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-- Via E-Mail alembo@moncon.com --

Mr. Alphonse Lembo
155 3rd Street, LLC
155 3rd Street
Brooklyn, New York

RE: 155 3rd Street
DRAFT Site Characterization Letter Report

Dear Mr. Lembo:

At the request of 155 3rd Street LLC (155 3rd), The ELM Group (ELM) completed a DRAFT sub-surface environmental investigation to characterize soil and groundwater conditions at 155 3rd Street, Brooklyn, New York (Site). The Site characterization activities were performed in June 2011. The Site characterization scope was developed based on the findings from a Phase I Environmental Site Assessment (ESA) for this Site performed by ELM in April 2011. In addition, the characterization was performed to support potential discussions with the United States Environmental Protection Agency (EPA) regarding the adjacent Gowanus Canal, which was placed on the National Priorities List (NPL aka Superfund) in early 2010.

The legal definition of the Site is Tax Block 462, Lot 14, Brooklyn, New York. The Site is approximately 1.06 acres (46,000 square feet [sf]) and is developed with a paved parking lot (approximately 20,000 sf), a one story office building (approximately 15,500 sf), and a partially paved storage area (approximately 10,000 sf) for construction materials.

The Site is bound to the north by 2nd Street and a truck/trailer parking facility fronting 2nd Street; to the east by the Gowanus Canal; to the south by 3rd Street and a materials processing facility identified as the "Foro Marble Company Inc."; and to the west by a two story commercial space identified as "Statewide Fireproof Door" and a parking facility (fronting Second Street) for oil transportation trucks identified as "Enterprise Transportation."

Background

ELM completed a Phase I ESA for the Site in April 2011. The ESA identified Recognized Environmental Conditions (RECs) in accordance with American Society for Testing and Materials (ASTM) Standard 1527-05 at the Site. These RECs are as follows:

- **On-Site Historic-REC (HREC) #1 – Auto Junk usage from 1977-1986**

  The Sanborn Maps identified an auto junk usage at the Site from 1977-1986. The auto junk usage was located on the northern portion of the Site, in the current location of the office building. No additional records were available to ELM indicating general housekeeping procedures, total amount of auto storage, or other indicators of operations. Based on the potential for adverse environmental conditions to have existed as a result of such operations (fuel leakage, motor oil leakage, etc) and lack of environmental regulation during this time period of operation, the auto junk usage may have potentially impacted the Site. ELM considers this Site usage during this time period to be an on-Site HREC.

- **Off-Site REC #1 - Gowanus Canal, NPL Site (No. NYN000206222)**

  This NPL adjoins the Site to the east and is comprised of the entire 1.8-mile long, man-made Gowanus canal. According to the Remedial Investigation (RI) prepared for the United States Environmental Protection Agency (EPA) in 2011, the canal was built in the 1860s by bulk heading and dredging a tidal creek and surrounding lowland marshes. Following construction, the canal quickly became one of the nation's busiest industrial waterways, servicing heavy industries that included manufactured-gas plants (MGPs), coal yards, cement manufacturers, tanneries, paint and ink factories, machine shops, chemical plants, and oil refineries. It was also the repository of untreated industrial wastes, raw sewage, and surface water runoff for decades, causing it to become a polluted waterway. Although the level of industrial activity along the canal had declined over the years, contamination remained in the sediments.

  On March 2, 2010, USEPA placed the Gowanus Canal on its NPL of hazardous waste Sites requiring further evaluation. Accordingly, EPA is performing a remedial investigation and feasibility study (RI/FS) of the canal according to the requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA, or "Superfund"), as amended.

The EPA RI identified primarily polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and inorganics in surface sediments of the Canal. The USEPA identified non-aqueous phase liquid (NAPL) (a possible coal tar waste), volatile organic compounds (VOCs), particularly benzene, toluene, ethylbenzene, and xylenes (BTEX) and total PAHs in connection with former manufactured gas plant operations.

ELM's Conceptual Site Model (CSM) for this Site included evaluation of potential impacts from the historic contamination present in the Gowanus Canal, and the previously identified on-Site historic auto junk usage. ELM's CSM and investigation was targeted toward understanding potential impacts from historic Site usage associated with the REC's identified in the ESA. Although not specifically identified as RECs in the Phase I ESA, the location of soil borings SB3/monitoring well MW3 and SB4/monitoring well MW4 were selected in the area of the auto junk storage identified on the 1977-1986 Sanborn Fire

Insurance maps. Soil boring SB5/monitoring well MW5 was located in the area of coal storage identified on the 1886 Sanborn map. Soil boring SB6/monitoring well MW6 was located in the area of the kindling factory horizontal boiler also depicted on historic Sanborn maps.

Soil boring SB6/monitoring well MW6, soil boring SB7/monitoring well MW7, and soil boring SB8/monitoring well MW8 were located as close to the Canal as practicably possible (each approximately 20 feet off the bulkhead wall).

To provide adequate coverage of Site conditions and assess off-Site impacts to the Site, soil borings SB2/monitoring well MW2 and SB1/monitoring well MW1 were also advanced in the western parking lot area.

The investigation characterized on-Site conditions at the boundary of the Gowanus Canal to evaluate Site contributions to conditions in the Gowanus Canal, if any, or, contributions from the Gowanus Canal to the Site.

SITE CHARACTERIZATION

From June 2 to June 3, 2011, ELM advanced eight soil borings and installed eight monitoring wells at the Site to investigate subsurface and groundwater conditions.

Soil boring and monitoring well locations are shown on Figure X.

Methodologies

ELM collected, handled samples, and disposed of waste materials consistent with all applicable local, State, and Federal regulations. Additional details concerning Site characterization field sampling and data collection methodologies are provided below.

1.1. Geophysical Survey

On June 1, 2011, NOVA Geophysical Services (NOVA) of Forest Hills, NY conducted a geophysical survey of the Site under ELM's supervision. The objectives of the survey were to identify the presence of subsurface obstructions and/or utilities at the Site to clear each of the eight proposed boring locations. NOVA surveyed the construction storage area, the parking area, and an area inside the on-Site garage using ground-penetrating radar (GPR), electromagnetics (EM), and comprehensive subsurface utility location (CSUL).

1.2. Soil Borings and Soil Sampling

Soil boring activities began on June 2, 2011 and were competed on June 3, 2011. A total of eight soil borings (SB1 through SB8) were advanced at the Site. Soil boring locations are depicted on Figure X.

AARCO Environmental Services Corp. (AARCO) advanced soil borings at the Site under ELM supervision. Before initiating subsurface sampling activities, AARCO removed any surface pavement (asphalt) or concrete using a jack hammer and placed the material in drums. Once the surface material was removed, AARCO hand-augered through the first 2 to 3 feet of subsurface to avoid any possible unknown utilities.

ELM oversaw the collection of soil samples from eight soil boring locations advanced by AARCO. AARCO used a track-mounted GeoProbe drill rig to advance the eight borings via direct push to a depth sufficient for the ELM field engineer to verify the presence of the silt/clay layer. ELM directed AARCO to terminate the eight borings in the silt/clay layer. Details on the silt/clay layer are presented in Section 4.2.1.1.

Soil samples were collected continuously at five foot intervals to the depth of the silt/clay layer, which was observed at depths ranging from 6 to 15 feet bgs. The direct push method produced a five-foot long sample core in a two-inch diameter polyvinyl chloride (PVC) MacroCore sleeve. ELM screened the soil samples for organic vapors using a MiniRAE 2000 photoionization detector (PID). According to the manufacturer, RAE Systems, Inc., the resolution of the PID is 0.1 part per million (ppm) in the 0 to 99.9 ppm range and 1 ppm in the 100 to 10,000 ppm range. The maximum reading that can be obtained by this instrument is 9,999 ppm.

ELM visually inspected the soils for variations with respect to soil type, grain size, stratigraphy, and other features that may limit or enhance the ability of potential contamination to migrate. ELM classified and logged the samples consistent with the Burmeister Soil Classification Naming System noting observations concerning lithology, odor, color, and the presence of separate-phase product. A discussion of the soil observations are presented in Section 4.2. Finally, ELM prepared boring logs which are included in Appendix X.

1.2.1. Soil Sample Collection

ELM collected samples for laboratory analysis from intervals which exhibited 1) the highest PID reading and/or 2) the interval immediately above the soil-water interface. In the event that highest PID reading was measured at the interval of the soil-water interface, ELM selected one sample to be analyzed. ELM labeled the sample containers, placed them in ice in a laboratory-supplied cooler along with completed chain of custody forms, and delivered to Alpha Analytical (Alpha) of Westborough, MA, via their courier.

Alpha Analytical Inc., a New York State ELAP-certified laboratory, analyzed the soil samples for volatile organic compounds (VOCs) by USEPA 8270 method, semi-VOCs (SVOCs) by method USEPA 8260, TAL metals, PCBs, (USEPA Method 8081), and pesticides (USEPA Method 8082). One soil sample was analyzed for quality assurance/quality control (QA/QC).

Section 4 presents the results of the soil sampling.

1.3. Groundwater Monitoring Well Installation

In June 2011, a total of 8 permanent shallow aquifer groundwater monitoring wells were installed by AARCO in each of the eight soil boring locations. Monitoring wells MW1 through MW8 were completed and sampled to characterize groundwater across the Site, and to determine the groundwater flow direction.

Monitoring wells were constructed of 2-inch-diameter flush jointed schedule 40 polyvinyl chloride (PVC) piping, screened with 0.020-slotted pipe from an interval above the water table (approximately 3 to 5 feet bgs, MW-1 was not screened above the water table due to installation limitations) to the top portion of the silt and/or clay layer (approximately 10 to 15 feet bgs), with sand pack from the bottom of the boring to 2 feet above the top of the screen depth. The wells were completed with a 2 foot bentonite plug above the sand pack and then grouted to the surface, where they were finished with a manhole set in concrete.

1.4. Groundwater Monitoring Well Sampling

On June 10, 2011, one week after monitoring well installation, the eight monitoring wells were gauged, and at least three well volumes were purged from MW1 through MW7. Monitoring wells MW1 through MW7 were sampled after purging and after stabilization of water quality indicator parameters (e.g. dissolved oxygen [DO], pH, temperature, oxidation / reduction potential [ORP/Eh], specific conductance, turbidity, etc.), following USEPA's Groundwater Issue Low Flow (Minimal Drawdown) Groundwater Sampling Procedures (April 1996). Turbidity was visually observed in the groundwater samples, despite following USEPA's Low Flow Procedures. ELM was unable to purge three well volumes from monitoring well MW8 due to low well water volume. ELM returned to the Site on June 15, 2011 and purged and sampled monitoring well MW8 via bailer.

Samples collected were properly labeled, preserved, and placed in a cooler for transport via courier to Analytical Laboratories. Standard chain-of-custody procedures were followed. All groundwater samples were analyzed for VOCs (USEPA Method 8260), SVOCs (USEPA Method 8270), PCBs, (USEPA Method 8081), pesticides (USEPA Method 8082) and metals (unfiltered and laboratory filtered). QA/QC samples consisting of two trip blanks (one collected on June 10 and one collected on June 15) were included with shipments to the laboratory to evaluate cross-contamination during shipment and the trip blanks were analyzed for VOCs only. One duplicate sample was collected from monitoring well MW3.

The eight monitoring wells were surveyed by Borbas Surveying and Mapping, LLC (Borbas) of Boonton, NJ on June 28, 2011. Section 4.3 presents the results of the groundwater sampling.

2. Supporting Documents

Health and safety procedures applicable to the Site characterization are contained in the Health and Safety Plan, prepared by ELM and dated June 1, 2011. This Health and Safety Plan (HASP) assigns responsibilities, establishes personnel protection standards and mandatory safety practices and procedures, and provides for contingencies that may arise during investigation on the Site.

3. Results

3.1. Geophysical Survey

The geophysical survey did not reveal the presence of any subsurface obstructions that were not previously identified based on available information.

3.2. Soil

The physical/soil screening and chemical results of Site characterization soil sampling activities are described below.

3.2.1.1. Physical/Screening Observations

A layer of fine to coarse sands with trace silt and gravels was identified from immediately below the asphalt/concrete pavement to an approximate depth of 6 feet below grade surface (bgs) across the Site. Isolated lenses of historic fill, containing brick, wood, concrete and glass, approximately two to four feet in thickness, were identified immediately below the asphalt/concrete pavement at SB5, SB6 and SB8. A layer of silt with trace clay and sands was identified below the sands layer to an indeterminate depth across the majority of the Site, excluding the area that encompasses SB6, SB7 and SB8, which is located directly adjacent to the bulkhead on the Gowanus Canal. In this area, a layer of clay with trace silt, sands and shell fragments was identified below the sands layer to an indeterminate depth. ELM observed a petroleum odor at SB4 (approximately 4 feet bgs), SB5 (approximately 1 foot bgs) and SB6 (approximately 6 feet bgs). The petroleum odor at SB6 was likely associated with an amber liquid observed in a phase separate from water at the soil-water interface (six to 6.5 feet bgs). The amber liquid was first observed as a sheen, and when the sample was disturbed and jarred for further analysis, small pools of water formed with thin layers of separate-phase liquid at the surface. The volume of separate-phase liquid in SB6 from six to 6.5 feet bgs was deminimis. The maximum PID reading recorded during soil boring advancement was 93.6 ppm at SB6 at approximately six feet bgs.

3.2.2. Chemical Analysis

Soil analytical results are presented in Table 1. A summary of the data is presented below.

3.2.2.1. Soil Volatile Organic Compounds

A review of the analytical results for subsurface soils indicates that twenty (20) of the seventy-two (72) volatile organic compounds (VOCs) analyzed for were detected in one or more samples. The maximum concentrations of detected compounds are summarized below:

<u>Soil Boring 1 –</u>

- 1,1,1-Trichloroethane was detected at a maximum concentration of 0.0074 parts per million (ppm) at SB1 in the 5-6’ below grade surface (bgs) sample interval.
- 1,2,4,5-Tetramethylbenzene was detected at a maximum concentration (estimated) of 0.0032 ppm at SB1 in the 5-6’ bgs sample interval.

- Chloroethane was detected at a maximum concentration (estimated) of 0.003 ppm at SB1 in the 5-6' bgs sample interval.
- Cis-1,2-dichloroethene was detected at a maximum concentration of 0.0057 ppm at SB1 in the 4-5' bgs sample interval.
- Diethyl ether was detected was detected at a maximum concentration (estimated) of 0.0072 ppm at SB1 in the 5-6' bgs sample interval.
- Tetrachloroethene was detected at a maximum concentration of 0.0092 ppm at SB1 in the 5-6' bgs sample interval.
- Trichloroethene was detected at a maximum concentration of 0.037 ppm at SB1 in the 5-6' bgs sample interval.

<u>Soil Boring 2 –</u>

No detections of VOCs in this sample location.

<u>Soil Boring 3 –</u>

- 2-Butanone was detected at a maximum concentration (estimated) of 0.028 ppm in the duplicate sample collected at SB3 in the 5.5-6.5' bgs sample interval.
- Acetone was detected at a maximum concentration of 0.12 ppm in the duplicate sample collected at SB3 in the 5.5-6.5' bgs sample interval.

<u>Soil Boring 4 –</u>

- Acetone was detected at a maximum concentration at SB4 in the 3.5-4.5' bgs sample interval.

<u>Soil Boring 5 –</u>

- 1,1-Dichloroethane was detected at a maximum concentration (estimated) of 0.0018 ppm at SB5 in the 1-2' bgs sample interval.
- Cymene was detected at a maximum concentration of 0.0043 ppm at SB5 in the 1-2' bgs sample interval.
- Naphthalene was detected at a maximum concentration of 0.16 ppm at SB5 in the 1-2' bgs sample interval.
- Toluene was detected at a maximum concentration of 0.0042 ppm at SB5 in the 1-2' bgs sample interval.
- Total xylenes were detected at a maximum concentration (estimated) of 0.0018 ppm at SB5 in the 1-2' bgs sample interval.

<u>Soil Boring 6 –</u>

- 1,2,4-Trimethylbenzene was detected at a maximum concentration (estimated) of 0.01 ppm at SB6 in the 5.5-6' bgs sample interval.

- 1,4-Diethyl benzene was detected at a maximum concentration (estimated) of 0.0072 ppm at SB6 in the 5.5-6' bgs sample interval.
- Carbon disulfide was detected at a maximum concentration (estimated) of 0.0074 ppm at SB6 in the 5.5-6' bgs sample interval.
- Isopropylbenzene was detected at a maximum concentration of 0.1 ppm at SB6 in the 5.5-6' bgs sample interval.
- Sec-butylbenzene was detected at a maximum concentration of 0.084 ppm at SB6 in the 5.5-6' bgs sample interval.
- T-butylbenzene was detected at a maximum concentration (estimated) of 0.052 ppm at SB6 in the 5.5-6' bgs sample interval.

Soil Boring 7 –

No detections of VOCs in this sample location.

Soil Boring 8 –

No detections of VOCs in this sample location.

3.2.2.2. Soil Semi-Volatile Organic Compounds

A review of the analytical results for subsurface soils indicates that twenty-four (24) of sixty-nine (69) semi-volatile organic compounds (SVOCs) analyzed for were detected in one or more samples. The maximum concentrations of detected compounds are summarized below.

Soil Boring 1 –

No detections of SVOCs in this sample location.

Soil Boring 2 –

- 3-Methylphenol was detected at a maximum concentration (estimated) of 0.13 ppm at SB2 in the 7-8' bgs sample interval.

Soil Boring 3 –

No detections of SVOCs in this sample location.

Soil Boring 4 –

- Bis[2-ethylhexyl]phthalate was detected at maximum concentration of 5.7 ppm at SB4 in the 3.5-4.5' bgs sample interval.

Soil Boring 5 –

- 3-Methylnaphthalene was detected at a maximum concentration of 1.7 ppm at SB5 in the 1-2' bgs sample interval.

- Acenaphthene was detected at a maximum concentration of 2.4 ppm at SB5 in the 1-2' bgs sample interval.
- Anthracene was detected at a maximum concentration of 4.2 ppm at SB5 in the 1-2' bgs sample interval.
- Benzo[a]anthracene was detected at maximum concentration of 6.1 ppm at SB5 in the 1-2' bgs sample interval.
- Benzo[a]pyrene was detected at a maximum concentration of 5.5 ppm at SB5 in the 1-2' bgs sample interval.
- Benzo[b]fluoranthene was detected at a maximum concentration of 7.1 ppm at SB5 in the 1-2' bgs sample interval.
- Benzo[g,h,i]perylene was detected at a maximum concentration of 2.5 ppm at SB5 in the 1-2' bgs sample interval.
- Benzo[k]fluoranthene was detected at a maximum concentration of 2.3 ppm at SB5 in the 1-2' bgs sample interval.
- Butylbenzylphthalate was detected at a maximum concentration of 1.8 ppm at SB5 in the 1-2' bgs sample interval.
- Carbazole was detected at a maximum concentration of 1.4 ppm at SB5 in the 1-2' bgs sample interval.
- Chrysene was detected at a maximum concentration of 5.8 ppm at SB5 in the 1-2' bgs sample interval.
- Dibenzo[a,h]anthracene was detected at a maximum concentration of 0.81 ppm at SB5 in the 1-2' bgs sample interval.
- Dibenzofuran was detected at a maximum concentration of 1.6 ppm at SB5 in the 1-2' bgs sample interval.
- Fluoranthene was detected at a maximum concentration of 16 ppm at SB5 in the 1-2' bgs sample interval.
- Fluorene was detected at a maximum concentration of 2.5 ppm at SB5 in the 1-2' bgs sample interval.
- Indeno[1,2,3-cd]pyrene was detected at a maximum concentration of 2.4 ppm at SB5 in the 1-2' bgs sample interval.
- Naphthalene was detected at a maximum concentration of 6.6 ppm at SB5 in the 1-2' bgs sample interval.
- N-nitroso-di-n-propylamine was detected at a maximum concentration of 4 ppm at SB5 in the 1-2' bgs sample interval.

- Phenanthrene was detected at a maximum concentration of 14 ppm at SB5 in the 1-2’ bgs sample interval.
- Phenol was detected at a maximum concentration (estimated) 0.66 ppm at SB5 in the 1-2’ bgs sample interval.
- Pyrene was detected at maximum concentration of 14 ppm at SB5 in the 1-2’ bgs sample interval.

Soil Boring 6 –

No detections of SVOCs in this sample location.

Soil Boring 7 –

- Acenaphthylene was detected at a maximum concentration of 0.4 ppm at SB7 in the 5-5.5’ bgs sample interval.

Soil Boring 8 –

No detections of SVOCs in this sample location.

3.2.2.3. Soil Polychlorinated Biphenyls

A review of the analytical results for subsurface soils indicates that three (3) of the seven (7) polychlorinated biphenyl (PCB) aroclors analyzed for were detected in one or more samples. The maximum concentrations of detected compounds are summarized below.

Soil Boring 1 –

No detections of PCBs in this sample location.

Soil Boring 2 –

No detections of PCBs in this sample location.

Soil Boring 3 –

No detections of PCBs in this sample location.

Soil Boring 4 –

- Aroclor-1260 was detected at a maximum concentration of 1.2 ppm at SB4 in the 3.5-4.5’ bgs sample interval.

Soil Boring 5 –

- Aroclor-1242 was detected at a maximum concentration of 0.233 ppm at SB5 in the 1-2’ bgs sample interval.
- Aroclor-1254 was detected at a maximum concentration of 1.02 ppm at SB5 in the 1-2’ bgs sample interval.
- Total PCBs were detected at maximum concentration of 2.283 ppm at SB5 in the 1-2’ bgs sample interval.

<u>Soil Boring 6 –</u>

No detections of PCBs in this sample location.

<u>Soil Boring 7 –</u>

No detections of PCBs in this sample location.

<u>Soil Boring 8 –</u>

No detections of PCBs in this sample location.

3.2.2.4. Soil Pesticides

A review of the analytical results for subsurface soils indicates that one (1) of the twenty (20) pesticide compounds analyzed for was detected in one sample. No other detections were noted for Borings 1,2,3,4,6,7 and 8.

<u>Soil Boring 5 –</u>

P,P'-DDT was detected at maximum concentration of 0.183 ppm at SB5 in the 1-2' bgs sample interval.

3.2.2.5. Soil Metals

A review of the analytical results for subsurface soils indicates that twenty-two (22) of the twenty-three (23) metals analyzed for were detected in one or more samples. The maximum concentrations of detected compounds are summarized below.

<u>Soil Boring 1 –</u>

- Magnesium was detected at a maximum concentration of 6,800 ppm at SB1 in the 4-5' bgs sample interval.
- Vanadium was detected at a maximum concentration of 31 ppm at SB1 in the 4-5' bgs sample interval.

<u>Soil Boring 2 –</u>

- Calcium was detected at a maximum concentration of 29,000 ppm at SB2 in the 7-8'bgs sample interval.

<u>Soil Boring 3 –</u>

No detections of Metals in this sample location.

<u>Soil Boring 4 –</u>

- Aluminum was detected at a maximum concentration of 8,800 ppm at SB4 in the 3.5-4.5' bgs sample interval.
- Barium was detected at a maximum concentration of 260 ppm at SB4 in the 3.5-4.5' bgs sample interval.

- Beryllium was detected at a maximum concentration of 1.1 ppm at SB4 in the 3.5-4.5' bgs sample interval.
- Chromium was detected at a maximum concentration of 110 ppm at SB4 in the 3.5-4.5' bgs sample interval.
- Cobalt was detected at a maximum concentration of 14 ppm at SB4 in the 3.5-4.5' bgs sample interval.
- Iron was detected at a maximum concentration of 24,000 ppm at SB4 in the 3.5-4.5' bgs sample interval.
- Nickel was detected at a maximum concentration of 100 ppm at SB4 in the 3.5-4.5' bgs sample interval.
- Selenium was detected at maximum concentration (estimated) of 1.6 ppm at SB4 in the 3.5-4.5' bgs sample interval
- Silver was detected at a maximum concentration of 2.4 ppm at SB4 in the 3.5-4.5' bgs sample interval.
- Zinc was detected at a maximum concentration of 600 ppm at SB4 in the 3.5-4.5' bgs sample interval.

<u>Soil Boring 5 –</u>

- Cadmium was detected at a maximum concentration of 8.2 ppm at SB5 in the 1-2' bgs sample interval.
- Copper was detected a maximum concentration of 280 ppm at SB5 in the 1-2' bgs sample interval.
- Mercury was detected a maximum concentration of 0.59 ppm at SB5 in the 1-2' bgs sample interval.
- Potassium was detected at a maximum concentration of 3,400 ppm at SB5 in the 1-2' bgs sample interval.
- Vanadium was detected at a maximum concentration of 31 ppm at SB5 in the 1-2' bgs sample interval

<u>Soil Boring 6 –</u>

- Lead was detected at a maximum concentration of 410 ppm at SB6 in the 5.5-6' bgs sample interval.
- Selenium was detected at maximum concentration (estimated) of 1.6 ppm at SB6 in the 5.5-6' bgs sample interval

<u>Soil Boring 7 –</u>

- Arsenic was detected at a maximum concentration of 11 ppm at SB7 in the 5-5.5' bgs sample interval.
- Manganese was detected at a maximum concentration of 350 ppm at SB7 in the 5-5.5' bgs sample interval.
- Sodium was detected at a maximum concentration of 1,900 ppm at SB7 in the 5-5.5' bgs sample interval.

Soil Boring 8–

- Antimony was detected a maximum concentration (estimated) of 1.8 ppm at SB8 in the 5-6' bgs sample interval.

3.3. Groundwater

The groundwater gauging and chemical results of Site characterization groundwater sampling activities are described below.

3.3.1. Groundwater Elevations and Hydrogeology

On June 10, 2011, one week after monitoring well installation, the eight monitoring wells were gauged. Groundwater was encountered approximately 2.5 to 5.5 feet bgs across the Site. Based on the well survey performed by Borbas and groundwater measurements gauged on June 10, the water table at the Site was calculated to be at an approximate elevation of 0 to +4 feet above mean sea level (NAVD88 Vertical Datum). Table 1 presents the groundwater elevations on June 10, 2011.

Table 1 – June 10, 2011 Groundwater Elevations

WELL ID	GROUND ELEVATION (FT AMSL)	OUTER CASING ELEVATION (FT AMSL)	INNER CASING ELEVATION (FT AMSL)	DEPTH TO WATER (FT BELOW TOP OF INNER CASING)	GROUNDWATER ELEVATION (FT AMSL)
MW-1	9.500	9.490	9.100	5.350	3.750
MW-2	8.300	8.300	8.010	4.083	3.927
MW-3	7.300	7.280	7.080	4.258	2.822
MW-4	6.100	6.080	5.580	2.658	2.922
MW-5	7.000	6.960	6.450	4.083	2.367
MW-6	6.500	6.490	6.200	5.242	0.958
MW-7	6.000	6.000	5.820	5.542	0.278
MW-8	6.300	6.300	5.740	3.325	2.415
Note: Vertical datum is NAVD88					

3.3.2. Field Sampling Parameters

With the exception of MW8, groundwater monitoring wells were sampled in accordance with USEPA's Low Flow groundwater sampling procedures, which included measurements of water quality indicator parameters to determine when they stabilized. When stability was achieved, the water quality indicator parameters were recorded and are presented in Table 2 below.

Table 2 – Field Sampling Parameters

LOCATION	DEPTH TO WATER (FEET BGS)	PH	ORP (MV)	DISSOLVED OXYGEN (MG/L)	SPECIFIC CONDUCTIVITY (MS/CM)	TEMPERATURE (°C)	TURBIDITY (NTU)
MW1	5.35	7.07	-185.6	5.26	1.125	18.8	46.8
MW2	4.08	8.2	-189	6.82	0.608	18.8	113
MW3	4.26	6.62	-178.2	2.19	1.64	19.45	67.5
MW4	2.66	6.61	-188.4	2.54	1.368	16.59	282
MW5	4.08	6.13	-185.1	3.81	2.999	18.4	235.8
MW6	5.24	7.25	-105.2	7.84	1.722	18.9	288.2
MW7	5.54	6.63	-139.9	7.87	1.783	18.19	308.9

3.3.3. Chemical Analysis

3.3.3.1. Groundwater Volatile Organic Compounds

A review of the analytical results for groundwater indicates that twenty-eight (28) of seventy-two (72) VOCs analyzed for were detected in one or more samples. The maximum concentrations of detected compounds are summarized below.

<u>Monitoring Well 1 –</u>

- 1,1,1-Trichloroethane was detected at a maximum concentration of 63 micrograms per liter (ug/l) at MW1.
- 1,1-Dichloroethane was detected at a maximum concentration of 36 ug/l at MW1.
- 1,1-Dichloroethene was detected at a maximum concentration of 4.3 ug/l at MW1.
- Chloroethane was detected at a maximum concentration of 36 ug/l at MW1.
- Cis-1,2-Dichloroethene was detected at a maximum concentration of 24 ug/l at MW1.
- Diethyl ether was detected at a maximum concentration of 170 ug/l at MW1.
- Tetrachloroethene was detected at a maximum concentration of 7.6 ug/l in MW1.
- Toluene was detected at a maximum concentration of 5.9 ug/l at MW1.
- Trichloroethene was detected at a maximum concentration of 170 ug/l at MW1.

<u>Monitoring Well 2 –</u>

- Cumene was detected at a maximum concentration of 0.7 ug/l at MW2.

Monitoring Well 3 –

- Carbon disulfide was detected at a maximum concentration of 0.53 ug/l at MW3.
- MTBE was detected at a maximum concentration of 26 ug/l in the duplicate sample collected at MW3.
- N-butylbenzene was detected at a maximum concentration of 1.4 ug/l at MW3.

Monitoring Well 4 –

No detections of VOCs in this well location.

Monitoring Well 5 –

- 1,2,4,5-Tetramethylbenzene was detected at a maximum concentration (estimated) of 0.87 ug/l at MW5.
- 1,2,4-Trimethylbenzene was detected at a maximum concentration of 3.5 ug/l at MW5.
- 1,2-Dichloroethane was detected at a maximum concentration of 2.7 ug/l at MW5.
- 1,3,5-Trimethylbenzene was detected at a maximum concentration (estimated) of 1.3 ug/l at MW5.
- 1,4-Diethyl benzene was detected at a maximum concentration (estimated) of 0.43 ug/l at MW5.
- 4-Ethyltoluene was detected at a maximum concentration of 2.0 ug/l at MW5.
- Benzene was detected at a maximum concentration of 1.4 ug/l at MW5.
- Bromomethane was detected at a maximum concentration of 0.44 ug/l at MW5.
- Ethylbenzene was detected at a maximum concentration of 3.1 ug/l at MW5.
- Styrene was detected at a maximum concentration (estimated) of 0.67 ug/l at MW5.
- Total xylenes were detected at a maximum concentration of 7.4 ug/l at MW5.

Monitoring Well 6 –

- Isopropylbenzene was detected at a maximum concentration of 1.2 ug/l at MW6.
- Sec-butylbenzene was detected at a maximum concentration (estimated) of 0.2 ug/l at MW6.
- T-butylbenzene was detected at maximum concentration (estimated) of 0.42 ug/l at MW6.

Monitoring Well 7 –

No detections of VOCs in this well location.

Monitoring Well 8 –

- Acetone was detected at a maximum concentration of 16 ug/l at MW8.

3.3.3.2. Semi-Volatile Organic Compounds

A review of the analytical results for groundwater indicates that nineteen (19) of sixty-five (65) SVOCs analyzed for were detected in one or more samples. The maximum concentrations of detected compounds are summarized below.

Monitoring Well 1 –

No detections of SVOCs in this well location.

Monitoring Well 2 –

- Benzoic acid was detected at a maximum concentration (estimated) of 27 ug/l at MW2.

Monitoring Well 3 –

No detections of SVOCs in this well location.

Monitoring Well 4 –

- Anthracene was detected at a maximum concentration of 0.88 ug/l at MW4.
- Fluoranthene was detected at a maximum concentration of 0.89 ug/l at MW4.
- Pyrene was detected at a maximum concentration of 0.68 ug/l at MW4.

Monitoring Well 5 –

- 2-Methylnaphthalene was detected at a maximum concentration of 54 ug/l at MW5.
- Acenaphthalene was detected at a maximum concentration of 63 ug/l at MW5.
- Carbazole was detected at a maximum concentration of 30 ug/l at MW5.
- Fluorene was detected at a maximum concentration of 13 ug/l at MW5.
- Naphthalene was detected at a maximum concentration of 17 ug/l at MW5.
- Phenanthrene was detected at a maximum concentration of 3.5 ug/l at MW5.

Monitoring Well 6 –

No detections of SVOCs in this well location.

Monitoring Well 7 –

- Acenaphthylene was detected at a maximum concentration of 0.2 ug/l at MW7.
- Benzo[a]anthracene was detected at a maximum concentration of 0.35 ug/l at MW7.
- Benzo[a]pyrene was detected at a maximum concentration of 0.73 ug/l at MW7.
- Benzo[b]fluoranthene was detected at a maximum concentration of 0.77 ug/l at MW7.
- Benzo[g,h,i]perylene was detected at a maximum concentration of 0.79 ug/l at MW7.
- Benzo[k]fluoranthene was detected at a maximum concentration of 0.27 ug/l at MW7.

- Chrysene was detected at a maximum concentration of 0.34 ug/l at MW7.
- Dibenzo[a,h]anthracene was detected at a maximum concentration of 0.69 ug/l at MW7.
- Indeno[1,2,3-cd]pyrene was detected at a maximum concentration of 0.83 ug/l at MW7.

Monitoring Well 8 –

No detections of SVOCs in this well location.

3.3.3.3. Polychlorinated Biphenyls

A review of the analytical results for groundwater indicates that one (1) of seven (7) PCB aroclors analyzed for was detected in one sample. No other detections were noted for Wells 1,2,3,5,6,7 and 8.

Monitoring Well 4 –

Aroclor-1260 was detected at a concentration of 0.175 ug/l at MW4.

3.3.3.4. Pesticides

A review of the analytical results for groundwater indicates that two (2) of twenty (20) pesticide compounds analyzed for were detected in one or more samples. No other detections were noted for Wells 1,2,3,5, and 6.

Monitoring Well 7 –

P,P'-DDT was detected at a maximum concentration (estimated) of 0.007 ug/l at MW7.

Monitoring Well 8 –

P,P'-DDD was detected at a maximum concentration (estimated) of 0.006 ug/l at MW8.

3.3.3.5. Metals

A review of the analytical results for groundwater indicates that twenty-two (22) of twenty-three (23) metals analyzed for were detected in one or more samples. The maximum concentrations of detected compounds are summarized below.

Monitoring Well 1 –

No detections of Metals in this well location.

Monitoring Well 2 –

- Mercury was detected at a maximum concentration of 1.4 ug/l at MW2.

Monitoring Well 3 –

- Manganese was detected at a maximum concentration of 3,500 ug/l at MW3.

Monitoring Well 4 –

- Beryllium was detected at a maximum concentration of 0.6 ug/l at MW4.
- Cadmium was detected at a maximum concentration of 8 ug/l at MW4.
- Chromium was detected at a maximum concentration of 100 ug/l at MW4.
- Iron was detected at a maximum concentration of 36,000 ug/l at MW4.
- Lead was detected at a maximum concentration of 354 ug/l at MW4.
- Thallium was detected at a maximum concentration (estimated) of 0.1 ug/l at MW4.

Monitoring Well 5 –

- Barium was detected at a maximum concentration of 668 ug/l at MW5.

Monitoring Well 6 –

No detections of Metals in this well location.

Monitoring Well 7 –

- Aluminum was detected at a maximum concentration of 12,000 ug/l at MW7.
- Arsenic was detected at a maximum concentration of 60 ug/l at MW7.
- Calcium was detected at a maximum concentration of 240,000 ug/l at MW7.
- Cobalt was detected at a maximum concentration of 25 ug/l at MW7.
- Copper was detected at a maximum concentration of 174 ug/l at MW7.
- Magnesium was detected at a maximum concentration of 360,000 ug/l at MW7.
- Mercury was detected at a maximum concentration of 1.4 ug/l at MW7.
- Nickel was detected at a maximum concentration of 145 ug/l at MW7.
- Potassium was detected at a maximum concentration 150,000 ug/l at MW7.
- Selenium was detected at a maximum concentration (estimated) of 6.0 ug/l at MW7.
- Sodium was detected at a maximum concentration of 3,700,000 ug/l at MW7.
- Vanadium was detected at a maximum concentration of 52 ug/l at MW7.
- Zinc was detected at a maximum concentration of 584 ug/l at MW7.

Monitoring Well 8 –

Antimony was detected at a maximum concentration of 11.3 ug/l at MW8.

Sincerely,

THE ELM GROUP

ENVIRONMENTAL LIABILITY MANAGEMENT, L.L.C.

DRAFT	**DRAFT**
Craig Puerta, PE Senior Manager	Peter Zimmermann Principal

Enclosures

c: David Yudelson, Sive Paget & Riesel, P.C.