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March 19, 2002

Vanasse Hangen Brustlin, Inc.

Ref: 06392.00 – 00096

Mr. Shamindar Singh
New York State Department of Environmental Conservation
Region 2 Office
47-40 21st Street
Long Island City, New York 11101

Re: Newtown Station/Former Gas Holder Tank Site
Soil Concentrations Remaining On-Site that Exceed Remedial Action Objectives
KeySpan Energy Facility
78-01 57th Avenue
Queens, NY 11373

Dear Mr. Singh,

Vanasse Hangen Brustlin, Inc. (VHB), on behalf of KeySpan Corporation (KeySpan), is submitting this on-site summary report of analytical results for the Interim Remedial Measure (IRM) excavation program underway at the referenced site. The IRM grid sampling program was proposed in the executive summary and recommendation and conclusion sections of the March 2001 Site Investigation Report. A separate "letter work plan", dated March 23, 2001, was forwarded to DEC detailing the specifics of the sampling program.

This letter discusses soils that currently remain on-site with lead concentrations exceeding the Remedial Action Objective (RAO) of 400 mg/kg (ppm). Additionally, concentrations of benzo(a)pyrene that exceed site cleanup goals are discussed. VHB proposes that the majority of these soils be left in place and provides a justification for this action that includes consideration of possible human health concerns associated with these soils should they be allowed to remain in place.

Based on the analytical results of the site investigation and subsequent risk assessment (in the aforementioned Investigation Report), several on-site locations of potential concern were identified. These locations contained elevated levels of lead in soil. The data collected during the grid sampling program further supported this position, and we proposed the implementation of an IRM removal activity to mitigate this significant health threat.

Upon completion of site restoration activities, VHB will prepare an IRM report that will summarize the remedial action. This report will be appended to the final Site Investigation Report and will document site restoration activities.

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SAMPLE RESULTS

Although considerable soil has been removed, lead continues to be detected at concentrations exceeding the 400 mg/kg RAO at the following locations:

Table 1

Sample Identification (grid, location, depth)	Lead Concentration (mg/kg)
D9 Surface (0-6")	2,980
E6 North Sidewall (1')	403
E9 South Sidewall (0-9')	2,840
F2 East Sidewall (2-7")	977
F2/3 Bottom (7')	755
G2 East Sidewall (2-10')	658
G2/3 Bottom (10')	530
H2/3 North Sidewall (10-12')	499
H2 East Sidewall (2-12')	1,700
H9 East Sidewall (2')	410
I2 East Sidewall (2-8')	856
J2/3 East Sidewall (2')	826
M2 East Sidewall (2-4')	685
N2 South Sidewall (0-2' along the VZ Verizon gate)	1,150
N2 East Sidewall (2' along the Verizon curb)	1,370
O2 Bottom (at grade)	422

Please refer to the attached Figure 1 for the grid and sample locations.

LOCATION OF EXCEEDANCES

Based upon these findings, there appear to be two discrete areas where exceedances remain: along the eastern property line adjacent to the Verizon property, and in the southwest corner of the site between the service building and the western property line abutting the CSX property.

EAST PROPERTY LINE - VERIZON

Eight (F2, G2, H2, I2, J2/3, M2, and both N2 samples) of the sixteen composite soil samples collected by VHB that exceed the RAO are located along the Verizon property line on the eastern portion of the site. Lead concentrations in these sidewall samples ranged from 658 ppm to 1,700 ppm. The eastern sidewall samples were collected under the Verizon concrete curbing that delineates the eastern property line of the site. The soil abutting the eastern sides of the former tanks consisted of fill material brought on site, possibly during the construction of the former holders. The fill was composed of brick, concrete, piping, and other debris. The fill was discovered at 1-foot bgs in grids F2/F3 and extended to 12 feet bgs into grids H2/3. The fill appeared to have ended at 8 feet bgs in grids I2/I3. The soil remaining under the Verizon curbing consists of this fill material.

Three (F2/3, G2/3, H2/3 north) bottom composite samples along the Verizon property have lead concentrations that exceed the RAO. These samples were collected after the majority of the fill material was excavated and range in depth from 7 to 12 feet below ground surface (bgs). The results of these samples range from 499 mg/kg to 755 mg/kg lead. Site safety and security measures prevented these excavations from remaining open for an extended period of time. Due to the depth of these excavations and proximity to the Verizon property, only these excavations were backfilled immediately following excavation and sample collection. Verizon vehicles always parked against the curbing and personnel frequently walked along the curbing, so it was deemed too dangerous to leave these grids open due to fall hazards existing to both VZ personnel and vehicles.
Therefore, they were sampled and backfilled on the same day they were excavated.

Three composite samples (E6, H9, and O2) exceed the RAO by less than 25 mg/kg. These samples range in concentration from 403 ppm to 422 ppm lead and are below the local background concentration of 468 mg/kg.

WEST PROPERTY LINE – ADJACENT TO SERVICE BUILDING

Two composite samples (D9 and E9), collected along the western property line, exceed the RAO. VHB and KeySpan are evaluating this area to determine the best course of action. One sample is located on the surface (collected from 0-6" bgs) of grid D9, west of the KeySpan service building. Lead was detected at a concentration of 2,980 ppm in this sample. The other sample was collected from the southern sidewall of grid E9 from a depth of 0-9'. Lead in this sample was detected at 2,840 ppm. The sidewall of E9 consists of fill material containing soil, brick, rock, pieces of steel, and piping.

TOXICITY CHARACTERISTIC LEACHING PROCEDURE ANALYSES

VHB and NYSDEC had a site walkover/meeting on November 27, 2001. During the walkover and after reviewing the laboratory data pertaining to the lead concentrations VHB proposed to leave on site, NYSDEC directed VHB to collect one TCLP composite sample from each of the two areas on site that exceeded the RAO goal. VHB concurred with NYSDEC that the two areas that required TCLP analysis were along the NE corner adjacent to the VZ property (N2) and the SW corner adjacent to CSX (E9). VHB collected two samples for Toxicity Characteristic Leaching Procedure (TCLP) analysis. Results of the analysis are presented below:

Table 2

Sample Identification (grid, location, depth)	TCLP Lead (mg/L)
N2 South Sidewall, adjacent to VZ fence, 0-2'	0.0745
E9 South Sidewall, 0-9'	58.9

VHB collected one composite soil sample from the southern sidewall of grid N2 adjacent to the parking lot gate on the Verizon property. This sample was collected from 0-2' of fill material that was composed of brick, concrete, and other debris. The TCLP lead result was below 1 mg/L.

The second soil sample for TCLP analysis was collected from the southern sidewall of grid E9 that abuts the KeySpan trailer and is within 5 feet of the CSX property. This soil sample yielded a TCLP Lead result of 58.9 mg/L. VHB and KeySpan are evaluating this area, including engineering options such as excavation and disposal at an approved hazardous waste facility, capping of the soil, or the installation of an impermeable barrier along the CSX property line. This area of the site will remain in KeySpan's possession as part of their service operations facility. The end use of the balance of the property is currently undetermined; however, cleanup goals under the IRM were established based on a future residential development scenario.

GRIDS J4/J5

On October 22, 2001, during the IRM excavation of lead-impacted soil, a black, coal tar-like material was encountered in grid J4. The material was black, thick, rigid, and odorous. At the time of discovery, the vertical and horizontal extent of this material was unknown. VHB collected a sample for characterization and Creamer Environmental, Inc. collected a sample for waste profiling. The analytical results of the sludge are summarized in Table 3.

Excavation of the coal tar material began on December 18, 2001. VHB field screened the excavated soils, impacted soil, and clean closure samples with a Photoionization Detector (PID) using standard jar headspace procedures. A distinguishable PID characteristic was consistent throughout the

excavation. PID readings of > 5,000 ppm were observed. After removing the stained materials, the PID readings dropped to 405 ppm. After removal of black and gray soil immediately below the coal-tar like material, the medium coarse brown sandy soil that VHB screened and subsequently sampled ranged from 0 to 80 ppm at the completion of excavation activities.

The highest PID readings upon completion of work were indicated at the bottom of the excavation at depths ranging from 7 to 17 feet (bgs). The readings for soils remaining on site ranged from 37 ppm at 12 feet bgs to 80 ppm at 17 feet bgs. Remaining sidewall readings taken over the course of the excavation ranged from 0 to 30 ppm at 15 feet bgs.

Upon completion of the removal activities, approximately 1,100 cubic yards of stained material and soil were excavated. Due to the nature of the recovered materials, treatment was required prior to disposal at a lined landfill. The material was transported under Hazardous Waste Manifest, and incinerated at Mid Atlantic Recycling Tech (MART) in Vineland, NJ for subsequent disposal at a licensed landfill operated by the Atlantic County Utilities Authority in Atlantic County, NJ.

Summary of Laboratory Analytical Results

A summary of laboratory analytical results from the J4 and J5 excavation area is presented in Table 4. Approximate limits of the excavation area are delineated on Figure 1. Table 6 summarizes the TCLP laboratory data for soil remaining at the site. It should be noted that results from the J4 and J5 sampling are not validated.

There are 4 samples that were collected by VHB that exceed one or more of the site cleanup goals from the J4/J5 area.

- The sample collected from the western portion of the excavation within grid J5 along the south sidewall from 0-3 feet bgs (West J5 South (0-3')) yielded two results above the site cleanup goals: benzo(a)pyrene, with a concentration of 0.098 mg/kg, and lead, with a concentration of 1,110 mg/kg;

- The sample collected from the middle portion of the excavation in grids J4/J5 along the southern sidewall from 0-3 feet bgs (Mid J4/J5 South (0-3')) yielded a result of 0.23 mg/kg benzo(a)pyrene;

- The sample collected from the middle bottom portion of the excavation in grids J4/J5 (Mid J4/J5 Bottom (15')) yielded a result of 0.094 mg/kg benzo(a)pyrene; and

- Finally, the sample collected from the eastern bottom portion of the excavation in grid J4 from 6-8 feet bgs (East J4 Bottom (6-8')) yielded a lead result of 409 mg/kg, which is just slightly above the 400 mg/kg goal set for the site.

- Several metals: barium, chromium, magnesium, manganese, mercury, selenium, sodium, and vanadium, are present at concentrations exceeding *average* detected background levels. However, with the exception of chromium, manganese and vanadium, the metals are present at concentrations below *maximum* detected background levels that suggest on-site metals

concentrations are consistent with background. Concentrations of chromium, manganese, and vanadium, while exceeding maximum background concentrations, are below site cleanup goals.

VHB collected one TCLP sample from the most heavily impacted soil remaining on site, as determined by headspace readings and olfactory indications. The sample from the residual gray soil in the eastern bottom portion of grid J4 at a depth of 6-8 feet bgs yielded a TCLP lead result of 8.9 mg/L, which exceeds the 5.0 mg/L regulatory level. Results for other TCLP analyses were below regulatory levels as indicated in Table 5.

EXPOSURE ASSESSMENT

Lead

As discussed in the baseline human health risk assessment (see the Site Investigation Report), toxicity values, *i.e.*, slope factors and reference doses, are not available for lead. Therefore, potential exposure to lead is not quantitatively assessed. Rather, assessment of noncancer hazards associated with potential residential exposure to lead is performed using the USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model.

In July 1994, the USEPA released OSWER Directive #9355.4-12 *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*. The lead screening level established in the Directive is 400 ppm. The USEPA and the Centers for Disease Control recommend a level of either 95% of a child resident population having blood lead concentrations below the 10 µg/dL benchmark or a 95% probability of an individual child having a blood lead concentration below 10 µg/dL. These benchmarks correspond to a lead concentration in soil of approximately 400 mg/kg as predicted by using default parameters in the USEPA's IEUBK model. Although the USEPA emphasizes that this 400 mg/kg screening concentration is not a cleanup goal for soils, this concentration was selected as the RAO for site soils given that potential redevelopment scenarios include residential land use.

Although the grid sampling indicates that some lead concentrations in soil exceed the RAO, VHB nevertheless proposes leaving some of these soils in-place. Concentrations in the sixteen soil sample locations remaining on-site that exceed the RAO range from 422 to 2,980 mg/kg. Results of three of these samples, E6, H9 and O2, are below the local background concentration and, therefore, do not present a significant incremental increase in exposure. Lead was detected in the sample from H2/3 at a concentration of 499 mg/kg. This value also is at the upper range of average background levels in suburban areas or near highways, 200 - 500 ppm, as presented in the DEC TAGM 4046. Therefore, we argue that this value is also typical of background conditions and does not present a significant incremental increase in human exposure.

Furthermore, although dermal contact with, incidental ingestion of, and inhalation of particulates from lead in soil are potentially complete exposure pathways under both current and future site use conditions, these exposure pathways are incomplete for eight of the sample locations (F2, G2, H2, I2, J2/3, M2, and both N2 samples). This is because the samples are located under the concrete curbing of the adjacent Verizon parking lot.

Although results from these samples exceed the RAO, these soils are not available for contact and consequently, the potential for human health exposure is minimal at best.

The bottom composite samples, F2/3 and G2/3, were collected at depths of 7' and 10' bgs and, therefore, also are unavailable for direct human exposure under existing site conditions. However, they could present a potential exposure source if these soils were exposed via excavation. Consequently, VHB is recommending that this portion of the site be deed restricted so as to prevent potential direct contact with these soils.

Results for samples collected from grids D9 and E9 are the highest concentrations remaining on-site (2,980 and 2,840 mg/kg, respectively). Additionally, lead was detected at a concentration of 1,110 mg/kg in a sample collected from grid J5. Benzo(a)pyrene also was detected at concentrations exceeding site cleanup goals in this grid (see discussion below). Proposed remedial action for these areas is discussed below.

Polycyclic Aromatic Hydrocarbons

Benzo(a)pyrene, a carcinogenic polycyclic aromatic hydrocarbon (cPAH), was detected in three samples at concentrations exceeding its site cleanup goal. Two of these sample results, West J5 south and Mid J4/J5 South, were for samples collected from 0-3' bgs. The sample result for West J5 south, 0.098 mg/kg, is slightly above the cleanup goal of 0.0672 mg/kg while the result for the Mid J4/J5 south sample is approximately three and one-half times greater than the site cleanup goal. VHB is recommending that this portion of the site be further remediated.

The third sample was collected from Mid J4/J5 bottom at a depth of 15' bgs. Given the depth at which this sample was collected, the potential for direct human contact is minimal. Additionally, the benzo(a)pyrene was detected at a concentration slightly above the cleanup goal. Furthermore, the other cPAHs were either not detected, or detected at concentrations below their respective cleanup goals. Consequently, the cPAHs are not present at concentrations that present a significant incremental increase in human exposure at this sample location.

Inorganics

Concentrations of inorganics in samples collected from grids J4/J5 are generally consistent with background concentrations and /or below site cleanup goals. Consequently, the concentrations of metals do not present a significant incremental increase in human exposure.

RECOMMENDATION

EAST PROPERTY LINE - VERIZON

The Verizon property abutting the site is covered by bituminous asphalt and is used as a parking area for Verizon vehicles. The asphalt provides an impermeable barrier to lead in soil. Additional excavation in the eastern direction was prohibitive because it would require, access to the property, sheeting/shoring, and coordination with Verizon for

parking and access. Since there is no exposure scenario and no potential for migration as evidenced by the TCLP data there is no justification for removal.

WEST PROPERTY LINE – ADJACENT TO SERVICE BUILDING

Electrical, gas, and sewer lines that originate on 57th Avenue and service the KeySpan building and trailer are located under grids D9 and E9. The presence of these existing utilities makes excavation and removal of soil impractical. The location of these soils relative to site structures and local topographical relief require either removal of site buildings, or substantial sheeting or shoring to support these structures during excavation.

KeySpan, at this time, is unable to remove the trailer because the company utilizes it for showers, lockers, and storage for their operations at the site. Additionally, access to the CSX property is required to excavate this soil and/or install an effective cap. We anticipate access to this area from CSX in the first quarter of 2002. A chain link fence delineates the property line and is currently holding back approximately 9 feet of fill in this area. The fence is preventing the fill from migrating onto the CSX property.

KeySpan is evaluating options for remediating this area. Two options under consideration include removal or capping. Removal actions will be conducted similar to the previous removal work performed on-site with the exception that some type of structural support (piling, tie-backs, benching, slope stabilization) would be required during removal to prevent undermining existing site structures.

Capping this area with an impermeable membrane may be performed when the balance of soils on CSX property is removed. The cap would be constructed by removal of the existing chain link fence, excavation and off-site disposal of the soils contained by the fence, and grading the area for positive drainage. The cover would consist of geotextile, 40-mil textured HDPE liner, 1-foot of clean fill, and 6-inches of topsoil. The area would then be seeded and mulched. Additionally, this portion of the site would be deed restricted.

GRIDS J4-J5

VHB recommends additional removals to address soils with elevated concentrations of cPAHs and lead in the 0 to 3-foot interval from grids J4-J5. Concentrations of cPAHs at depth in this area were at (slightly above for benzo (a) pyrene) or below cleanup goals and no further action is required. Additional removals can be coordinated with pending off-site work. Verification sampling will be conducted consistent with previous activities.

We anticipate fieldwork to start in the first quarter of 2002. We will provide 2 weeks notice prior to the commencement of fieldwork. If you have any questions or need more information please call me at 716/655-2734.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Matthew J. Wawrowski, PE
Project Manager

cc. T. Bell (KSE)
K. Frantzen (VHB)