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October 9, 2001
98248-1012

Mr. Amen M. Omorogbe, P.E.
Project Manager MGP Remedial Section
New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Western Remedial Action, 11th Floor
625 Broadway
Albany, New York 12233-7010

Re: Former Clifton MGP Site
Revised Supplemental Remedial Investigation (RI) Work Plan

Dear Mr. Omorogbe:

On behalf of our client, KeySpan Energy, GEI Consultants, Inc. (GEI) is submitting this revised work plan to conduct supplemental remedial investigations at the former manufactured gas plant (MGP) site located at 25 and 40 Willow Avenue Clifton, Staten Island, New York. This revised work plan has been revised from the September 18, 2001 work plan submitted to you by GEI to address the comments about delineation activities at the 40 Willow Avenue parcel that you provided to Ms. Tracey Bell of KeySpan via email on September 26, 2001. Following your review of this work plan, please contact Ms. Tracey Bell with KeySpan with your approval or if you have any questions.

Work Plan

The work described herein will be conducted in accordance with the procedures specified in the NYSDEC-approved November 9, 1998 RI Work Plan for the site. In addition, the work will be conducted following the quality assurance/quality control (QA/QC) procedures established in the approved RI work plan. All field activities will comply with the health and safety procedures specified in the NYSDEC-approved site-specific Health and Safety Plan.

The scope of work presented below is based on the requested supplemental RI scope of work presented in the NYSDEC August 1, 2001 letter plus additional delineation activities at the 40 Willow Avenue parcel.

Bay Street Evaluation

Six borings (SB-68 through SB-73) will be installed along Bay Street to evaluate whether tar is present atop the till surface at Bay Street and to evaluate the dip of that surface. Three of these borings will be completed at the top of the till surface and three will be drilled 10 feet into the till unit. The till surface is anticipated to be approximately 40 to 45 feet below ground surface (bgs). Each boring will be completed on the 25 Willow Avenue parcel

along Bay Street (Figure 1). Completion of these borings will promote an understanding of the potential for tar migration from either Relief Holder No. 1 or the former tar separator toward New York Harbor atop the till surface.

At a minimum, one soil boring (SB-70) will be completed as a 2-inch diameter PVC monitoring well to evaluate the groundwater quality discharging from the site along the former stream trace. If no tar is present in the other borings, they will be grouted upon completion. If tar is present in a particular boring, the vertical extent of tar will be evaluated to the extent practical. Additionally, if tar is in a particular boring along Bay Street, a 2-inch diameter PVC monitoring well will be installed with a sump beneath the screen interval to serve as a potential point of tar recovery.

Up to two soil samples from each boring will be submitted to Severn Trent Laboratories (STL) in Shelton, Connecticut for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), poly-nuclear aromatic hydrocarbons (PAHs), RCRA 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and total cyanide. STL is an approved New York State ELAP laboratory.

Quality assurance/quality control samples will include laboratory-blind duplicate samples, matrix spike/matrix spike duplicate (MS/MSD) samples, equipment rinsate blank samples, and trip blank samples. The blind duplicate, MS/MSD, and rinsate blank samples will be collected at a frequency of one per 20 soil samples. Trip blanks will be submitted at a frequency of one trip blank set per day of sample shipment to the laboratory. Trip blank samples will be analyzed for BTEX; the other QA/QC samples will be analyzed for BTEX, PAHs, and RCRA 8 metals.

Following installation of the well at boring SB-70 and any other completed well installations, each well will be developed in accordance with the methods described in the NYSDEC-approved November 9, 1998 RI Work Plan. Groundwater samples from each newly installed well will be collected no sooner than two weeks after development. Each groundwater sample collected will be analyzed for BTEX, PAHs, RCRA 8 metals, and total cyanide. One blind duplicate sample, one MS/MSD, and one equipment rinsate blank sample will be collected and analyzed for BTEX, PAHs, RCRA 8 metals and total cyanide. One trip blank sample (for BTEX analysis) will be submitted per day of sampling.

STL will provide New York State Category B data deliverables for the soil and groundwater samples. The analytical results will be validated in accordance with New York requirements. Data will be provided in both electronic and printed format. The analytical results will be incorporated into the existing site-wide database.

Immediately prior to the start of groundwater sampling activities, a full round of groundwater elevations and storm sewer invert elevations will be collected from the existing and newly

installed shallow aquifer wells and accessible storm sewer manhole locations to confirm groundwater flow directions in the shallow aquifer.

Storm Sewer and Former Stream Trace Assessment

To further assess the potential for the storm water line to act as a preferential pathway for dissolved phase constituents, three storm water samples will be collected: one from a manhole upstream of the site (along Willow Avenue), one from an on-site manhole, and one from a manhole downstream of the site (across Bay Street). Each storm water sample will be analyzed for PAHs, BTEX, RCRA 8 metals, total cyanide, pH, and hardness.

A test pit trench (TP-11) will be excavated from the location of the existing storm sewer line northerly parallel to Bay Street approximately 100 feet in length (Figure 1). The purpose of this trench is to assess the presence or absence of tar in either the storm sewer backfill and/or along the former stream trace. The trench will be excavated with a standard backhoe with a maximum reach of approximately 12 feet. The test pits will extend to the maximum reach of the backhoe or to the limits dictated by soil conditions. No analytical samples will be collected from the test pit.

Materials excavated from the test pit will be placed on plastic sheeting laid on pavement. A temporary berm will be created around this temporary lay-down area to contain any liquids that may drain from the excavated materials. Upon test pit completion, the test pit will be backfilled in reverse sequence of excavation so that the deepest materials will be replaced first and the shallowest materials will be replaced last. The bituminous concrete pavement will be replaced after the test pit is backfilled.

Ambient air quality will be monitored around the area of the proposed test pit. This perimeter air monitoring and the worker health and safety air monitoring methods and frequency will be performed as specified in the NYSDEC-approved November 9, 1998 RI Work Plan. In general, the ambient air quality will be monitored around the perimeter of the excavation using a PID organic vapor analyzer (OVA) and a particulate meter. Particulate meters and a PID-OVA will be used to monitor the potential dust and volatiles within the work zone.

Vertical Delineation at SB-10, SB-14, and SB-54

Three soil borings (SB-74, 75 and 76) will be completed at the previous soil borings locations SB-10, SB-14, and SB-54 to evaluate the vertical extent of tar encountered at these locations (Figure 1). Each proposed boring will be completed to the top of the till confining layer. Upon completion each soil boring will be grouted. Up to two soil samples will be colleted from each soil boring for analysis of BTEX, PAHs, RCRA 8 metals, and total cyanide. Quality control samples will be collected as described above.

Lynhurst Avenue Residential Parcels

One approximately 40-foot deep soil boring (SB-77) will be completed between Relief Holder No. 2 and the residential properties on Lynhurst Avenue. The boring is proposed to be located approximately 20 feet from the fence line between the residential lots and the 40 Willow Avenue parcel (Figure 2). The actual location of the proposed boring will be dependant upon physical constraints and negotiated access to the residential lot(s). However, completing the boring on #55, #59, or #61 Lynhurst Avenue would adequately address NYSDEC's request to evaluate deeper potential extent of tar from Relief Holder No. 2. Up to two soil samples from this boring will be collected for analysis of BTEX, PAHs, RCRA 8 metals, and total cyanide.

NYSDEC requested completion of one deep boring to approximately 90 feet bgs "south of Lynhurst Avenue to establish the extent of off-site impact." Residential dwellings are present on the southern side of Lynhurst Avenue; therefore, the only potential location to drill a deep boring would be within Lynhurst Avenue. The depth of this boring will be extended beyond the requested 90 foot depth to intercept the top of the saprolite (weathered bedrock) estimated to be approximately 125 to 135 feet bgs. By extending this boring to the top of saprolite, we will document the presence/absence of any potential tar throughout the vertical extent of the soil profile. The depth and hydrogeologic conditions at this site require the use of a sonic drilling rig to efficiently complete this soil boring.

As Figure 2 shows, there are significant overhead and underground utilities located within Lynhurst Avenue that will have to be cleared and potentially relocated prior to this boring being drilled. The presence of these utilities will dictate the actual location of the boring. Based on a site visit conducted by GEI, a drilling contractor, and Mr. Jack Rodak of KeySpan, we believe a potential boring location would be in the vicinity of # 58 Lynhurst Avenue, provided that the overhead electric lines could be adequately shielded.

40 Willow Avenue – Relief Holder No. 2

Twelve GeoProbe® soil borings (GP-01 through GP-12) are proposed to refine the extent of tar impacts immediately surrounding Relief Holder No. 2 on the 40 Willow Avenue parcel. As requested, an additional boring (GP-12) was placed on-site between borings SB-65 and SB-66. In light of NYSDEC comments provided on September 26, 2001, each boring will be completed to a maximum depth of 45 feet bgs. The data from these borings will be used to more adequately refine any volume estimates of soils that may require remediation in the future. Figure 3 shows the proposed boring locations along with previous boring and well locations.

Soil samples will be collected continuously from each boring using 4-foot long Macrocore® samplers. If sample volume permits, soil samples for potential laboratory analyses will be collected at 2-ft depth increments, otherwise, the samples will be collected at 4-foot sample

increments. Up to two soil samples per boring will be submitted for the laboratory analyses listed below, with a maximum of 25 soil samples being analyzed.

Soil samples will be submitted to STL in Shelton, CT for analysis of polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene, and xylenes (BTEX), and lead. Quality assurance/quality control samples shall include laboratory-blind duplicate samples, matrix spike/matrix spike duplicate (MS/MSD) samples, equipment rinsate blank samples, and trip blank samples. The blind duplicate, MS/MSD, and rinsate blank samples will be collected at a frequency of 1 per 20 soil samples. Trip blanks will be submitted at a frequency of one trip blank set per day of sample shipment to the laboratory. Trip blank samples will be analyzed for BTEX, the other QA/QC samples will be analyzed for BTEX, PAHs, and lead.

STL will provide New York State Category B data deliverables and the analytical results will be validated in accordance with New York requirements. Data will be provided in both electronic and printed format. The analytical results will be incorporated into the site-wide database.

Test Pit Assessment of Relief Holder No. 2

Two test pits (TP-12 and TP-13) will be excavated to confirm the diameter of the holder structure and to assess the construction and integrity of the holder walls (Figure 3). At each test pit, once the top edge of the holder wall is encountered, the excavator will attempt to clear soils from around the outside of the holder to allow the examination of the structure, construction, and integrity of the walls. The test pits will extend into the inside of the holder to examine the inner construction of the holder. The test pits will extend to the maximum reach of the excavator (approximately 15 feet bgs) or to the limits dictated by soil conditions. Once completed, the test pits will be backfilled with the material that was excavated in reverse sequence of removal, so that the deepest soils are placed at the bottom of the excavation. Each test pit will be photo-documented. The holder diameter, and the observed wall construction materials and thickness will be recorded along with all field observations. No soil samples will be analyzed from these test pits.

Three groundwater samples will be collected from the area surrounding Relief Holder No. 2 to characterize groundwater that may need to be handled should dewatering activities be part of a potential remedy. One groundwater sample will be collected from the existing piezometer PZ-3 on the southern side of Relief Holder No. 2; one grab groundwater sample will be collected from a test pit and one sample will be collected from a temporary micro-well to be installed on the northern side of the holder. The groundwater samples will be analyzed for parameters required to determine potential on-site treatment needs and for New York City Department of Environmental Protection's *Limitations For Effluent to Sanitary or Combined Sewers*. The groundwater samples will be analyzed for VOCs, SVOCs, , pH, RCRA 8 metals, copper, nickel, zinc, hexavalent chromium, flash point, total suspended solids, total dissolved solids, total PCBs,

total petroleum hydrocarbons (TPH), total cyanide, and amenable cyanide. The analytical results from the groundwater treatment evaluation will not be validated.

Survey

The locations and elevations of each newly completed soil boring, monitoring well, and storm sewer sampling point will be surveyed by a New York State licensed surveyor. These survey data will be incorporated into the site survey database.

RI Report Revision

The newly obtained data will be incorporated into the site-wide database and will be used to supplement the understanding of site conditions. Following evaluation of the geologic, hydrogeologic, soil and groundwater analytical data, the existing RI report will be revised and submitted for NYSDEC review and approval. The revised RI report will include new boring, well, and test pit completion logs, summaries of laboratory data, laboratory data reports, and an evaluation and discussion of the mobility of dissolved phase contaminants and DNAPL tar. The report will also include a revised groundwater contour map for the upper (water table) aquifer and a top of till contour map based on the borings that intercepted the till unit.

Schedule

A detailed project schedule will be prepared and provided to NYSDEC once a project start date has been established. Issues affecting the start date include negotiation of access agreements, utility clearance, and the availability of the sonic drilling rig. The schedule will address the field activities, data evaluation, report preparation, review, revision, and report submittal dates.

Field activities to drill the planned soil borings and complete the monitoring well installations can commence following NYSDEC approval of this work scope. However, given that a sonic drilling rig is required to complete at least a portion of the work, the actual start date may depend on the availability of the sonic drilling contractor. At last assessment, the sonic drilling rig could be available approximately one month from receipt of approval to proceed with the work plan.

GEI is evaluating the most time and cost-effective combination of drilling methods (hollow stem auger, sonic, and geoprobe) to complete the scope of work. The selected drilling methods will directly affect the duration of the drilling program. At this time, we believe that the drilling activities can be conducted between approximately four weeks (assuming mostly hollow stem methods) and 2½ weeks (assuming mostly sonic drilling methods).

Groundwater sampling can commence two weeks after installation of the last new monitoring well. Laboratory analytical results will be provided on a standard three-week turnaround basis.

Following receipt of the validated analytical results, the data will be used to prepare the revised RI report.

If you have any questions or require any additional information, please contact Ms. Tracey Bell at 718-403-3053 or by email at tbell@keyspanenergy.com.

Sincerely,

GEI CONSULTANTS, INC.

David B. Terry, P.G., LEP
Project Manager

DBT:jls
Enclosures
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c: T. Bell
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