile (z)	1749

**Maximum Likelihood Estimate(MLE) Method**

Mean	472.3
SD	551.4
95% UTL with 90% Coverage	1771
95% UPL (t)	1532
90% Percentile (z)	1179
95% Percentile (z)	1379
99% Percentile (z)	1755

**Assuming Lognormal Distribution**

DL/2 Substitution Method	
Mean (Log Scale)	3.989
SD (Log Scale)	3.124
95% UTL 90% Coverage	84599
95% UPL (t)	21912
90% Percentile (z)	2958
95% Percentile (z)	9202
99% Percentile (z)	77355

**Log ROS Method**

Mean in Original Scale	502.8
SD in Original Scale	535.9
95% UTL with 90% Coverage	138262
95% BCA UTL with 90% Coverage	1200
95% Bootstrap (%) UTL with 90% Coverage	1200
95% UPL (t)	31759
90% Percentile (z)	3588
95% Percentile (z)	12347
99% Percentile (z)	125422

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected)	0.314
Theta Star	1780
nu star	5.648

A-D Test Statistic	1.299
5% A-D Critical Value	0.796
K-S Test Statistic	0.345
5% K-S Critical Value	0.299

Data not Gamma Distributed at 5% Significance Level

**Data Distribution Test with Detected Values Only**

Data do not follow a Discernable Distribution (0.05)

**Nonparametric Statistics**

**Kaplan-Meier (KM) Method**

Mean	503
SD	508.1
SE of Mean	170.4

95% KM UTL with 90% Coverage 1700

95% KM Chebyshev UPL 2826

95% KM UPL (t)	1480
90% Percentile (z)	1154
95% Percentile (z)	1339
99% Percentile (z)	1685

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean	514.7
Median	479.6
SD	524.7
k star	0.332
Theta star	1548
Nu star	6.648
95% Percentile of Chisquare (2k)	2.941
90% Percentile	1498
95% Percentile	2277
99% Percentile	4278

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL	2863
95% Hawkins Wixley (HW) Approx. Gamma UPL	3574
95% WH Approx. Gamma UTL with 90% Coverage	4107
95% HW Approx. Gamma UTL with 90% Coverage	5562

Note: DL/2 is not a recommended method.

Vanadium



Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

Raw Statistics		Log-Transformed Statistics	
Minimum	9.82	Minimum	2.284
Maximum	45.5	Maximum	3.818
Second Largest	38.5	Second Largest	3.651
First Quartile	11.85	First Quartile	2.472
Median	18.4	Median	2.912
Third Quartile	27.63	Third Quartile	3.319
Mean	21.05	Mean	2.941
Geometric Mean	18.93	SD	0.472
SD	10.1		
Coefficient of Variation	0.48		
Skewness	0.874		

**Background Statistics**

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	40.5	95% UTL with 90% Coverage	46.98
95% UPL (t)	38.95	95% UPL (t)	43.68
90% Percentile (z)	33.99	90% Percentile (z)	34.66
95% Percentile (z)	37.66	95% Percentile (z)	41.14
99% Percentile (z)	44.55	99% Percentile (z)	56.75

Gamma Distribution Test		Data Distribution Test	
k star	4.18	Data appear Normal at 5% Significance Level	
Theta Star	5.035		
MLE of Mean	21.05		
MLE of Standard Deviation	10.29		
nu star	167.2		

A-D Test		Nonparametric Statistics	
A-D Test Statistic	0.437	90% Percentile	32.2
5% A-D Critical Value	0.745	95% Percentile	38.85
K-S Test Statistic	0.139	99% Percentile	44.17
5% K-S Critical Value	0.194		

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 90% Coverage	
90% Percentile	34.84	95% Percentile Bootstrap UTL with 90% Coverage	45.5
95% Percentile	40.33	95% BCA Bootstrap UTL with 90% Coverage	45.5
99% Percentile	52.02	95% UPL	45.15
		95% Chebyshev UPL	66.17
95% WH Approx. Gamma UPL	41.25	Upper Threshold Limit Based upon IQR	51.29
95% HW Approx. Gamma UPL	41.74		
95% WH Approx. Gamma UTL with 90% Coverage	43.66		
95% HW Approx. Gamma UTL with 90% Coverage	44.33		

General Statistics			
Total Number of Observations	20	Number of Distinct Observations	19
Tolerance Factor	1.926		
Raw Statistics		Log-Transformed Statistics	
Minimum	13.5	Minimum	2.603
Maximum	55.8	Maximum	4.022
Second Largest	54.9	Second Largest	4.006
First Quartile	18.75	First Quartile	2.929
Median	24.2	Median	3.186
Third Quartile	32.8	Third Quartile	3.49
Mean	27.45	Mean	3.231
Geometric Mean	25.31	SD	0.407
SD	11.95		
Coefficient of Variation	0.435		
Skewness	1.212		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	50.47	95% UTL with 90% Coverage	55.45
95% UPL (t)	48.62	95% UPL (t)	52.08
90% Percentile (z)	42.76	90% Percentile (z)	42.65
95% Percentile (z)	47.11	95% Percentile (z)	49.45
99% Percentile (z)	55.25	99% Percentile (z)	65.27
Gamma Distribution Test		Data Distribution Test	
k star	5.407	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5.076		
MLE of Mean	27.45		
MLE of Standard Deviation	11.8		
nu star	216.3		
A-D Test Statistic	0.383	Nonparametric Statistics	
5% A-D Critical Value	0.744	90% Percentile	40.59
K-S Test Statistic	0.116	95% Percentile	54.95
5% K-S Critical Value	0.194	99% Percentile	55.63
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	55.8
90% Percentile	43.24	95% Percentile Bootstrap UTL with 90% Coverage	55.8
95% Percentile	49.3	95% BCA Bootstrap UTL with 90% Coverage	55.8
99% Percentile	62.05	95% UPL	55.76
		95% Chebyshev UPL	80.82

95% WH Approx. Gamma UPL	50.22																		
95% HW Approx. Gamma UPL	50.59																		
95% WH Approx. Gamma UTL with 90% Coverage	52.85																		
95% HW Approx. Gamma UTL with 90% Coverage	53.37																		

Upper Threshold Limit Based upon IQR	53.88																		

**ATTACHMENT A-3**  
**STATISTICAL ANALYSIS OUTPUT SHEETS**



General Background Statistics for Data Sets with Non-Detects

User Selected Options

From File	Data.no outliers.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alkalinity

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Tolerance Factor	2.454	Number of Missing Values	1

Raw Statistics

Minimum	45
Maximum	860
Second Largest	800
First Quartile	180
Median	210
Third Quartile	480
Mean	366.1
Geometric Mean	265.1
SD	291
Coefficient of Variation	0.795
Skewness	0.958

Log-Transformed Statistics

Minimum	3.807
Maximum	6.757
Second Largest	6.685
First Quartile	5.193
Median	5.347
Third Quartile	6.174
Mean	5.58
SD	0.918

Warning: There are only 9 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.829

Data appear Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.829

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	1080
95% UPL (t)	936.5
90% Percentile (z)	739
95% Percentile (z)	844.7
99% Percentile (z)	1043

Assuming Lognormal Distribution

95% UTL with 90% Coverage	2519
95% UPL (t)	1601
90% Percentile (z)	859.2
95% Percentile (z)	1199
99% Percentile (z)	2241

Gamma Distribution Test

k star	1.205
Theta Star	303.8

Data Distribution Test

Data appear Normal at 5% Significance Level

MLE of Mean	366.1		
MLE of Standard Deviation	333.5		
nu star	21.69		
A-D Test Statistic	0.329	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.733	90% Percentile	812
K-S Test Statistic	0.209	95% Percentile	836
5% K-S Critical Value	0.283	99% Percentile	855.2
Data appear Gamma Distributed at 5% Significance Level			
<b>Assuming Gamma Distribution</b>		95% UTL with 90% Coverage	860
90% Percentile	805	95% Percentile Bootstrap UTL with 90% Coverage	860
95% Percentile	1027	95% BCA Bootstrap UTL with 90% Coverage	860
99% Percentile	1537	95% UPL	860
		95% Chebyshev UPL	1703
95% WH Approx. Gamma UPL	1149	Upper Threshold Limit Based upon IQR	930
95% HW Approx. Gamma UPL	1216		
95% WH Approx. Gamma UTL with 90% Coverage	1493		
95% HW Approx. Gamma UTL with 90% Coverage	1629		

**Aluminum**

<b>General Statistics</b>			
Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		
<b>Raw Statistics</b>		<b>Log-Transformed Statistics</b>	
Minimum	3870	Minimum	8.261
Maximum	20300	Maximum	9.918
Second Largest	16500	Second Largest	9.711
First Quartile	4645	First Quartile	8.444
Median	8675	Median	9.066
Third Quartile	13250	Third Quartile	9.491
Mean	9360	Mean	9.011
Geometric Mean	8191	SD	0.536
SD	4895		
Coefficient of Variation	0.523		
Skewness	0.672		
<b>Background Statistics</b>			
<b>Normal Distribution Test</b>		<b>Lognormal Distribution Test</b>	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
<b>Assuming Normal Distribution</b>		<b>Assuming Lognormal Distribution</b>	
95% UTL with 90% Coverage	18787	95% UTL with 90% Coverage	22998
95% UPL (t)	18033	95% UPL (t)	21174
90% Percentile (z)	15633	90% Percentile (z)	16281
95% Percentile (z)	17411	95% Percentile (z)	19781

99% Percentile (z)	20747	99% Percentile (z)	28502
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<b>Gamma Distribution Test</b>	
k star	3.357
Theta Star	2788
MLE of Mean	9360
MLE of Standard Deviation	5109
nu star	134.3

<b>Data Distribution Test</b>	
Data appear Normal at 5% Significance Level	

A-D Test Statistic	0.587
5% A-D Critical Value	0.746
K-S Test Statistic	0.2
5% K-S Critical Value	0.195

<b>Nonparametric Statistics</b>	
90% Percentile	15870
95% Percentile	16690
99% Percentile	19578

Data follow Appx. Gamma Distribution at 5% Significance Level

<b>Assuming Gamma Distribution</b>	
90% Percentile	16210
95% Percentile	19028
99% Percentile	25100
95% WH Approx. Gamma UPL	19543
95% HW Approx. Gamma UPL	19868
95% WH Approx. Gamma UTL with 90% Coverage	20795
95% HW Approx. Gamma UTL with 90% Coverage	21228

95% UTL with 90% Coverage	20300
95% Percentile Bootstrap UTL with 90% Coverage	20300
95% BCA Bootstrap UTL with 90% Coverage	20300
95% UPL	20110
95% Chebyshev UPL	31223
Upper Threshold Limit Based upon IQR	26158

**Antimony**

<b>General Statistics</b>			
Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs! Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit! The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony was not processed!

**Arsenic**

<b>General Statistics</b>			
Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

<b>Raw Statistics</b>	
Minimum	1.58
Maximum	9.96
Second Largest	9.58
First Quartile	1.913

<b>Log-Transformed Statistics</b>	
Minimum	0.457
Maximum	2.299
Second Largest	2.26
First Quartile	0.648



Median	3.955	Median	1.375
Third Quartile	6.213	Third Quartile	1.826
Mean	4.504	Mean	1.322
Geometric Mean	3.751	SD	0.629
SD	2.766		
Coefficient of Variation	0.614		
Skewness	0.797		

**Background Statistics**

<b>Normal Distribution Test</b>		<b>Lognormal Distribution Test</b>	
Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

<b>Assuming Normal Distribution</b>		<b>Assuming Lognormal Distribution</b>	
95% UTL with 90% Coverage	9.83	95% UTL with 90% Coverage	12.59
95% UPL (t)	9.404	95% UPL (t)	11.42
90% Percentile (z)	8.048	90% Percentile (z)	8.394
95% Percentile (z)	9.053	95% Percentile (z)	10.55
99% Percentile (z)	10.94	99% Percentile (z)	16.19

<b>Gamma Distribution Test</b>		<b>Data Distribution Test</b>	
k star	2.49	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.809		
MLE of Mean	4.504		
MLE of Standard Deviation	2.854		
nu star	99.59		

A-D Test Statistic	0.655	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.748	90% Percentile	8.95
K-S Test Statistic	0.166	95% Percentile	9.599
5% K-S Critical Value	0.195	99% Percentile	9.888

Data appear Gamma Distributed at 5% Significance Level

<b>Assuming Gamma Distribution</b>		95% UTL with 90% Coverage		9.96
90% Percentile	8.328	95% Percentile Bootstrap UTL with 90% Coverage		9.96
95% Percentile	9.985	95% BCA Bootstrap UTL with 90% Coverage		9.96
99% Percentile	13.61	95% UPL		9.941
		95% Chebyshev UPL		16.86
95% WH Approx. Gamma UPL	10.31	Upper Threshold Limit Based upon IQR		12.66
95% HW Approx. Gamma UPL	10.52			
95% WH Approx. Gamma UTL with 90% Coverage	11.05			
95% HW Approx. Gamma UTL with 90% Coverage	11.34			

Barium

**General Statistics**

Total Number of Observations	19	Number of Distinct Observations	18
Tolerance Factor	1.949	Number of Missing Values	1

**Raw Statistics**

Minimum	36
Maximum	177
Second Largest	130
First Quartile	43.3
Median	57.4
Third Quartile	89.25
Mean	72.01
Geometric Mean	64.14
SD	38.79
Coefficient of Variation	0.539
Skewness	1.393

**Log-Transformed Statistics**

Minimum	3.584
Maximum	5.176
Second Largest	4.868
First Quartile	3.768
Median	4.05
Third Quartile	4.478
Mean	4.161
SD	0.476

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.901

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	147.6
95% UPL (t)	141
90% Percentile (z)	121.7
95% Percentile (z)	135.8
99% Percentile (z)	162.2

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	162.3
95% UPL (t)	149.7
90% Percentile (z)	118.1
95% Percentile (z)	140.4
99% Percentile (z)	194.2

**Gamma Distribution Test**

k star	3.808
Theta Star	18.91
MLE of Mean	72.01
MLE of Standard Deviation	36.9
nu star	144.7

Data follow Appx. Gamma Distribution at 5% Significance Level

**Data Distribution Test**

Data Follow Appr. Gamma Distribution at 5% Significance Level

A-D Test Statistic	0.773
5% A-D Critical Value	0.744
K-S Test Statistic	0.17
5% K-S Critical Value	0.199

**Nonparametric Statistics**

90% Percentile	124.4
95% Percentile	134.7
99% Percentile	168.5

**Assuming Gamma Distribution**

90% Percentile	121.5
95% Percentile	141.4
99% Percentile	184.1

95% UTL with 90% Coverage 177

95% Percentile Bootstrap UTL with 90% Coverage 177

95% BCA Bootstrap UTL with 90% Coverage 177

95% UPL 177

95% Chebyshev UPL 245.5

95% WH Approx. Gamma UPL 144.8

Upper Threshold Limit Based upon IQR 158.2

95% HW Approx. Gamma UPL 145.7

95% WH Approx. Gamma UTL with 90% Coverage 154.4

95% HW Approx. Gamma UTL with 90% Coverage 156

General Statistics			
Number of Valid Data	20	Number of Detected Data	19
Number of Distinct Detected Data	18	Number of Non-Detect Data	1
Tolerance Factor	1.926	Percent Non-Detects	5.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.255	Minimum Detected	-1.366
Maximum Detected	1.42	Maximum Detected	0.351
Mean of Detected	0.763	Mean of Detected	-0.428
SD of Detected	0.412	SD of Detected	0.6
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.913
5% Shapiro Wilk Critical Value	0.901	5% Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.732	Mean (Log Scale)	-0.51
SD	0.426	SD (Log Scale)	0.691
95% UTL 90% Coverage	1.551	95% UTL 90% Coverage	2.27
95% UPL (t)	1.486	95% UPL (t)	2.041
90% Percentile (z)	1.277	90% Percentile (z)	1.454
95% Percentile (z)	1.432	95% Percentile (z)	1.869
99% Percentile (z)	1.722	99% Percentile (z)	2.993
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.727	Mean in Original Scale	0.733
SD	0.423	SD in Original Scale	0.424
95% UTL with 90% Coverage	1.543	95% UTL with 90% Coverage	2.197
		95% BCA UTL with 90% Coverage	1.393
		95% Bootstrap (%) UTL with 90% Coverage	1.42
95% UPL (t)	1.478	95% UPL (t)	1.981
90% Percentile (z)	1.27	90% Percentile (z)	1.428
95% Percentile (z)	1.424	95% Percentile (z)	1.82
99% Percentile (z)	1.712	99% Percentile (z)	2.871
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.834	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.269		
nu star	107.7		
A-D Test Statistic	0.546	Nonparametric Statistics	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.154	Mean	0.738
5% K-S Critical Value	0.2	SD	0.406
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0933

					95% KM UTL with 90% Coverage	1.52
<b>Assuming Gamma Distribution</b>					95% KM Chebyshev UPL	2.552
<b>Gamma ROS Statistics with Extrapolated Data</b>					95% KM UPL (t)	1.458
	Mean	0.725		90% Percentile (z)	1.259	
	Median	0.603		95% Percentile (z)	1.406	
	SD	0.436		99% Percentile (z)	1.683	
	k star	0.687				
	Theta star	1.056		<b>Gamma ROS Limits with Extrapolated Data</b>		
	Nu star	27.47		95% Wilson Hilferty (WH) Approx. Gamma UPL	2.174	
	95% Percentile of Chisquare (2k)	4.708		95% Hawkins Wixley (HW) Approx. Gamma UPL	2.693	
				95% WH Approx. Gamma UTL with 90% Coverage	2.38	
	90% Percentile	1.829		95% HW Approx. Gamma UTL with 90% Coverage	3.011	
	95% Percentile	2.486				
	99% Percentile	4.056				

Note. DL/2 is not a recommended method

**Bicarbonate**

<b>General Statistics</b>					
Total Number of Observations	9	Number of Distinct Observations	9		
Tolerance Factor	2.454	Number of Missing Values	1		
<b>Raw Statistics</b>			<b>Log-Transformed Statistics</b>		
Minimum	45	Minimum	3.807		
Maximum	510	Maximum	6.234		
Second Largest	380	Second Largest	5.94		
First Quartile	160	First Quartile	5.075		
Median	190	Median	5.247		
Third Quartile	370	Third Quartile	5.914		
Mean	257.2	Mean	5.343		
Geometric Mean	209.1	SD	0.754		
SD	152.5				
Coefficient of Variation	0.593				
Skewness	0.303				

Warning: There are only 9 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

<b>Background Statistics</b>					
<b>Normal Distribution Test</b>			<b>Lognormal Distribution Test</b>		
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.911		
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829		
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level			
<b>Assuming Normal Distribution</b>			<b>Assuming Lognormal Distribution</b>		
95% UTL with 90% Coverage	631.5	95% UTL with 90% Coverage	1329		

95% UPL (t)	556.1	95% UPL (t)	915.9
90% Percentile (z)	452.7	90% Percentile (z)	549.2
95% Percentile (z)	508.1	95% Percentile (z)	722.2
99% Percentile (z)	612	99% Percentile (z)	1207

**Gamma Distribution Test**

k star	1.785
Theta Star	144.1
MLE of Mean	257.2
MLE of Standard Deviation	192.5
nu star	32.13

**Data Distribution Test**  
Data appear Normal at 5% Significance Level

A-D Test Statistic	0.347
5% A-D Critical Value	0.728
K-S Test Statistic	0.225
5% K-S Critical Value	0.282

**Nonparametric Statistics**

90% Percentile	406
95% Percentile	458
99% Percentile	499.6

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	514
95% Percentile	632.8
99% Percentile	898.1
95% WH Approx. Gamma UPL	690.2
95% HW Approx. Gamma UPL	726.8
95% WH Approx. Gamma UTL with 90% Coverage	865.2
95% HW Approx. Gamma UTL with 90% Coverage	933.7

95% UTL with 90% Coverage	510
95% Percentile Bootstrap UTL with 90% Coverage	510
95% BCA Bootstrap UTL with 90% Coverage	510
95% UPL	510
95% Chebyshev UPL	957.9
Upper Threshold Limit Based upon IQR	685

**Boron**

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	19
Tolerance Factor	1.926		

**Raw Statistics**

Minimum	1.84
Maximum	38.8
Second Largest	38.1
First Quartile	4.42
Median	7.555
Third Quartile	16.25
Mean	11.59
Geometric Mean	8.258
SD	10.68
Coefficient of Variation	0.922
Skewness	1.725

**Log-Transformed Statistics**

Minimum	0.61
Maximum	3.658
Second Largest	3.64
First Quartile	1.486
Median	2.022
Third Quartile	2.788
Mean	2.111
SD	0.832

**Background Statistics**

<b>Normal Distribution Test</b>		<b>Lognormal Distribution Test</b>	
Shapiro Wilk Test Statistic	0.769	Shapiro Wilk Test Statistic	0.967

Shapiro Wilk Critical Value		0.905	Shapiro Wilk Critical Value		0.905
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% UTL with 90% Coverage	32.16		95% UTL with 90% Coverage	40.98	
95% UPL (t)	30.51		95% UPL (t)	36.05	
90% Percentile (z)	25.28		90% Percentile (z)	23.98	
95% Percentile (z)	29.16		95% Percentile (z)	32.44	
99% Percentile (z)	36.44		99% Percentile (z)	57.18	
Gamma Distribution Test			Data Distribution Test		
k star	1.412		Data appear Gamma Distributed at 5% Significance Level		
Theta Star	8.209				
MLE of Mean	11.59				
MLE of Standard Deviation	9.754				
nu star	56.48				
A-D Test Statistic	0.592		Nonparametric Statistics		
5% A-D Critical Value	0.756		90% Percentile	22.08	
K-S Test Statistic	0.174		95% Percentile	38.14	
5% K-S Critical Value	0.197		99% Percentile	38.67	
Data appear Gamma Distributed at 5% Significance Level					
Assuming Gamma Distribution			95% UTL with 90% Coverage	38.8	
90% Percentile	24.51		95% Percentile Bootstrap UTL with 90% Coverage	38.8	
95% Percentile	30.81		95% BCA Bootstrap UTL with 90% Coverage	38.8	
99% Percentile	45.09		95% UPL	38.77	
			95% Chebyshev UPL	59.3	
95% WH Approx. Gamma UPL	31.9		Upper Threshold Limit Based upon IQR		
95% HW Approx. Gamma UPL	32.54			34	
95% WH Approx. Gamma UTL with 90% Coverage	34.8				
95% HW Approx. Gamma UTL with 90% Coverage	35.77				

**Bromide**

General Statistics			
Number of Valid Data	10	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B)

The data set for variable Bromide was not processed!

**Cadmium**

General Statistics			
Number of Valid Data	20	Number of Detected Data	5

Number of Distinct Detected Data	5	Number of Non-Detect Data	15
Tolerance Factor	1.926	Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.509	Minimum Detected	-0.675
Maximum Detected	0.633	Maximum Detected	-0.457
Mean of Detected	0.578	Mean of Detected	-0.552
SD of Detected	0.0498	SD of Detected	0.0872
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic	0.944
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.332	Mean (Log Scale)	-1.178
SD	0.147	SD (Log Scale)	0.373
95% UTL 90% Coverage	0.616	95% UTL 90% Coverage	0.632
95% UPL (t)	0.593	95% UPL (t)	0.596
90% Percentile (z)	0.521	90% Percentile (z)	0.497
95% Percentile (z)	0.574	95% Percentile (z)	0.569
99% Percentile (z)	0.675	99% Percentile (z)	0.734

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.423	Mean in Original Scale	0.448
SD	0.118	SD in Original Scale	0.0946
95% UTL with 90% Coverage	0.651	95% UTL with 90% Coverage	0.656
		95% BCA UTL with 90% Coverage	0.633
		95% Bootstrap (%) UTL with 90% Coverage	0.633
95% UPL (t)	0.633	95% UPL (t)	0.636
90% Percentile (z)	0.575	90% Percentile (z)	0.573
95% Percentile (z)	0.618	95% Percentile (z)	0.619
99% Percentile (z)	0.699	99% Percentile (z)	0.714

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	66.49	Data appear Normal at 5% Significance Level	
Theta Star	0.00869		
nu star	664.9		

A-D Test Statistic	0.275	Nonparametric Statistics	
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5% A-D Critical Value	0.678	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.222	Mean	0.526
5% K-S Critical Value	0.357	SD	0.0372
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0093
		95% KM UTL with 90% Coverage	0.598
<b>Assuming Gamma Distribution</b>		95% KM Chebyshev UPL	0.692
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.592
Mean	0.254	90% Percentile (z)	0.574
Median	0.229	95% Percentile (z)	0.587
SD	0.24	99% Percentile (z)	0.613
k star	0.201		
Theta star	1.261	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	8.055	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.297
95% Percentile of Chisquare (2k)	2.072	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.812
		95% WH Approx. Gamma UTL with 90% Coverage	1.498
90% Percentile	0.768	95% HW Approx. Gamma UTL with 90% Coverage	2.183
95% Percentile	1.306		
99% Percentile	2.785		

Note: DL/2 is not a recommended method

**Calcium**

<b>General Statistics</b>			
Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		
<b>Raw Statistics</b>		<b>Log-Transformed Statistics</b>	
Minimum	1740	Minimum	7.462
Maximum	43300	Maximum	10.68
Second Largest	42500	Second Largest	10.66
First Quartile	3065	First Quartile	8.028
Median	7650	Median	8.942
Third Quartile	18025	Third Quartile	9.799
Mean	13973	Mean	9.006
Geometric Mean	8153	SD	1.102
SD	14430		
Coefficient of Variation	1.033		
Skewness	1.22		

<b>Background Statistics</b>			
<b>Normal Distribution Test</b>		<b>Lognormal Distribution Test</b>	
Shapiro Wilk Test Statistic	0.78	Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
<b>Assuming Normal Distribution</b>		<b>Assuming Lognormal Distribution</b>	
95% UTL with 90% Coverage	41765	95% UTL with 90% Coverage	68089
95% UPL (t)	39540	95% UPL (t)	57450
90% Percentile (z)	32465	90% Percentile (z)	33469
95% Percentile (z)	37708	95% Percentile (z)	49948



99% Percentile (z) 47541

99% Percentile (z) 105848

**Gamma Distribution Test**

**Data Distribution Test**

k star 0.937

Data appear Gamma Distributed at 5% Significance Level

Theta Star 14905

MLE of Mean 13973

MLE of Standard Deviation 14431

nu star 37.5

A-D Test Statistic 0.654

**Nonparametric Statistics**

5% A-D Critical Value 0.767

90% Percentile 40070

K-S Test Statistic 0.16

95% Percentile 42540

5% K-S Critical Value 0.199

99% Percentile 43148

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

95% UTL with 90% Coverage 43300

90% Percentile 32689

95% Percentile Bootstrap UTL with 90% Coverage 43300

95% Percentile 42828

95% BCA Bootstrap UTL with 90% Coverage 43300

99% Percentile 66484

95% UPL 43260

95% WH Approx. Gamma UPL 44811

95% Chebyshev UPL 78424

95% HW Approx. Gamma UPL 46680

Upper Threshold Limit Based upon IQR 40465

95% WH Approx. Gamma UTL with 90% Coverage 49602

95% HW Approx. Gamma UTL with 90% Coverage 52272

**Carbonate**

**General Statistics**

Number of Valid Data 9

Number of Detected Data 5

Number of Distinct Detected Data 5

Number of Non-Detect Data 4

Tolerance Factor 2.454

Percent Non-Detects 44.44%

Number of Missing Values 1

**Raw Statistics**

**Log-transformed Statistics**

Minimum Detected 24

Minimum Detected 3.178

Maximum Detected 430

Maximum Detected 6.064

Mean of Detected 198.8

Mean of Detected 4.827

SD of Detected 180

SD of Detected 1.188

Minimum Non-Detect 5

Minimum Non-Detect 1.609

Maximum Non-Detect 5

Maximum Non-Detect 1.609

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
Shapiro Wilk Test Statistic		0.878		Shapiro Wilk Test Statistic		0.942	
5% Shapiro Wilk Critical Value		0.762		5% Shapiro Wilk Critical Value		0.762	
Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
<b>Assuming Normal Distribution</b>				<b>Assuming Lognormal Distribution</b>			
DL/2 Substitution Method				DL/2 Substitution Method			
Mean		111.6		Mean (Log Scale)		3.089	
SD		164.1		SD (Log Scale)		2.226	
95% UTL	90% Coverage	514.1		95% UTL	90% Coverage	5173	
95% UPL (t)		433.1		95% UPL (t)		1723	
90% Percentile (z)		321.8		90% Percentile (z)		380.5	
95% Percentile (z)		381.4		95% Percentile (z)		854.3	
99% Percentile (z)		493.2		99% Percentile (z)		3894	
<b>Maximum Likelihood Estimate(MLE) Method</b>				<b>Log ROS Method</b>			
Mean		31		Mean in Original Scale		112.9	
SD		241.8		SD in Original Scale		163.1	
95% UTL with	90% Coverage	624.3		95% UTL with	90% Coverage	4563	
95% UPL (t)		504.9		95% UPL (t)		1625	
90% Percentile (z)		340.8		90% Percentile (z)		393.5	
95% Percentile (z)		428.7		95% Percentile (z)		840.8	
99% Percentile (z)		593.4		99% Percentile (z)		3494	
<b>Gamma Distribution Test with Detected Values Only</b>				<b>Data Distribution Test with Detected Values Only</b>			
k star (bias corrected)		0.619		Data appear Normal at 5% Significance Level			
Theta Star		321.1					
nu star		6.191					
A-D Test Statistic		0.284		<b>Nonparametric Statistics</b>			
5% A-D Critical Value		0.689		<b>Kaplan-Meier (KM) Method</b>			
K-S Test Statistic		0.236		Mean		121.1	
5% K-S Critical Value		0.363		SD		148.2	
Data appear Gamma Distributed at 5% Significance Level				SE of Mean		55.22	
<b>Assuming Gamma Distribution</b>				95% KM UTL with		90% Coverage	
Gamma ROS Statistics with Extrapolated Data				95% KM Chebyshev UPL		801.9	
Mean		110.4		95% KM UPL (t)		411.5	
Median		24		90% Percentile (z)		311	
SD		164.9		95% Percentile (z)		364.8	
k star		0.14		99% Percentile (z)		465.8	
Theta star		786.4		<b>Gamma ROS Limits with Extrapolated Data</b>			
Nu star		2.528		95% Wilson Hilferty (WH) Approx. Gamma UPL		745.1	
95% Percentile of Chisquare (2k)		1.565		95% Hawkins Wixley (HW) Approx. Gamma UPL		1077	
90% Percentile		324.1		95% WH Approx. Gamma UTL with		90% Coverage	
95% Percentile		615.3		95% HW Approx. Gamma UTL with		90% Coverage	
99% Percentile		1472				1995	

Note: DL/2 is not a recommended method

**Chloride**

**General Statistics**

Number of Valid Data	10	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	4
Tolerance Factor	2.355	Percent Non-Detects	40.00%

**Raw Statistics**

Minimum Detected	10
Maximum Detected	1100
Mean of Detected	621.7
SD of Detected	401.2
Minimum Non-Detect	10
Maximum Non-Detect	10

**Log-transformed Statistics**

Minimum Detected	2.303
Maximum Detected	7.003
Mean of Detected	5.831
SD of Detected	1.775
Minimum Non-Detect	2.303
Maximum Non-Detect	2.303

**Warning:** There are only 6 Detected Values in this data

**Note:** It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.974
5% Shapiro Wilk Critical Value	0.788

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.702
5% Shapiro Wilk Critical Value	0.788

Data not Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	375
SD	436.8
95% UTL 90% Coverage	1404
95% UPL (t)	1215
90% Percentile (z)	934.8
95% Percentile (z)	1094
99% Percentile (z)	1391

**Assuming Lognormal Distribution**

DL/2 Substitution Method	
Mean (Log Scale)	4.142
SD (Log Scale)	2.55
95% UTL 90% Coverage	25548
95% UPL (t)	8481
90% Percentile (z)	1654
95% Percentile (z)	4177
99% Percentile (z)	23748

**Maximum Likelihood Estimate(MLE) Method**

Mean	203.3
SD	624.5
95% UTL with 90% Coverage	1674
95% UPL (t)	1404
90% Percentile (z)	1004
95% Percentile (z)	1231
99% Percentile (z)	1656

**Log ROS Method**

Mean in Original Scale	377.3
SD in Original Scale	434.7
95% UTL with 90% Coverage	23570
95% BCA UTL with 90% Coverage	1100
95% Bootstrap (%) UTL with 90% Coverage	1100
95% UPL (t)	8184
90% Percentile (z)	1706
95% Percentile (z)	4148
99% Percentile (z)	21975

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.593	Data appear Normal at 5% Significance Level	
Theta Star	1048		
nu star	7.118		
A-D Test Statistic	0.669	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.716	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.276	Mean	377
5% K-S Critical Value	0.341	SD	412.6
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	142.9
<b>Assuming Gamma Distribution</b>		95% KM UTL with 90% Coverage	1349
Gamma ROS Statistics with Extrapolated Data		95% KM Chebyshev UPL	2263
Mean	373	95% KM UPL (t)	1170
Median	180	90% Percentile (z)	905.8
SD	438.7	95% Percentile (z)	1056
k star	0.138	99% Percentile (z)	1337
Theta star	2703	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	2.76	95% Wilson Hilferty (WH) Approx. Gamma UPL	2467
95% Percentile of Chisquare (2k)	1.543	95% Hawkins Wixley (HW) Approx. Gamma UPL	3618
90% Percentile	1091	95% WH Approx. Gamma UTL with 90% Coverage	3723
95% Percentile	2084	95% HW Approx. Gamma UTL with 90% Coverage	6212
99% Percentile	5018		

Note: DL/2 is not a recommended method.

**Chromium**

General Statistics			
Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		
Raw Statistics		Log-Transformed Statistics	
Minimum	4.75	Minimum	1.558
Maximum	22	Maximum	3.091
Second Largest	20.3	Second Largest	3.011
First Quartile	5.94	First Quartile	1.782
Median	9.67	Median	2.269
Third Quartile	14.48	Third Quartile	2.672
Mean	10.69	Mean	2.254
Geometric Mean	9.526	SD	0.494
SD	5.283		
Coefficient of Variation	0.494		
Skewness	0.73		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

**Assuming Normal Distribution**

95% UTL with 90% Coverage	20.87
95% UPL (t)	20.05
90% Percentile (z)	17.46
95% Percentile (z)	19.38
99% Percentile (z)	22.98

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	24.69
95% UPL (t)	22.88
90% Percentile (z)	17.95
95% Percentile (z)	21.48
99% Percentile (z)	30.09

**Gamma Distribution Test**

k star	3.855
Theta Star	2.773
MLE of Mean	10.69
MLE of Standard Deviation	5.444
nu star	154.2

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.454
5% A-D Critical Value	0.745
K-S Test Statistic	0.165
5% K-S Critical Value	0.195

**Nonparametric Statistics**

90% Percentile	17.6
95% Percentile	20.39
99% Percentile	21.68

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	17.99
95% Percentile	20.93
99% Percentile	27.21
95% WH Approx. Gamma UPL	21.44
95% HW Approx. Gamma UPL	21.73
95% WH Approx. Gamma UTL with 90% Coverage	22.73
95% HW Approx. Gamma UTL with 90% Coverage	23.13

95% UTL with 90% Coverage 22

95% Percentile Bootstrap UTL with 90% Coverage	22
95% BCA Bootstrap UTL with 90% Coverage	22
95% UPL	21.92
95% Chebyshev UPL	34.29
Upper Threshold Limit Based upon IQR	27.28

**HexChrom**

**General Statistics**

Number of Valid Data	10	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable HexChrom was not processed!

**Cobalt**

**General Statistics**

Total Number of Observations	19	Number of Distinct Observations	19
Tolerance Factor	1.949	Number of Missing Values	1

**Raw Statistics**

Minimum	2.49
Maximum	9.36
Second Largest	9.19
First Quartile	3.15
Median	4.6
Third Quartile	6.645
Mean	5.137
Geometric Mean	4.694
SD	2.267
Coefficient of Variation	0.441
Skewness	0.682

**Log-Transformed Statistics**

Minimum	0.912
Maximum	2.236
Second Largest	2.218
First Quartile	1.147
Median	1.526
Third Quartile	1.894
Mean	1.546
SD	0.436

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.901

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	9.556
95% UPL (t)	9.171
90% Percentile (z)	8.043
95% Percentile (z)	8.866
99% Percentile (z)	10.41

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	10.97
95% UPL (t)	10.19
90% Percentile (z)	8.205
95% Percentile (z)	9.612
99% Percentile (z)	12.94

**Gamma Distribution Test**

k star	4.833
Theta Star	1.063
MLE of Mean	5.137
MLE of Standard Deviation	2.337
nu star	183.7

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.487
5% A-D Critical Value	0.742
K-S Test Statistic	0.168
5% K-S Critical Value	0.199

**Nonparametric Statistics**

90% Percentile	8.814
95% Percentile	9.207
99% Percentile	9.329

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	8.267
95% Percentile	9.485
99% Percentile	12.06
95% WH Approx. Gamma UPL	9.695
95% HW Approx. Gamma UPL	9.799
95% WH Approx. Gamma UTL with 90% Coverage	10.28
95% HW Approx. Gamma UTL with 90% Coverage	10.42

95% UTL with 90% Coverage	9.36
95% Percentile Bootstrap UTL with 90% Coverage	9.36
95% BCA Bootstrap UTL with 90% Coverage	9.36
95% UPL	9.36
95% Chebyshev UPL	15.28
Upper Threshold Limit Based upon IQR	11.89

Copper

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

Raw Statistics

Log-Transformed Statistics

Minimum	4.47	Minimum	1.497
Maximum	22.8	Maximum	3.127
Second Largest	19.6	Second Largest	2.976
First Quartile	5.69	First Quartile	1.738
Median	9.015	Median	2.199
Third Quartile	13.4	Third Quartile	2.592
Mean	10.36	Mean	2.211
Geometric Mean	9.125	SD	0.519
SD	5.379		
Coefficient of Variation	0.519		
Skewness	0.822		

Background Statistics

Normal Distribution Test

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.91	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution

Assuming Lognormal Distribution

95% UTL with 90% Coverage	20.72	95% UTL with 90% Coverage	24.79
95% UPL (t)	19.89	95% UPL (t)	22.89
90% Percentile (z)	17.25	90% Percentile (z)	17.75
95% Percentile (z)	19.21	95% Percentile (z)	21.43
99% Percentile (z)	22.87	99% Percentile (z)	30.52

Gamma Distribution Test

Data Distribution Test

k star	3.522	Data appear Normal at 5% Significance Level	
Theta Star	2.941		
MLE of Mean	10.36		
MLE of Standard Deviation	5.519		
nu star	140.9		

A-D Test Statistic	0.407
5% A-D Critical Value	0.745
K-S Test Statistic	0.16
5% K-S Critical Value	0.195

Nonparametric Statistics

90% Percentile	17.17
95% Percentile	19.76
99% Percentile	22.19

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% UTL with 90% Coverage

90% Percentile	17.76	95% Percentile Bootstrap UTL with 90% Coverage	22.8
95% Percentile	20.78	95% BCA Bootstrap UTL with 90% Coverage	22.8
99% Percentile	27.27	95% UPL	22.64
		95% Chebyshev UPL	34.38
95% WH Approx. Gamma UPL	21.31	Upper Threshold Limit Based upon IQR	24.97
95% HW Approx. Gamma UPL	21.63		



95% WH Approx. Gamma UTL with 90% Coverage	22.65
95% HW Approx. Gamma UTL with 90% Coverage	23.07

luoride

**General Statistics**

Number of Valid Data	10	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	5
Tolerance Factor	2.355	Percent Non-Detects	50.00%

**Raw Statistics**

Minimum Detected	1.4
Maximum Detected	14
Mean of Detected	7.02
SD of Detected	5.997
Minimum Non-Detect	1
Maximum Non-Detect	1

**Log-transformed Statistics**

Minimum Detected	0.336
Maximum Detected	2.639
Mean of Detected	1.584
SD of Detected	1.002
Minimum Non-Detect	0
Maximum Non-Detect	0

**Warning:** There are only 5 Detected Values in this data

**Note:** It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.82
5% Shapiro Wilk Critical Value	0.762

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.907
5% Shapiro Wilk Critical Value	0.762

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	3.76
SD	5.272
95% UTL 90% Coverage	16.18
95% UPL (t)	13.9
90% Percentile (z)	10.52
95% Percentile (z)	12.43
99% Percentile (z)	16.02

**Assuming Lognormal Distribution**

DL/2 Substitution Method	
Mean (Log Scale)	0.445
SD (Log Scale)	1.374
95% UTL 90% Coverage	39.67
95% UPL (t)	21.9
90% Percentile (z)	9.078
95% Percentile (z)	14.95
99% Percentile (z)	38.13

**Maximum Likelihood Estimate(MLE) Method**

Mean	0.691
SD	8.177
95% UTL with 90% Coverage	19.95

**Log ROS Method**

Mean in Original Scale	3.668
SD in Original Scale	5.338
95% UTL with 90% Coverage	83.47
95% BCA UTL with 90% Coverage	14
95% Bootstrap (%) UTL with 90% Coverage	14
95% UPL (t)	37.45
90% Percentile (z)	11.41

95% UPL (t)	16.41
90% Percentile (z)	11.17



95% Percentile (z)	14.14	95% Percentile (z)	22.38
99% Percentile (z)	19.71	99% Percentile (z)	79.15
<b>Gamma Distribution Test with Detected Values Only</b>		<b>Data Distribution Test with Detected Values Only</b>	
k star (bias corrected)	0.74	Data appear Normal at 5% Significance Level	
Theta Star	9.49		
nu star	7.397		
A-D Test Statistic	0.416	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.686	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.265	Mean	4.21
5% K-S Critical Value	0.362	SD	4.72
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.669
		95% KM UTL with 90% Coverage	15.33
<b>Assuming Gamma Distribution</b>		95% KM Chebyshev UPL	25.79
<b>Gamma ROS Statistics with Extrapolated Data</b>		95% KM UPL (t)	13.29
Mean	3.51	90% Percentile (z)	10.26
Median	0.7	95% Percentile (z)	11.97
SD	5.447	99% Percentile (z)	15.19
k star	0.143		
Theta star	24.56	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	2.859	95% Wilson Hilferty (WH) Approx. Gamma UPL	22.55
95% Percentile of Chisquare (2k)	1.588	95% Hawkins Wixley (HW) Approx. Gamma UPL	31.27
		95% WH Approx. Gamma UTL with 90% Coverage	34.66
90% Percentile	10.33	95% HW Approx. Gamma UTL with 90% Coverage	54.87
95% Percentile	19.49		
99% Percentile	46.35		

Note: DL/2 is not a recommended method.

**Iron**

<b>General Statistics</b>			
Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		
<b>Raw Statistics</b>		<b>Log-Transformed Statistics</b>	
Minimum	5680	Minimum	8.645
Maximum	20300	Maximum	9.918
Second Largest	17900	Second Largest	9.793
First Quartile	6953	First Quartile	8.847
Median	10035	Median	9.214
Third Quartile	14325	Third Quartile	9.57
Mean	11010	Mean	9.231
Geometric Mean	10212	SD	0.399
SD	4399		
Coefficient of Variation	0.4		
Skewness	0.603		

**Background Statistics**

Normal Distribution Test

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.925	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
<b>Assuming Normal Distribution</b>		<b>Assuming Lognormal Distribution</b>	
95% UTL with 90% Coverage	19483	95% UTL with 90% Coverage	22002
95% UPL (t)	18805	95% UPL (t)	20691
90% Percentile (z)	16648	90% Percentile (z)	17019
95% Percentile (z)	18246	95% Percentile (z)	19670
99% Percentile (z)	21245	99% Percentile (z)	25809
<b>Gamma Distribution Test</b>		<b>Data Distribution Test</b>	
k star	5.82	Data appear Normal at 5% Significance Level	
Theta Star	1892		
MLE of Mean	11010		
MLE of Standard Deviation	4564		
nu star	232.8		
A-D Test Statistic	0.419	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.744	90% Percentile	17360
K-S Test Statistic	0.164	95% Percentile	18020
5% K-S Critical Value	0.194	99% Percentile	19844
Data appear Gamma Distributed at 5% Significance Level			
<b>Assuming Gamma Distribution</b>		95% UTL with 90% Coverage	20300
90% Percentile	17113	95% Percentile Bootstrap UTL with 90% Coverage	20300
95% Percentile	19430	95% BCA Bootstrap UTL with 90% Coverage	20300
99% Percentile	24293	95% UPL	20180
95% WH Approx. Gamma UPL	19797	95% Chebyshev UPL	30660
95% HW Approx. Gamma UPL	19986	Upper Threshold Limit Based upon IQR	25384
95% WH Approx. Gamma UTL with 90% Coverage	20802		
95% HW Approx. Gamma UTL with 90% Coverage	21054		
<b>lead</b>			
<b>General Statistics</b>			
Total Number of Observations	19	Number of Distinct Observations	19
Tolerance Factor	1.949	Number of Missing Values	1
<b>Raw Statistics</b>		<b>Log-Transformed Statistics</b>	
Minimum	2	Minimum	0.693
Maximum	13.4	Maximum	2.595
Second Largest	9.52	Second Largest	2.253
First Quartile	3.15	First Quartile	1.147
Median	4.8	Median	1.569
Third Quartile	6.38	Third Quartile	1.847
Mean	5.345	Mean	1.558
Geometric Mean	4.751	SD	0.489
SD	2.866		

Coefficient of Variation	0.536		
Skewness	1.46		

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical Value	0.901

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	10.93
95% UPL (t)	10.44
90% Percentile (z)	9.018
95% Percentile (z)	10.06
99% Percentile (z)	12.01

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	12.31
95% UPL (t)	11.33
90% Percentile (z)	8.886
95% Percentile (z)	10.61
99% Percentile (z)	14.8

**Gamma Distribution Test**

k star	3.743
Theta Star	1.428
MLE of Mean	5.345
MLE of Standard Deviation	2.763
nu star	142.2

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.409
5% A-D Critical Value	0.744
K-S Test Statistic	0.146
5% K-S Critical Value	0.199

**Nonparametric Statistics**

90% Percentile	9.232
95% Percentile	9.908
99% Percentile	12.7

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	9.048
95% Percentile	10.55
99% Percentile	13.75
95% WH Approx. Gamma UPL	10.8
95% HW Approx. Gamma UPL	10.9
95% WH Approx. Gamma UTL with 90% Coverage	11.53
95% HW Approx. Gamma UTL with 90% Coverage	11.68

95% UTL with 90% Coverage	13.4
95% Percentile Bootstrap UTL with 90% Coverage	13.4
95% BCA Bootstrap UTL with 90% Coverage	13.4
95% UPL	13.4
95% Chebyshev UPL	18.16
Upper Threshold Limit Based upon IQR	11.23

**Magnesium**

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

**Raw Statistics**

Minimum	1950
Maximum	9910
Second Largest	8700
First Quartile	2630

**Log-Transformed Statistics**

Minimum	7.576
Maximum	9.201
Second Largest	9.071
First Quartile	7.874

Median	4070	Median	8.311
Third Quartile	6778	Third Quartile	8.821
Mean	4800	Mean	8.348
Geometric Mean	4220	SD	0.525
SD	2478		
Coefficient of Variation	0.516		
Skewness	0.633		

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.905

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	9573
95% UPL (t)	9191
90% Percentile (z)	7976
95% Percentile (z)	8876
99% Percentile (z)	10565

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	11597
95% UPL (t)	10696
90% Percentile (z)	8269
95% Percentile (z)	10006
99% Percentile (z)	14309

**Gamma Distribution Test**

k star	3.468
Theta Star	1384
MLE of Mean	4800
MLE of Standard Deviation	2578
nu star	138.7

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.483
5% A-D Critical Value	0.746
K-S Test Statistic	0.159
5% K-S Critical Value	0.195

**Nonparametric Statistics**

90% Percentile	8349
95% Percentile	8761
99% Percentile	9680

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	8256
95% Percentile	9671
99% Percentile	12714
95% WH Approx. Gamma UPL	9927
95% HW Approx. Gamma UPL	10081
95% WH Approx. Gamma UTL with 90% Coverage	10554
95% HW Approx. Gamma UTL with 90% Coverage	10761

**95% UTL with 90% Coverage**

95% UTL with 90% Coverage	9910
95% Percentile Bootstrap UTL with 90% Coverage	9910
95% BCA Bootstrap UTL with 90% Coverage	9910
95% UPL	9850
95% Chebyshev UPL	15869
Upper Threshold Limit Based upon IQR	12999

**Manganese**

**General Statistics**

Total Number of Observations	20	Number of Distinct Observations	18
Tolerance Factor	1.926		

Raw Statistics			Log-Transformed Statistics		
Minimum	97.2		Minimum	4.577	
Maximum	405		Maximum	6.004	
Second Largest	379		Second Largest	5.938	
First Quartile	152.5		First Quartile	5.027	
Median	176		Median	5.17	
Third Quartile	232.8		Third Quartile	5.45	
Mean	203.8		Mean	5.24	
Geometric Mean	188.8		SD	0.392	
SD	87.48				
Coefficient of Variation	0.429				
Skewness	1.227				
<b>Background Statistics</b>					
<b>Normal Distribution Test</b>			<b>Lognormal Distribution Test</b>		
Shapiro Wilk Test Statistic	0.859		Shapiro Wilk Test Statistic	0.952	
Shapiro Wilk Critical Value	0.905		Shapiro Wilk Critical Value	0.905	
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
<b>Assuming Normal Distribution</b>			<b>Assuming Lognormal Distribution</b>		
95% UTL with 90% Coverage	372.3		95% UTL with 90% Coverage	401.6	
95% UPL (t)	358.8		95% UPL (t)	378.1	
90% Percentile (z)	315.9		90% Percentile (z)	311.9	
95% Percentile (z)	347.7		95% Percentile (z)	359.7	
99% Percentile (z)	407.3		99% Percentile (z)	469.9	
<b>Gamma Distribution Test</b>			<b>Data Distribution Test</b>		
k star	5.71		Data appear Gamma Distributed at 5% Significance Level		
Theta Star	35.7				
MLE of Mean	203.8				
MLE of Standard Deviation	85.29				
nu star	228.4				
A-D Test Statistic	0.605		<b>Nonparametric Statistics</b>		
5% A-D Critical Value	0.744		90% Percentile	361	
K-S Test Statistic	0.191		95% Percentile	380.3	
5% K-S Critical Value	0.194		99% Percentile	400.1	
Data appear Gamma Distributed at 5% Significance Level					
<b>Assuming Gamma Distribution</b>			95% UTL with 90% Coverage		
90% Percentile	317.9		95% Percentile Bootstrap UTL with 90% Coverage	405	
95% Percentile	361.3		95% BCA Bootstrap UTL with 90% Coverage	405	
99% Percentile	452.5		95% UPL	403.7	
			95% Chebyshev UPL	594.6	
95% WH Approx. Gamma UPL	367.7		Upper Threshold Limit Based upon IQR	353.1	
95% HW Approx. Gamma UPL	369.8				
95% WH Approx. Gamma UTL with 90% Coverage	386.5				
95% HW Approx. Gamma UTL with 90% Coverage	389.6				
Mercury					

**General Statistics**

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**  
 Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!  
 The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mercury was not processed!

**Polychlorinated Biphenyls**

**General Statistics**

Number of Valid Data	20	Number of Detected Data	17
Number of Distinct Detected Data	17	Number of Non-Detect Data	3
Tolerance Factor	1.926	Percent Non-Detects	15.00%

**Raw Statistics**

Minimum Detected	0.323
Maximum Detected	3.37
Mean of Detected	1.254
SD of Detected	0.991
Minimum Non-Detect	0.25
Maximum Non-Detect	0.25

**Log-transformed Statistics**

Minimum Detected	-1.13
Maximum Detected	1.215
Mean of Detected	-0.0506
SD of Detected	0.762
Minimum Non-Detect	-1.386
Maximum Non-Detect	-1.386

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.826
5% Shapiro Wilk Critical Value	0.892

Data not Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.938
5% Shapiro Wilk Critical Value	0.892

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	1.084
SD	0.999
95% UTL 90% Coverage	3.008
95% UPL (t)	2.854
90% Percentile (z)	2.364
95% Percentile (z)	2.727
99% Percentile (z)	3.408

**Assuming Lognormal Distribution**

DL/2 Substitution Method	
Mean (Log Scale)	-0.355
SD (Log Scale)	1.021
95% UTL 90% Coverage	5.007
95% UPL (t)	4.278
90% Percentile (z)	2.594
95% Percentile (z)	3.758
99% Percentile (z)	7.535

**Maximum Likelihood Estimate(MLE) Method**

Mean	1.007
SD	1.082
95% UTL with 90% Coverage	3.092

**Log ROS Method**

Mean in Original Scale	1.09
SD in Original Scale	0.993
95% UTL with 90% Coverage	4.665
95% BCA UTL with 90% Coverage	3.37
95% Bootstrap (%) UTL with 90% Coverage	3.37
95% UPL (t)	4.02

95% UPL (t) 2.925

90% Percentile (z)	2.394	90% Percentile (z)	2.503
95% Percentile (z)	2.787	95% Percentile (z)	3.556
99% Percentile (z)	3.525	99% Percentile (z)	6.868
<b>Gamma Distribution Test with Detected Values Only</b>		<b>Data Distribution Test with Detected Values Only</b>	
k star (bias corrected)	1.651	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.759		
nu star	56.13		
A-D Test Statistic	0.554	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.173	Mean	1.114
5% K-S Critical Value	0.212	SD	0.946
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.218
		95% KM UTL with 90% Coverage	2.937
<b>Assuming Gamma Distribution</b>		95% KM Chebyshev UPL	5.341
<b>Gamma ROS Statistics with Extrapolated Data</b>		95% KM UPL (t)	2.791
Mean	1.066	90% Percentile (z)	2.327
Median	0.659	95% Percentile (z)	2.671
SD	1.019	99% Percentile (z)	3.316
k star	0.3	<b>Gamma ROS Limits with Extrapolated Data</b>	
Theta star	3.549	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.45
Nu star	12.01	95% Hawkins Wixley (HW) Approx. Gamma UPL	6.015
95% Percentile of Chisquare (2k)	2.747	95% WH Approx. Gamma UTL with 90% Coverage	5.025
		95% HW Approx. Gamma UTL with 90% Coverage	7.017
90% Percentile	3.143		
95% Percentile	4.873		
99% Percentile	9.37		

Note: DL/2 is not a recommended method

**Nickel**

<b>General Statistics</b>			
Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		
<b>Raw Statistics</b>		<b>Log-Transformed Statistics</b>	
Minimum	4.02	Minimum	1.391
Maximum	22.5	Maximum	3.114
Second Largest	18.6	Second Largest	2.923
First Quartile	5.093	First Quartile	1.628
Median	7.585	Median	2.026
Third Quartile	10.85	Third Quartile	2.383
Mean	9.267	Mean	2.087
Geometric Mean	8.064	SD	0.531
SD	5.31		
Coefficient of Variation	0.573		
Skewness	1.203		

**Background Statistics**

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.861		Shapiro Wilk Test Statistic		0.941	
Shapiro Wilk Critical Value		0.905		Shapiro Wilk Critical Value		0.905	
Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% UTL with 90% Coverage		19.49		95% UTL with 90% Coverage		22.4	
95% UPL (t)		18.68		95% UPL (t)		20.64	
90% Percentile (z)		16.07		90% Percentile (z)		15.92	
95% Percentile (z)		18		95% Percentile (z)		19.3	
99% Percentile (z)		21.62		99% Percentile (z)		27.7	
Gamma Distribution Test				Data Distribution Test			
k star		3.224		Data appear Gamma Distributed at 5% Significance Level			
Theta Star		2.875					
MLE of Mean		9.267					
MLE of Standard Deviation		5.161					
nu star		128.9					
A-D Test Statistic		0.524		Nonparametric Statistics			
5% A-D Critical Value		0.746		90% Percentile		17.25	
K-S Test Statistic		0.137		95% Percentile		18.8	
5% K-S Critical Value		0.195		99% Percentile		21.76	
Data appear Gamma Distributed at 5% Significance Level							
Assuming Gamma Distribution				95% UTL with 90% Coverage		22.5	
90% Percentile		16.19		95% Percentile Bootstrap UTL with 90% Coverage		22.5	
95% Percentile		19.05		95% BCA Bootstrap UTL with 90% Coverage		22.5	
99% Percentile		25.24		95% UPL		22.31	
95% WH Approx. Gamma UPL		19.54		95% Chebyshev UPL		32.98	
95% HW Approx. Gamma UPL		19.75		Upper Threshold Limit Based upon IQR		19.49	
95% WH Approx. Gamma UTL with 90% Coverage		20.81					
95% HW Approx. Gamma UTL with 90% Coverage		21.12					
<b>Nitrate (as N)</b>							
General Statistics							
Number of Valid Data		10		Number of Detected Data		9	
Number of Distinct Detected Data		9		Number of Non-Detect Data		1	
Tolerance Factor		2.355		Percent Non-Detects		10.00%	
Raw Statistics				Log-transformed Statistics			
Minimum Detected		1.6		Minimum Detected		0.47	
Maximum Detected		25		Maximum Detected		3.219	
Mean of Detected		9.078		Mean of Detected		1.734	
SD of Detected		8.78		SD of Detected		1.066	
Minimum Non-Detect		1		Minimum Non-Detect		0	
Maximum Non-Detect		1		Maximum Non-Detect		0	



Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set  
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.833  
5% Shapiro Wilk Critical Value 0.829

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.908  
5% Shapiro Wilk Critical Value 0.829

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method  
Mean 8.22  
SD 8.711  
95% UTL 90% Coverage 28.73  
95% UPL (t) 24.97  
90% Percentile (z) 19.38  
95% Percentile (z) 22.55  
99% Percentile (z) 28.49

**Assuming Lognormal Distribution**

DL/2 Substitution Method  
Mean (Log Scale) 1.491  
SD (Log Scale) 1.265  
95% UTL 90% Coverage 87.33  
95% UPL (t) 50.54  
90% Percentile (z) 22.47  
95% Percentile (z) 35.57  
99% Percentile (z) 84.22

**Maximum Likelihood Estimate(MLE) Method**

Mean 7.757  
SD 8.899  
95% UTL with 90% Coverage 28.71  
95% UPL (t) 24.87  
90% Percentile (z) 19.16  
95% Percentile (z) 22.39  
99% Percentile (z) 28.46

**Log ROS Method**

Mean in Original Scale 8.211  
SD in Original Scale 8.72  
95% UTL with 90% Coverage 93.64  
95% BCA UTL with 90% Coverage 25  
95% Bootstrap (%) UTL with 90% Coverage 25  
95% UPL (t) 53.32  
90% Percentile (z) 23.13  
95% Percentile (z) 37.13  
99% Percentile (z) 90.21

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected) 0.873  
Theta Star 10.39  
nu star 15.72

A-D Test Statistic 0.418  
5% A-D Critical Value 0.74  
K-S Test Statistic 0.226  
5% K-S Critical Value 0.286

Data appear Gamma Distributed at 5% Significance Level

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

Kaplan-Meier (KM) Method  
Mean 8.33  
SD 8.167  
SE of Mean 2.739

95% KM UTL with 90% Coverage 27.56  
95% KM Chebyshev UPL 45.67  
95% KM UPL (t) 24.03  
90% Percentile (z) 18.8  
95% Percentile (z) 21.76  
99% Percentile (z) 27.33

**Assuming Gamma Distribution**

Gamma ROS Statistics with Extrapolated Data  
Mean 8.17  
Median 4.35  
SD 8.762  
k star 0.312

	Theta star	26.22	Gamma ROS Limits with Extrapolated Data	
	Nu star	6.233	95% Wilson Hilferty (WH) Approx. Gamma UPL	38.17
	95% Percentile of Chisquare (2k)	2.816	95% Hawkins Wixley (HW) Approx. Gamma UPL	50.14
	90% Percentile	23.98	95% WH Approx. Gamma UTL with 90% Coverage	52.41
	95% Percentile	36.92	95% HW Approx. Gamma UTL with 90% Coverage	74.35
	99% Percentile	70.37		

Note: DL/2 is not a recommended method.

nitrite (as N)

General Statistics			
Number of Valid Data	10	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	4
Tolerance Factor	2.355	Percent Non-Detects	40.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	1.6	Maximum Detected	0.47
Mean of Detected	1.3	Mean of Detected	0.248
SD of Detected	0.237	SD of Detected	0.185
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

**Warning: There are only 6 Detected Values in this data**

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.949	Shapiro Wilk Test Statistic	0.948
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.98	Mean (Log Scale)	-0.128
SD	0.449	SD (Log Scale)	0.505
95% UTL 90% Coverage	2.038	95% UTL 90% Coverage	2.891
95% UPL (t)	1.844	95% UPL (t)	2.324
90% Percentile (z)	1.556	90% Percentile (z)	1.681
95% Percentile (z)	1.719	95% Percentile (z)	2.02
99% Percentile (z)	2.025	99% Percentile (z)	2.85
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.085	Mean in Original Scale	1.088

SD	0.333	SD in Original Scale	0.331
95% UTL with 90% Coverage	1.87	95% UTL with 90% Coverage	2.169
		95% BCA UTL with 90% Coverage	1.6
		95% Bootstrap (%) UTL with 90% Coverage	1.6
95% UPL (t)	1.726	95% UPL (t)	1.896
90% Percentile (z)	1.512	90% Percentile (z)	1.553
95% Percentile (z)	1.633	95% Percentile (z)	1.739
99% Percentile (z)	1.861	99% Percentile (z)	2.149
<b>Gamma Distribution Test with Detected Values Only</b>		<b>Data Distribution Test with Detected Values Only</b>	
k star (bias corrected)	17.92	Data appear Normal at 5% Significance Level	
Theta Star	0.0725		
nu star	215.1		
A-D Test Statistic	0.259	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.697	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.193	Mean	1.18
5% K-S Critical Value	0.332	SD	0.223
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0771
<b>Assuming Gamma Distribution</b>		95% KM UTL with 90% Coverage	1.704
<b>Gamma ROS Statistics with Extrapolated Data</b>		95% KM Chebyshev UPL	2.198
Mean	0.891	95% KM UPL (t)	1.608
Median	1.05	90% Percentile (z)	1.465
SD	0.58	95% Percentile (z)	1.546
k star	0.372	99% Percentile (z)	1.698
Theta star	2.393	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	7.446	95% Wilson Hilferty (WH) Approx. Gamma UPL	3.858
95% Percentile of Chisquare (2k)	3.171	95% Hawkins Wixley (HW) Approx. Gamma UPL	5.343
		95% WH Approx. Gamma UTL with 90% Coverage	5.159
90% Percentile	2.548	95% HW Approx. Gamma UTL with 90% Coverage	7.73
95% Percentile	3.794		
99% Percentile	6.953		

Note: DL/2 is not a recommended method

**o-Phosphate (as P)**

General Statistics			
Number of Valid Data	9	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	3
Tolerance Factor	2.454	Percent Non-Detects	33.33%
Number of Missing Values	1		
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.1	Minimum Detected	0.0953
Maximum Detected	2.5	Maximum Detected	0.916
Mean of Detected	1.617	Mean of Detected	0.438
SD of Detected	0.531	SD of Detected	0.314
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.91  
5% Shapiro Wilk Critical Value 0.788

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.94  
5% Shapiro Wilk Critical Value 0.788

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method  
Mean 1.244  
SD 0.698  
95% UTL 90% Coverage 2.958  
95% UPL (t) 2.613  
90% Percentile (z) 2.139  
95% Percentile (z) 2.393  
99% Percentile (z) 2.869

**Assuming Lognormal Distribution**

DL/2 Substitution Method  
Mean (Log Scale) 0.061  
SD (Log Scale) 0.618  
95% UTL 90% Coverage 4.839  
95% UPL (t) 3.567  
90% Percentile (z) 2.346  
95% Percentile (z) 2.936  
99% Percentile (z) 4.473

**Maximum Likelihood Estimate(MLE) Method**

Mean 1.26  
SD 0.674  
95% UTL with 90% Coverage 2.915  
95% UPL (t) 2.582  
90% Percentile (z) 2.124  
95% Percentile (z) 2.369  
99% Percentile (z) 2.829

**Log ROS Method**

Mean in Original Scale 1.301  
SD in Original Scale 0.636  
95% UTL with 90% Coverage 4.01  
95% BCA UTL with 90% Coverage 2.5  
95% Bootstrap (%) UTL with 90% Coverage 2.5  
95% UPL (t) 3.128  
90% Percentile (z) 2.223  
95% Percentile (z) 2.669  
99% Percentile (z) 3.76

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected) 6.112  
Theta Star 0.265  
nu star 73.34

A-D Test Statistic 0.297  
5% A-D Critical Value 0.698  
K-S Test Statistic 0.236  
5% K-S Critical Value 0.332

Data appear Gamma Distributed at 5% Significance Level

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

Kaplan-Meier (KM) Method  
Mean 1.444  
SD 0.465  
SE of Mean 0.17

95% KM UTL with 90% Coverage 2.584  
95% KM Chebyshev UPL 3.579  
95% KM UPL (t) 2.355  
90% Percentile (z) 2.04  
95% Percentile (z) 2.209  
99% Percentile (z) 2.525

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean 1.096  
Median 1.2  
SD 0.888

k star	0.23		
Theta star	4.766	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	4.139	95% Wilson Hilferty (WH) Approx. Gamma UPL	6.411
95% Percentile of Chisquare (2k)	2.281	95% Hawkins Wixley (HW) Approx. Gamma UPL	9.737
		95% WH Approx. Gamma UTL with 90% Coverage	9.456
90% Percentile	3.305	95% HW Approx. Gamma UTL with 90% Coverage	16.13
95% Percentile	5.436		
99% Percentile	11.18		

Note: DL/2 is not a recommended method.

**Phosphorus, Total**

General Statistics			
Number of Valid Data	10	Number of Detected Data	9
Number of Distinct Detected Data	7	Number of Non-Detect Data	1
Tolerance Factor	2.355	Percent Non-Detects	10.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.84	Minimum Detected	-0.174
Maximum Detected	380	Maximum Detected	5.94
Mean of Detected	182.9	Mean of Detected	3.349
SD of Detected	175.2	SD of Detected	2.904
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.763	Shapiro Wilk Test Statistic	0.725
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	164.6	Mean (Log Scale)	2.875
SD	174.9	SD (Log Scale)	3.121
95% UTL 90% Coverage	576.6	95% UTL 90% Coverage	27583
95% UPL (t)	501	95% UPL (t)	7154
90% Percentile (z)	388.8	90% Percentile (z)	967.5
95% Percentile (z)	452.4	95% Percentile (z)	3007
99% Percentile (z)	571.6	99% Percentile (z)	25223

Maximum Likelihood Estimate(MLE) Method	Log ROS Method
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Mean	154.6	Mean in Original Scale	164.6
SD	180.1	SD in Original Scale	175
95% UTL with 90% Coverage	578.7	95% UTL with 90% Coverage	45068
		95% BCA UTL with 90% Coverage	380
		95% Bootstrap (%) UTL with 90% Coverage	380
95% UPL (t)	500.8	95% UPL (t)	10366
90% Percentile (z)	385.4	90% Percentile (z)	1173
95% Percentile (z)	450.8	95% Percentile (z)	4033
99% Percentile (z)	573.5	99% Percentile (z)	40886
<b>Gamma Distribution Test with Detected Values Only</b>		<b>Data Distribution Test with Detected Values Only</b>	
k star (bias corrected)	0.314	Data do not follow a Discernable Distribution (0.05)	
Theta Star	582.4		
nu star	5.651		
A-D Test Statistic	1.322	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.796	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.348	Mean	164.7
5% K-S Critical Value	0.299	SD	165.9
Data not Gamma Distributed at 5% Significance Level		SE of Mean	55.65
<b>Assuming Gamma Distribution</b>		95% KM UTL with 90% Coverage	555.4
<b>Gamma ROS Statistics with Extrapolated Data</b>		95% KM Chebyshev UPL	923.1
Mean	168.7	95% KM UPL (t)	483.6
Median	160.7	90% Percentile (z)	377.3
SD	171.1	95% Percentile (z)	437.6
k star	0.333	99% Percentile (z)	550.6
Theta star	506.4	<b>Gamma ROS Limits with Extrapolated Data</b>	
Nu star	6.663	95% Wilson Hilferty (WH) Approx. Gamma UPL	937.9
95% Percentile of Chisquare (2k)	2.946	95% Hawkins Wixley (HW) Approx. Gamma UPL	1172
		95% WH Approx. Gamma UTL with 90% Coverage	1345
90% Percentile	490.8	95% HW Approx. Gamma UTL with 90% Coverage	1823
95% Percentile	745.9		
99% Percentile	1400		

Note: DL/2 is not a recommended method.

### Potassium

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	18
Tolerance Factor	1.974	Number of Missing Values	2
Raw Statistics		Log-Transformed Statistics	
Minimum	1160	Minimum	7.056
Maximum	3080	Maximum	8.033
Second Largest	2890	Second Largest	7.969
First Quartile	1453	First Quartile	7.279
Median	2015	Median	7.608
Third Quartile	2440	Third Quartile	7.8
Mean	2022	Mean	7.568

Geometric Mean	1935	SD	0.31
SD	600.6		
Coefficient of Variation	0.297		
Skewness	0.136		

**Background Statistics**

**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.897

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.897

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

95% UTL with 90% Coverage	3207
95% UPL (t)	3095
90% Percentile (z)	2791
95% Percentile (z)	3010
99% Percentile (z)	3419

**Assuming Lognormal Distribution**

95% UTL with 90% Coverage	3567
95% UPL (t)	3366
90% Percentile (z)	2878
95% Percentile (z)	3221
99% Percentile (z)	3978

**Gamma Distribution Test**

k star	9.65
Theta Star	209.5
MLE of Mean	2022
MLE of Standard Deviation	650.8
nu star	347.4

**Data Distribution Test**

Data appear Normal at 5% Significance Level

A-D Test Statistic	0.349
5% A-D Critical Value	0.739
K-S Test Statistic	0.137
5% K-S Critical Value	0.203

**Nonparametric Statistics**

90% Percentile	2806
95% Percentile	2919
99% Percentile	3048

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile	2888
95% Percentile	3197
99% Percentile	3834
95% WH Approx. Gamma UPL	3246
95% HW Approx. Gamma UPL	3273
95% WH Approx. Gamma UTL with 90% Coverage	3406
95% HW Approx. Gamma UTL with 90% Coverage	3441

**95% UTL with 90% Coverage**

95% Percentile Bootstrap UTL with 90% Coverage	3080
95% BCA Bootstrap UTL with 90% Coverage	3080
95% UPL	3080
95% Chebyshev UPL	4711
Upper Threshold Limit Based upon IQR	3921

**Selenium**

**General Statistics**

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).



The data set for variable Selenium was not processed!

Silver

General Statistics

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver was not processed!

Sodium

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Tolerance Factor	1.926		

Raw Statistics

Minimum	65.3
Maximum	4190
Second Largest	3690
First Quartile	186.5
Median	727.5
Third Quartile	1583
Mean	1198
Geometric Mean	625
SD	1219
Coefficient of Variation	1.017
Skewness	1.263

Log-Transformed Statistics

Minimum	4.179
Maximum	8.34
Second Largest	8.213
First Quartile	5.228
Median	6.568
Third Quartile	7.367
Mean	6.438
SD	1.324

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.839
Shapiro Wilk Critical Value	0.905

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	3546
95% UPL (t)	3358
90% Percentile (z)	2760
95% Percentile (z)	3203
99% Percentile (z)	4034

Assuming Lognormal Distribution

95% UTL with 90% Coverage	8010
95% UPL (t)	6531
90% Percentile (z)	3412
95% Percentile (z)	5520
99% Percentile (z)	13612

Gamma Distribution Test

Data Distribution Test



k star	0.797	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1504		
MLE of Mean	1198		
MLE of Standard Deviation	1342		
nu star	31.88		
A-D Test Statistic	0.361	Nonparametric Statistics	
5% A-D Critical Value	0.773	90% Percentile	2997
K-S Test Statistic	0.133	95% Percentile	3715
5% K-S Critical Value	0.2	99% Percentile	4095
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	4190
90% Percentile	2917	95% Percentile Bootstrap UTL with 90% Coverage	4190
95% Percentile	3893	95% BCA Bootstrap UTL with 90% Coverage	4190
99% Percentile	6199	95% UPL	4165
		95% Chebyshev UPL	6643
95% WH Approx. Gamma UPL	4106	Upper Threshold Limit Based upon IQR	3677
95% HW Approx. Gamma UPL	4409		
95% WH Approx. Gamma UTL with 90% Coverage	4570		
95% HW Approx. Gamma UTL with 90% Coverage	4980		

TDS

General Statistics			
Total Number of Observations	10	Number of Distinct Observations	10
Tolerance Factor	2.355		
Raw Statistics		Log-Transformed Statistics	
Minimum	164	Minimum	5.1
Maximum	4900	Maximum	8.497
Second Largest	4730	Second Largest	8.462
First Quartile	628	First Quartile	6.433
Median	1024	Median	6.91
Third Quartile	3055	Third Quartile	8.015
Mean	1940	Mean	7.109
Geometric Mean	1222	SD	1.092
SD	1781		
Coefficient of Variation	0.918		
Skewness	0.887		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	6135	95% UTL with 90% Coverage	16012
95% UPL (t)	5365	95% UPL (t)	9984

90% Percentile (z) 4223  
 95% Percentile (z) 4870  
 99% Percentile (z) 6084

90% Percentile (z) 4957  
 95% Percentile (z) 7372  
 99% Percentile (z) 15519

**Gamma Distribution Test**

k star 0.922  
 Theta Star 2103  
 MLE of Mean 1940  
 MLE of Standard Deviation 2020  
 nu star 18.45

**Data Distribution Test**

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic 0.382  
 5% A-D Critical Value 0.744  
 K-S Test Statistic 0.197  
 5% K-S Critical Value 0.273

**Nonparametric Statistics**

90% Percentile 4747  
 95% Percentile 4824  
 99% Percentile 4885

Data appear Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

90% Percentile 4557  
 95% Percentile 5981  
 99% Percentile 9307

95% UTL with 90% Coverage 4900

95% Percentile Bootstrap UTL with 90% Coverage 4900

95% BCA Bootstrap UTL with 90% Coverage 4900

95% UPL 4900

95% Chebyshev UPL 10084

95% WH Approx. Gamma UPL 6755

Upper Threshold Limit Based upon IQR 6696

95% HW Approx. Gamma UPL 7204

95% WH Approx. Gamma UTL with 90% Coverage 8752

95% HW Approx. Gamma UTL with 90% Coverage 9647

**Sulfate**

**General Statistics**

Number of Valid Data 9  
 Number of Distinct Detected Data 6  
 Tolerance Factor 2.454

Number of Detected Data 6  
 Number of Non-Detect Data 3  
 Percent Non-Detects 33.33%

**Raw Statistics**

Minimum Detected 14  
 Maximum Detected 750  
 Mean of Detected 239.5  
 SD of Detected 276  
 Minimum Non-Detect 10  
 Maximum Non-Detect 10

**Log-transformed Statistics**

Minimum Detected 2.639  
 Maximum Detected 6.62  
 Mean of Detected 4.757  
 SD of Detected 1.473  
 Minimum Non-Detect 2.303  
 Maximum Non-Detect 2.303

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

**Background Statistics**

**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.833  
 5% Shapiro Wilk Critical Value 0.788

Data appear Normal at 5% Significance Level

**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic 0.972  
 5% Shapiro Wilk Critical Value 0.788

Data appear Lognormal at 5% Significance Level

**Assuming Normal Distribution**

DL/2 Substitution Method  
 Mean 161.3  
 SD 247.7  
 95% UTL 90% Coverage 769.3  
 95% UPL (t) 646.9  
 90% Percentile (z) 478.8  
 95% Percentile (z) 568.8  
 99% Percentile (z) 737.7

**Assuming Lognormal Distribution**

DL/2 Substitution Method  
 Mean (Log Scale) 3.708  
 SD (Log Scale) 1.958  
 95% UTL 90% Coverage 4973  
 95% UPL (t) 1891  
 90% Percentile (z) 501  
 95% Percentile (z) 1020  
 99% Percentile (z) 3873

**Maximum Likelihood Estimate(MLE) Method**

Mean 88.5  
 SD 313.3  
 95% UTL with 90% Coverage 857.3  
 95% UPL (t) 702.6  
 90% Percentile (z) 490  
 95% Percentile (z) 603.8  
 99% Percentile (z) 817.3

**Log ROS Method**

Mean in Original Scale 160.7  
 SD in Original Scale 248.2  
 95% UTL with 90% Coverage 9618  
 95% BCA UTL with 90% Coverage 750  
 95% Bootstrap (%) UTL with 90% Coverage 750  
 95% UPL (t) 3038  
 90% Percentile (z) 623.7  
 95% Percentile (z) 1456  
 99% Percentile (z) 7140

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected) 0.521  
 Theta Star 459.7  
 nu star 6.252

A-D Test Statistic 0.195  
 5% A-D Critical Value 0.719  
 K-S Test Statistic 0.156  
 5% K-S Critical Value 0.343

Data appear Gamma Distributed at 5% Significance Level

**Data Distribution Test with Detected Values Only**

Data appear Normal at 5% Significance Level

**Nonparametric Statistics**

Kaplan-Meier (KM) Method  
 Mean 164.3  
 SD 231.6  
 SE of Mean 84.56

95% KM UTL with 90% Coverage 732.7  
 95% KM Chebyshev UPL 1228  
 95% KM UPL (t) 618.3  
 90% Percentile (z) 461.1  
 95% Percentile (z) 545.3  
 99% Percentile (z) 703.1

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean 159.7  
 Median 37  
 SD 248.9  
 k star 0.155  
 Theta star 1029  
 Nu star 2.793  
 95% Percentile of Chisquare (2k) 1.697  
 90% Percentile 475.5  
 95% Percentile 872.9  
 99% Percentile 2018

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL 1023  
 95% Hawkins Wixley (HW) Approx. Gamma UPL 1461  
 95% WH Approx. Gamma UTL with 90% Coverage 1607  
 95% HW Approx. Gamma UTL with 90% Coverage 2621

Note: DL/2 is not a recommended method

Thallium

General Statistics

Number of Valid Data	20	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	20

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!  
 Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!  
 The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Thallium was not processed!

KN

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
Tolerance Factor	2.355		

Raw Statistics

Minimum	70
Maximum	600
Second Largest	320
First Quartile	130
Median	165
Third Quartile	195
Mean	204.4
Geometric Mean	168.6
SD	155.5
Coefficient of Variation	0.761
Skewness	2.152

Log-Transformed Statistics

Minimum	4.248
Maximum	6.397
Second Largest	5.768
First Quartile	4.868
Median	5.102
Third Quartile	5.272
Mean	5.127
SD	0.621

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.75
Shapiro Wilk Critical Value	0.842

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.842

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	570.6
95% UPL (t)	503.4
90% Percentile (z)	403.7
95% Percentile (z)	460.2
99% Percentile (z)	566.2

Assuming Lognormal Distribution

95% UTL with 90% Coverage	727.1
95% UPL (t)	555.9
90% Percentile (z)	373.5
95% Percentile (z)	467.9
99% Percentile (z)	714.3

Gamma Distribution Test

k star	1.992
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Data Distribution Test

Data appear Gamma Distributed at 5% Significance Level

Theta Star	102.6		
MLE of Mean	204.4		
MLE of Standard Deviation	144.8		
nu star	39.85		

A-D Test Statistic	0.487	<b>Nonparametric Statistics</b>	
5% A-D Critical Value	0.733	90% Percentile	348
K-S Test Statistic	0.234	95% Percentile	474
5% K-S Critical Value	0.269	99% Percentile	574.8

Data appear Gamma Distributed at 5% Significance Level

<b>Assuming Gamma Distribution</b>		95% UTL with 90% Coverage	600
90% Percentile	397.9	95% Percentile Bootstrap UTL with 90% Coverage	600
95% Percentile	485.4	95% BCA Bootstrap UTL with 90% Coverage	600
99% Percentile	679.6	95% UPL	600
		95% Chebyshev UPL	915.4
95% WH Approx. Gamma UPL	517.8	Upper Threshold Limit Based upon IQR	292.5
95% HW Approx. Gamma UPL	524.1		
95% WH Approx. Gamma UTL with 90% Coverage	629		
95% HW Approx. Gamma UTL with 90% Coverage	645.9		

**Total Phosphate**

<b>General Statistics</b>			
Number of Valid Data	10	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	1
Tolerance Factor	2.355	Percent Non-Detects	10.00%

<b>Raw Statistics</b>		<b>Log-transformed Statistics</b>	
Minimum Detected	2.6	Minimum Detected	0.956
Maximum Detected	1200	Maximum Detected	7.09
Mean of Detected	558.6	Mean of Detected	4.464
SD of Detected	536.6	SD of Detected	2.905
Minimum Non-Detect	1.5	Minimum Non-Detect	0.405
Maximum Non-Detect	1.5	Maximum Non-Detect	0.405

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

<b>Background Statistics</b>			
<b>Normal Distribution Test with Detected Values Only</b>		<b>Lognormal Distribution Test with Detected Values Only</b>	
Shapiro Wilk Test Statistic	0.778	Shapiro Wilk Test Statistic	0.727
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

**Assuming Normal Distribution**

**DL/2 Substitution Method**

Mean	502.9
SD	535.8
95% UTL 90% Coverage	1765
95% UPL (t)	1533
90% Percentile (z)	1190
95% Percentile (z)	1384
99% Percentile (z)	1749

**Maximum Likelihood Estimate(MLE) Method**

Mean	472.3
SD	551.4
95% UTL with 90% Coverage	1771
95% UPL (t)	1532
90% Percentile (z)	1179
95% Percentile (z)	1379
99% Percentile (z)	1755

**Gamma Distribution Test with Detected Values Only**

k star (bias corrected)	0.314
Theta Star	1780
nu star	5.648
A-D Test Statistic	1.299
5% A-D Critical Value	0.796
K-S Test Statistic	0.345
5% K-S Critical Value	0.299

Data not Gamma Distributed at 5% Significance Level

**Assuming Gamma Distribution**

**Gamma ROS Statistics with Extrapolated Data**

Mean	514.7
Median	479.6
SD	524.7
k star	0.332
Theta star	1548
Nu star	6.648
95% Percentile of Chisquare (2k)	2.941
90% Percentile	1498
95% Percentile	2277
99% Percentile	4278

**Assuming Lognormal Distribution**

**DL/2 Substitution Method**

Mean (Log Scale)	3.989
SD (Log Scale)	3.124
95% UTL 90% Coverage	84599
95% UPL (t)	21912
90% Percentile (z)	2958
95% Percentile (z)	9202
99% Percentile (z)	77355

**Log ROS Method**

Mean in Original Scale	502.8
SD in Original Scale	535.9
95% UTL with 90% Coverage	138262
95% BCA UTL with 90% Coverage	1200
95% Bootstrap (%) UTL with 90% Coverage	1200
95% UPL (t)	31759
90% Percentile (z)	3588
95% Percentile (z)	12347
99% Percentile (z)	125422

**Data Distribution Test with Detected Values Only**

Data do not follow a Discernable Distribution (0.05)

**Nonparametric Statistics**

**Kaplan-Meier (KM) Method**

Mean	503
SD	508.1
SE of Mean	170.4
95% KM UTL with 90% Coverage	1700
95% KM Chebyshev UPL	2826
95% KM UPL (t)	1480
90% Percentile (z)	1154
95% Percentile (z)	1339
99% Percentile (z)	1685

**Gamma ROS Limits with Extrapolated Data**

95% Wilson Hilferty (WH) Approx. Gamma UPL	2863
95% Hawkins Wixley (HW) Approx. Gamma UPL	3574
95% WH Approx. Gamma UTL with 90% Coverage	4107
95% HW Approx. Gamma UTL with 90% Coverage	5562

Note: DL/2 is not a recommended method

Vanadium

Total Number of Observations		20	Number of Distinct Observations		20
Tolerance Factor		1.926			
<b>Raw Statistics</b>			<b>Log-Transformed Statistics</b>		
Minimum	9.82	Minimum	2.284		
Maximum	45.5	Maximum	3.818		
Second Largest	38.5	Second Largest	3.651		
First Quartile	11.85	First Quartile	2.472		
Median	18.4	Median	2.912		
Third Quartile	27.63	Third Quartile	3.319		
Mean	21.05	Mean	2.941		
Geometric Mean	18.93	SD	0.472		
SD	10.1				
Coefficient of Variation	0.48				
Skewness	0.874				
<b>Background Statistics</b>					
<b>Normal Distribution Test</b>			<b>Lognormal Distribution Test</b>		
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.943		
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905		
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
<b>Assuming Normal Distribution</b>			<b>Assuming Lognormal Distribution</b>		
95% UTL with 90% Coverage	40.5	95% UTL with 90% Coverage	46.98		
95% UPL (t)	38.95	95% UPL (t)	43.68		
90% Percentile (z)	33.99	90% Percentile (z)	34.66		
95% Percentile (z)	37.66	95% Percentile (z)	41.14		
99% Percentile (z)	44.55	99% Percentile (z)	56.75		
<b>Gamma Distribution Test</b>			<b>Data Distribution Test</b>		
k star	4.18	Data appear Normal at 5% Significance Level			
Theta Star	5.035				
MLE of Mean	21.05				
MLE of Standard Deviation	10.29				
nu star	167.2				
A-D Test Statistic	0.437	<b>Nonparametric Statistics</b>			
5% A-D Critical Value	0.745	90% Percentile	32.2		
K-S Test Statistic	0.139	95% Percentile	38.85		
5% K-S Critical Value	0.194	99% Percentile	44.17		
Data appear Gamma Distributed at 5% Significance Level					
<b>Assuming Gamma Distribution</b>			95% UTL with 90% Coverage		
90% Percentile	34.84	95% Percentile Bootstrap UTL with 90% Coverage	45.5		
95% Percentile	40.33	95% BCA Bootstrap UTL with 90% Coverage	45.5		
99% Percentile	52.02	95% UPL	45.15		
95% WH Approx. Gamma UPL	41.25	95% Chebyshev UPL	66.17		
95% HW Approx. Gamma UPL	41.74	Upper Threshold Limit Based upon IQR	51.29		
95% WH Approx. Gamma UTL with 90% Coverage	43.66				
95% HW Approx. Gamma UTL with 90% Coverage	44.33				



Zinc

## General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Tolerance Factor	1.926		

## Raw Statistics

Minimum	13.5
Maximum	55.8
Second Largest	54.9
First Quartile	18.75
Median	24.2
Third Quartile	32.8
Mean	27.45
Geometric Mean	25.31
SD	11.95
Coefficient of Variation	0.435
Skewness	1.212

## Log-Transformed Statistics

Minimum	2.603
Maximum	4.022
Second Largest	4.006
First Quartile	2.929
Median	3.186
Third Quartile	3.49
Mean	3.231
SD	0.407

## Background Statistics

## Normal Distribution Test

Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical Value	0.905

Data not Normal at 5% Significance Level

## Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

## Assuming Normal Distribution

95% UTL with 90% Coverage	50.47
95% UPL (t)	48.62
90% Percentile (z)	42.76
95% Percentile (z)	47.11
99% Percentile (z)	55.25

## Assuming Lognormal Distribution

95% UTL with 90% Coverage	55.45
95% UPL (t)	52.08
90% Percentile (z)	42.65
95% Percentile (z)	49.45
99% Percentile (z)	65.27

## Gamma Distribution Test

k star	5.407
Theta Star	5.076
MLE of Mean	27.45
MLE of Standard Deviation	11.8
nu star	216.3

## Data Distribution Test

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.383
5% A-D Critical Value	0.744
K-S Test Statistic	0.116
5% K-S Critical Value	0.194

Data appear Gamma Distributed at 5% Significance Level

## Nonparametric Statistics

90% Percentile	40.59
95% Percentile	54.95
99% Percentile	55.63

## Assuming Gamma Distribution

90% Percentile	43.24
95% Percentile	49.3
99% Percentile	62.05

95% UTL with 90% Coverage 55.8

95% Percentile Bootstrap UTL with 90% Coverage 55.8

95% BCA Bootstrap UTL with 90% Coverage 55.8

95% UPL 55.76

95% Chebyshev UPL 80.82



