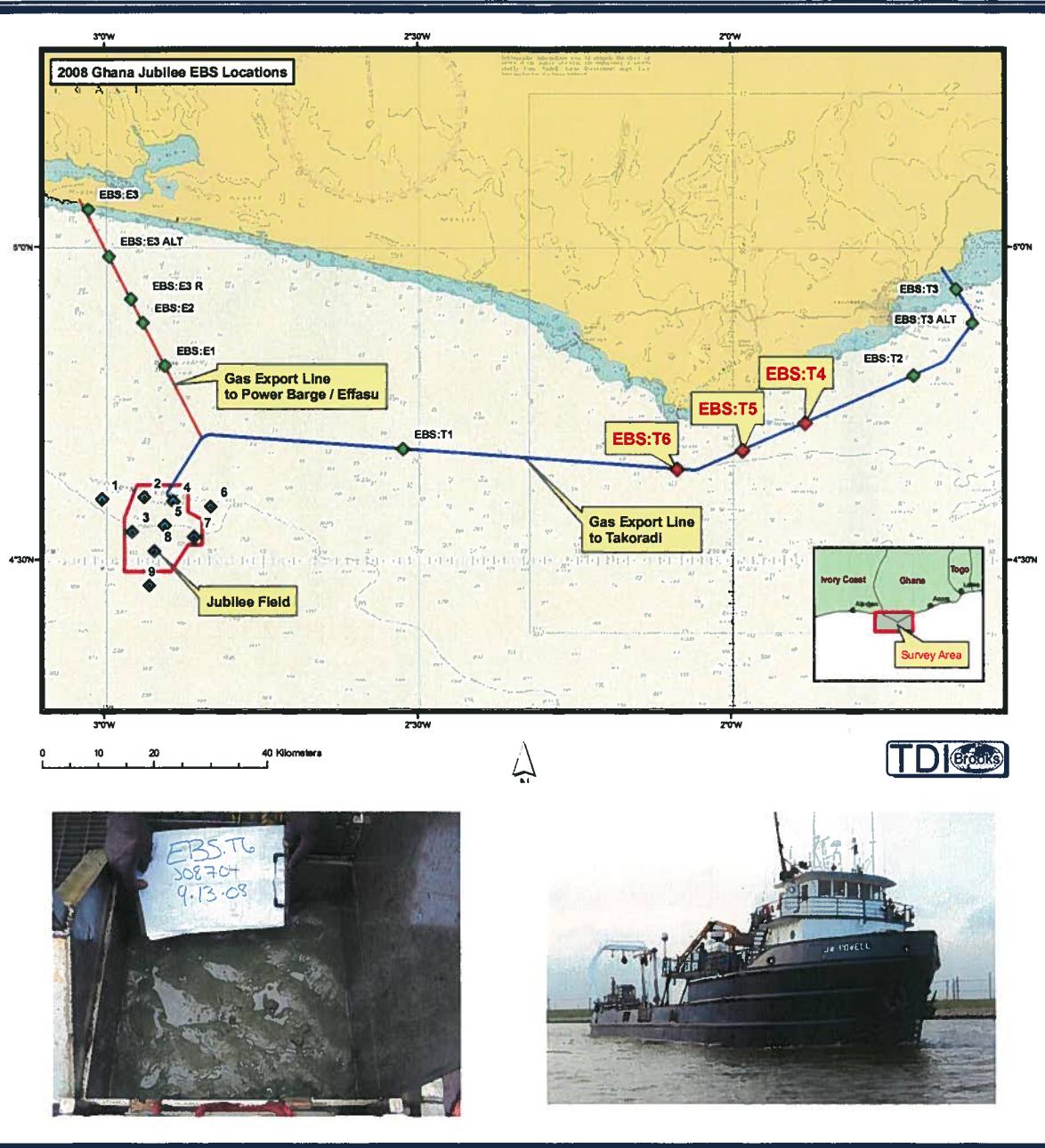


JUBILEE FIELD
Ghana
Technical Report # 08-2181**Environmental Baseline**
Analytical Report
TDI-Brooks**December 2008**

JUBILEE FIELD

Ghana

Environmental Baseline Survey

Analytical Report

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Introduction

TDI-Brooks International conducted an Environmental Baseline Survey (EBS) around the Jubilee Field for Tullow Ghana Limited. The survey was conducted off the *R/V JW Powell* from 9 September 2008 through 13 September 2008.

The Jubilee Field Unit Partners are developing the Jubilee Field, which is located in the Deepwater Tano and West Cape Three Points blocks, approximately 60 km offshore Ghana (**Figure 1**). The development includes production wells, water injection wells, and gas injection wells all to be tied in via manifolds and riser bases to a floating production, storage, and offloading vessel located 130 km WSW of Takoradi, Ghana.

Water and sediment samples were collected in the area of the gas export line to Power Barge/Effasu, gas export line to Takoradi and the Jubilee field. Water depths varied from 16 to >1800 m. The location of 4 stations that had to be relocated due to sampling difficulties is shown in **Figure 1**. The site, EBS:E3 along the gas export line to Power Barge/Effasu, was in water too shallow to sample. Sampling was attempted at EBS:E3 ALT, but that site was still too shallow for sampling. However, a third site was selected and successfully sampled, EBS:E3R. All pre-selected sites in the Jubilee field were successfully sampled. The following sites, EBS:T1, EBS:T3, EBS:T3ALT, EBS:T3, along the gas export line to Takoradi were sampled but sediment recoveries were poor. Consequently 3 new sites, EBS:T4, EBS:T5, and EBS:T6 were sampled.

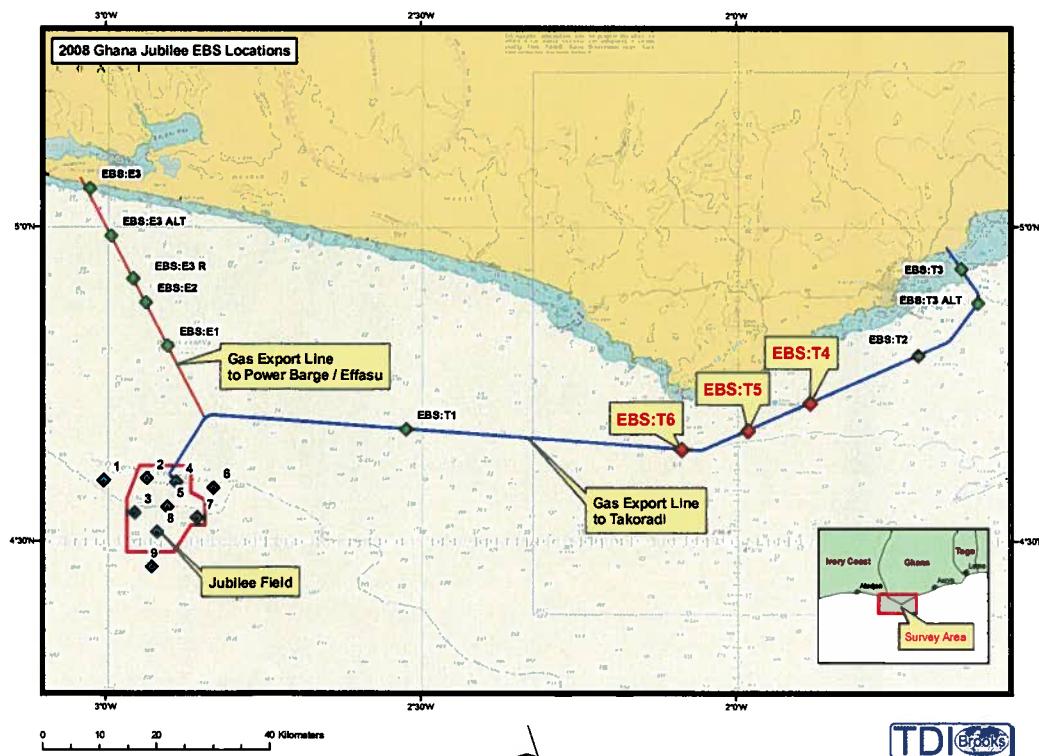


Figure 1. Map of Sampling Locations

Box cores and CTD casts and water samples were collected from all final stations. (Table 1).

Table 1. Location and depth of EIA stations.

Locations	Date	Time	Lat.	Long.	Depths
EBS:T3	9/9/2008	8:54:34	N04 55.9778	W001 38.3939	16.6
EBS:T3 CTD	9/9/2008	9:22:28	N04 55.9825	W001 38.3912	17.3
EBS:T3 ALT_SS	9/9/2008	10:04:41	N04 52.6817	W001 36.8161	28.1
EBS:T2_SS	9/9/2008	11:19:42	N04 47.6608	W001 42.5213	33.3
EBS:T2_CTD	9/9/2008	11:33:02	N04 47.6612	W001 42.5264	34.4
EBS:T1_CTD	9/9/2008	18:51:36	N04 40.5986	W002 31.3688	73.6
EBS:T1_SS	9/9/2008	18:57:59	N04 40.5979	W002 31.3806	73.3
Jub_EBS006_SS	9/9/2008	23:05:02	N04 35.0791	W002 49.7665	942.5
Jub_EBS006_CTD	9/10/2008	0:20:51	N04 35.0795	W002 49.7700	947.5
Jub_EBS007_SS	9/10/2008	1:36:19	N04 32.1627	W002 51.3290	1180
Jub_EBS007_CTD	9/10/2008	1:36:55	N04 32.1621	W002 51.3283	1180
Jub_EBS007_SSR	9/10/2008	7:28:48	N04 32.1616	W002 51.3295	1180
Jub_EBS009_CTD	9/10/2008	9:25:36	N04 27.4913	W002 55.6064	1741.7
Jub_EBS009_SS	9/10/2008	9:33:42	N04 27.4861	W002 55.6122	1745.8
Jub_EBS009_SSR	9/10/2008	10:41:07	N04 27.4902	W002 55.6085	1766.7
Jub_EBS008_CTD	9/10/2008	12:18:45	N04 30.7940	W002 55.1232	1441.7
Jub_EBS008_SS	9/10/2008	12:19:07	N04 30.7939	W002 55.1238	1441.7
Jub_EBS005_SS	9/10/2008	13:40:55	N04 33.2307	W002 54.1438	1341.7
Jub_EBS005_CTD	9/10/2008	13:41:11	N04 33.2303	W002 54.1463	1341.7
Jub_EBS005_SSR	9/10/2008	14:17:50	N04 33.2375	W002 54.1485	1345.8
Jub_EBS004_CTD	9/10/2008	15:32:48	N04 35.5703	W002 53.2760	985.7
Jub_EBS004_SS	9/10/2008	15:33:08	N04 35.5699	W002 53.2754	985.7
Jub_EBS002_CTD	9/10/2008	16:44:46	N04 35.9511	W002 56.0940	992.9
Jub_EBS002_SS	9/10/2008	16:45:10	N04 35.9526	W002 56.0960	996.4
Jub_EBS003_CTD	9/10/2008	17:59:21	N04 32.6502	W002 57.2635	1382.1
Jub_EBS003_SS	9/10/2008	17:59:50	N04 32.6484	W002 57.2649	1378.6
Jub_EBS003_SSR	9/10/2008	18:45:29	N04 32.6479	W002 57.2523	1385.7
Jub_EBS001_SS	9/10/2008	20:11:04	N04 35.7645	W003 00.1693	1264.3
Jub_EBS001_CTD	9/10/2008	20:11:17	N04 35.7623	W003 00.1697	1267.8
EBS:E1_SS	9/11/2008	6:48:48	N04 48.6119	W002 54.1051	74.5
EBS:E1_CTD	9/11/2008	7:14:55	N04 48.6048	W002 54.0901	75
EBS:E2_CTD	9/11/2008	8:00:50	N04 52.7208	W002 56.1984	64
EBS:E2_SS	9/11/2008	8:08:57	N04 52.7146	W002 56.2021	64.5
EBS:E3ALT_SS	9/11/2008	9:15:20	N04 59.1209	W002 59.4770	40
EBS:E3ALT_CTD	9/11/2008	9:44:24	N04 59.1210	W002 59.4679	40
EBS:E3ALT_BWS	9/11/2008	12:49:04	N04 59.1270	W002 59.4796	41.5
EBS:E3ALT_SWS	9/11/2008	12:49:31	N04 59.1264	W002 59.4778	41
EBS:E2_SWS	9/11/2008	13:51:49	N04 52.7187	W002 56.2057	65
EBS:E2_BWS	9/11/2008	13:52:30	N04 52.7186	W002 56.2068	64.7
EBS:E1_BWS	9/11/2008	15:03:43	N04 48.6058	W002 54.1054	74.7

Jub_EBS001_BWS	9/11/2008	17:25:30	N04 35.7604	W003 00.1770	1264.3
Jub_EBS003_BWS	9/12/2008	8:42:27	N04 32.6422	W002 57.2571	1385.7
Jub_EBS003_SWS	9/12/2008	8:43:09	N04 32.6418	W002 57.2586	1385.7
Jub_EBS002_BWS	9/12/2008	9:40:13	N04 35.9558	W002 56.0827	992.9
Jub_EBS002_SWS	9/12/2008	9:40:33	N04 35.9534	W002 56.0837	996.4
Jub_EBS004_BWS	9/12/2008	10:33:41	N04 35.5656	W002 53.2608	985.7
Jub_EBS004_SWS	9/12/2008	10:33:52	N04 35.5652	W002 53.2631	985.7
Jub_EBS005_SWS	9/12/2008	11:11:56	N04 33.2326	W002 54.1396	1346.4
Jub_EBS005_BWS	9/12/2008	11:27:21	N04 33.2357	W002 54.1425	1346.4
Jub_EBS008_SWS	9/12/2008	12:14:41	N04 30.7959	W002 55.1206	1435.7
Jub_EBS008_BWS	9/12/2008	12:24:44	N04 30.7965	W002 55.1183	1435.7
Jub_EBS009_SWS	9/12/2008	13:07:22	N04 27.5013	W002 55.6101	517.8
Jub_EBS009_BWS	9/12/2008	13:15:17	N04 27.4933	W002 55.6082	92.9
Jub_EBS007_SWS	9/12/2008	14:10:38	N04 32.1587	W002 51.3165	521.4
Jub_EBS007_BWS	9/12/2008	14:19:54	N04 32.1560	W002 51.3265	1178.6
Jub_EBS006_SWS	9/12/2008	14:57:03	N04 35.0784	W002 49.7678	942.9
Jub_EBS006_BWS	9/12/2008	15:09:02	N04 35.0769	W002 49.7658	942.9
EBS:E3_R_BWS	9/12/2008	20:37:10	N04 55.0104	W002 57.3632	50
EBS:E3_R_SS	9/12/2008	22:08:07	N04 55.0121	W002 57.3743	50
EBS:E3_R_SWS	9/12/2008	22:25:17	N04 55.0046	W002 57.3810	50
EBS:E3_R_CTD	9/12/2008	22:51:45	N04 55.0220	W002 57.3748	50
EBS:T1_BWS	9/13/2008	6:35:59	N04 40.5954	W002 31.3866	73.3
EBS:T1_SWS	9/13/2008	6:42:46	N04 40.5964	W002 31.3789	73.3
EBS:T6_SWS	9/13/2008	10:48:16	N04 38.6372	W002 05.0963	52.5
EBS:T6_BWS	9/13/2008	10:53:11	N04 38.6428	W002 05.0989	53.1
EBS:T6_CTD	9/13/2008	11:12:55	N04 38.6369	W002 05.1030	53.1
EBS:T6_SS	9/13/2008	11:23:01	N04 38.6367	W002 05.1029	51.9
EBS:T6_SSR	9/13/2008	11:53:23	N04 38.6394	W002 05.1046	52.5
EBS:T5_SWS	9/13/2008	13:23:36	N04 40.4249	W001 58.8556	45
EBS:T5_BWS	9/13/2008	13:32:23	N04 40.4351	W001 58.8604	45
EBS:T5_CTD	9/13/2008	13:46:10	N04 40.4357	W001 58.8554	44.7
EBS:T5_SS	9/13/2008	13:52:42	N04 40.4334	W001 58.8589	45.3
EBS:T4_SWS	9/13/2008	16:08:51	N04 43.0769	W001 52.8862	38.9
EBS:T4_BWS	9/13/2008	16:11:08	N04 43.0778	W001 52.8890	38.9
EBS:T4_CTD	9/13/2008	16:23:38	N04 43.0776	W001 52.8870	38.7
EBS:T4_SS	9/13/2008	16:32:05	N04 43.0827	W001 52.8965	39.4

SS=sediment sample, SWS=surface water sample, BWS=bottom water sample, SSR=sediment sample re-take. Blue cells were sites not successfully sampled.

Methods

Sediment Collection

Sediment samples were collected using a 50-cm x 50-cm box core. A visual inspection of the sediment surface was made to determine if the core was acceptable. Digital photographs were taken of surface of box cores. A 22-cm x 22-cm template was

pushed into the box core, as were two 3-inch diameter push cores. Chemistry samples were collected around the sub-sampling equipment.

A 22-cm x 22-cm template was used in the box core for subsampling infauna. Macroinfauna were sieved from the 0.484-m² area to a depth of 0.15-m. The overlying water was carefully siphoned off on to a 0.5-mm screen to retain any organisms floating in the water. Any organisms retained were rinsed from the screen into the sample jar, or into the bucket with the sediment for sieving. Infaunal organisms were separated from the sediment by gentle washing the sediment sample through a 500-micron sieve using the floatation process. Organisms larger than 0.5-mm were retained on the screens. Mud was transferred from the bucket to sieve in increments to prevent overloading and slowing the sieving process. Organisms retained on the sieve were gently concentrated using water through the bottom of the sieve to move the sample material to a corner of the sieve. The sample was washed into a jar using a large mouth funnel and buffered formalin dispensed from the squeeze bottle. The jar was filled no more than half the jar volume to ensure sufficient room for the fixative. The jars containing the infauna were filled to the top with a seawater formalin solution containing rose bengal to yield a final concentration of between 5 and 10 % buffered formalin. Samples were shipped back to College Station, Texas for analysis.

Chemistry samples were taken from the top 2-cm of the sediment surrounding the box core template and push cores. All chemistry sampling was performed using a Teflon scoop. Trace metals were sampled first in the center, hydrocarbon, total nitrogen, total phosphorus, and sulfate subsamples were taken from the next concentric zone around the center, and finally the grain size sample obtained from the periphery of the box core down to 10-cm. All sediment samples were frozen with the exception of grain size and sulfate, which were refrigerated. The analyses conducted are listed in **Table 2**. Additionally, Eh measurements, as an indicator of oxidation/reduction potential, were also taken for each box core.

Table 2. Sediment Analyses

Analysis	Analytes
Metals	Pb, Cd, Hg, and Ba
Organics	PAH, TOC
Other	Total Nitrogen, Total Phosphorus, Grain Size, Eh, Sulfate

Water Collection

A SeaBird CTD cast was taken at all stations. CTD casts were acquired using a 2,000-m SeaBird Instrument, SBE-19 SeaCat. CTD casts were taken approximately 1 m below the surface to near-bottom. The CTD measured conductivity and temperature versus depth. Salinity and sound velocity were derived from the conductivity and temperature measurements. Additionally, the CTD unit housed an oxygen probe. Water column samples were collected using a 5-L Niskin Bottle. Water column samples were taken at two depths. Water was sampled near surface and near-bottom at shallow water sites and near surface and 100 m at the Jubilee sites. Field measurements were taken on a subsample from the Niskin Bottle. Water was collected for metals, nutrients,

total dissolved solids and suspended solids (**Table 3**). Trace metal samples were refrigerated. Water samples for suspended solids were filtered in the field and frozen. Nutrient samples were frozen. Water samples for total dissolved solids were kept cold. All samples were shipped to College Station, Texas for analysis.

Table 3. Water Analyses

Analysis	Analytes
Metals	Pb, Cd, Hg, and Ba
Inorganic	Total Nitrogen and Total Phosphorus
Other	Suspended solids, Total Dissolved Solids

Analytical Methods

PAH Sediment Extraction

An automated extraction apparatus (Dionex ASE200 Accelerated Solvent Extractor) was used to extract various organics (PAH/TPH) from 1 to 15 g of a pre-dried, homogenous sample. All appropriate surrogates and spiking solutions were added. The extractions were performed using 100% dichloromethane inside stainless-steel extraction cells held at elevated temperature and solvent pressure. The extracted compounds dissolved in the hot solvent were collected in 60-mL glass vials.

The following ASE extraction conditions were used to extract the sediments:

Extraction solvent:	100% dichloromethane
Solvent pressure:	1,500 psi
Cell temperature:	100°C
Cell pre-heat time:	5 min (non-adjustable pre-set for 100°C)
Static pressure time:	2 min
Static cycles:	2 ea
Solvent flush:	60% of cell volume each cycle
Nitrogen purge time:	90 sec at end to dry cell
Method rinse:	ON (between samples)
Total extraction time:	approximately 11 min/cell

The solvent in the glass tube was concentrated in a 55 - 60°C water bath until the solvent was reduced in volume to approximately 5-10 mL. The extract was transferred into a Kurderna-Danish (KD) concentrator tube. The sample volume was reduced to 0.5 mL in a 55 - 60°C water bath. The extract was then submitted for instrument analysis.

PAH Analysis

The quantitative method for the determination of polycyclic aromatic hydrocarbons (PAHs) and their alkylated homologues in extracts of water and sediment was performed by capillary gas chromatography/mass spectrometry (GC/MS) in selected ion monitoring mode (SIM). The gas chromatograph was temperature-programmed and operated in splitless mode. The capillary column was an Agilent Technologies HP-5MS (60 m long by 0.25 mm ID and 0.25 µm film thickness). Carrier flow was by electronic

pressure control. The mass spectrometer scanned from 35 to 500 AMU every second or less and utilized 70 volts electron energy in electron impact ionization mode. The data acquisition system acquired and stored all data during analysis.

Calibration solutions were prepared at five concentrations ranging from 0.02 to 1 $\mu\text{g/mL}$ by diluting a commercially available solution containing the analytes of interest (typically NIST SRM 2260). For each analyte of interest, a relative response factor (RRF) was determined for each calibration level. The 5 response factors were then averaged to produce a mean relative response factor for each analyte.

An analytical set contained standards, samples, and quality control samples. Each extraction batch was analyzed as an analytical set including samples and some or all of the following quality control samples: method-blank, duplicate, matrix-spike, matrix-spike duplicate, and standard reference material.

Total Organic Carbon

Total organic carbon was determined in oven-dried, acid treated sediments using a LECO CR-412 Carbon Determinator. Samples were acid treated by adding 50% v/v of phosphoric acid to remove any inorganic carbon. Dried sediment was combusted at 1,350°C under an oxygen atmosphere and carbon present in the samples is oxidized to form CO₂ gas. This sample gas then flowed through two scrubber tubes. The first tube contained Anhydrene (Mg(ClO₄)₂), AR610 (halogen trap), and tin or copper granules to remove water and any chlorine gas, respectively. The second tube contained Anhydrene, which removes residual moisture. The sample gas then flowed through a nondispersive infrared (NDIR) detection cell.

In the NDIR detector cell, infrared energy is emitted from a nichrome wire heated to 850°C. Radiant energy enters the cell through a calcium fluoride window and projects through the cell chamber, which contains carrier or sample gas. Gases absorb infrared energy as they pass through the cell chamber. As energy exits the cell chamber through a second calcium fluoride window, a precise wavelength filter selectively blocks all wavelengths except that of CO₂ from passing into the detector. The detector responds to the energy changes between the carrier gas and sample gas and ultimately determines the concentration of the carbon contained in the sample.

Prior to analysis, the instrument establishes a baseline. As analysis proceeds, the integrated area under the signal detected is proportional to the amount of CO₂ passing through the NDIR cell. The computer reads the cell output nine times per second and provides a linearized output. The weight-corrected result is the total weight percent of carbon.

Grain Size

Sediment samples collected in the field were refrigerated until analysis. The large or coarse fraction ($> 63 \text{ }\mu\text{m}$) was determined by sieving and the fine fraction ($< 63 \text{ }\mu\text{m}$) was analyzed by gravimetric pipetting. Approximately 25-50 g of sample were weighed into a 750 ml wide-mouth mason jar which was filled with about 250 mL of deflocculant

solution (2.5 - 3.0 g/L sodium hexametaphosphate in deionized water). The jars were shaken until the sample was totally disaggregated. The sample was then poured through a 63 *um* sieve. The coarse fraction (retained on the sieve) was concentrated against the bottom lip of the sieve and washed into a 150 mL beaker. Most of the supernatant was re-sieved. Material that went through the sieve was collected in a 1000 mL graduated cylinder. The volume of the cylinder was adjusted to 975 mL with deflocculent solution and covered. The coarse fraction was dried in an oven set between 70 – 90 °C. After drying, the coarse fraction was transferred to the top sieve in the sieve stack that is arranged in descending order, depending upon the sizes desired. The sieve stack was shaken to sort particles by size. The material retained on the sieve was transferred and weighed to determine %sand

The pipette analysis for the silt and clay size fractions was accomplished by filling the graduated cylinders to 1000 mL with deflocculent solution. The cylinders were kept in a constant temperature water bath at 24 °C for 24 hours. Following the incubation period, the samples in the cylinders were agitated for 1 minute with a plunger. The samples then sat, undisturbed for 20 seconds. A 25 mL aliquot was withdrawn at a depth of 20 cm and emptied into a 50 mL beaker. The sample sat, undisturbed for another 2 hours and 3 minutes after which another 25 mL aliquot was withdrawn for a depth of 10 cm and emptied into a 50 mL beaker. The beakers were dried in an oven set between 70 – 90 °C. After drying the samples were weighed to determine %silt and %clay.

Total Nitrogen and Total Phosphorus

Total phosphorus was determined using Standard Methods for Examination of Water Wastewater, 20th edition, method 4500-P E. Basically, a water sample is treated with ammonium molybdate and potassium antimonyl tartrate in an acidic medium that is reduced to molybdenum blue by ascorbic acid. The sample is read on a UV/VIS spectrophotometer at 880 nm.

Total nitrogen was determined using EPA method, 351.2. Basically, a sample is heated with sulfuric acid with mercuric sulfate and potassium sulfate. The sample is the sum of free ammonia and organic nitrogen which have been converted to ammonium sulfate. The samples are analyzed using an Auto Analyzer, treated with salicylate-nitroprussie, buffer, and hypochlorite and read at 660 nm.

Sulfate-Sulfur

Sediment samples were preserved with zinc acetate in the field. Sulfate was determined on a method modified from Standard Methods for the Examination of Water and Wastewater, 13th edition. Basically samples were centrifuged and 40 µL of sample was removed for analysis. Conditioning reagent (isopropyl alcohol, HCl, NaCl and glycerol) was added to a cuvette followed by water, sample and saturated BaCl₂. With the addition of the BaCl₂ the cuvette was shaken for 1 minute. The sample was placed in a UV/VIS spectrophotometer set at 420 nm. The highest absorbance during a 4-minute monitoring period was recorded.

Metals Waters

Samples were collected employing clean techniques with pre-cleaned bottles, equipment and instructions (compliant with EPA method 1669) provided by Albion Environmental (AE). Only samples to determine total recoverable metals were collected. Trace metal samples were collected in pre-cleaned and blanked plastic bottles and mercury samples were collected separately in pre-cleaned and blank glass bottles.

As required by EPA clean sampling method 1669, field quality assurance (QA) / quality control (QC) samples were collected and analyzed to confirm that the sampling was conducted consistently and without contamination. A field blank was collected during the sample collection to confirm the lack of contamination from the sampling procedures used.

Samples were received in good condition at Albion Environmental (AE). Trace metal samples were preserved under clean room conditions to a pH of < 2 using ultrapure nitric acid. Preserved samples were allowed to equilibrate for at least 72 hours to insure all metals adsorbed to the container walls were re-solubilized. In addition, all samples were also heated at > 65 degree Celsius for at least six hours to insure complete re-solubilization of all trace metals in the samples. As required by EPA method 1631 revision E, mercury (Hg) samples were preserved under clean room conditions with bromine monochloride (BrCl). Preserved Hg samples were also heated at > 65 degree Celsius for at least six hours to insure complete re-solubilization of all Hg in the samples.

Trace metals samples were analyzed by inductively coupled plasma-mass spectrometry (ICP-MS; US EPA 200.8/1638). Seawater samples were diluted 25 fold to minimize dissolved solids effects on the ICP-MS analyses as required by EPA method 200.8/1638. Matrix matching to the diluted seawater samples was also performed to minimize potential interferences. A full suite of in-house (laboratory) QA/QC samples was run with every sample set to insure the highest data quality. These include initial and continuing calibration standards, method blanks, laboratory control samples (blank spikes) and MS/MSD analysis. In addition, although not required by method 1638, AE ran two certified reference materials as independent indicators of method accuracy. Trace metals analyses proceeded nominally and all QA/QC samples met method acceptance criteria.

Mercury samples were analyzed by purge/trap cold vapor atomic fluorescence (P/T CVAF; U.S. EPA. Method 1631, revision E). The method detection limit for method 1631E is 0.0002 ppb and the method reporting limit is 0.0005 ppb. Seawater is a compatible matrix for this analytical method and no matrix specific method adjustments were required. A full suite of in-house (laboratory) QA/QC samples was run with every sample set to insure the highest data quality. This QA/QC suite includes method required QA/QC samples (i.e. matrix spike and matrix spike duplicate, method blanks and quality control sample) as well as optional QA/QC samples (i.e. blank spikes, laboratory duplicates and certified reference materials). Mercury analyses proceeded nominally and all QA/QC samples met method acceptance criteria.

Metals Sediments

Approximately 0.5 g. of sample was placed in a clean 100 mL beaker or flask to which 20 mL of concentrated, trace-metal grade HNO₃ and 2.5 mL HClO₄ were added. The container was covered with a watch glass and placed on a hot plate. The temperature of the hot plate was adjusted to allow reflux with acid evaporation. The samples were allowed to reflux for 4 hours or overnight. Following reflux, the temperature was turned up to drive off the HNO₃. The samples were cooled. The samples were then placed back on a hot plate to which 20 mL of D.I. water was added and heated until the solution clears or boils.

For mercury analysis, approximately 0.5 g. of sample was placed in a clean 50 mL round bottom flask to which 5 mL of concentrated, trace-metal grade nitric acid was added. The flasks were placed under condensers, ensuring sufficient water flow to permit reflux. The heat was turned up high enough to allow the nitric acid to reflux. The samples were allowed to reflux for two hours and then cooled. The condensers were rinsed with 1% hydrochloric acid into the flask. The samples were then diluted to 50 mL with 1% hydrochloric acid and transferred to 2 oz. bottles.

Following digestion, As and Se were analyzed by hydride generation. Mercury was analyzed by cold vapor. All other analytes were analyzed by either ICP, ICP-MS or graphite furnace AA.

Nutrients Waters

Urea, total nitrogen, total phosphorus, NO₃⁻, NO₂⁻, HSiO₃⁻, HPO₄⁼, NH₄⁺ were analyzed in collected waters. Samples were analyzed using a TECHNICON Auto-Analyizer. Nitrate and nitrite analyses were based on the methodology of Armstrong et al (Armstrong et al., 1967) and utilize a ground Cd column for reduction of NO₃⁻ to NO₂⁻. Orthophosphate was measured using chemistry based on the investigations of Bernhardt and Wilhelms (Bernhardt and Wilhelms, 1967) with the modification of hydrazine as reductant. Silicate determination was accomplished using the methods of Armstrong et al. (Armstrong, Stearns et al., 1967) using stannous chloride. Ammonium analysis is based on the method of Harwood (Harwood and Kuhn 1970) and used dichloro-isocyanurate as an oxidizer. Urea is measured using diacetyl-monoximine and themicarbozide. The total concentrations of nitrogen and phosphorus were determined after an initial decomposition step. This method involves persulfate oxidation while heating the sample in an autoclave (115°C, 20 minutes)(Hansen and Koroleff 1999). After oxidation of the samples nutrient determination was conducted on the Technicon II analyzer.

Total Suspended Solids

Total suspended solids were determined by a gravimetric method described in U.S.EPA. 1995. Environmental Monitoring and Assessment Program (EMAP): Laboratory Methods Manual – Estuaries, Volume 1: Biological and Physical Analyses. United States Environmental Protection Agency, Office of Research and Development,

Narragansett, RI. EPA/620/R-95/008. Basically a volume of water is filtered through a 0.45 μ glass fiber filter. The filter is dried at 103-105°C to a constant weight and weighed.

Total Dissolved Solids

Total dissolved solids were determined using Standard Methods for Examination of Water Wastewater, 20th edition, method 2540-C. Basically, a sample was filtered through a 0.45 μ filter. An aliquot of the filtrate was evaporated to dryness in a weighed dish to a constant weight at 180°C.

Water Metals Data

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 (Data Report L1215-9457-001)

B&B ID	AE Sample ID	Coll. Date	Location	Sample Type	Matrix	Processing	Method	Anal. Date	Ba (ppb)	Cd (ppb)	Pb (ppb)
Field Samples (Notes 1,2,3)											
GEB0196	LL-3145	9/11/2008	JUN-EBS-001 top 1m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.50	< 3.0	< 3.0
GEB0197	LL-3113	9/12/2008	JUB-EBS-001 bottom 100m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.43	< 3.0	< 3.0
GEB0198	LL-3153	9/12/2008	JEB-EBS-002 top 1m	Grab (Metals) 1 of 2	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.96	< 3.0	< 3.0
GEB0200	LL-3131	9/12/2008	JUB-EBS-002 bottom 100m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.15	< 3.0	< 3.0
GEB0201	LL-3121	9/12/2008	JUB-EBS-003 top 1 m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.54	< 3.0	< 3.0
GEB0202	LL-3163	9/12/2008	JUB-EBS-003 bottom 100m	Grab (Metals) 1 of 2	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.11	< 3.0	< 3.0
GEB0204	LL-3135	9/12/2008	JUB-EBS-004 top 1 m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.43	< 3.0	< 3.0
GEB0205	LL-3095	9/12/2008	JUB-EBS-004 bottom 100m	Grab (Metals) 1 of 2	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	4.97	< 3.0	< 3.0
GEB0207	LL-3123	9/12/2008	JUB-EBS-005 top 1m	Grab (metals) 1 of 2	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.60	< 3.0	< 3.0
GEB0209	LL-3194	9/12/2008	JUB-EBS-005 bottom 100m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.11	< 3.0	< 3.0
GEB0212	LL-3165	9/12/2008	JUB-EBS-006 top 1 m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.53	< 3.0	< 3.0
GEB0213	LL-3129	9/12/2008	JUB-EBS-006 bottom 100m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.08	< 3.0	< 3.0
GEB0214	LL-3171	9/12/2008	JUB-EBS-007 top 1m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.46	< 3.0	< 3.0
GEB0215	LL-3133	9/12/2008	JUB-EBS-007 bottom 100m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.23	< 3.0	< 3.0
GEB0216	LL-3155	9/12/2008	JUB-EBS-008 top 1 m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.50	< 3.0	< 3.0
GEB0217	LL-3093	9/12/2008	JUB-EBS-008 bottom 100m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.00	< 3.0	< 3.0
GEB0218	LL-3192	9/12/2008	JUB-EBS-009 top 1 m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.50	< 3.0	< 3.0
GEB0219	LL-3099	9/12/2008	JUB-EBS-009 bottom 100m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.17	< 3.0	< 3.0
GEB0220	LL-3125	9/11/2008	EBS-E1 top 1 m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.44	< 3.0	< 3.0
GEB0221	LL-3196	9/11/2008	EBS-E1 bottom 75m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.06	< 3.0	< 3.0
GEB0222	LL-3111	9/11/2008	EBS-E2 top 1 m	Grab (metals) 1 of 2	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.57	< 3.0	< 3.0
GEB0224	LL-3105	9/11/2008	EBS-E2 bottom 67m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.15	< 3.0	< 3.0
GEB0228	LL-3157	9/11/2008	EBS-E3R top 1 m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.56	< 3.0	< 3.0
GEB0229	LL-3103	9/11/2008	EBS-E3R bottom 50m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.15	< 3.0	< 3.0
GEB0232	LL-3094	9/13/2008	EBS-T4 top 1m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.57	< 3.0	< 3.0
GEB0233	LL-3096	9/13/2008	EBS-T4 bottom 39m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.34	< 3.0	< 3.0
GEB0236	LL-3097	9/13/2008	EBS-T5 top 1m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.49	< 3.0	< 3.0
GEB0237	LL-3098	9/13/2008	EBS-T4 bottom	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.39	< 3.0	< 3.0
GEB0238	LL-3100	9/13/2008	EBS-T6 top 1m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.47	< 3.0	< 3.0
GEB0239	LL-3102	9/13/2008	EBS-T6 bottom 49m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.35	< 3.0	< 3.0

Notes:

1. Metals samples were collected using pre-cleaned sample containers and procedures compliant with EPA clean metals guidance (EPA methods 1669 and 1631E)
 2. Metals concentration units are micrograms per liter (= parts per billion)
 3. All trace elements were analyzed by normal mode (direct aspiration) ICP-MS modified for matrix matching to saltwater samples (EPA method 200.8/1638 modified).
- Saltwater samples were diluted 25 fold for this analysis.

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B&B ID	AE Sample ID	Coll. Date	Location	Sample Type	Matrix	Processing	Method	Anal. Date	Ba (ppb)	Cd (ppb)	Pb (ppb)
Field Quality Assurance (QA) Samples											
Equipment Blank											
KK-5468	10/29/2007	Albion Env.	Bottle BLK (250 ml)	DIW	Diss.	EPA 200.8/1638	10/31/2007	< 0.10	< 0.10	< 0.10	< 0.10
Field Blanks											
GEB0210	LL-3143	9/12/2008	JUB-EBS-005	Grab Field Blank	DIW	Total Rec.	EPA 200.8/1638	11/26/2008	< 0.10	< 0.10	< 0.10
GEB0234	LL-3174	9/13/2008	EBS-T4	Grab Field Blank	DIW	Total Rec.	EPA 200.8/1638	11/26/2008	< 0.10	< 0.10	< 0.10
Field Duplicate											
No field duplicate samples were collected with this sample set											
Laboratory Quality Assurance Samples											
Reporting Limit Normal Mode ICP-MS Analyzed Undiluted Samples											
Reporting Limit Diluted (DF=25) Seawater Samples											
Certified Reference Materials											
1640-2		Albion Env.	NIST SRM	Water	Total Rec.	EPA 200.8/1638	11/26/2008	144	22.7	27.6	
Certified Value	% R							148	22.8	27.9	
1643-E-1		Albion Env.	NIST SRM	Water	Total Rec.	EPA 200.8/1638	11/26/2008	97	100	99	
Certified Value	% R							97	100	99	
SLRS4-3		Albion Env.	NRCC CRM	Water	Total Rec.	EPA 200.8/1638	11/26/2008	542	6.49	21.3	
Certified Value	% R							544	6.57	19.6	
CASS-4		Albion Env.	NRCC CRM	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	101	99	109	
Certified Value	% R							101	99	109	
Laboratory Duplicates											
GEB0197	LL-3113	9/12/2008	JUB-EBS-001 bottom 100m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.43	< 3.0	< 3.0
	LL-3113-LDUP	9/12/2008	JUB-EBS-001 bottom 100m	Lab. Duplicate	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.34	< 3.0	< 3.0
Relative Percent Difference (RPD)											
GEB0198	LL-3153	9/12/2008	JEB-EBS-002 top 1m	Grab (Metals) 1 of 2	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.96	< 3.0	< 3.0
	LL-3153-LDUP	9/12/2008	JEB-EBS-002 top 1m	Lab. Duplicate	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.77	< 3.0	< 3.0
	LL-3153-LREP	9/12/2008	JEB-EBS-002 top 1m	Lab. Replicate	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.88	< 3.0	< 3.0

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B&B ID	AE Sample ID	Coll Date	Location	Sample Type	Matrix	Processing	Method	Anal. Date	Ba (ppb)	Cd (ppb)	Pb (ppb)
Relative Standard Deviation (RSD)											
GEB0200	LL-3131	9/12/2008	JUB-EBS-002 bottom 100m	Grab (metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.15	< 3.0	< 3.0
	LL-3131-LDUP	9/12/2008	JUB-EBS-002 bottom 100m	Lab. Duplicate	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.42	< 3.0	< 3.0
RPD											
Matrix Spikes											
GEB0198	LL-3153	9/12/2008	JEB-EBS-002 top 1m	Grab (Metals) 1 of 2	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.96	< 3.0	< 3.0
	LL-3153-MS	9/12/2008	JEB-EBS-002 top 1m	Matrix Spike	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	32.2	23.8	27.3
	LL-3153-MSD	9/12/2008	JEB-EBS-002 top 1m	MS Duplicate	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	31.1	23.1	26.1
Expected											
% R MS											
% R MSD											
RPD MS/MSD											
GEB0215	LL-3133	9/12/2008	JUB-EBS-007 bottom 100m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.23	< 3.0	< 3.0
	LL-3133-MS	9/12/2008	JUB-EBS-007 bottom 100m	Matrix Spike	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	29.8	22.2	25.3
	LL-3133-MSD	9/12/2008	JUB-EBS-007 bottom 100m	MS Duplicate	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	29.5	23.1	25.2
Expected											
% R MS											
% R MSD											
RPD MS/MSD											
GEB0236	LL-3097	9/13/2008	EBS-T5 top 1m	Grab (Metals)	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	5.49	< 3.0	< 3.0
	LL-3097-MS	9/13/2008	EBS-T5 top 1m	Matrix Spike	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	30.1	22.7	25.3
	LL-3097-MSD	9/13/2008	EBS-T5 top 1m	MS Duplicate	Seawater	Total Rec.	EPA 200.8/1638	11/26/2008	30.7	23.3	26.7
Expected											
% R MS											
% R MSD											
RPD MS/MSD											
Blank Spike											
LCS-3											
Expected											
% R											
Percent Recovery at Reporting Limit (ML, Low Calibration Standard)											
CalStd-1	Albion Env.			Blank Spike	DIW	Total Rec.	EPA 1638/200.8	11/26/2008	0.95	1.16	1.01
Reporting Limit (ML)	Albion Env.			Low Calib. Std.	DIW	Total Rec.	EPA 1638/200.8	11/26/2008	1.00	1.00	1.00
% R									95	116	101
Method Blank	Method Blank			Albion Env.	DIW	Total Rec.	EPA 200.8/1638	11/26/2008	< 0.10	< 0.10	< 0.10
LL-4578	Albion Env.										

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B&B ID	AE Sample ID	Collection Date	Location	Sample Type	Matrix	Processing	Method	Anal. Date	Hg (ng/L)
Field Samples (Notes 1,2,3,4)									
GEB0240	LL-3128	9/11/2008	JUB-EBS-001 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.278
GEB0241	LL-3148	9/12/2008	JUB-EBS-001 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0242	LL-3152	9/12/2008	JUB-EBS-002 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0243	LL-3144	9/12/2008	JUB-EBS-002 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.218
GEB0244	LL-3124	9/12/2008	JUB-EBS-003 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0245	LL-3150	9/12/2008	JUB-EBS-003 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0246	LL-3146	9/12/2008	JUB-EBS-004 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0247	LL-3138	9/12/2008	JUB-EBS-004 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0248	LL-3140	9/12/2008	JUB-EBS-005 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0249	LL-3118	9/12/2008	JUB-EBS-005 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0252	LL-3168	9/12/2008	JUB-EBS-006 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0253	LL-3166	9/12/2008	JUB-EBS-006 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0254	LL-3108	9/12/2008	JUB-EBS-007 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.279
GEB0255	LL-3112	9/12/2008	JUB-EBS-007 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.235
GEB0256	LL-3116	9/12/2008	JUB-EBS-008 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0257	LL-3120	9/12/2008	JUB-EBS-008 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0258	LL-3114	9/12/2008	JUB-EBS-009 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0259	LL-3110	9/12/2008	JUB-EBS-009 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0260	LL-3126	9/11/2008	EBS-E1 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.259
GEB0263	LL-3136	9/11/2008	EBS-E1 bottom 75m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.237
GEB0262	LL-3122	9/11/2008	EBS-E2 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.412
GEB0263	LL-3132	9/11/2008	EBS-E2 bottom 67m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.229
GEB0266	LL-3164	9/12/2008	EBS-E3R top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0267	LL-3162	9/12/2008	EBS-E3R bottom 50m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0270	LL-3193	9/13/2008	EBS-T4 top 1m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0271	LL-3170	9/13/2008	EBS-T4 bottom 39m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0274	LL-3195	9/13/2008	EBS-T5 top 1m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.200
GEB0275	LL-3197	9/13/2008	EBS-T5 bottom 44m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0276	LL-3154	9/12/2008	EBS-T6 top 1m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
GEB0277	LL-3156	9/12/2008	EBS-T6 bottom 49m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20

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B&B ID	AE Sample ID	Collection Date	Location	Sample Type	Matrix	Processing Method	Anal. Date	Hg (ng/L)
Notes								
1. Mercury samples were collected using pre-cleaned sample containers and procedures compliant with EPA clean mercury guidance (EPA methods 1669 and 1631E)								
2. Mercury (Hg) concentration units are nanograms of Hg per liter (= parts per trillion) to facilitate data presentation of such low Hg concentrations typical of ambient seawater.								
3. To minimize data censoring, Hg data are reported down to the method detection limit of 0.20 ng/L								
4. Mercury was detected in one of the pour field blanks (LL-3106 at 0.208 ppqr) just above the method detection limit of 0.20 ng/L. Although generally not a concern, because of the extremely low Hg concentrations observed in the seawater samples, this detectable field blank indicates that some of the Hg observed in the seawater samples may be due to low-level Hg contamination during sampling. However, an inspection of the seawater Hg data suggests that the potential bias due to low-level Hg contamination during sampling was likely minimal.								
Field Quality Assurance (QA) Samples								
Equipment Blanks								
LL-2789	7/18/2008	Albion Env.	Bottle Blank (125)	DIW	Total Rec.	EPA 1631e	7/23/2008	< 0.20
LL-2793	7/22/2008	Albion Env.	Bottle Blank (250)	DIW	Total Rec.	EPA 1631e	7/23/2008	< 0.20
Field Blanks (Note 4)								
GEB0250	LL-3106	9/12/2008	JUB-EBS-005	Grab Field Blank	DIW	Total Rec.	EPA 1631e	11/14/2008
GEB0272	LL-3172	9/13/2008	EBS-T4	Grab Field Blank	DIW	Total Rec.	EPA 1631e	11/14/2008
Field Duplicate								
No field duplicate samples were collected with this sample set								
Laboratory Quality Assurance Samples								
Method Reporting Limit (ML)								
Method Detection Limit (MDL)								
Certified Reference Materials								
DORM2-K24	Albion Env.	NRCC CRM	Tissue	Total Rec.	EPA 1631e	11/14/2008	4700000	0.50
Certified Value							4640000	0.20
% R							101	

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B&B ID	AE Sample ID	Collection Date	Location	Sample Type	Matrix	Processing	Method	Anal. Date	Hg (ng/L)
	TMA-989		Albion Env.	EPA Ref. Std.	Water	Total Rec.	EPA 1631e	11/14/2008	203000
	Certified Value								202000
	% R								100
Laboratory Duplicates									
GEB0256	LL-3116	9/12/2008	JUB-EBS-008 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
	LL-3116-LDUP	9/12/2008	JUB-EBS-008 top 1 m	Lab. Duplicate	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
Relative Percent Difference (RPD)									
GEB0257	LL-3120	9/12/2008	JUB-EBS-008 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
	LL-3120-LDUP	9/12/2008	JUB-EBS-008 bottom 100m	Lab. Duplicate	Seawater	Total Rec.	EPA 1631e	11/14/2008	< 0.20
RPD									
GEB0263	LL-3132	9/11/2008	EBS-E2 bottom 67m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.229
	LL-3132-LDUP	9/11/2008	EBS-E2 bottom 67m	Lab. Duplicate	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.223
	RPD								2.7
Matrix Spikes									
GEB0254	LL-3108	9/12/2008	JUB-EBS-007 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.279
	LL-3108-MS	9/12/2008	JUB-EBS-007 top 1 m	Matrix Spike	Seawater	Total Rec.	EPA 1631e	11/14/2008	2.06
	LL-3108-MSD	9/12/2008	JUB-EBS-007 top 1 m	MS Duplicate	Seawater	Total Rec.	EPA 1631e	11/14/2008	1.93
	Expected								2.22
	%R MS								80
	%R MSD								74
	RPD MS/MSD								6.5
GEB0255	LL-3112	9/12/2008	JUB-EBS-007 bottom 100m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.235
	LL-3112-MS	9/12/2008	JUB-EBS-007 bottom 100m	Matrix Spike	Seawater	Total Rec.	EPA 1631e	11/14/2008	1.91
	LL-3112-MSD	9/12/2008	JUB-EBS-007 bottom 100m	MS Duplicate	Seawater	Total Rec.	EPA 1631e	11/14/2008	1.99
	Expected								2.22
	%R MS								75
	%R MSD								79
	RPD MS/MSD								4.1

TDI-BI / B&B Laboratories Clean Metals and Mercury Ghana Seawater Monitoring Study
Final Aqueous Mercury Data for Samples Collected 11-13 September 2008
(Data Report L1215-9457-002)

B&B ID	AE Sample ID	Collection Date	Location	Sample Type	Matrix	Processing	Method	Anal. Date	Hg (ng/L)
GEB0262	LL-3122	9/11/2008	EBS-E2 top 1 m	Grab (Hg)	Seawater	Total Rec.	EPA 1631e	11/14/2008	0.412
	LL-3122-MS	9/11/2008	EBS-E2 top 1 m	Matrix Spike	Seawater	Total Rec.	EPA 1631e	11/14/2008	2.08
	LL-3122-MSD	9/11/2008	EBS-E2 top 1 m	MS Duplicate	Seawater	Total Rec.	EPA 1631e	11/14/2008	2.13
Expected									2.22
%R MS									75
% R MSD									77
RPD MS/MSD									2.4
Blank Spikes									
LCS-1		Albion Env.	Blank Spike	DIW	Total Rec.	EPA 1631e	11/14/2008	2.28	
Expected									2.22
% R									103
QCS5 NIST-1		Albion Env.	Ind. Chk. Std.	DIW	Total Rec.	EPA 1631e	11/14/2008	5.26	
Expected									105
QCS5-IV-1		Albion Env.	Ind. Chk. Std.	DIW	Total Rec.	EPA 1631e	11/14/2008	4.83	
Expected									5.00
% R									97
Percent Recovery at Reporting Limit (ML, Low Calibration Standard)									
CalStd-1		Albion Env.	Low Calib. Std.	DIW	Total Rec.	EPA 1631e	11/14/2008	0.489	
Reporting Limit (ML)									0.500
% R									98
Method Blanks									
MBLK-8		Albion Env.	Method Blank	DIW	Total Rec.	EPA 1631e	11/14/2008	< 0.20	
MBLK-13		Albion Env.	Method Blank	DIW	Total Rec.	EPA 1631e	11/14/2008	< 0.20	
MBLK-17		Albion Env.	Method Blank	DIW	Total Rec.	EPA 1631e	11/14/2008	< 0.20	

Sediment Metal Data

LET Sample Report

Units: %

Batch Number: L08090597

Analyte: % Moisture

LET I.D.	Submitter I.D.	%	Matrix
L08090598	GEB0031	62.5	Soil/Sediment
L08090599	GEB0032	77.7	Soil/Sediment
L08090600	GEB0033	71.8	Soil/Sediment
L08090601	GEB0034	74.7	Soil/Sediment
L08090602	GEB0035	56.9	Soil/Sediment
L08090603	GEB0036	70.4	Soil/Sediment
L08090604	GEB0037	71.8	Soil/Sediment
L08090605	GEB0038	76.2	Soil/Sediment
L08090606	GEB0039	76.2	Soil/Sediment
L08090607	GEB0040	36.6	Soil/Sediment
L08090608	GEB0041	39.3	Soil/Sediment
L08090609	GEB0042	37.5	Soil/Sediment
L08090610	GEB0043	47.6	Soil/Sediment
L08090611	GEB0044	50.1	Soil/Sediment
L08090612	GEB0045	53.5	Soil/Sediment

LET Sample Report

LET Sample ID: L08090598

Batch Number: L08090597

Submitter Sample ID: GEB0031

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	171	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	8	5

LET Sample Report

LET Sample ID: L08090599

Batch Number: L08090597

Submitter Sample ID: GEB0032

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	264	0.5
Cd	0.2	0.2
Hg	<0.1	0.1
Pb	17	5

LET Sample Report

LET Sample ID: L08090600

Batch Number: L08090597

Submitter Sample ID: GEB0033

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	273	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090601

Batch Number: L08090597

Submitter Sample ID: GEB0034

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	262	0.5
Cd	0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090602

Batch Number: L08090597

Submitter Sample ID: GEB0035

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	144	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090603

Batch Number: L08090597

Submitter Sample ID: GEB0036

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	234	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	9	5

LET Sample Report

LET Sample ID: L08090604

Batch Number: L08090597

Submitter Sample ID: GEB0037

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	253	0.5
Cd	0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090605

Batch Number: L08090597

Submitter Sample ID: GEB0038

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	291	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090606

Batch Number: L08090597

Submitter Sample ID: GEB0039

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	368	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	7	5

LET Sample Report

LET Sample ID: L08090607

Batch Number: L08090597

Submitter Sample ID: GEB0040

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	26	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090608

Batch Number: L08090597

Submitter Sample ID: GEB0041

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	23	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090609

Batch Number: L08090597

Submitter Sample ID: GEB0042

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	29	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	16	5

LET Sample Report

LET Sample ID: L08090610

Batch Number: L08090597

Submitter Sample ID: GEB0043

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	25	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	17	5

LET Sample Report

LET Sample ID: L08090611

Batch Number: L08090597

Submitter Sample ID: GEB0044

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	42	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	10	5

LET Sample Report

LET Sample ID: L08090612

Batch Number: L08090597

Submitter Sample ID: GEB0045

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Concentration	
	Dry Weight	D.L.
Ba	41	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	9	5

LET Duplicate Report

LET Sample ID: L08090600D
Submitter Sample ID: GEB0033
Units: mcg/g

Batch Number: L08090597
Matrix: Soil/Sediment

Analyte	Sample	D.L.	Duplicate	Average	
				Values	% Deviation
Ba	273	0.5	279	276	2.2
Cd	<0.2	0.2	<0.2	<0.2	0.0
Hg	<0.1	0.1	<0.1	<0.1	0.0
Pb	10	5	8	9	22.2

LET Duplicate Report

LET Sample ID: L08090606D

Batch Number: L08090597

Submitter Sample ID: GEB0039

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Sample	D.L.	Duplicate	Average Values	% Deviation
Ba	368	0.5	371	370	0.8
Cd	<0.2	0.2	<0.2	<0.2	0.0
Hg	<0.1	0.1	<0.1	<0.1	0.0
Pb	7	5	10	9	35.3

LET Duplicate Report

LET Sample ID: L08090612D

Batch Number: L08090597

Submitter Sample ID: GEB0045

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Sample	D.L.	Duplicate	Average Values	% Deviation
Ba	41	0.5	42	42	2.4
Cd	<0.2	0.2	<0.2	<0.2	0.0
Hg	<0.1	0.1	<0.1	<0.1	0.0
Pb	9	5	10	10	10.5

LET Spike Report

LET Sample ID: L08090603S

Batch Number: L08090597

Submitter Sample ID: GEB0036

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Sample		Spiked Sample	Sample Equivalent Spike	% Recovery
	Dry Weight	D.L.			
Ba	234	0.5	310	79.7	**
Cd	<0.2	0.2	18	19.9	90.4
Hg	<0.1	0.1	3.5	3.98	87.9
Pb	9	5	380	398	93.2

** indicates spike too low

LET Spike Report

LET Sample ID: L08090609S

Batch Number: L08090597

Submitter Sample ID: GEB0042

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Sample			Sample	
	Dry Weight	D.L.	Spiked Sample	Equivalent Spike	% Recovery
Ba	29	0.5	108	79.2	99.7
Cd	<0.2	0.2	19	19.8	96.0
Hg	<0.1	0.1	4.1	3.96	104
Pb	16	5	400	396	97.0

LET Blank Report

LET Sample ID: L08090597

Batch Number: L08090597

Submitter Sample ID: Blank-1

Matrix: Soil/Sediment

Units: mcg/g

Analyte	Sample Equivalent Concentration	Detection Limit
Ba	<0.5	0.5
Cd	<0.2	0.2
Hg	<0.1	0.1
Pb	<5	5

LET Reference Sample Report

LET Sample ID: L08090613

Batch Number: L08090597

SRM ID: ERA-D048

Matrix: Soil/Sediment

Units: mcg/g

Analyte	LET Concentration	Detection Limit	Certified Mean ± s.d.
Ba	165	0.5	159 ± 34
Cd	203	0.6	240 ± 49
Hg	3.5	0.1	3.6 ± 1.15
Pb	82	5	79.3 ± 16.9

B&B Laboratories
Project J08704
Report 08-2181

**2008 Jubilee Development Group-Ghana EBS
Total Organic Carbon
Client Submitted Samples**

Contract #

Sample Name	GEB0001	GEB0003	GEB0005	GEB0007
Client Name	JUB-EBS-001 (1 of 2)	JUB-EBS-002 (1 of 2)	JUB-EBS-003R (1 of 2)	JUB-EBS-004 (1 of 2)
Matrix	Sediment	Sediment	Sediment	Sediment
Collection Date	09/10/08	09/10/08	09/10/08	09/10/08
Received Date	09/18/08	09/18/08	09/18/08	09/18/08
Analysis Batch TOC	LECO1041	LECO1041	LECO1041	LECO1041
Preparation Date TOC	10/02/08	10/02/08	10/02/08	10/02/08
Analysis Date TOC	10/03/08	10/03/08	10/03/08	10/03/08
Sample Dry Weight (mg)	354.6	352.9	354.7	351.6
Method TOC	SEDMT-TC	SEDMT-TC	SEDMT-TC	SEDMT-TC
Target Analyte	mg Carbon	Q	mg Carbon	Q
Total Organic Carbon (TOC)	5.01		9.88	7.77
	% Carbon	Q	% Carbon	Q
Total Organic Carbon (TOC)	1.41		2.80	2.19
	% Carbon	Q	% Carbon	Q

Qualifiers (Q): J=Below the MDL, U=Not detected, I=Interference, NA=Not Applicable, *=Outside QA limits, refer to narrative

Sample Name	GEB0009	GEB0011	GEB0013	GEB0015
Client Name	JUB-EBS-005R (1 of 2)	JUB-EBS-006 (1 of 2)	JUB-EBS-007R (1 of 2)	JUB-EBS-008 (1 of 2)
Matrix	Sediment	Sediment	Sediment	Sediment
Collection Date	09/10/08	09/09/08	09/10/08	09/10/08
Received Date	09/18/08	09/18/08	09/18/08	09/18/08
Analysis Batch TOC	LECO1041	LECO1041	LECO1041	LECO1041
Preparation Date TOC	10/02/08	10/02/08	10/02/08	10/02/08
Analysis Date TOC	10/03/08	10/03/08	10/03/08	10/03/08
Sample Dry Weight (mg)	352.7	353.9	353.9	352.4
Method TOC	SEDMT-TC	SEDMT-TC	SEDMT-TC	SEDMT-TC

Target Analyte	mg Carbon	Q						
Total Organic Carbon (TOC)	4.27		7.54		8.45		8.41	
	% Carbon	Q						
Total Organic Carbon (TOC)	1.21		2.13		2.39		2.39	

Sample Name	GEB0017	GEB0019	GEB0021	GEB0023
Client Name	JUB-EBS-009R (1 of 2)	EBS-E1 (1 of 2)	EBS-E2 (1 of 2)	EBS-E3R (1 of 2)
Matrix	Sediment	Sediment	Sediment	Sediment
Collection Date	09/10/08	09/11/08	09/11/08	09/12/08
Received Date	09/18/08	09/18/08	09/18/08	09/18/08
Analysis Batch TOC	LECO1041	LECO1041	LECO1041	LECO1041
Preparation Date TOC	10/02/08	10/02/08	10/02/08	10/02/08
Analysis Date TOC	10/03/08	10/03/08	10/03/08	10/03/08
Sample Dry Weight (mg)	353.6	354.6	350.7	352.7
Method TOC	SEDMT-TC	SEDMT-TC	SEDMT-TC	SEDMT-TC

Target Analyte	mg Carbon	Q						
Total Organic Carbon (TOC)	7.79		4.16		3.03		10.25	
	% Carbon	Q						
Total Organic Carbon (TOC)	2.20		1.17		0.86		2.91	

Sample Name	GEB0025	GEB0027	GEB0029
Client Name	EBS-T4 (1 of 2)	EBS-T5 (1 of 2)	EBS-T6 (1 of 2)
Matrix	Sediment	Sediment	Sediment
Collection Date	09/13/08	09/13/08	09/13/08
Received Date	09/18/08	09/18/08	09/18/08
Analysis Batch TOC	LECO1041	LECO1041	LECO1041
Preparation Date TOC	10/02/08	10/02/08	10/02/08
Analysis Date TOC	10/03/08	10/03/08	10/03/08
Sample Dry Weight (mg)	351.4	353.7	353.7
Method TOC	SEDMT-TC	SEDMT-TC	SEDMT-TC

Target Analyte	mg Carbon	Q	mg Carbon	Q	mg Carbon	Q
Total Organic Carbon (TOC)	2.90		3.53		4.57	
	% Carbon	Q	% Carbon	Q	% Carbon	Q
Total Organic Carbon (TOC)	0.83		1.00		1.29	

Sample Name AC1041B
Client Name NA
Matrix Sediment
Collection Date NA
Received Date NA
Analysis Batch TOC LECO1041
Preparation Date TOC 10/02/08
Analysis Date TOC 10/03/08
Sample Dry Weight (mg) 350.0
Method TOC SEDMT-TC

Target Analyte	mg Carbon		mg Carbon	
	Q		MDL	3x MDL
Total Organic Carbon (TOC)	0.09	J	0.11	0.33
% Carbon		% Carbon		
Total Organic Carbon (TOC)	0.03	J	0.03	0.09

Sample Name	GEB0001	GEB0001D
Client Name	JUB-EBS-001 (1 of 2)	JUB-EBS-001 (1 of 2)
Matrix	Sediment	Sediment
Collection Date	09/10/08	09/10/08
Received Date	09/18/08	09/18/08
Analysis Batch TOC	LECO1041	LECO1041
Preparation Date TOC	10/02/08	10/02/08
Analysis Date TOC	10/03/08	10/03/08
Sample Dry Weight (mg)	354.6	354.2
Method	SEDMT-TC	SEDMT-TC

Target Analyte	mg Carbon	Q	mg Carbon	Q				mg Carbon	
					RPD	Q		MDL	2x MDL
Total Organic Carbon (TOC)	5.01		5.05					0.11	0.22
	% Carbon	Q	% Carbon	Q				% Carbon	
Total Organic Carbon (TOC)	1.41		1.43			1		MDL	2x MDL
								0.03	0.06

B&B Laboratories
Project J08704
Report 08-8121

2008 Jubilee Development Group-Ghana EBS
Total Organic Carbon
Standard Reference Material Report

Contract #

Sample Name LC1041SRM
Client Name SRM8704
Matrix Sediment
Collection Date NA
Received Date NA
Analysis Batch TOC LECO1041
Preparation Date TOC NA
Analysis Date TOC 10/03/08
Sample Dry Weight (mg) 351.7
Method TOC SEDMT-TC

Target Analyte	mg Carbon	Q	Certified Value		
Total Organic Carbon (TOC)	11.73		SRM8704	-5%	+5%
	% Carbon	Q % Recovery Q	% Carbon		
Total Organic Carbon (TOC)	3.34	100	3.351	3.183	3.519

SRMs are not acidified

Sample Name LC1041SRM
Client Name SRM8704
Matrix Sediment
Collection Date NA
Received Date NA
Analysis Batch TOC LECO1041
Preparation Date TOC NA
Analysis Date TOC 10/03/08
Sample Dry Weight (mg) 351.7
Method TOC SEDMT-TC

Target Analyte	mg Carbon	Q	Certified Value		
Total Organic Carbon (TOC)	11.73		SRM8704	-5%	+5%
	% Carbon	Q	% Carbon		
Total Organic Carbon (TOC)	3.34	100	3.35	3.18	3.52

Grain Size Data

Sample ID	GEB0344	GEB0345	GEB0346	GEB0347	GEB0348	GEB0349
Sample Name	JUB-EBS-001	JUB-EBS-002	JUB-EBS-003R	JUB-EBS-004	JUB-EBS-005R	JUB-EBS-006
Matrix	SED	SED	SED	SED	SED	SED
Collection Date	09/10/08	09/10/08	09/10/08	09/10/08	09/10/08	09/10/08
Received Date	09/23/08	09/23/08	09/23/08	09/23/08	09/23/08	09/23/08
Analysis Date	10/06/08	10/06/08	10/06/08	10/06/08	10/06/08	10/06/08
Sample Wet Weight (g)	10.38	11.01	9.31	7.40	11.24	10.43
Analysis	%	%	%	%	%	%
GRAVEL	0	0	0	0	0	0
SAND	32.58	2.82	7.11	3.99	44.85	18.02
SILT	27.93	44.05	32.75	41.92	17.79	40.27
CLAY	39.49	53.13	60.14	54.09	37.36	41.71

Qualifiers (Q): NA=Not applicable, *=Outside QA limits, refer to narrative

B&B Laboratories
Project J08704
Job# 08-2181

2008 Ghana Julilee Project
Grain Size
Client Submitted Samples

Sample ID	GEB0350	GEB0351	GEB0352	GEB0353	GEB0354	GEB0355
Sample Name	JUB-EBS-007R	JUB-EBS-008	JUB-EBS-009R	EBS-E1	EBS-E2	EBS-E3R
Matrix	SED	SED	SED	SED	SED	SED
Collection Date	09/10/08	09/10/08	09/10/08	09/11/08	09/12/08	09/12/08
Received Date	09/23/08	09/23/08	09/23/08	09/23/08	09/23/08	09/23/08
Analysis Date	10/06/08	10/06/08	10/06/08	10/06/08	10/06/08	10/06/08
Sample Wet Weight (g)	8.89	7.99	9.66	19.00	20.18	32.64
Analysis	%	%	%	%	%	%
GRAVEL	0	0	0	0	7.13	17.36
SAND	5.53	1.73	1.1	70.79	56.45	61.04
SILT	41.61	37.56	45.05	15.53	20.56	11.34
CLAY	52.86	60.71	53.85	13.68	15.86	10.26

Qualifiers (Q): NA=Not applicable, *=Outside QA limits, refer to narrative

B&B Laboratories
Project J08704
Job# 08-2181

2008 Ghana Jubilee Project
Grain Size
Client Submitted Samples

Sample ID	GEB0361	GEB0362	GEB0363
Sample Name	EBS-T4	EBS-T5	EBS-T6
Matrix	SED	SED	SED
Collection Date	09/13/08	09/13/08	09/13/08
Received Date	09/23/08	09/23/08	09/23/08
Analysis Date	10/06/08	10/06/08	10/06/08
Sample Wet Weight (g)	14.69	8.73	11.24

Analysis	%	%	%
GRAVEL	0	0	0
SAND	28.18	14.06	2.14
SILT	52.08	58.44	68.50
CLAY	19.74	27.50	29.36

Qualifiers (Q): NA=Not applicable, *=Outside QA limits, refer to narrative

B&B Laboratories
Project J08704
Job # 08-2181

2008 Ghana Jubilee EBS
Grain Size
Laboratory Duplicate Report

Sample ID	GEB0353	GEB0353DUP
Sample Name	EBS-E1	EBS-E1
Matrix	SED	SED
Collection Date	09/11/08	09/11/08
Received Date	09/23/08	09/23/08
Analysis Date	10/06/08	10/06/08
Sample Wet Weight (g)	19.00	18.47

Analysis	%	%	RPD %
Gravel	0	0	0.0
SAND	70.79	70.29	0.7
SILT	15.53	15.79	1.7
CLAY	13.68	13.92	1.7

Qualifiers (Q): NA=Not applicable, *=Outside QA limits, refer to narrative

Total Suspended Solids Data

Client/Project Nam	B&B ID	Client ID	Filter Wt. G	Wt. G	TSS Wt. G	TSS Wt mG	Filter Vol. mL	Concentration mg/L
Ghana Jubilee	GEB061	JUB-EBS-001 1 M	0.1127	0.1776	0.0649	64.90	2600	24.96
Ghana Jubilee	GEB062	JUB-EBS-001 100 M	0.1118	0.1746	0.0628	62.80	3000	20.93
Ghana Jubilee	GEB063	JUB-EBS-002 1 M	0.1111	0.1292	0.0181	18.10	2800	6.46
Ghana Jubilee	GEB064	JUB-EBS-002 100 M	0.1123	0.1533	0.0410	40.97	3000	13.66
Ghana Jubilee	GEB065	JUB-EBS-003 1 M	0.1116	0.1308	0.0192	19.17	3000	6.39
Ghana Jubilee	GEB066	JUB-EBS-003 100 M	0.1115	0.1904	0.0789	78.87	2840	27.77
Ghana Jubilee	GEB067	JUB-EBS-004 1 M	0.1128	0.1448	0.0320	32.03	3000	10.88
Ghana Jubilee	GEB068	JUB-EBS-004 100 M	0.1141	0.1763	0.0622	62.17	3000	20.72
Ghana Jubilee	GEB069	JUB-EBS-005 1 M	0.1144	0.2501	0.1357	135.70	3000	45.23
Ghana Jubilee	GEB070	JUB-EBS-005 100 M	0.1138	0.1581	0.0443	44.27	3000	14.76
Ghana Jubilee	GEB071	JUB-EBS-006 1 M	0.1134	0.1826	0.0692	69.17	3000	23.06
Ghana Jubilee	GEB072	JUB-EBS-006 100 M	0.1117	0.1622	0.0505	50.53	3000	16.84
Ghana Jubilee	GEB073	JUB-EBS-007 1 M	0.1102	0.1875	0.0773	77.30	3000	25.77
Ghana Jubilee	GEB074	JUB-EBS-007 100 M	0.1135	0.2043	0.0908	90.77	3000	30.26
Ghana Jubilee	GEB075	JUB-EBS-008 1 M	0.1145	0.1679	0.0534	53.43	3000	17.81
Ghana Jubilee	GEB076	JUB-EBS-008 100 M	0.1137	0.1868	0.0731	73.13	3000	24.38
Ghana Jubilee	GEB077	JUB-EBS-009 1 M	0.1128	0.1661	0.0533	53.33	3000	17.78
Ghana Jubilee	GEB078	JUB-EBS-009 100 M	0.1110	0.1447	0.0337	33.67	3000	11.22
Ghana Jubilee	GEB079	EBS-E1 1 M	0.1135	0.1779	0.0644	64.43	2700	23.86
Ghana Jubilee	GEB080	EBS-E1 75 M	0.1122	0.2140	0.1018	101.80	3000	33.93
Ghana Jubilee	GEB081	EBS-E2 1 M	0.1114	0.2352	0.1238	123.77	2500	49.51
Ghana Jubilee	GEB082	EBS-E2 67 M	0.1113	0.2609	0.1496	149.57	3000	49.86
Ghana Jubilee	GEB085	EBS-E3R 1 M	0.1121	0.2230	0.1109	110.87	3000	36.96
Ghana Jubilee	GEB086	EBS-E3R 50 M	0.1124	0.3750	0.2626	262.57	3150	83.35
Ghana Jubilee	GEB089	EBS-T4 1 M	0.1147	0.2217	0.1070	107.00	3000	35.67
Ghana Jubilee	GEB090	EBS-T4 39 M	0.1127	0.1866	0.0739	73.93	3000	24.64
Ghana Jubilee	GEB091	EBS-T5 1 M	0.1127	0.2247	0.1120	112.00	3180	35.22
Ghana Jubilee	GEB092	EBS-T5 44 M	0.1130	0.3579	0.2449	244.87	3000	81.62
Ghana Jubilee	GEB093	EBS-T6 1 M	0.1126	0.1353	0.0227	22.67	3000	7.56
Ghana Jubilee	GEB094	EBS-T6 49M	0.1124	0.1592	0.0468	46.77	3000	0.02

Nutrient Data

B&B Laboratories	Nutrient Analysis		Total N	Total P	Total P
	Sample Designation	Client Designation	conc. (umol/L)	conc. (mg/L)	conc. (mg/L)
GEB0095	JUB-EBS-001 1M	4.82	0.068	0.48	0.0149
GEB0096	JUB-EBS-001 100 M	19.74	0.276	1.22	0.0377
GEB0097	JUB-EBS-002 1 M	3.75	0.052	0.47	0.0145
GEB0098	JUB-EBS-002 100 M	18.71	0.262	1.06	0.0329
GEB0099	JUB-EBS-003 1 M	13.60	0.190	0.54	0.0168
GEB0100	JUB-EBS-003 100 M	12.95	0.181	1.11	0.0345
GEB0101	JUB-EBS-004 1M	9.37	0.131	0.56	0.0174
GEB0102	JUB-EBS-004 100 M	22.97	0.322	1.47	0.0455
GEB0103	JUB-EBS-005 1M	3.96	0.055	0.60	0.0185
GEB0104	JUB-EBS-005 100 M	21.67	0.303	1.43	0.0442
GEB0105	JUB-EBS-006 1M	6.49	0.091	0.62	0.0192
GEB0106	JUB-EBS-006 100 M	31.19	0.437	1.44	0.0446
GEB0107	JUB-EBS-007 1M	9.00	0.126	0.60	0.0186
GEB0108	JUB-EBS-007	30.22	0.423	1.43	0.0443
GEB0109	JUB-EBS-008 1M	3.14	0.044	0.49	0.0152
GEB0110	JUB-EBS-008 100 M	22.03	0.309	1.37	0.0423
GEB0111	JUB-EBS-009 1M	6.09	0.085	0.52	0.0160
GEB0112	JUB-EBS-009 100 M	19.51	0.273	1.32	0.0410
GEB0113	EBS-E1 1 M	22.63	0.317	0.67	0.0207
GEB0114	EBS-E1 100 M	27.06	0.379	1.41	0.0438
GEB0115	EBS-E2 1 M	11.22	0.157	0.74	0.0228
GEB0116	EBS-E2 100 M	24.09	0.337	1.40	0.0435
GEB0119	EBS-E3R 1 M	5.90	0.083	0.76	0.0236
GEB0120	EBS-E3R 100 M	20.21	0.283	1.47	0.0455
GEB0123	EBS-T4 1 M	4.65	0.065	0.74	0.0230
GEB0124	EBS-T4 100 M	12.64	0.177	1.08	0.0334
GEB0125	EBS-T5 1 M	8.52	0.119	0.91	0.0282
GEB0126	EBS-T5 100 M	13.68	0.192	1.18	0.0366
GEB0127	EBS-T6 1 M	7.51	0.105	0.90	0.0280
GEB0128	EBS-T6 100 M	15.30	0.214	1.33	0.0411

B&B Laboratories
Job# J08704
Report# 08-2181

2008 Ghana Jubilee Project
Nutrients
Client Submitted Samples

B&B Laboratories		Nutrient Analysis		
8091802				
Sample Designation	Client Designation	Total N conc. (umol/L)	Total N conc. (mg/L)	Total P conc. (umol/L)

Total Blank Summary	Total N conc. (uM)	Total N conc. (mg)	Total P conc. (uM)	Total P conc. (mg)
Blank	17.08	0.239	0.23	0.0072
Blank	17.34	0.243	0.21	0.0066
Blank	16.69	0.234	0.18	0.0057
Blank	15.95	0.223	0.17	0.0054
Blank	13.03	0.183	0.17	0.0051

Average	16.02	0.19
Standard Deviation	1.75	0.0283

B&B Laboratories		Nutrient Analysis	
EPA		Total N	Total P
Sample Designation	Client Designation	conc. (umol/L)	conc. (mg/L)
GEB0101	JUB-EBS-004 1 M	9.37	0.131
GEB0101 Duplicate	JUB-EBS-004 1 M	9.44	0.132
	RPD	0.7%	0.7%
			9.3%
			9.3%
GEB0116	EBS-E2 100 M	24.09	0.337
GEB0116 Duplicate	EBS-E2 100 M	23.76	0.333
	RPD	1.4%	1.4%
			9.7%
			9.7%
GEB0128	EBS-T6 100 M	15.30	0.214
GEB0128 Duplicate	EBS-T6 100 M	15.21	0.213
	RPD	0.6%	0.6%
			3.2%
			3.2%

Nutrient	Detection Limit (uM)	Standard Range (uM)	Standard Range (mg/L)	Dissolved SPEX Acceptance Limits (uM)	Total SPEX Acceptance Limits (uM)
NO ₃ ⁻	0.108	3.80-30.43	0.236-1.887	2.60-4.14	7.07-13.82
HPO ₄ ⁼	0.0236	0.27-2.12	0.0259-0.205	1.65-2.58	1.50-2.14
HSIO ₃ ⁻	0.127	3.84-30.68	0.296-2.36		
NH ₄ ⁺	0.0778	0.50-4.02	0.00902-0.0722	1.63-4.54	
NO ₂ ⁻	0.0113	0.10-0.81	0.00460-0.0372	3.33-4.82	
Urea	0.138	0.50-3.97	0.0300-0.238		

B&B Laboratories		Nutrient Analysis				
EPA	Sample Designation	Sample Type	Total N conc. (uM)	Recovery % (X = 11.14)	Total P conc. (uM)	Recovery % (X = 1.94)
SPEX Total SRM1	SPEX Total SRM	11.65	104.55	1.90	97.80	
SPEX Total SRM2	SPEX Total SRM	11.54	103.55	1.90	97.91	
SPEX Total SRM3	SPEX Total SRM	11.84	106.30	1.89	97.47	
SPEX Total SRM4	SPEX Total SRM	11.65	104.58	1.92	99.21	
SPEX Total SRM5	SPEX Total SRM	10.97	98.46	1.94	99.97	
Mean		11.53	1.91			
Standard Deviation		0.3319	0.0207			

Below are the values for the detection limits of the six nutrients.

Nutrient	Detection Limit (uM)	Standard Range (uM)	Standard Range (mg/L)	Dissolved SPEX Acceptance Limits (uM)	Total SPEX Acceptance Limits (uM)
NO ₃ ⁻	0.108	3.80-30.43	0.236-1.887	5.93-8.96	7.07-13.82
HPO ₄ ⁼	0.0236	0.27-2.12	0.0259-0.205	1.65-2.58	1.50-2.14
HSIO ₃ ⁻	0.127	3.84-30.68	0.296-2.36		
NH ₄ ⁺	0.0778	0.50-4.02	0.00902-0.0722	1.63-4.54	
NO ₂ ⁻	0.0113	0.10-0.81	0.00460-0.0372	3.33-4.82	
Urea	0.138	0.50-3.97	0.0300-0.238		

B&B Laboratories		Nutrient Analysis			
EPA		NO_3^- conc. (μM)	Recovery % ($x=7.43$)	$\text{HPO}_4^{=}$ conc. (μM)	Recovery % ($x=2.12$)
Sample Designation	Sample Type				
SPEX SRMa	Total SRM	7.23	97.3	2.09	98.6
SPEX SRMb	Total SRM	7.16	96.4	2.08	98.2
SPEX SRMc	Total SRM	7.36	99.1	2.17	102.1

Mean	7.25	2.11
Standard Deviation	0.1033	0.0461

Below are the values for the detection limits of the six nutrients.

Nutrient	Detection Limit (μM)	Standard Range (μM)	Standard Range (mg/L)	Dissolved SPEX Acceptance Limits (μM)	Total SPEX Acceptance Limits (μM)
NO_3^-	0.108	3.80-30.43	0.236-1.887	5.93-8.96	7.07-13.82
$\text{HPO}_4^{=}$	0.0236	0.27-2.12	0.0259-0.205	1.65-2.58	1.50-2.14
HSIO_3^-	0.127	3.84-30.68	0.296-2.36		
NH_4^+	0.0778	0.50-4.02	0.00902-0.0722	1.63-4.54	
NO_2^-	0.0113	0.10-0.81	0.00460-0.0372	3.33-4.82	
Urea	0.138	0.50-3.97	0.0300-0.238		

PAH Data

Sample Name	GEB0001.D JUB-EBS-001 (1 of 2)	GEB0003.D JUB-EBS-002 (1 of 2)	GEB0005.D JUB-EBS-003R (1 of 2)	GEB0007.D JUB-EBS-004 (1 of 2)	GEB0009.D JUB-EBS-005R (1 of 2)					
Client Name										
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment					
Collection Date	09/10/08	09/10/08	09/10/08	09/10/08	09/10/08					
Received Date	09/18/08	09/18/08	09/18/08	09/18/08	09/18/08					
Extraction Date	10/31/08	10/31/08	10/31/08	10/31/08	10/31/08					
Extraction Batch	ENV 1946	ENV 1946	ENV 1946	ENV 1946	ENV 1946					
Date Acquired	11/05/08	11/06/08	11/06/08	11/06/08	11/06/08					
Method	PAH-2002	PAH-2002	PAH-2002	PAH-2002	PAH-2002					
Sample Dry Weight (g)	15.3	15.1	15.2	15.0	15.0					
% Moisture	63	76	75	76	58					
% Dry	37	24	25	24	42					
Dilution	NA	NA	NA	NA	NA					
Target Compounds	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q
Naphthalene	13.5		12.7		9.1		12.3		8.1	
C1-Naphthalenes	8.1		7.4		5.4		7.1		5.1	
C2-Naphthalenes	16.8		17.4		12.7		16.3		10.9	
C3-Naphthalenes	14.3		18.3		12.7		17.0		9.8	
C4-Naphthalenes	7.4		11.1		7.9		9.8		5.5	
Benzothiophene	0.3		0.4		0.2		0.3		0.2	
C1-Benzothiophenes	0.5		0.6		0.3 J		0.5		0.4	
C2-Benzothiophenes	1.1		0.9		0.8		1.2		0.7	
C3-Benzothiophenes	0.7		0.7		0.9		0.9		0.5	
Biphenyl	1.4		1.8		1.5		2.1		1.0	
Acenaphthylene	0.5		0.7		0.6		0.8		0.4	
Acenaphthene	3.7		5.2		3.1		4.4		2.3	
Dibenzofuran	3.0		4.1		3.0		4.4		2.0	
Fluorene	1.8		3.2		1.8		3.6		1.2	
C1-Fluorenes	2.9		4.6		3.4		4.4		2.2	
C2-Fluorenes	3.7		7.3		5.5		6.8		3.3	
C3-Fluorenes	2.7		4.3		3.4		5.9		2.1	
Carbazole	0.2 J		0.5		0.6		0.5		0.2 J	
Anthracene	0.3		0.6		0.4		0.7		0.3	
Phenanthrene	2.7		5.3		3.2		4.8		1.9	
C1-Phenanthrene/Anthracenes	2.5		5.4		3.4		4.8		1.9	
C2-Phenanthrene/Anthracenes	2.8		6.1		4.5		6.6		2.9	
C3-Phenanthrene/Anthracenes	0.9		2.6		1.5		1.9		0.6	
C4-Phenanthrene/Anthracenes	0.6		1.4		0.9		1.6		0.4	
Dibenzothiophene	0.2		0.4		0.3		0.4		0.2	
C1-Dibenzothiophene	0.5		0.8		0.6		0.9		0.4	
C2-Dibenzothiophene	0.4		1.1		0.7		1.2		0.4	
C3-Dibenzothiophene	0.4		1.0		0.7		1.4		0.3 J	
Fluoranthene	1.9		3.6		2.8		4.1		1.5	
Pyrene	1.7		3.3		2.7		3.9		1.4	
C1-Fluoranthenes/Pyrenes	0.8		1.9		0.9		1.7		0.6	
C2-Fluoranthenes/Pyrenes	1.0		2.5		1.2		1.6		0.6	
C3-Fluoranthenes/Pyrenes	0.4		1.7		0.8		1.4		0.3 J	
Naphthobenzothiophene	1.0		2.6		1.5		3.4		0.8	
C1-Naphthobenzothiophenes	0.3 J		1.5		1.0		1.4		0.4 J	
C2-Naphthobenzothiophenes	0.7		2.0		1.2		2.2		0.6	
C3-Naphthobenzothiophenes	0.5		1.8		0.9		1.5		<0.4 U	
Benz(a)anthracene	0.6		1.4		0.8		1.9		0.5	
Chrysene	1.5		2.9		2.0		2.4		1.1	
C1-Chrysenes	0.8		2.2		1.1		2.0		0.6	
C2-Chrysenes	<0.3 U		4.9		1.9		6.0		1.5	
C3-Chrysenes	<0.3 U		2.6		<0.3 U		2.3		<0.3 U	
C4-Chrysenes	<0.3 U		<0.3 U		<0.3 U		2.8		<0.3 U	
Benzo(b)fluoranthene	1.8		3.4		2.5		3.3		1.4	
Benzo(k)fluoranthene	0.4		0.9		0.7		0.9		0.3	
Benzo(e)pyrene	0.7		1.7		1.0		1.6		0.6	
Benzo(a)pyrene	0.6		1.4		0.8		1.0		0.4	
Perylene	5.3		2.5		2.0		3.8		1.6	
Indeno(1,2,3-c,d)pyrene	1.2		2.3		1.5		2.0		0.9	
Dibenzo(a,h)anthracene	0.1 J		0.9		0.2		0.3		0.1 J	
Benzo(g,h,i)perylene	0.8		1.6		1.0		1.4		0.6	
Total PAHs	116		176		118		176		81.0	
Individual Alkyl Isomers and Hopanes										
2-Methylnaphthalene	6.0		5.9		4.4		5.9		3.7	
1-Methylnaphthalene	7.3		6.1		4.5		5.7		4.7	
2,6-Dimethylnaphthalene	7.9		7.9		5.9		8.4		5.0	
1,6,7-Trimethylnaphthalene	1.3		2.1		1.6		1.9		1.1	
1-Methylphenanthrene	1.0		1.7		1.2		1.6		0.9	
C29-Hopane	10.5		23.8		17.3		25.2		6.6	
18a-Oleanane	9.8		20.9		14.1		24.6		5.5	
C30-Hopane	16.0		36.2		25.6		39.2		10.1	
Surrogate (Su)	Su Recovery (%)		Su Recovery (%)		Su Recovery (%)		Su Recovery (%)		Su Recovery (%)	
Naphthalene-d8	83		78		72		72		84	
Acenaphthene-d10	95		86		89		90		93	
Phenanthrene-d10	81		74		69		73		83	
Chrysene-d12	89		82		73		72		95	
Perylene-d12	78		71		62		67		73	

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

Sample Name	GEB0011.D JUB-EBS-006 (1 of 2)	GEB0013.D JUB-EBS-007R (1 of 2)	GEB0015.D JUB-EBS-008 (1 of 2)	GEB0017.D JUB-EBS-009R (1 of 2)	GEB0019.D EBS-E1 (1 of 2)					
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment					
Collection Date	09/09/08	09/10/08	09/10/08	09/10/08	09/11/08					
Received Date	09/18/08	09/18/08	09/18/08	09/18/08	09/18/08					
Extraction Date	10/31/08	10/31/08	10/31/08	10/31/08	10/31/08					
Extraction Batch	ENV 1946	ENV 1946	ENV 1946	ENV 1946	ENV 1946					
Date Acquired	11/06/08	11/06/08	11/06/08	11/06/08	11/06/08					
Method	PAH-2002	PAH-2002	PAH-2002	PAH-2002	PAH-2002					
Sample Dry Weight (g)	15.3	15.0	15.0	15.0	15.0					
% Moisture	68	71	77	70	36					
% Dry	32	29	23	30	64					
Dilution	NA	NA	NA	NA	NA					
Target Compounds	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q
Naphthalene	13.9		10.7		7.6		8.7		4.3	
C1-Naphthalenes	8.3		6.7		4.1		5.5		2.8	
C2-Naphthalenes	18.8		15.3		9.7		14.8		7.1	
C3-Naphthalenes	16.4		14.5		10.5		16.4		7.0	
C4-Naphthalenes	9.2		8.8		6.2		8.9		3.9	
Benzothiophene	0.3		0.3		0.1 J		0.2		0.1 J	
C1-Benzothiophenes	0.5		0.3 J		0.3 J		0.3 J		0.1 J	
C2-Benzothiophenes	1.3		1.4		1.0		1.3		0.6	
C3-Benzothiophenes	0.8		0.6		0.6		0.7		0.4	
Biphenyl	1.8		1.8		1.4		1.6		0.6	
Aceanaphthylene	0.7		0.7		0.6		0.6		0.3	
Aceanaphthene	4.7		4.1		3.1		4.1		1.8	
Dibenzofuran	3.8		3.7		3.0		3.5		1.6	
Fluorene	3.1		3.2		2.4		1.7		0.8	
C1-Fluorenes	3.7		3.4		3.4		3.5		1.9	
C2-Fluorenes	4.4		5.7		6.1		4.4		3.4	
C3-Fluorenes	4.4		4.9		3.7		4.2		2.4	
Carbazole	0.3 J		0.6		0.5		0.4		0.4	
Anthracene	0.5		0.6		0.4		0.4		0.3	
Phenanthrene	3.8		5.1		4.1		3.8		1.9	
C1-Phenanthrene/Anthracenes	3.4		3.7		3.9		3.6		2.5	
C2-Phenanthrene/Anthracenes	4.6		4.8		5.0		4.1		4.7	
C3-Phenanthrene/Anthracenes	1.7		1.7		1.7		1.4		1.2	
C4-Phenanthrene/Anthracenes	0.8		1.2		0.9		0.8		0.7	
Dibenzothiophene	0.3		0.4		0.3		0.4		0.2	
C1-Dibenzothiophene	0.6		0.6		0.7		0.8		0.4	
C2-Dibenzothiophene	0.7		1.0		1.0		0.9		0.8	
C3-Dibenzothiophene	0.7		0.9		1.0		0.7		0.6	
Fluoranthene	2.1		4.2		2.9		2.1		1.4	
Pyrene	2.4		4.2		2.8		3.1		1.6	
C1-Fluoranthenes/Pyrenes	1.0		1.5		1.3		0.9		0.9	
C2-Fluoranthenes/Pyrenes	0.9		1.4		1.7		1.1		0.8	
C3-Fluoranthenes/Pyrenes	1.1		1.0		1.0		0.8		1.1	
Naphthobenzothiophene	1.6		2.6		1.8		0.9		0.4	
C1-Naphthobenzothiophenes	0.5		0.8		1.0		0.5		0.6	
C2-Naphthobenzothiophenes	0.7		1.3		1.5		0.9		1.1	
C3-Naphthobenzothiophenes	0.4 J		1.2		1.0		0.6		0.6	
Benz(a)anthracene	0.7		2.0		1.1		0.7		0.7	
Chrysene	1.5		3.0		2.3		1.7		1.0	
C1-Chrysenes	0.9		1.6		1.3		0.8		0.9	
C2-Chrysenes	3.1		3.7		2.3		1.1		2.2	
C3-Chrysenes	1.3	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U	<0.3 U
C4-Chrysenes	<0.3 U		<0.3 U		<0.3 U		<0.3 U		<0.3 U	
Benz(b)fluoranthene	1.9		3.3		2.9		2.1		1.6	
Benz(k)fluoranthene	0.4		0.7		0.5		0.4		0.3	
Benz(e)pyrene	0.7		1.8		1.1		0.6		0.6	
Benz(a)pyrene	0.6		1.2		0.7		0.4		0.7	
Perylene	3.2		2.6		1.6		1.7		2.2	
Indeno(1,2,3-c,d)pyrene	1.2		1.9		1.5		0.8		1.1	
Dibenzo(a,h)anthracene	0.1 J		0.2		0.2		0.1 J		0.1 J	
Benzo(g,h,i)perylene	0.8		1.3		1.0		0.5		0.9	
Total PAHs	141		148		115		120		73.6	
Individual Alkyl Isomers and Hopanes										
2-Methylnaphthalene	6.2		5.2		3.5		4.5		2.1	
1-Methylnaphthalene	7.5		5.8		3.3		4.5		2.5	
2,6-Dimethylnaphthalene	8.9		7.3		4.6		6.7		3.7	
1,6,7-Trimethylnaphthalene	1.9		1.7		1.2		1.7		0.7	
1-Methylphenanthrene	1.3		1.4		1.4		1.5		1.2	
C29-Hopane	18.7		19.9		20.7		4.2		11.3	
18a-Oleanane	4.6		17.3		17.6		7.9		5.9	
C30-Hopane	17.5		29.9		31.6		19.6		11.1	
Surrogate (Su)	Su Recovery (%)		Su Recovery (%)		Su Recovery (%)		Su Recovery (%)		Su Recovery (%)	
Naphthalene-d8	79		81		71		73		90	
Acenaphthene-d10	94		97		84		87		97	
Phenanthrene-d10	82		81		79		72		82	
Chrysene-d12	92		98		96		88		97	
Perylene-d12	81		75		64		57		85	

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

2008 Jubilee Development Group
Ghana EBS Project
Polycyclic Aromatic Hydrocarbon Data
Client Submitted Samples

Sample Name	GEB0021.D	GEB0023.D	GEB0025.D	GEB0027.D	GEB0029.D					
Client Name	EBS-E2 (1 of 2)	EBS-E3R (1 of 2)	EBS-T4 (1 of 2)	EBS-T5 (1 of 2)	EBS-T6 (1 of 2)					
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment					
Collection Date	09/11/08	09/12/08	09/13/08	09/13/08	09/13/08					
Received Date	09/18/08	09/18/08	09/18/08	09/18/08	09/18/08					
Extraction Date	10/31/08	10/31/08	10/31/08	10/31/08	10/31/08					
Extraction Batch	ENV 1946	ENV 1946	ENV 1946	ENV 1946	ENV 1946					
Date Acquired	11/06/08	11/06/08	11/06/08	11/06/08	11/06/08					
Method	PAH-2002	PAH-2002	PAH-2002	PAH-2002	PAH-2002					
Sample Dry Weight (g)	15.2	15.3	15.3	15.4	15.1					
% Moisture	42	35	48	46	55					
% Dry	58	65	52	54	45					
Dilution	NA	NA	NA	NA	NA					
Target Compounds	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q
Naphthalene	3.7		4.6		3.5		9.0		6.7	
C1-Naphthalenes	2.6		3.0		2.5		6.3		5.2	
C2-Naphthalenes	6.9		7.0		6.8		14.8		13.9	
C3-Naphthalenes	6.9		6.4		6.2		12.7		12.6	
C4-Naphthalenes	4.3		3.7		3.6		7.4		6.8	
Benzothiophene	0.1 J		0.1 J		0.1 J		0.2		0.2	
C1-Benzothiophenes	0.1 J		0.3 J		0.1 J		0.2 J		0.3 J	
C2-Benzothiophenes	0.7		0.6		0.4		1.0		0.5	
C3-Benzothiophenes	0.4		0.4		0.4		0.7		0.7	
Biphenyl	0.7		0.7		0.6		1.0		1.0	
Aceanaphthylene	0.3		0.3		0.3		0.6		0.6	
Aceanaphthene	1.9		1.9		1.6		3.8		3.2	
Dibenzofuran	1.5		1.6		1.3		2.8		2.5	
Fluorene	0.9		0.8		0.6		1.3		1.2	
C1-Fluorenes	1.9		1.5		1.5		2.5		3.2	
C2-Fluorenes	2.6		2.0		3.9		4.9		4.3	
C3-Fluorenes	3.0		1.6		3.1		3.5		3.8	
Carbazole	0.2 J		0.1 J		0.3 J		0.3 J		0.4	
Anthracene	0.3		0.2		0.5		0.6		0.8	
Phenanthrene	2.1		1.7		2.7		3.6		3.9	
C1-Phenanthrene/Anthracenes	2.7		2.3		2.5		3.7		4.1	
C2-Phenanthrene/Anthracenes	4.6		3.3		4.5		5.0		6.6	
C3-Phenanthrene/Anthracenes	1.6		0.9		1.7		2.3		3.1	
C4-Phenanthrene/Anthracenes	1.3		0.6		1.2		1.5		1.7	
Dibenzothiophene	0.2		0.2		0.3		0.4		0.5	
C1-Dibenzothiophene	0.4		0.4		0.6		0.7		0.9	
C2-Dibenzothiophene	0.9		0.5		0.9		1.2		1.5	
C3-Dibenzothiophene	0.9		0.5		1.0		1.3		1.5	
Fluoranthene	1.6		0.8		5.0		5.2		6.0	
Pyrene	1.6		0.8		4.7		5.5		6.2	
C1-Fluoranthenes/Pyrenes	0.9		0.4		2.3		2.5		3.0	
C2-Fluoranthenes/Pyrenes	0.9		0.6		1.7		2.0		2.4	
C3-Fluoranthenes/Pyrenes	1.0		0.5		0.9		1.1		1.6	
Naphthobenzothiophene	0.7		0.3		1.3		1.7		1.9	
C1-Naphthobenzothiophenes	0.6		0.4 J		0.8		1.0		1.6	
C2-Naphthobenzothiophenes	0.9		0.9		1.1		1.6		2.3	
C3-Naphthobenzothiophenes	0.5		0.4 J		0.6		1.2		1.0	
Benz(a)anthracene	0.8		0.3		3.2		3.3		3.9	
Chrysene	1.1		0.6		3.5		3.6		4.3	
C1-Chrysenes	1.0		0.4		2.3		2.8		3.0	
C2-Chrysenes	0.7		0.5		1.9		3.4		3.1	
C3-Chrysenes	<0.3 U		<0.3 U		<0.3 U		<0.3 U		<0.3 U	
C4-Chrysenes	<0.3 U		<0.3 U		<0.3 U		<0.3 U		<0.3 U	
Benz(b)fluoranthene	1.7		0.9		5.1		5.9		6.3	
Benz(k)fluoranthene	0.4		0.3		1.3		1.6		1.6	
Benzo(e)pyrene	0.9		0.5		2.5		2.8		2.8	
Benzo(a)pyrene	0.9		0.5		3.3		3.3		3.7	
Perylene	2.9		1.2 J		3.8		5.2		5.8	
Indeno(1,2,3-c,d)pyrene	1.1		0.6		3.0		3.3		3.6	
Dibenzo(a,h)anthracene	0.1 J		0.1 J		0.1 J		0.3		0.5	
Benzo(g,h,i)perylene	0.9		0.6		2.9		3.1		3.1	
Total PAHs	74.9		58.8		104		154		159	
Individual Alkyl Isomers and Hopanes										
2-Methylnaphthalene	2.0		2.3		1.9		4.6		3.7	
1-Methylnaphthalene	2.3		2.6		2.2		5.7		4.9	
2,6-Dimethylnaphthalene	3.8		3.4		3.9		7.6		7.6	
1,6,7-Trimethylnaphthalene	0.7		0.6		0.8		1.3		0.8	
1-Methylphenanthrene	1.4		1.2		1.1		1.5		1.6	
C29-Hopane	12.0		8.7		19.7		25.0		23.9	
18a-Oleanane	5.3		4.3		7.8		10.9		10.7	
C30-Hopane	11.6		9.2		20.3		24.4		24.4	
Surrogate (Su)	Su Recovery (%)	Su Recovery (%)	Su Recovery (%)	Su Recovery (%)	Su Recovery (%)	Su Recovery (%)				
Naphthalene-d8	87	84	81	84	88					
Acenaphthene-d10	98	96	94	98	97					
Phenanthrene-d10	81	82	87	85	93					
Chrysene-d12	101	97	98	98	99					
Perylene-d12	87	84	85	82	92					

Qualifiers (Q): J=Below the MDL, U=Not detected, B=in procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

Sample Name	ENV1946.A.D
Client Name	Procedural Blank
Matrix	Sediment
Collection Date	NA
Received Date	NA
Extraction Date	10/31/08
Extraction Batch	ENV 1946
Date Acquired	11/05/08
Method	PAH-2002
Sample Dry Weight (g)	15.0
% Moisture	NA
% Dry	NA
Dilution	NA

Target Compounds	Su Corrected Conc. (ng/dry g)	Q	3X MDL	Actual MDL
Naphthalene	0.2	0.5	0.2	
C1-Naphthalenes	0.1 J	1.0	0.3	
C2-Naphthalenes	0.2 J	1.1	0.4	
C3-Naphthalenes	<0.4 U	1.1	0.4	
C4-Naphthalenes	<0.4 U	1.1	0.4	
Benzothiophene	<0.2 U	0.5	0.2	
C1-Benzothiophenes	<0.3 U	1.0	0.3	
C2-Benzothiophenes	<0.3 U	1.0	0.3	
C3-Benzothiophenes	<0.3 U	1.0	0.3	
Biphenyl	<0.1 U	0.4	0.1	
Aceanaphthylene	<0.2 U	0.6	0.2	
Aceanaphthene	<0.1 U	0.4	0.1	
Dibenzofuran	<0.2 U	0.6	0.2	
Fluorene	<0.2 U	0.6	0.2	
C1-Fluorennes	<0.4 U	1.2	0.4	
C2-Fluorennes	<0.4 U	1.2	0.4	
C3-Fluorennes	<0.4 U	1.2	0.4	
Carbazole	<0.3 U	1.0	0.3	
Anthracene	<0.2 U	0.6	0.2	
Phenanthrene	<0.1 U	0.4	0.1	
C1-Phenanthrene/Anthracenes	<0.3 U	0.9	0.3	
C2-Phenanthrene/Anthracenes	<0.3 U	0.9	0.3	
C3-Phenanthrene/Anthracenes	<0.3 U	0.9	0.3	
C4-Phenanthrene/Anthracenes	<0.3 U	0.9	0.3	
Dibenzothiophene	<0.2 U	0.5	0.2	
C1-Dibenzothiophene	<0.3 U	0.9	0.3	
C2-Dibenzothiophene	<0.3 U	0.9	0.3	
C3-Dibenzothiophene	<0.3 U	0.9	0.3	
Fluoranthene	<0.2 U	0.6	0.2	
Pyrene	<0.2 U	0.6	0.2	
C1-Fluoranthenes/Pyrenes	<0.4 U	1.2	0.4	
C2-Fluoranthenes/Pyrenes	<0.4 U	1.2	0.4	
C3-Fluoranthenes/Pyrenes	<0.4 U	1.2	0.4	
Naphthobenzothiophene	<0.2 U	0.6	0.2	
C1-Naphthobenzothiophenes	<0.4 U	1.2	0.4	
C2-Naphthobenzothiophenes	<0.4 U	1.2	0.4	
C3-Naphthobenzothiophenes	<0.4 U	1.2	0.4	
Benz(a)anthracene	<0.1 U	0.4	0.1	
Chrysene	<0.2 U	0.5	0.2	
C1-Chrysenes	<0.3 U	1.0	0.3	
C2-Chrysenes	<0.3 U	1.0	0.3	
C3-Chrysenes	<0.3 U	1.0	0.3	
C4-Chrysenes	<0.3 U	1.0	0.3	
Benz(b)fluoranthene	<0.3 U	0.9	0.3	
Benz(k)fluoranthene	<0.2 U	0.7	0.2	
Benz(e)pyrene	<0.3 U	0.9	0.3	
Benz(a)pyrene	<0.2 U	0.7	0.2	
Perylene	<1.4 U	4.1	1.4	
Indeno(1,2,3-c,d)pyrene	<0.3 U	0.8	0.3	
Dibenzo(a,h)anthracene	<0.2 U	0.5	0.2	
Benzo(g,h,i)perylene	<0.1 U	0.4	0.1	
Total PAHs	0.5			

Individual Alkyl Isomers and Hopane

2-Methylnaphthalene	0.1 J	0.6	0.2
1-Methylnaphthalene	0.1 J	0.4	0.1
2,6-Dimethylnaphthalene	<0.2 U	0.6	0.2
1,6,7-Trimethylnaphthalene	<0.1 U	0.3	0.1
1-Methylphenanthrene	<0.2 U	0.6	0.2
C29-Hopane	<1.1 U	3.3	1.1
18a-Oleanane	<1.1 U	3.3	1.1
C30-Hopane	<1.1 U	3.3	1.1

Surrogate (Su)

Surrogate (Su)	Su Recovery (%)
Naphthalene-d8	97
Acenaphthene-d10	98
Phenanthrene-d10	92
Chrysene-d12	81
Perylene-d12	97

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

2008 Jubilee Development Group
Ghana EBS Project
Polycyclic Aromatic Hydrocarbon Data
Matrix Spike Report

Sample Name	GEB0029.D	ENV1946.C.D		ENV1946.D.D						
Client Name	EBS-T6 (1 of 2)	MS (EBS-T6 (1 of 2))		MSD (EBS-T6 (1 of 2))						
Matrix	Sediment	Sediment		Sediment						
Collection Date	09/13/08	09/13/08		09/13/08						
Received Date	09/18/08	09/18/08		09/18/08						
Extraction Date	10/31/08	10/31/08		10/31/08						
Extraction Batch	ENV 1946	ENV 1946		ENV 1946						
Date Acquired	11/06/08	11/05/08		11/05/08						
Method	PAH-2002	PAH-2002		PAH-2002						
Sample Dry Weight (g)	15.05	15.0		15.2						
% Moisture	55	55		55						
% Dry	45	45		45						
Dilution	NA	NA		NA						
Target Compounds	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q Recovery (%) Q Q	Su Corrected Conc. (ng/dry g)	Q	Recovery (%) Q Q	RPD (%)	Q	Spike Amount (ng)
Naphthalene	6.7		13.3	98		13.2	99	1		100
C1-Naphthalenes	5.2		NA			NA				
C2-Naphthalenes	13.9		NA			NA				
C3-Naphthalenes	12.6		NA			NA				
C4-Naphthalenes	6.8		NA			NA				
Benzothiophene	0.2		6.4	93		6.5	95	2		100
C1-Benzothiophenes	0.3	J	NA			NA				
C2-Benzothiophenes	0.5		NA			NA				
C3-Benzothiophenes	0.7		NA			NA				
Biphenyl	1.0		8.2	108		8.2	109	0		100
Acenaphthylene	0.6		7.5	103		7.6	106	1		100
Acenaphthene	3.2		10.1	103		9.5	96	6		100
Dibenzofuran	2.5		9.2	100		8.9	97	3		100
Fluorene	1.2		8.8	114		8.7	114	1		100
C1-Fluorenes	3.2		NA			NA				
C2-Fluorenes	4.3		NA			NA				
C3-Fluorenes	3.8		NA			NA				
Carbazole	0.4		6.7	94		6.4	91	5		100
Anthracene	0.8		7.3	97		7.0	94	4		100
Phenanthrene	3.9		9.7	87		9.6	87	1		100
C1-Phenanthrene/Anthracenes	4.1		NA			NA				
C2-Phenanthrene/Anthracenes	6.6		NA			NA				
C3-Phenanthrene/Anthracenes	3.1		NA			NA				
C4-Phenanthrene/Anthracenes	1.7		NA			NA				
Dibenzothiophene	0.5		6.5	90		6.6	92	2		100
C1-Dibenzothiophene	0.9		NA			NA				
C2-Dibenzothiophene	1.5		NA			NA				
C3-Dibenzothiophene	1.5		NA			NA				
Fluoranthene	6.0		13.0	104		12.4	97	5		100
Pyrene	6.2		12.2	90		12.0	88	2		100
C1-Fluoranthenes/Pyrenes	3.0		NA			NA				
C2-Fluoranthenes/Pyrenes	2.4		NA			NA				
C3-Fluoranthenes/Pyrenes	1.6		NA			NA				
Naphthobenzothiophene	1.9		NA			NA				100
C1-Naphthobenzothiophenes	1.6		NA			NA				
C2-Naphthobenzothiophenes	2.3		NA			NA				
C3-Naphthobenzothiophenes	1.0		NA			NA				
Benz(a)anthracene	3.9		11.3	111		11.6	117	3		100
Chrysene	4.3		10.4	91		9.9	85	5		100
C1-Chrysenes	3.0		NA			NA				
C2-Chrysenes	3.1		NA			NA				
C3-Chrysenes	<0.3	U	NA			NA				
C4-Chrysenes	<0.3	U	NA			NA				
Benz(b)fluoranthene	6.3		12.8	97		12.3	92	4		100
Benz(k)fluoranthene	1.6		8.2	99		7.9	95	4		100
Benzo(e)pyrene	2.8		9.4	99		9.3	99	1		100
Benzo(a)pyrene	3.7		10.4	100		9.9	94	5		100
Perylene	5.8		12.6	102		12.2	97	3		100
Indeno(1,2,3-c,d)pyrene	3.6		10.0	96		9.8	94	2		100
Dibenzo(a,h)anthracene	0.5		6.3	87		6.1	85	3		100
Benzo(g,h,i)perylene	3.1		9.1	90		8.8	87	3		100
Average % Recovery			98		96					
Individual Alkyl Isomers and Hopane										
2-Methylnaphthalene	3.7		11.0	109		10.5	103	5		100
1-Methylnaphthalene	4.9		11.9	105		11.9	107	0		100
2,6-Dimethylnaphthalene	7.6		14.4	101		14.8	110	3		100
1,6,7-Trimethylnaphthalene	0.8		6.2	81		6.0	79	3		100
1-Methylphenanthrene	1.6		7.6	90		7.5	89	1		100
C29-Hopane	23.9		NA			NA				
18a-Oleanane	10.7		NA			NA				
C30-Hopane	24.4		NA			NA				
Surrogate (Su)	Su Recovery (%)		Su Recovery (%)		Su Recovery (%)					
Naphthalene-d8	88		76		84					
Acenaphthene-d10	97		91		96					
Phenanthrene-d10	93		82		86					
Chrysene-d12	99		89		99					
Perylene-d12	92		88		88					

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, Y=Invalid Spike, *=Outside QA limits, refer to narrative

Sample Name	GEB0013.D	ENV1946E.D
Client Name	JUB-EBS-007R (1 of 2)	Dupl. (JUB-EBS-007R (1 of 2))
Matrix	Sediment	Sediment
Collection Date	09/10/08	09/10/08
Received Date	09/18/08	09/18/08
Extraction Date	10/31/08	10/31/08
Extraction Batch	ENV 1946	ENV 1946
Date Acquired	11/06/08	11/05/08
Method	PAH-2002	PAH-2002
Sample Dry Weight (g)	15.0	15.0
% Moisture	71	71
% Dry	29	29
Dilution	NA	NA

Target Compounds	Su Corrected Conc. (ng/dry g)	Q	Su Corrected Conc. (ng/dry g)	Q	RPD (%)	Q	Q	MDL	2xMDL
Naphthalene	10.7		11.4	6				0.2	0.3
C1-Naphthalenes	6.7		6.9	3				0.3	0.7
C2-Naphthalenes	15.3		15.2	1				0.4	0.7
C3-Naphthalenes	14.5		14.1	3				0.4	0.7
C4-Naphthalenes	8.8		8.0	10				0.4	0.7
Benzothiophene	0.3		0.3	0		X		0.2	0.3
C1-Benzothiophenes	0.3 J		0.3 J	0		X		0.3	0.7
C2-Benzothiophenes	1.4		1.3	7				0.3	0.7
C3-Benzothiophenes	0.6		0.6	0		X		0.3	0.7
Biphenyl	1.8		1.8	0				0.1	0.3
Aceanaphthylene	0.7		0.6	15				0.2	0.4
Aceanaphthene	4.1		3.8	8				0.1	0.3
Dibenzofuran	3.7		3.6	3				0.2	0.4
Fluorene	3.2		2.9	10				0.2	0.4
C1-Fluorenes	3.4		3.6	6				0.4	0.8
C2-Fluorenes	5.7		5.1	11				0.4	0.8
C3-Fluorenes	4.9		4.3	13				0.4	0.8
Carbazole	0.6		0.5	18		X		0.3	0.7
Anthracene	0.6		0.5	18				0.2	0.4
Phenanthrene	5.1		4.1	22				0.1	0.3
C1-Phenanthrene/Anthracenes	3.7		3.6	3				0.3	0.6
C2-Phenanthrene/Anthracenes	4.8		4.5	6				0.3	0.6
C3-Phenanthrene/Anthracenes	1.7		1.4	19				0.3	0.6
C4-Phenanthrene/Anthracenes	1.2		1.2	0				0.3	0.6
Dibenzothiophene	0.4		0.4	0				0.2	0.3
C1-Dibenzothiophene	0.6		0.7	15		X		0.3	0.6
C2-Dibenzothiophene	1.0		0.9	11				0.3	0.6
C3-Dibenzothiophene	0.9		0.9	0				0.3	0.6
Fluoranthene	4.2		3.3	24				0.2	0.4
Pyrene	4.2		3.5	18				0.2	0.4
C1-Fluoranthenes/Pyrenes	1.5		t.2	22				0.4	0.8
C2-Fluoranthenes/Pyrenes	1.4		1.2	15				0.4	0.8
C3-Fluoranthenes/Pyrenes	1.0		1.0	0				0.4	0.8
Naphthobenzothiophene	2.6		2.2	17				0.2	0.4
C1-Naphthobenzothiophenes	0.8		0.8	0		X		0.4	0.8
C2-Naphthobenzothiophenes	1.3		1.3	0				0.4	0.8
C3-Naphthobenzothiophenes	1.2		1.0	18				0.4	0.8
Benz(a)anthracene	2.0		2.1	5				0.1	0.3
Chrysene	3.0		2.9	3				0.2	0.3
C1-Chrysenes	1.6		1.5	6				0.3	0.7
C2-Chrysenes	3.7		3.4	8				0.3	0.7
C3-Chrysenes	<0.3 U		<0.3 U					0.3	0.7
C4-Chrysenes	<0.3 U		<0.3 U					0.3	0.7
Benz(b)fluoranthene	3.3		3.0	10				0.3	0.6
Benz(k)fluoranthene	0.7		0.7	0				0.2	0.5
Benz(e)pyrene	1.8		2.2	20				0.3	0.6
Benz(a)pyrene	1.2		1.0	18				0.2	0.4
Perylene	2.6		2.7	4		X		1.4	2.8
Indeno(1,2,3-c,d)pyrene	1.9		1.8	5				0.3	0.6
Dibenz(a,h)anthracene	0.2		0.2	0		X		0.2	0.3
Benzo(g,h,i)perylene	1.3		1.2	8				0.1	0.3
Total PAHs	148		141	5					

Individual Alkyl Isomers and Hopane

2-Methylnaphthalene	5.2	5.4	4	0.2	0.4
1-Methylnaphthalene	5.8	5.9	2	0.1	0.3
2,6-Dimethylnaphthalene	7.3	7.6	4	0.2	0.4
1,6,7-Trimethylnaphthalene	1.7	1.8	6	0.1	0.2
1-Methylphenanthrene	1.4	1.4	0	0.2	0.4
C29-Hopane	19.9	22.0	10	1.1	2.2
18a-Oleanane	17.3	17.7	2	1.1	2.2
C30-Hopane	29.9	31.5	5	1.1	2.2

Surrogate (Su)	Su Recovery (%)	Su Recovery (%)
Naphthalene-d8	81	79
Acenaphthene-d10	97	90
Phenanthrene-d10	81	79
Chrysene-d12	98	84
Perylene-d12	75	78

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, X=<2xMDL, *=Outside QA limits, refer to narrative

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Target Compounds	<table> <thead> <tr> <th></th> <th>Su Corrected Conc. (ng/dry g)</th> <th>Q</th> <th>Q1</th> <th>(%) RPD</th> <th>SRM 1941b Certified Conc. (ng/dry g)</th> <th>-20% Conc. (ng/dry g)</th> <th>+20% Conc. (ng/dry g)</th> </tr> </thead> <tbody> <tr> <td>Naphthalene</td><td>834</td><td></td><td>2</td><td>848</td><td>678</td><td>1018</td><td></td></tr> <tr> <td>C1-Naphthalenes</td><td>243</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Naphthalenes</td><td>213</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Naphthalenes</td><td>163</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C4-Naphthalenes</td><td>86.4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Benzothiophene</td><td>33.0</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C1-Benzothiophenes</td><td>29.8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Benzothiophenes</td><td>15.6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Benzothiophenes</td><td>10.6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Biphenyl</td><td>74.2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Aceanaphthylene</td><td>80.1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Aceanaphthene</td><td>34.2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Dibenzofuran</td><td>95.8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Fluorene</td><td>71.0</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C1-Fluorenes</td><td>71.8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Fluorenes</td><td>163</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Fluorenes</td><td>177</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Carbazole</td><td>18.8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Anthracene</td><td>179</td><td></td><td>3</td><td>184</td><td>147</td><td>221</td><td></td></tr> <tr> <td>Phenanthrone</td><td>436</td><td></td><td>7</td><td>406</td><td>325</td><td>487</td><td></td></tr> <tr> <td>C1-Phenanthrone/Anthracenes</td><td>310</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Phenanthrone/Anthracenes</td><td>265</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Phenanthrone/Anthracenes</td><td>188</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C4-Phenanthrone/Anthracenes</td><td>91.9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Dibenzothiophene</td><td>53.0</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C1-Dibenzothiophene</td><td>73.9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Dibenzothiophene</td><td>118</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Dibenzothiophene</td><td>107</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Fluoranthene</td><td>744</td><td></td><td>13</td><td>651</td><td>521</td><td>781</td><td></td></tr> <tr> <td>Pyrene</td><td>560</td><td></td><td>4</td><td>581</td><td>465</td><td>697</td><td></td></tr> <tr> <td>C1-Fluoranthenes/Pyrenes</td><td>338</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Fluoranthenes/Pyrenes</td><td>263</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Fluoranthenes/Pyrenes</td><td>103</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Naphthobenzothiophene</td><td>14.1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C1-Naphthobenzothiophenes</td><td>117</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Naphthobenzothiophenes</td><td>104</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Naphthobenzothiophenes</td><td>55</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Benz(a)anthracene</td><td>359</td><td></td><td>7</td><td>335</td><td>268</td><td>402</td><td></td></tr> <tr> <td>Chrysene</td><td>443</td><td></td><td>10</td><td>399</td><td>319</td><td>479</td><td></td></tr> <tr> <td>C1-Chrysenes</td><td>343</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C2-Chrysenes</td><td>163</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C3-Chrysenes</td><td>59.4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C4-Chrysenes</td><td>21.9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Benz(b)fluoranthene</td><td>495</td><td></td><td>9</td><td>453</td><td>362</td><td>544</td><td></td></tr> <tr> <td>Benz(k)fluoranthene</td><td>237</td><td></td><td>5</td><td>225</td><td>180</td><td>270</td><td></td></tr> <tr> <td>Benz(e)pyrene</td><td>336</td><td></td><td>3</td><td>325</td><td>260</td><td>390</td><td></td></tr> <tr> <td>Benz(a)pyrene</td><td>307</td><td></td><td>15</td><td>358</td><td>286</td><td>430</td><td></td></tr> <tr> <td>Perylene</td><td>362</td><td></td><td>9</td><td>397</td><td>318</td><td>476</td><td></td></tr> <tr> <td>Indeno(1,2,3-c,d)pyrene</td><td>361</td><td></td><td>6</td><td>341</td><td>273</td><td>409</td><td></td></tr> <tr> <td>Dibenzo(a,h)anthracene</td><td>60.9</td><td></td><td>14</td><td>53.0</td><td>42.4</td><td>63.6</td><td></td></tr> <tr> <td>Benz(g,h,i)perylene</td><td>251</td><td></td><td>20</td><td>307</td><td>246</td><td>368</td><td></td></tr> <tr> <td>Total PAHs</td><td>10461</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2">Individual Aikyl Isomers and Hopane</td></tr> <tr> <td>2-Methylnaphthalene</td><td>263</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>1-Methylnaphthalene</td><td>129</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>2,6-Dimethylnaphthalene</td><td>132</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>1,6,7-Trimethylnaphthalene</td><td>20.5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>1-Methylphenanthrene</td><td>74.8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C29-Hopane</td><td>226</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>18a-Oleanane</td><td>31.7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>C30-Hopane</td><td>285</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Surrogate (Su)</td><td>Su Recovery (%)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Naphthalene-d8</td><td>72</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Aceanaphthene-d10</td><td>89</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Phenanthrone-d10</td><td>72</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Chrysene-d12</td><td>75</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>Perylene-d12</td><td>73</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		Su Corrected Conc. (ng/dry g)	Q	Q1	(%) RPD	SRM 1941b Certified Conc. (ng/dry g)	-20% Conc. (ng/dry g)	+20% Conc. (ng/dry g)	Naphthalene	834		2	848	678	1018		C1-Naphthalenes	243							C2-Naphthalenes	213							C3-Naphthalenes	163							C4-Naphthalenes	86.4							Benzothiophene	33.0							C1-Benzothiophenes	29.8							C2-Benzothiophenes	15.6							C3-Benzothiophenes	10.6							Biphenyl	74.2							Aceanaphthylene	80.1							Aceanaphthene	34.2							Dibenzofuran	95.8							Fluorene	71.0							C1-Fluorenes	71.8							C2-Fluorenes	163							C3-Fluorenes	177							Carbazole	18.8							Anthracene	179		3	184	147	221		Phenanthrone	436		7	406	325	487		C1-Phenanthrone/Anthracenes	310							C2-Phenanthrone/Anthracenes	265							C3-Phenanthrone/Anthracenes	188							C4-Phenanthrone/Anthracenes	91.9							Dibenzothiophene	53.0							C1-Dibenzothiophene	73.9							C2-Dibenzothiophene	118							C3-Dibenzothiophene	107							Fluoranthene	744		13	651	521	781		Pyrene	560		4	581	465	697		C1-Fluoranthenes/Pyrenes	338							C2-Fluoranthenes/Pyrenes	263							C3-Fluoranthenes/Pyrenes	103							Naphthobenzothiophene	14.1							C1-Naphthobenzothiophenes	117							C2-Naphthobenzothiophenes	104							C3-Naphthobenzothiophenes	55							Benz(a)anthracene	359		7	335	268	402		Chrysene	443		10	399	319	479		C1-Chrysenes	343							C2-Chrysenes	163							C3-Chrysenes	59.4							C4-Chrysenes	21.9							Benz(b)fluoranthene	495		9	453	362	544		Benz(k)fluoranthene	237		5	225	180	270		Benz(e)pyrene	336		3	325	260	390		Benz(a)pyrene	307		15	358	286	430		Perylene	362		9	397	318	476		Indeno(1,2,3-c,d)pyrene	361		6	341	273	409		Dibenzo(a,h)anthracene	60.9		14	53.0	42.4	63.6		Benz(g,h,i)perylene	251		20	307	246	368		Total PAHs	10461							Individual Aikyl Isomers and Hopane		2-Methylnaphthalene	263							1-Methylnaphthalene	129							2,6-Dimethylnaphthalene	132							1,6,7-Trimethylnaphthalene	20.5							1-Methylphenanthrene	74.8							C29-Hopane	226							18a-Oleanane	31.7							C30-Hopane	285							Surrogate (Su)	Su Recovery (%)							Naphthalene-d8	72							Aceanaphthene-d10	89							Phenanthrone-d10	72							Chrysene-d12	75							Perylene-d12	73						
	Su Corrected Conc. (ng/dry g)	Q	Q1	(%) RPD	SRM 1941b Certified Conc. (ng/dry g)	-20% Conc. (ng/dry g)	+20% Conc. (ng/dry g)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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C1-Benzothiophenes	29.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C2-Benzothiophenes	15.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C3-Benzothiophenes	10.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Biphenyl	74.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Aceanaphthylene	80.1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Aceanaphthene	34.2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Dibenzofuran	95.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Fluorene	71.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C1-Fluorenes	71.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C2-Fluorenes	163																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C3-Fluorenes	177																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Carbazole	18.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Anthracene	179		3	184	147	221																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Phenanthrone	436		7	406	325	487																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
C1-Phenanthrone/Anthracenes	310																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C2-Phenanthrone/Anthracenes	265																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C3-Phenanthrone/Anthracenes	188																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C4-Phenanthrone/Anthracenes	91.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Dibenzothiophene	53.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C1-Dibenzothiophene	73.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C2-Dibenzothiophene	118																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C3-Dibenzothiophene	107																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Fluoranthene	744		13	651	521	781																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Pyrene	560		4	581	465	697																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
C1-Fluoranthenes/Pyrenes	338																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C2-Fluoranthenes/Pyrenes	263																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C3-Fluoranthenes/Pyrenes	103																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Naphthobenzothiophene	14.1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C1-Naphthobenzothiophenes	117																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C2-Naphthobenzothiophenes	104																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C3-Naphthobenzothiophenes	55																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Benz(a)anthracene	359		7	335	268	402																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Chrysene	443		10	399	319	479																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
C1-Chrysenes	343																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C2-Chrysenes	163																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C3-Chrysenes	59.4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C4-Chrysenes	21.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Benz(b)fluoranthene	495		9	453	362	544																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Benz(k)fluoranthene	237		5	225	180	270																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Benz(e)pyrene	336		3	325	260	390																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Benz(a)pyrene	307		15	358	286	430																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Perylene	362		9	397	318	476																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Indeno(1,2,3-c,d)pyrene	361		6	341	273	409																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Dibenzo(a,h)anthracene	60.9		14	53.0	42.4	63.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Benz(g,h,i)perylene	251		20	307	246	368																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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2-Methylnaphthalene	263																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1-Methylnaphthalene	129																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
2,6-Dimethylnaphthalene	132																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1,6,7-Trimethylnaphthalene	20.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1-Methylphenanthrene	74.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C29-Hopane	226																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
18a-Oleanane	31.7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
C30-Hopane	285																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Surrogate (Su)	Su Recovery (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Naphthalene-d8	72																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Aceanaphthene-d10	89																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Phenanthrone-d10	72																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Chrysene-d12	75																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Perylene-d12	73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

Sample Name MS30535B.D
Client Name SRM 1582
Matrix Petroleum
Collection Date NA
Received Date NA
Extraction Date NA
Extraction Batch ENV 1946
Date Acquired 11/05/08
Method PAH-2002
Sample Weight (g) 1.7

Target Compounds	Su Corrected Conc. (ug/g)	Q	RPD (%)	SRM 1582 Certified Conc. (ug/g)	B&B Average	-15% Conc. (ug/g)	+15% Conc. (ug/g)
Naphthalene	135	7.1		145	123	167	
C1-Naphthalenes	588	5.6		622	529	715	
C2-Naphthalenes	1040	13.4		1189	1011	1367	
C3-Naphthalenes	1030	0.7		1037	881	1193	
C4-Naphthalenes	660	13.3		754	641	867	
Benzothiophene	10.5						
C1-Benzothiophenes	21.2						
C2-Benzothiophenes	74.5						
C3-Benzothiophenes	137						
Biphenyl	32.5	6.0		34.5	29.3	39.7	
Aceanaphthylene	<10 U						
Aceanaphthene	17.8	6.0		18.9	16.1	21.7	
Dibenzofuran	11.1						
Fluorene	33.3	7.2		35.8	30.4	41.2	
C1-Fluorennes	135	2.2		132	112	152	
C2-Fluorennes	294	13.8		256	218	294	
C3-Fluorennes	247	2.0		242	206	278	
Carbazole	6.9 J						
Anthracene	7.4 J						
Phenanthrone	122	10.5	100 ± 7.0	110	93.3	126	
C1-Phenanthrone/Anthracenes	323	0.9		326	277	375	
C2-Phenanthrone/Anthracenes	513	5.7		543	462	624	
C3-Phenanthrone/Anthracenes	480	8.4		522	444	600	
C4-Phenanthrone/Anthracenes	246	11.1		275	234	316	
Dibenzothiophene	36.5	2.8	32.9 ± 1.7	35.5	30.2	40.8	
C1-Dibenzothiophene	134	6.9		125	106	144	
C2-Dibenzothiophene	226	12.8		257	218	296	
C3-Dibenzothiophene	217	14.1		250	213	288	
Fluoranthene	9.9 J						
Pyrene	9.4 J						
C1-Fluoranthenes/Pyrenes	60.1	13.5		68.8	58.5	79.1	
C2-Fluoranthenes/Pyrenes	93.5	11.6		105	89.3	121	
C3-Fluoranthenes/Pyrenes	79.2	7.5		85.4	72.6	98.2	
Naphthobenzothiophene	39.3	1.3		39.8	33.8	45.8	
C1-Naphthobenzothiophenes	59.3	0.7		58.9	50.1	67.7	
C2-Naphthobenzothiophenes	73.9	5.5		78.1	66.4	89.8	
C3-Naphthobenzothiophenes	49.5	10.9		55.2	46.9	63.5	
Benz(a)anthracene	4.4 J						
Chrysene	22.8	5.4		21.6	18.4	24.8	
C1-Chrysenes	75.2	9.5		68.4	58.1	78.7	
C2-Chrysenes	119	4.9		125	106	144	
C3-Chrysenes	78.0	12.6		88.5	75.2	102	
C4-Chrysenes	<10 U						
Benz(o)fluoranthene	3.6 J						
Benz(k)fluoranthene	1.9 J						
Benz(o)pyrene	9.1 J						
Benz(e)pyrene	1.8 J						
Perylene	36.3	8.1	30.2 ± 1.7	33.5	28.4	38.5	
Indeno(1,2,3-c,d)pyrene	3.5 J						
Dibenzo(a,h)anthracene	1.0 J						
Benz(g,h,i)perylene	1.2 J						
Total PAHs	7611						
Selected Ratios							
D2/P2	0.441	7.2		0.473	0.402	0.544	
D3/P3	0.452	5.8		0.479	0.407	0.551	
D2/C2	1.899	7.9		2.056	1.748	2.364	
D3/C3	2.782	1.5		2.825	2.401	3.249	
FI-Py2/C2	0.786	6.7		0.840	0.714	0.966	
FI-Py3/C3	1.015	5.1		0.965	0.820	1.110	
Individual Alkyl Isomers and Hopane							
2-Methylnaphthalene	558	7.6		602	512	692	
1-Methylnaphthalene	396	4.7		415	353	477	
2,6-Dimethylnaphthalene	552	8.7		602	512	692	
1,6,7-Trimethylnaphthalene	144	5.4		152	129	175	
1-Methylphenanthrene	91.3	9.1		100	85.0	115	
C29-Hopane	244						
18a-Oleanane	19.4						
C30-Hopane	314	11.1		281	239	323	

Surrogate (Su) Su Recovery (%)

Naphthalene-d8 92
Acenaphthene-d10 96
Phanthrene-d10 94
Chrysene-d12 97
Perylene-d12 97

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

Sample Name	MS30535I.D
Client Name	AR-WKCC-250-025
Matrix	Solution
Collection Date	NA
Received Date	NA
Extraction Date	NA
Extraction Batch	ENV 1946
Date Acquired	11/05/08
Method	PAH-2000
Sample Volume (mL)	1.0

Target Compounds	Conc. (ng/ml)	Q	RPD (%)	LCM Certified Conc. Conc. (ng/ml)	-15% Conc. Conc. (ng/ml)	+15% Conc. Conc. (ng/ml)
Naphthalene	263		4.1	253	215	290
C1-Naphthalenes	NA					
C2-Naphthalenes	NA					
C3-Naphthalenes	NA					
C4-Naphthalenes	NA					
Benzothiophene	266		5.9	251	213	288
C1-Benzothiophenes	NA					
C2-Benzothiophenes	NA					
C3-Benzothiophenes	NA					
Biphenyl	261		4.1	250	213	288
Acenaphthylene	262		4.6	250	213	288
Acenaphthene	263		4.9	251	213	288
Dibenzofuran	260		3.8	250	213	288
Fluorene	258		2.9	251	213	288
C1-Fluorenes	NA					
C2-Fluorenes	NA					
C3-Fluorenes	NA					
Carbazole	253		1.1	250	213	288
Anthracene	272		8.3	250	213	288
Phenanthrene	259		3.3	251	213	288
C1-Phenanthrene/Anthracenes	NA					
C2-Phenanthrene/Anthracenes	NA					
C3-Phenanthrene/Anthracenes	NA					
C4-Phenanthrene/Anthracenes	NA					
Dibenzothiophene	260		3.8	250	213	288
C1-Dibenzothiophenes	NA					
C2-Dibenzothiophenes	NA					
C3-Dibenzothiophenes	NA					
Fluoranthene	263		4.8	251	213	288
Pyrene	261		4.1	251	213	288
C1-Fluoranthenes/Pyrenes	NA					
C2-Fluoranthenes/Pyrenes	NA					
C3-Fluoranthenes/Pyrenes	NA					
Naphthobenzothiophene	237		-5.5	251	213	288
C1-Naphthobenzothiophenes	NA					
C2-Naphthobenzothiophenes	NA					
C3-Naphthobenzothiophenes	NA					
Benz(a)anthracene	243		-3.1	251	213	288
Chrysene	250		-0.2	251	213	288
C1-Chrysenes	NA					
C2-Chrysenes	NA					
C3-Chrysenes	NA					
C4-Chrysenes	NA					
Benzo(b)fluoranthene	265		5.7	250	213	288
Benzo(k)fluoranthene	263		4.8	251	213	288
Benz(o)pyrene	269		7.1	251	213	288
Benz(o)a)pyrene	255		1.8	250	213	288
Perylene	256		2.2	250	213	288
Indeno(1,2,3-c,d)pyrene	270		7.5	251	213	288
Dibenzo(a,h)anthracene	253		1.0	250	213	288
Benzo(g,h,i)perylene	266		6.0	250	213	288
Individual Alkyl Isomers and Hopanes						
2-Methylnaphthalene	262		4.4	251	213	288
1-Methylnaphthalene	266		6.1	250	213	288
2,6-Dimethylnaphthalene	256		2.2	251	213	288
1,6,7-Trimethylnaphthalene	250		-0.2	250	213	288
1-Methylphenanthrene	253		1.0	251	213	288
C29-Hopane	NA					
18a-Oleanane	NA					
C30-Hopane	247		-1.3	250	213	288

Surrogate (Su)	Su Recovery (%)
Naphthalene-d8	106
Acenaphthene-d10	102
Phenanthrene-d10	105
Chrysene-d12	102
Perylene-d12	104

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

Sulfate Data

B&B Laboratories
Project J08704
Report 08-2181

2008 Jubilee Development Group
Ghana EBS Project
Sulfate Data
Client Submitted Samples

Sample Name	GEB0365	GEB0366	GEB0369	GEB0370	GEB0372
Client Name	JUB-EBS-001	JUB-EBS-002	JUB-EBS-003R	JUB-EBS-004	JUB-EBS-005R
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment
Collection Date	09/10/08	09/10/08	09/10/08	09/10/08	09/10/08
Received Date	09/18/08	09/18/08	09/18/08	09/18/08	09/18/08
Sulfate	Conc. (mM) 136.5	Conc. (mM) 94.5	Conc. (mM) 96.4	Conc. (mM) 182	Conc. (mM) 135.7

B&B Laboratories
Project J08704
Report 08-2181

2008 Jubilee Development Group
Ghana EBS Project
Sulfate Data
Client Submitted Samples

Sample Name	GEB0374	GEB0375	GEB00377	GEB0379	GEB0381
Client Name	JUB-EBS-006	JUB-EBS-007R	JUB-EBS-008	JUB-EBS-009R	EBS-E1
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment
Collection Date	09/09/08	09/10/08	09/10/08	09/10/08	09/11/08
Received Date	09/18/08	09/18/08	09/18/08	09/18/08	09/18/08
Conc. (mM)	217.4	132.9	118.5	81.1	76.4

B&B Laboratories
Project J08704
Report 08-2181

2008 Jubilee Development Group
Ghana EBS Project
Sulfate Data
Client Submitted Samples

Sample Name	GEB0382	GEB0385	GEB0386	GEB0388	GEB0390
Client Name	EBS-E2	EBS-E3R	EBS-T4	EBS-T5	EBS-T6
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment
Collection Date	09/11/08	09/12/08	09/13/08	09/13/08	09/13/08
Received Date	09/18/08	09/18/08	09/18/08	09/18/08	09/18/08
Conc. (mM)	71	65.6	65.3	84.1	138.6

Total Nitrogen/ Total Phosphorus Data

ANALYTICAL REPORT

Job Number: 600-1974-1

Job Description: B&B Laboratories Inc.

For:
B&B Laboratories
1902 Pinon Street
College Station, TX 77845
Attention: Sue McDonald

C. Lance Tigrett

Approved for release.
Lance C Tigrett
Data Review Analyst I
10/22/2008 9:35 AM

Designee for
Dean A Joiner
Project Manager I
dean.joiner@testamericainc.com
10/22/2008

The test results in this report meet all NELAP requirements unless specified within the case narrative. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Project Manager.

TestAmerica Houston Certifications and Approvals: TX NELAP T104704223-06-TX, ARDEQ 88-0759, LADEQ 01967, OKDEQ 9503, UT DOH GULF

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Job Narrative
600-J1974-1

Comments

No additional comments.

Receipt

Samples were received out of temperature for the parameters of Total Phosphorus and Total Nitrogen.. At the clients request via e-mail on October 2, 2008, the laboratory continued with the analysis.

General Chemistry

No analytical or quality issues were noted.

Industrial Hygiene

No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: B&B Laboratories

Job Number: 600-1974-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
600-1974-1	GEB0046				
Nitrogen, Kjeldahl		630	200	mg/Kg	351.2
Phosphorus as PO4		690	25	mg/Kg	SM 4500 P E
Nitrogen, Total		630	0.012	mg/Kg	Total Nitrogen
600-1974-2	GEB0047				
Nitrogen, Kjeldahl		850	200	mg/Kg	351.2
Phosphorus as PO4		570	25	mg/Kg	SM 4500 P E
Nitrogen, Total		850	0.012	mg/Kg	Total Nitrogen
600-1974-3	GEB0048				
Nitrogen, Kjeldahl		960	200	mg/Kg	351.2
Phosphorus as PO4		460	25	mg/Kg	SM 4500 P E
Nitrogen, Total		960	0.012	mg/Kg	Total Nitrogen
600-1974-4	GEB0049				
Nitrogen, Kjeldahl		930	200	mg/Kg	351.2
Phosphorus as PO4		520	25	mg/Kg	SM 4500 P E
Nitrogen, Total		930	0.012	mg/Kg	Total Nitrogen
600-1974-5	GEB0050				
Nitrogen, Kjeldahl		570	40	mg/Kg	351.2
Phosphorus as PO4		610	25	mg/Kg	SM 4500 P E
Nitrogen, Total		570	0.012	mg/Kg	Total Nitrogen
600-1974-6	GEB0051				
Nitrogen, Kjeldahl		720	40	mg/Kg	351.2
Phosphorus as PO4		560	25	mg/Kg	SM 4500 P E
Nitrogen, Total		720	0.012	mg/Kg	Total Nitrogen
600-1974-7	GEB0052				
Nitrogen, Kjeldahl		630	40	mg/Kg	351.2
Phosphorus as PO4		540	25	mg/Kg	SM 4500 P E
Nitrogen, Total		630	0.012	mg/Kg	Total Nitrogen

EXECUTIVE SUMMARY - Detections

Client: B&B Laboratories

Job Number: 600-1974-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
600-1974-8	GEB0053				
Nitrogen, Kjeldahl		570	40	mg/Kg	351.2
Phosphorus as PO4		430	25	mg/Kg	SM 4500 P E
Nitrogen, Total		570	0.012	mg/Kg	Total Nitrogen
600-1974-9	GEB0054				
Nitrogen, Kjeldahl		820	200	mg/Kg	351.2
Phosphorus as PO4		400	25	mg/Kg	SM 4500 P E
Nitrogen, Total		820	0.012	mg/Kg	Total Nitrogen
600-1974-10	GEB0055				
Nitrogen, Kjeldahl		450	40	mg/Kg	351.2
Phosphorus as PO4		810	25	mg/Kg	SM 4500 P E
Nitrogen, Total		450	0.012	mg/Kg	Total Nitrogen
600-1974-11	GEB0056				
Nitrogen, Kjeldahl		510	40	mg/Kg	351.2
Phosphorus as PO4		890	25	mg/Kg	SM 4500 P E
Nitrogen, Total		510	0.012	mg/Kg	Total Nitrogen
600-1974-12	GEB0057				
Nitrogen, Kjeldahl		380	40	mg/Kg	351.2
Phosphorus as PO4		1300	25	mg/Kg	SM 4500 P E
Nitrogen, Total		380	0.012	mg/Kg	Total Nitrogen
600-1974-13	GEB0058				
Nitrogen, Kjeldahl		540	40	mg/Kg	351.2
Phosphorus as PO4		900	25	mg/Kg	SM 4500 P E
Nitrogen, Total		540	0.012	mg/Kg	Total Nitrogen
600-1974-14	GEB0059				
Nitrogen, Kjeldahl		630	40	mg/Kg	351.2
Phosphorus as PO4		790	25	mg/Kg	SM 4500 P E
Nitrogen, Total		630	0.012	mg/Kg	Total Nitrogen

EXECUTIVE SUMMARY - Detections

Client: B&B Laboratories

Job Number: 600-1974-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
600-1974-15	GEB0060				
Nitrogen, Kjeldahl		620	40	mg/Kg	351.2
Phosphorus as PO4		790	25	mg/Kg	SM 4500 P E
Nitrogen, Total		620	0.012	mg/Kg	Total Nitrogen

METHOD SUMMARY

Client: B&B Laboratories

Job Number: 600-1974-1

Description	Lab Location	Method	Preparation Method
Matrix	Solid		
Nitrogen, Total Kjeldahl	TAL HOU	MCAWW 351.2	
Nitrogen, Nitrate-Nitrite Deionized Water Leaching Procedure	TAL HOU	MCAWW 353.2	ASTM DI Leach
Phosphorus	TAL HOU	SM SM 4500 P E	
Phosphorous, Total and Ortho	TAL HOU	SM SM 4500 P B	
Nitrogen, Total	TAL HOU	EPA Total Nitrogen	

Lab References:

TAL HOU = TestAmerica Houston

Method References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

METHOD / ANALYST SUMMARY

Client: B&B Laboratories

Job Number: 600-1974-1

Method	Analyst	Analyst ID
MCAWW 351.2	Contreras, Enrique N	ENC
MCAWW 353.2	Walker, Gerald (Gerry) C	GCW
SM SM 4500 P E	Gregory, Sharita N	SNG
EPA Total Nitrogen	Moody, Tracy A	TAM

SAMPLE SUMMARY

Client: B&B Laboratories

Job Number: 600-1974-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
600-1974-1	GEB0046	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-2	GEB0047	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-3	GEB0048	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-4	GEB0049	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-5	GEB0050	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-6	GEB0051	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-7	GEB0052	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-8	GEB0053	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-9	GEB0054	Solid	09/10/2008 0000	10/02/2008 0938
600-1974-10	GEB0055	Solid	09/11/2008 0000	10/02/2008 0938
600-1974-11	GEB0056	Solid	09/11/2008 0000	10/02/2008 0938
600-1974-12	GEB0057	Solid	09/12/2008 0000	10/02/2008 0938
600-1974-13	GEB0058	Solid	09/13/2008 0000	10/02/2008 0938
600-1974-14	GEB0059	Solid	09/13/2008 0000	10/02/2008 0938
600-1974-15	GEB0060	Solid	09/13/2008 0000	10/02/2008 0938

SAMPLE RESULTS

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0046 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-1 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	630	Date Analyzed: mg/Kg	10/08/2008 1112 200	5.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1753 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	690	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	630	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0047 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-2 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	850	Date Analyzed: mg/Kg	10/08/2008 1114 200	5.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1756 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	570	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	850	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

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Job Number: 600-1974-1

Client Sample ID: GEB0048 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-3 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	960	Date Analyzed: mg/Kg	10/08/2008 1115 200	5.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1757 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	460	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	960	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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Job Number: 600-1974-1

Client Sample ID: GEB0049 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-4 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	930	Date Analyzed: mg/Kg	10/08/2008 1116 200	5.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1758 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	520	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	930	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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Job Number: 600-1974-1

Client Sample ID: GEB0050 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-5 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	570	Date Analyzed: mg/Kg	10/08/2008 1100 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1759 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	610	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	570	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

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College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0051 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-6 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	720	Date Analyzed: mg/Kg	10/08/2008 1101 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1803 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	560	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	720	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0052 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-7 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	630	Date Analyzed: mg/Kg	10/08/2008 1118 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1804 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	540	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	630	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0053 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-8 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	570	Date Analyzed: mg/Kg	10/08/2008 1120 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1805 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	430	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	570	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0054 **Date Sampled:** 09/10/2008 0000
Lab Sample ID: 600-1974-9 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	820	Date Analyzed: mg/Kg	10/08/2008 1104 200	5.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1806 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	400	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	820	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0055 **Date Sampled:** 09/11/2008 0000
Lab Sample ID: 600-1974-10 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	450	Date Analyzed: mg/Kg	10/08/2008 1121 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1809 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	810	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	450	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0056 **Date Sampled:** 09/11/2008 0000
Lab Sample ID: 600-1974-11 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	510	Date Analyzed: mg/Kg	10/08/2008 1121 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1810 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	890	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	510	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0057 **Date Sampled:** 09/12/2008 0000
Lab Sample ID: 600-1974-12 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	380	Date Analyzed: mg/Kg	10/08/2008 1123 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1811 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	1300	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	380	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0058 **Date Sampled:** 09/13/2008 0000
Lab Sample ID: 600-1974-13 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	540	Date Analyzed: mg/Kg	10/08/2008 1124 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1812 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	900	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	540	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
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1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0059 **Date Sampled:** 09/13/2008 0000
Lab Sample ID: 600-1974-14 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	630	Date Analyzed: mg/Kg	10/08/2008 1125 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1815 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	790	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	630	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1974-1

Client Sample ID: GEB0060 **Date Sampled:** 09/13/2008 0000
Lab Sample ID: 600-1974-15 **Date Received:** 10/02/2008 0938
 Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: 351.2 Nitrogen, Kjeldahl	620	Date Analyzed: mg/Kg	10/08/2008 1126 40	1.0
Method: Soluble-353.2 Nitrate Nitrite as N	ND	Date Analyzed: mg/Kg	10/10/2008 1816 0.50	1.0
Method: SM 4500 P E Prep Method: SM 4500 P B Phosphorus as PO4	790	Date Analyzed: Date Prepared: mg/Kg	10/07/2008 1645 10/07/2008 1420 25	5.0
Method: Total Nitrogen Nitrogen, Total	620	Date Analyzed: mg/Kg	10/21/2008 1802 0.012	1.0

DATA REPORTING QUALIFIERS

Client: B&B Laboratories

Job Number: 600-1974-1

Lab Section	Qualifier	Description
General Chemistry	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

QUALITY CONTROL RESULTS

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 600-3591					
LCS 600-3591/2-A	Lab Control Spike	T	Solid	SM 4500 P B	
MB 600-3591/1-A	Method Blank	T	Solid	SM 4500 P B	
600-1974-1	GEB0046	T	Solid	SM 4500 P B	
600-1974-2	GEB0047	T	Solid	SM 4500 P B	
600-1974-2DU	Duplicate	T	Solid	SM 4500 P B	
600-1974-2MS	Matrix Spike	T	Solid	SM 4500 P B	
600-1974-3	GEB0048	T	Solid	SM 4500 P B	
600-1974-4	GEB0049	T	Solid	SM 4500 P B	
600-1974-5	GEB0050	T	Solid	SM 4500 P B	
600-1974-6	GEB0051	T	Solid	SM 4500 P B	
600-1974-7	GEB0052	T	Solid	SM 4500 P B	
600-1974-8	GEB0053	T	Solid	SM 4500 P B	
600-1974-9	GEB0054	T	Solid	SM 4500 P B	
600-1974-10	GEB0055	T	Solid	SM 4500 P B	
600-1974-11	GEB0056	T	Solid	SM 4500 P B	
600-1974-11DU	Duplicate	T	Solid	SM 4500 P B	
600-1974-11MS	Matrix Spike	T	Solid	SM 4500 P B	
600-1974-12	GEB0057	T	Solid	SM 4500 P B	
600-1974-13	GEB0058	T	Solid	SM 4500 P B	
600-1974-14	GEB0059	T	Solid	SM 4500 P B	
600-1974-15	GEB0060	T	Solid	SM 4500 P B	
Analysis Batch:600-3597					
LCS 600-3591/2-A	Lab Control Spike	T	Solid	SM 4500 P E	600-3591
MB 600-3591/1-A	Method Blank	T	Solid	SM 4500 P E	600-3591
600-1974-1	GEB0046	T	Solid	SM 4500 P E	600-3591
600-1974-2	GEB0047	T	Solid	SM 4500 P E	600-3591
600-1974-2DU	Duplicate	T	Solid	SM 4500 P E	600-3591
600-1974-2MS	Matrix Spike	T	Solid	SM 4500 P E	600-3591
600-1974-3	GEB0048	T	Solid	SM 4500 P E	600-3591
600-1974-4	GEB0049	T	Solid	SM 4500 P E	600-3591
600-1974-5	GEB0050	T	Solid	SM 4500 P E	600-3591
600-1974-6	GEB0051	T	Solid	SM 4500 P E	600-3591
600-1974-7	GEB0052	T	Solid	SM 4500 P E	600-3591
600-1974-8	GEB0053	T	Solid	SM 4500 P E	600-3591
600-1974-9	GEB0054	T	Solid	SM 4500 P E	600-3591
600-1974-10	GEB0055	T	Solid	SM 4500 P E	600-3591
600-1974-11	GEB0056	T	Solid	SM 4500 P E	600-3591
600-1974-11DU	Duplicate	T	Solid	SM 4500 P E	600-3591
600-1974-11MS	Matrix Spike	T	Solid	SM 4500 P E	600-3591
600-1974-12	GEB0057	T	Solid	SM 4500 P E	600-3591
600-1974-13	GEB0058	T	Solid	SM 4500 P E	600-3591
600-1974-14	GEB0059	T	Solid	SM 4500 P E	600-3591
600-1974-15	GEB0060	T	Solid	SM 4500 P E	600-3591

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:600-3643					
LCS 600-3643/11	Lab Control Spike	T	Solid	351.2	
MB 600-3643/10	Method Blank	T	Solid	351.2	
600-1974-1	GEB0046	T	Solid	351.2	
600-1974-1DU	Duplicate	T	Solid	351.2	
600-1974-1MS	Matrix Spike	T	Solid	351.2	
600-1974-2	GEB0047	T	Solid	351.2	
600-1974-3	GEB0048	T	Solid	351.2	
600-1974-4	GEB0049	T	Solid	351.2	
600-1974-5	GEB0050	T	Solid	351.2	
600-1974-6	GEB0051	T	Solid	351.2	
600-1974-7	GEB0052	T	Solid	351.2	
600-1974-8	GEB0053	T	Solid	351.2	
600-1974-9	GEB0054	T	Solid	351.2	
600-1974-10	GEB0055	T	Solid	351.2	
600-1974-11	GEB0056	T	Solid	351.2	
600-1974-11DU	Duplicate	T	Solid	351.2	
600-1974-11MS	Matrix Spike	T	Solid	351.2	
600-1974-12	GEB0057	T	Solid	351.2	
600-1974-13	GEB0058	T	Solid	351.2	
600-1974-14	GEB0059	T	Solid	351.2	
600-1974-15	GEB0060	T	Solid	351.2	
Prep Batch: 600-3780					
600-1974-1	GEB0046	S	Solid	DI Leach	
600-1974-1DU	Duplicate	S	Solid	DI Leach	
600-1974-1MS	Matrix Spike	S	Solid	DI Leach	
600-1974-2	GEB0047	S	Solid	DI Leach	
600-1974-3	GEB0048	S	Solid	DI Leach	
600-1974-4	GEB0049	S	Solid	DI Leach	
600-1974-5	GEB0050	S	Solid	DI Leach	
600-1974-6	GEB0051	S	Solid	DI Leach	
600-1974-7	GEB0052	S	Solid	DI Leach	
600-1974-8	GEB0053	S	Solid	DI Leach	
600-1974-9	GEB0054	S	Solid	DI Leach	
600-1974-9DU	Duplicate	S	Solid	DI Leach	
600-1974-9MS	Matrix Spike	S	Solid	DI Leach	
600-1974-10	GEB0055	S	Solid	DI Leach	
600-1974-11	GEB0056	S	Solid	DI Leach	
600-1974-12	GEB0057	S	Solid	DI Leach	
600-1974-13	GEB0058	S	Solid	DI Leach	
600-1974-14	GEB0059	S	Solid	DI Leach	
600-1974-15	GEB0060	S	Solid	DI Leach	

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:600-3842					
600-1974-1 GEB0046 S Solid 353.2					
600-1974-1DU Duplicate S Solid 353.2					
600-1974-1MS Matrix Spike S Solid 353.2					
600-1974-2 GEB0047 S Solid 353.2					
600-1974-3 GEB0048 S Solid 353.2					
600-1974-4 GEB0049 S Solid 353.2					
600-1974-5 GEB0050 S Solid 353.2					
600-1974-6 GEB0051 S Solid 353.2					
600-1974-7 GEB0052 S Solid 353.2					
600-1974-8 GEB0053 S Solid 353.2					
600-1974-9 GEB0054 S Solid 353.2					
600-1974-9DU Duplicate S Solid 353.2					
600-1974-9MS Matrix Spike S Solid 353.2					
600-1974-10 GEB0055 S Solid 353.2					
600-1974-11 GEB0056 S Solid 353.2					
600-1974-12 GEB0057 S Solid 353.2					
600-1974-13 GEB0058 S Solid 353.2					
600-1974-14 GEB0059 S Solid 353.2					
600-1974-15 GEB0060 S Solid 353.2					
Analysis Batch:600-4409					
600-1974-1 GEB0046 T Solid Total Nitrogen					
600-1974-2 GEB0047 T Solid Total Nitrogen					
600-1974-3 GEB0048 T Solid Total Nitrogen					
600-1974-4 GEB0049 T Solid Total Nitrogen					
600-1974-5 GEB0050 T Solid Total Nitrogen					
600-1974-6 GEB0051 T Solid Total Nitrogen					
600-1974-7 GEB0052 T Solid Total Nitrogen					
600-1974-8 GEB0053 T Solid Total Nitrogen					
600-1974-9 GEB0054 T Solid Total Nitrogen					
600-1974-10 GEB0055 T Solid Total Nitrogen					
600-1974-11 GEB0056 T Solid Total Nitrogen					
600-1974-12 GEB0057 T Solid Total Nitrogen					
600-1974-13 GEB0058 T Solid Total Nitrogen					
600-1974-14 GEB0059 T Solid Total Nitrogen					
600-1974-15 GEB0060 T Solid Total Nitrogen					

Report Basis

S = Soluble

T = Total

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Method Blank - Batch: 600-3643**Method: 351.2****Preparation: N/A**

Lab Sample ID: MB 600-3643/10
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/08/2008 1053
Date Prepared: N/A

Analysis Batch: 600-3643
Prep Batch: N/A
Units: mg/Kg

Instrument ID: WC07 Lachat-2
Lab File ID: N/A
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Result	Qual	RL
Nitrogen, Kjeldahl	ND		1.0

Lab Control Spike - Batch: 600-3643**Method: 351.2****Preparation: N/A**

Lab Sample ID: LCS 600-3643/11
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/08/2008 1054
Date Prepared: N/A

Analysis Batch: 600-3643
Prep Batch: N/A
Units: mg/Kg

Instrument ID: WC07 Lachat-2
Lab File ID: N/A
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrogen, Kjeldahl	10.0	9.96	100	90 - 110	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Matrix Spike - Batch: 600-3643

Method: 351.2

Preparation: N/A

Lab Sample ID: 600-1974-1
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 10/08/2008 1113
Date Prepared: N/A

Analysis Batch: 600-3643
Prep Batch: N/A
Units: mg/Kg

Instrument ID: WC07 Lachat-2
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 20 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrogen, Kjeldahl	630	400	1050	104	90 - 110	

Matrix Spike - Batch: 600-3643

Method: 351.2

Preparation: N/A

Lab Sample ID: 600-1974-11
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/08/2008 1123
Date Prepared: N/A

Analysis Batch: 600-3643
Prep Batch: N/A
Units: mg/Kg

Instrument ID: WC07 Lachat-2
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 20 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrogen, Kjeldahl	510	400	937	106	90 - 110	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Duplicate - Batch: 600-3643

Method: 351.2

Preparation: N/A

Lab Sample ID: 600-1974-1
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 10/08/2008 1113
Date Prepared: N/A

Analysis Batch: 600-3643
Prep Batch: N/A
Units: mg/Kg

Instrument ID: WC07 Lachat-2
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 20 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrogen, Kjeldahl	630	617	2	20	

Duplicate - Batch: 600-3643

Method: 351.2

Preparation: N/A

Lab Sample ID: 600-1974-11
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/08/2008 1122
Date Prepared: N/A

Analysis Batch: 600-3643
Prep Batch: N/A
Units: mg/Kg

Instrument ID: WC07 Lachat-2
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 20 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrogen, Kjeldahl	510	607	17	20	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Matrix Spike - Batch: 600-3842

Method: 353.2

Preparation: N/A

Lab Sample ID: 600-1974-1 Analysis Batch: 600-3842
Client Matrix: Solid Prep Batch: N/A
Dilution: 1.0 Units: mg/Kg
Date Analyzed: 10/10/2008 1755
Date Prepared: N/A
Date Leached: 10/10/2008 0934 Leachate Batch: 600-3780

Instrument ID: WC05 Lachat-1
Lab File ID: N/A
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-S	ND	10.0	10.4	101	80 - 120	

Matrix Spike - Batch: 600-3842

Method: 353.2

Preparation: N/A

Lab Sample ID: 600-1974-9 Analysis Batch: 600-3842
Client Matrix: Solid Prep Batch: N/A
Dilution: 1.0 Units: mg/Kg
Date Analyzed: 10/10/2008 1808
Date Prepared: N/A
Date Leached: 10/10/2008 0934 Leachate Batch: 600-3780

Instrument ID: WC05 Lachat-1
Lab File ID: N/A
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N-S	ND	10.0	10.5	102	80 - 120	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Duplicate - Batch: 600-3842

Method: 353.2

Preparation: N/A

Lab Sample ID: 600-1974-1 Analysis Batch: 600-3842
Client Matrix: Solid Prep Batch: N/A
Dilution: 1.0 Units: mg/Kg
Date Analyzed: 10/10/2008 1754
Date Prepared: N/A
Date Leached: 10/10/2008 0934 Leachate Batch: 600-3780

Instrument ID: WC05 Lachat-1
Lab File ID: N/A
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N-S	ND	ND	110	20	

Duplicate - Batch: 600-3842

Method: 353.2

Preparation: N/A

Lab Sample ID: 600-1974-9 Analysis Batch: 600-3842
Client Matrix: Solid Prep Batch: N/A
Dilution: 1.0 Units: mg/Kg
Date Analyzed: 10/10/2008 1807
Date Prepared: N/A
Date Leached: 10/10/2008 0934 Leachate Batch: 600-3780

Instrument ID: WC05 Lachat-1
Lab File ID: N/A
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Nitrate Nitrite as N-S	ND	ND	124	20	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Method Blank - Batch: 600-3591

Method: SM 4500 P E
Preparation: SM 4500 P B

Lab Sample ID: MB 600-3591/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/07/2008 1645
Date Prepared: 10/07/2008 1420

Analysis Batch: 600-3597
Prep Batch: 600-3591
Units: mg/Kg

Instrument ID: Spectronic 20D+
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL
Phosphorus as PO ₄	ND		0.050

Lab Control Spike - Batch: 600-3591

Method: SM 4500 P E
Preparation: SM 4500 P B

Lab Sample ID: LCS 600-3591/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/07/2008 1645
Date Prepared: 10/07/2008 1420

Analysis Batch: 600-3597
Prep Batch: 600-3591
Units: mg/Kg

Instrument ID: Spectronic 20D+
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Phosphorus as PO ₄	1.53	1.50	98	90 - 110	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Matrix Spike - Batch: 600-3591

Method: SM 4500 P E
Preparation: SM 4500 P B

Lab Sample ID: 600-1974-11
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 10/07/2008 1645
Date Prepared: 10/07/2008 1420

Analysis Batch: 600-3597
Prep Batch: 600-3591
Units: mg/Kg

Instrument ID: Spectronic 20D+
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Phosphorus as PO4	890	153	1010	79	75 - 125	4

Matrix Spike - Batch: 600-3591

Method: SM 4500 P E
Preparation: SM 4500 P B

Lab Sample ID: 600-1974-2
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 10/07/2008 1645
Date Prepared: 10/07/2008 1420

Analysis Batch: 600-3597
Prep Batch: 600-3591
Units: mg/Kg

Instrument ID: Spectronic 20D+
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Phosphorus as PO4	570	153	704	89	75 - 125	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1974-1

Duplicate - Batch: 600-3591

Method: SM 4500 P E
Preparation: SM 4500 P B

Lab Sample ID: 600-1974-11
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 10/07/2008 1645
Date Prepared: 10/07/2008 1420

Analysis Batch: 600-3597
Prep Batch: 600-3591
Units: mg/Kg

Instrument ID: Spectronic 20D+
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Phosphorus as PO4	890	932	4	20	

Duplicate - Batch: 600-3591

Method: SM 4500 P E
Preparation: SM 4500 P B

Lab Sample ID: 600-1974-2
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 10/07/2008 1645
Date Prepared: 10/07/2008 1420

Analysis Batch: 600-3597
Prep Batch: 600-3591
Units: mg/Kg

Instrument ID: Spectronic 20D+
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Phosphorus as PO4	570	520	9	20	

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

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**B&B Laboratories
Chain of Custody
Project J08704 SDG - 08091802
to Test America for TN/TP Analysis**



#	Client Name	B&B Sample ID	Client ID	Collection Date	Receive Date	Analysis	Matrix
1	2008 Jubilee Development Group - Ghana EBS	GEB0046	JUB-EBS-001	09/10/08	09/18/08	TN/TP	SED
2	2008 Jubilee Development Group - Ghana EBS	GEB0047	JUB-EBS-002	09/10/08	09/18/08	TN/TP	SED
3	2008 Jubilee Development Group - Ghana EBS	GEB0048	JUB-EBS-003R	09/10/08	09/18/08	TN/TP	SED
4	2008 Jubilee Development Group - Ghana EBS	GEB0049	JUB-EBS-004	09/10/08	09/18/08	TN/TP	SED
5	2008 Jubilee Development Group - Ghana EBS	GEB0050	JUB-EBS-005R	09/10/08	09/18/08	TN/TP	SED
6	2008 Jubilee Development Group - Ghana EBS	GEB0051	JUB-EBS-006	09/10/08	09/18/08	TN/TP	SED
7	2008 Jubilee Development Group - Ghana EBS	GEB0052	JUB-EBS-007R	09/10/08	09/18/08	TN/TP	SED
8	2008 Jubilee Development Group - Ghana EBS	GEB0053	JUB-EBS-008	09/10/08	09/18/08	TN/TP	SED
9	2008 Jubilee Development Group - Ghana EBS	GEB0054	JUB-EBS-009R	09/10/08	09/18/08	TN/TP	SED
10	2008 Jubilee Development Group - Ghana EBS	GEB0055	EBS-E1	09/11/08	09/18/08	TN/TP	SED
11	2008 Jubilee Development Group - Ghana EBS	GEB0056	EBS-E2	09/11/08	09/18/08	TN/TP	SED
12	2008 Jubilee Development Group - Ghana EBS	GEB0057	EBS-E3R	09/12/08	09/18/08	TN/TP	SED
13	2008 Jubilee Development Group - Ghana EBS	GEB0058	EBS-T4	09/13/08	09/18/08	TN/TP	SED
14	2008 Jubilee Development Group - Ghana EBS	GEB0059	EBS-T5	09/13/08	09/18/08	TN/TP	SED
15	2008 Jubilee Development Group - Ghana EBS	GEB0060	EBS-T6	09/13/08	09/18/08	TN/TP	SED

B&B Signature *Mauranda Yugu* **Test America Signature** *[Signature]*

Date	10-1-08
Time	1:14 PM

TDI Signature *[Signature]* **Test America Signature** *[Signature]*

Date	10-2-08
Time	9:38 AM

Login Sample Receipt Check List

Client: B&B Laboratories

Job Number: 600-1974-1

Login Number: 1974
Creator: Trenery, Michael J
List Number: 1

List Source: TestAmerica Houston

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	14.4 9.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Total Dissolved Solid Data

ANALYTICAL REPORT

Job Number: 600-1975-1

Job Description: B&B Laboratories Inc.

For:
B&B Laboratories
1902 Pinon Street
College Station, TX 77845
Attention: Sue McDonald

C. Lance Tippett

Designee for
Dean A Joiner
Project Manager I
dean.joiner@testamericainc.com
10/10/2008

The test results in this report meet all NELAP requirements unless specified within the case narrative. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Project Manager.

TestAmerica Houston Certifications and Approvals: TX NELAP T104704223-06-TX, ARDEQ 88-0759, LADEQ 01967, OKDEQ 9503, UT DOH GULF

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**Job Narrative
600-J1975-1**

Comments

No additional comments.

Receipt

Samples were received out of temperature and hold time for the parameter of Total Dissolved Solids(TDS). At the clients request via e-mail on October 2, 2008, the laboratory continued with the analysis.

General Chemistry

No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: B&B Laboratories

Job Number: 600-1975-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
600-1975-1	GEB0162					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-2	GEB0163					
Total Dissolved Solids		37000	H	200	mg/L	SM 2540C
600-1975-3	GEB0164					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-4	GEB0165					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-5	GEB0166					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-6	GEB0167					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-7	GEB0168					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-8	GEB0169					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-9	GEB0170					
Total Dissolved Solids		37000	H	200	mg/L	SM 2540C
600-1975-10	GEB0171					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-11	GEB0172					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C

EXECUTIVE SUMMARY - Detections

Client: B&B Laboratories

Job Number: 600-1975-1

Lab Sample ID	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
Analyte						
600-1975-12	GEB0173					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-13	GEB0174					
Total Dissolved Solids		37000	H	100	mg/L	SM 2540C
600-1975-14	GEB0175					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-15	GEB0176					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-16	GEB0177					
Total Dissolved Solids		35000	H	200	mg/L	SM 2540C
600-1975-17	GEB0178					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-18	GEB0179					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-19	GEB0180					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-20	GEB0181					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-21	GEB0182					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-22	GEB0183					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C

EXECUTIVE SUMMARY - Detections

Client: B&B Laboratories

Job Number: 600-1975-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
600-1975-23	GEB0186					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-24	GEB0187					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-25	GEB0190					
Total Dissolved Solids		38000	H	200	mg/L	SM 2540C
600-1975-26	GEB0191					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-27	GEB0192					
Total Dissolved Solids		37000	H	200	mg/L	SM 2540C
600-1975-28	GEB0193					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-29	GEB0194					
Total Dissolved Solids		39000	H	200	mg/L	SM 2540C
600-1975-30	GEB0195					
Total Dissolved Solids		37000	H	200	mg/L	SM 2540C

METHOD SUMMARY

Client: B&B Laboratories

Job Number: 600-1975-1

Description	Lab Location	Method	Preparation Method
Matrix Water			
Solids, Total Dissolved (TDS)	TAL HOU	SM SM 2540C	

Lab References:

TAL HOU = TestAmerica Houston

Method References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

METHOD / ANALYST SUMMARY

Client: B&B Laboratories

Job Number: 600-1975-1

Method	Analyst	Analyst ID
SM SM 2540C	Watson, Don A	DAW

SAMPLE SUMMARY

Client: B&B Laboratories

Job Number: 600-1975-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
600-1975-1	GEB0162	Water	09/11/2008 0000	10/02/2008 0938
600-1975-2	GEB0163	Water	09/11/2008 0000	10/02/2008 0938
600-1975-3	GEB0164	Water	09/12/2008 0000	10/02/2008 0938
600-1975-4	GEB0165	Water	09/12/2008 0000	10/02/2008 0938
600-1975-5	GEB0166	Water	09/12/2008 0000	10/02/2008 0938
600-1975-6	GEB0167	Water	09/12/2008 0000	10/02/2008 0938
600-1975-7	GEB0168	Water	09/12/2008 0000	10/02/2008 0938
600-1975-8	GEB0169	Water	09/12/2008 0000	10/02/2008 0938
600-1975-9	GEB0170	Water	09/12/2008 0000	10/02/2008 0938
600-1975-10	GEB0171	Water	09/12/2008 0000	10/02/2008 0938
600-1975-11	GEB0172	Water	09/12/2008 0000	10/02/2008 0938
600-1975-12	GEB0173	Water	09/12/2008 0000	10/02/2008 0938
600-1975-13	GEB0174	Water	09/12/2008 0000	10/02/2008 0938
600-1975-14	GEB0175	Water	09/12/2008 0000	10/02/2008 0938
600-1975-15	GEB0176	Water	09/12/2008 0000	10/02/2008 0938
600-1975-16	GEB0177	Water	09/12/2008 0000	10/02/2008 0938
600-1975-17	GEB0178	Water	09/12/2008 0000	10/02/2008 0938
600-1975-18	GEB0179	Water	09/12/2008 0000	10/02/2008 0938
600-1975-19	GEB0180	Water	09/11/2008 0000	10/02/2008 0938
600-1975-20	GEB0181	Water	09/01/2008 0000	10/02/2008 0938
600-1975-21	GEB0182	Water	09/11/2008 0000	10/02/2008 0938
600-1975-22	GEB0183	Water	09/11/2008 0000	10/02/2008 0938
600-1975-23	GEB0186	Water	09/12/2008 0000	10/02/2008 0938
600-1975-24	GEB0187	Water	09/12/2008 0000	10/02/2008 0938
600-1975-25	GEB0190	Water	09/13/2008 0000	10/02/2008 0938
600-1975-26	GEB0191	Water	09/13/2008 0000	10/02/2008 0938
600-1975-27	GEB0192	Water	09/13/2008 0000	10/02/2008 0938
600-1975-28	GEB0193	Water	09/13/2008 0000	10/02/2008 0938
600-1975-29	GEB0194	Water	09/13/2008 0000	10/02/2008 0938
600-1975-30	GEB0195	Water	09/13/2008 0000	10/02/2008 0938

SAMPLE RESULTS

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0162
Lab Sample ID: 600-1975-1

Date Sampled: 09/11/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1745 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0163
Lab Sample ID: 600-1975-2

Date Sampled: 09/11/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	37000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0164
Lab Sample ID: 600-1975-3

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1745 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0165
Lab Sample ID: 600-1975-4

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0166
Lab Sample ID: 600-1975-5

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0167
Lab Sample ID: 600-1975-6

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0168
Lab Sample ID: 600-1975-7

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000	H mg/L	Date Analyzed: 10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0169
Lab Sample ID: 600-1975-8

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	39000 H	Date Analyzed: mg/L	10/08/2008 1745 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0170
Lab Sample ID: 600-1975-9

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	37000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0171
Lab Sample ID: 600-1975-10

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	39000 H	Date Analyzed: mg/L	10/08/2008 1745 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0172 **Date Sampled:** 09/12/2008 0000
Lab Sample ID: 600-1975-11 **Date Received:** 10/02/2008 0938
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	38000	H	mg/L	10/08/2008 1745
			200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0173 **Date Sampled:** 09/12/2008 0000
Lab Sample ID: 600-1975-12 **Date Received:** 10/02/2008 0938
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	39000	H	mg/L	10/08/2008 1745
			200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0174
Lab Sample ID: 600-1975-13

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	37000 H	Date Analyzed: mg/L	10/08/2008 1500 100	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0175
Lab Sample ID: 600-1975-14

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0176
Lab Sample ID: 600-1975-15

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0177
Lab Sample ID: 600-1975-16

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	35000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0178
Lab Sample ID: 600-1975-17

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0179 **Date Sampled:** 09/12/2008 0000
Lab Sample ID: 600-1975-18 **Date Received:** 10/02/2008 0938
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	38000	H	mg/L	10/08/2008 1500
				200
				1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0180
Lab Sample ID: 600-1975-19

Date Sampled: 09/11/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0181 **Date Sampled:** 09/01/2008 0000
Lab Sample ID: 600-1975-20 **Date Received:** 10/02/2008 0938
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	39000	H	Date Analyzed: 10/08/2008 1745 mg/L	200 1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0182
Lab Sample ID: 600-1975-21

Date Sampled: 09/11/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0183
Lab Sample ID: 600-1975-22

Date Sampled: 09/11/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	38000	H	mg/L	10/08/2008 1500 200 1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0186
Lab Sample ID: 600-1975-23

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0187
Lab Sample ID: 600-1975-24

Date Sampled: 09/12/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	39000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0190
Lab Sample ID: 600-1975-25

Date Sampled: 09/13/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C Total Dissolved Solids	38000 H	Date Analyzed: mg/L	10/08/2008 1500 200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0191
Lab Sample ID: 600-1975-26

Date Sampled: 09/13/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C		Date Analyzed:	10/08/2008 1745	
Total Dissolved Solids	39000 H	mg/L	200	1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0192 **Date Sampled:** 09/13/2008 0000
Lab Sample ID: 600-1975-27 **Date Received:** 10/02/2008 0938
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	37000	H	mg/L	10/08/2008 1500 200 1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0193 **Date Sampled:** 09/13/2008 0000
Lab Sample ID: 600-1975-28 **Date Received:** 10/02/2008 0938
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	39000	H	mg/L	10/08/2008 1745 200 1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0194
Lab Sample ID: 600-1975-29

Date Sampled: 09/13/2008 0000
Date Received: 10/02/2008 0938
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	39000	H	Date Analyzed: 10/08/2008 1745 mg/L	200 1.0

Sue McDonald
B&B Laboratories
1902 Pinon Street
College Station, TX 77845

Job Number: 600-1975-1

Client Sample ID: GEB0195 **Date Sampled:** 09/13/2008 0000
Lab Sample ID: 600-1975-30 **Date Received:** 10/02/2008 0938
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: SM 2540C				
Total Dissolved Solids	37000	H	mg/L	10/08/2008 1500
			200	1.0

DATA REPORTING QUALIFIERS

Client: B&B Laboratories

Job Number: 600-1975-1

Lab Section	Qualifier	Description
General Chemistry	H	Sample was prepped or analyzed beyond the specified holding time

QUALITY CONTROL RESULTS

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1975-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:600-3717					
LCS 600-3717/2	Lab Control Spike	T	Water	SM 2540C	
MB 600-3717/1	Method Blank	T	Water	SM 2540C	
600-1975-2	GEB0163	T	Water	SM 2540C	
600-1975-2DU	Duplicate	T	Water	SM 2540C	
600-1975-4	GEB0165	T	Water	SM 2540C	
600-1975-4DU	Duplicate	T	Water	SM 2540C	
600-1975-5	GEB0166	T	Water	SM 2540C	
600-1975-6	GEB0167	T	Water	SM 2540C	
600-1975-7	GEB0168	T	Water	SM 2540C	
600-1975-9	GEB0170	T	Water	SM 2540C	
600-1975-13	GEB0174	T	Water	SM 2540C	
600-1975-14	GEB0175	T	Water	SM 2540C	
600-1975-15	GEB0176	T	Water	SM 2540C	
600-1975-16	GEB0177	T	Water	SM 2540C	
600-1975-17	GEB0178	T	Water	SM 2540C	
600-1975-18	GEB0179	T	Water	SM 2540C	
600-1975-19	GEB0180	T	Water	SM 2540C	
600-1975-21	GEB0182	T	Water	SM 2540C	
600-1975-22	GEB0183	T	Water	SM 2540C	
600-1975-23	GEB0186	T	Water	SM 2540C	
600-1975-24	GEB0187	T	Water	SM 2540C	
600-1975-25	GEB0190	T	Water	SM 2540C	
600-1975-27	GEB0192	T	Water	SM 2540C	
600-1975-30	GEB0195	T	Water	SM 2540C	
Analysis Batch:600-3721					
LCS 600-3721/2	Lab Control Spike	T	Water	SM 2540C	
MB 600-3721/1	Method Blank	T	Water	SM 2540C	
600-1975-1	GEB0162	T	Water	SM 2540C	
600-1975-1DU	Duplicate	T	Water	SM 2540C	
600-1975-3	GEB0164	T	Water	SM 2540C	
600-1975-8	GEB0169	T	Water	SM 2540C	
600-1975-10	GEB0171	T	Water	SM 2540C	
600-1975-11	GEB0172	T	Water	SM 2540C	
600-1975-12	GEB0173	T	Water	SM 2540C	
600-1975-20	GEB0181	T	Water	SM 2540C	
600-1975-26	GEB0191	T	Water	SM 2540C	
600-1975-28	GEB0193	T	Water	SM 2540C	
600-1975-29	GEB0194	T	Water	SM 2540C	

Report Basis

T = Total

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1975-1

Method Blank - Batch: 600-3717

Method: SM 2540C

Preparation: N/A

Lab Sample ID: MB 600-3717/1

Analysis Batch: 600-3717

Instrument ID: No Equipment Assigned

Client Matrix: Water

Prep Batch: N/A

Lab File ID: N/A

Dilution: 1.0

Units: mg/L

Initial Weight/Volume: 100 mL

Date Analyzed: 10/08/2008 1500

Final Weight/Volume: 100 mL

Date Prepared: N/A

Analyte

Result

Qual

RL

Total Dissolved Solids

ND

10

Lab Control Spike - Batch: 600-3717

Method: SM 2540C

Preparation: N/A

Lab Sample ID: LCS 600-3717/2

Analysis Batch: 600-3717

Instrument ID: No Equipment Assigned

Client Matrix: Water

Prep Batch: N/A

Lab File ID: N/A

Dilution: 1.0

Units: mg/L

Initial Weight/Volume: 100 mL

Date Analyzed: 10/08/2008 1500

Final Weight/Volume: 100 mL

Date Prepared: N/A

Analyte

Spike Amount

Result

% Rec.

Limit

Qual

Total Dissolved Solids

1800

1750

97

90 - 110

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1975-1

Duplicate - Batch: 600-3717

Method: SM 2540C

Preparation: N/A

Lab Sample ID: 600-1975-2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2008 1500
Date Prepared: N/A

Analysis Batch: 600-3717
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 5 mL
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Dissolved Solids	37000	37100	1	10	

Duplicate - Batch: 600-3717

Method: SM 2540C

Preparation: N/A

Lab Sample ID: 600-1975-4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2008 1500
Date Prepared: N/A

Analysis Batch: 600-3717
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 5 mL
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Dissolved Solids	38000	38300	1	10	

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

Quality Control Results

Client: B&B Laboratories

Job Number: 600-1975-1

Method Blank - Batch: 600-3721**Method: SM 2540C****Preparation: N/A**

Lab Sample ID: MB 600-3721/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2008 1745
Date Prepared: N/A

Analysis Batch: 600-3721
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 100 mL
Final Weight/Volume: 100 mL

Analyte	Result	Qual	RL
Total Dissolved Solids	ND		10

Lab Control Spike - Batch: 600-3721**Method: SM 2540C****Preparation: N/A**

Lab Sample ID: LCS 600-3721/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2008 1745
Date Prepared: N/A

Analysis Batch: 600-3721
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 100 mL
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Dissolved Solids	1800	1760	98	90 - 110	

Duplicate - Batch: 600-3721**Method: SM 2540C****Preparation: N/A**

Lab Sample ID: 600-1975-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2008 1745
Date Prepared: N/A

Analysis Batch: 600-3721
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 5 mL
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Dissolved Solids	38000	38400	1	10	

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



B&B Laboratories
Chain of Custody
Project J08704 SDG - 08092303
to Test America for TDS analysis



1475

#	Client Name	B&B Sample ID	Client ID	Collection Date	Receive Date	Analysis	Matrix	Comments
1	2008 Jubilee Development Group - Ghana EBS	GEB0162	JUB-EBS-001	09/11/08	09/23/08	TDS	WATER	top - 1m
2	2008 Jubilee Development Group - Ghana EBS	GEB0163	JUB-EBS-001	09/11/08	09/23/08	TDS	WATER	bottom - 100m
3	2008 Jubilee Development Group - Ghana EBS	GEB0164	JUB-EBS-002	09/12/08	09/23/08	TDS	WATER	top - 1m
4	2008 Jubilee Development Group - Ghana EBS	GEB0165	JUB-EBS-002	09/12/08	09/23/08	TDS	WATER	bottom - 100m
5	2008 Jubilee Development Group - Ghana EBS	GEB0166	JUB-EBS-003	09/12/08	09/23/08	TDS	WATER	top - 1m
6	2008 Jubilee Development Group - Ghana EBS	GEB0167	JUB-EBS-003	09/12/08	09/23/08	TDS	WATER	bottom - 100m
7	2008 Jubilee Development Group - Ghana EBS	GEB0168	JUB-EBS-004	09/12/08	09/23/08	TDS	WATER	top - 1m
8	2008 Jubilee Development Group - Ghana EBS	GEB0169	JUB-EBS-004	09/12/08	09/23/08	TDS	WATER	bottom - 100m
9	2008 Jubilee Development Group - Ghana EBS	GEB0170	JUB-EBS-005	09/12/08	09/23/08	TDS	WATER	top - 1m
10	2008 Jubilee Development Group - Ghana EBS	GEB0171	JUB-EBS-005	09/12/08	09/23/08	TDS	WATER	bottom - 100m
11	2008 Jubilee Development Group - Ghana EBS	GEB0172	JUB-EBS-006	09/12/08	09/23/08	TDS	WATER	top - 1m
12	2008 Jubilee Development Group - Ghana EBS	GEB0173	JUB-EBS-006	09/12/08	09/23/08	TDS	WATER	bottom - 100m
13	2008 Jubilee Development Group - Ghana EBS	GEB0174	JUB-EBS-007	09/12/08	09/23/08	TDS	WATER	top - 1m
14	2008 Jubilee Development Group - Ghana EBS	GEB0175	JUB-EBS-007	09/12/08	09/23/08	TDS	WATER	bottom - 100m
15	2008 Jubilee Development Group - Ghana EBS	GEB0176	JUB-EBS-008	09/12/08	09/23/08	TDS	WATER	top - 1m
16	2008 Jubilee Development Group - Ghana EBS	GEB0177	JUB-EBS-008	09/12/08	09/23/08	TDS	WATER	bottom - 100m
17	2008 Jubilee Development Group - Ghana EBS	GEB0178	JUB-EBS-009	09/12/08	09/23/08	TDS	WATER	top - 1m
18	2008 Jubilee Development Group - Ghana EBS	GEB0179	JUB-EBS-009	09/12/08	09/23/08	TDS	WATER	bottom - 100m
19	2008 Jubilee Development Group - Ghana EBS	GEB0180	EBS-E1	09/11/08	09/23/08	TDS	WATER	top - 1m
20	2008 Jubilee Development Group - Ghana EBS	GEB0181	EBS-E1	09/01/08	09/23/08	TDS	WATER	bottom - 75m
21	2008 Jubilee Development Group - Ghana EBS	GEB0182	EBS-E2	09/11/08	09/23/08	TDS	WATER	top - 1m
22	2008 Jubilee Development Group - Ghana EBS	GEB0183	EBS-E2	09/11/08	09/23/08	TDS	WATER	bottom - 67m
23	2008 Jubilee Development Group - Ghana EBS	GEB0186	EBS-E3R	09/12/08	09/23/08	TDS	WATER	top - 1m
24	2008 Jubilee Development Group - Ghana EBS	GEB0187	EBS-E3R	09/12/08	09/23/08	TDS	WATER	bottom - 50m
25	2008 Jubilee Development Group - Ghana EBS	GEB0190	EBS-T4	09/13/08	09/23/08	TDS	WATER	top - 1m
26	2008 Jubilee Development Group - Ghana EBS	GEB0191	EBS-T4	09/13/08	09/23/08	TDS	WATER	bottom - 39m
27	2008 Jubilee Development Group - Ghana EBS	GEB0192	EBS-T5	09/13/08	09/23/08	TDS	WATER	top - 1m
28	2008 Jubilee Development Group - Ghana EBS	GEB0193	EBS-T5	09/13/08	09/23/08	TDS	WATER	bottom - 44m
29	2008 Jubilee Development Group - Ghana EBS	GEB0194	EBS-T6	09/13/08	09/23/08	TDS	WATER	top - 1m
30	2008 Jubilee Development Group - Ghana EBS	GEB0195	EBS-T6	09/13/08	09/23/08	TDS	WATER	bottom - 49m

B&B Signature

Anuanda Ayu

10-1-08 1:14 pm

Test America Signature

10-2-5

Date

936

Time

Home Office
1902 Pinon
College Station, TX 77845

(979) 693-3446 (O)
(979) 693-6389 (F)
WWW.TDI-BI.COM

Login Sample Receipt Check List

Client: B&B Laboratories

Job Number: 600-1975-1

Login Number: 1975

List Source: TestAmerica Houston

Creator: Trenery, Michael J

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	14.1 9.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	