Proposed Remedial Approach
East 173rd Street Works
(Starlight Park)
Bronx Former MGP Site

Bronx, New York

Site ID V00552-2

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SUBMITTED TO

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Project 013942

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1. Introduction

Consolidated Edison Company of New York, Inc. (Con Edison) is currently developing a Remedial Action Plan (RAP) for the East 173rd Street Works former manufactured gas plant (MGP) site. In order to expedite the completion of the RAP, this Proposed Remedial Approach has been prepared to allow the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), the New York City Department of Parks and Recreation (Parks Department), and community stakeholders the opportunity to review and provide input early in the development of the RAP.

This Proposed Remedial Approach was developed in accordance with the Voluntary Cleanup Agreement (VCA), dated August 15, 2002, Index #02-0003-02-08, between Con Edison and the NYSDEC. The remedial approach is based on:

- Data and conclusions presented in the report titled *Focused Remedial Investigation, East 173rd Street Works, Bronx, New York* (GEI, April 2003)
- State of New York Department of Transportation (NYDOT) Plans and Drawings for the Mainline Improvement I-895, Arthur Sheridan Expressway (which includes the renovations to Starlight Park), dated May 1, 2001
- Recommendations received from the NYSDEC, the NYSDOH and the Bronx community stakeholders
- Recommendations received from the Parks Department

1.1 Background

The East 173rd Street former MGP site (the Site) is located between the Sheridan Expressway and the Bronx River in the neighborhood of West Farms, in the Borough of the Bronx, New York (Figure 1). The Site is defined as all land occupied by former MGP operations. The term "on-site" refers to land within the boundary of the former MGP. The Site was once owned and operated by the Northern Union Gas Company, one of Con Edison's predecessor companies. The Site is approximately 3 acres in size and is located within the central portion of Starlight Park (7.3 acres), a part of the Bronx River Park. The former MGP property boundary and former locations of MGP structures are shown on Figure 2. Starlight Park is currently owned by the City of New York and is operated by the Parks Department.

GEI Consultants Inc. (GEI), contracted to Con Edison, conducted a focused remedial investigation (FRI) at the Site from June 2002 through August 2002. The FRI was conducted to:

- Locate the subsurface remnants of any MGP structures or other structures that may exist in Starlight Park and that might be associated with waste source areas or serve as preferential pathways for the migration of MGP waste or other contamination
- Characterize potential MGP impacts in Starlight Park's soil and groundwater, and Bronx River sediment
- Characterize site-specific geology and hydrology
- Delineate the lateral and vertical extent of potential MGP waste impacts in the soil, groundwater, and sediment

1.2 Conclusions of the Focused Remedial Investigation

Potential contaminants associated with the production, purification and storage of manufactured gas include liquid residues and solid by-products. Liquid residues include tars and oils that are complex mixtures of hydrocarbons. Organic compounds associated with these tars and oils include volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Solid by-products commonly found at MGP sites include ash, purifier material and tar. Inorganic compounds associated with ash and purifier material include metals and complex cyanide. The mixture of organic and inorganic compounds found at any particular MGP site is dependent on the nature of the raw materials and gas making processes historically used at the site.

Compounds detected in soil, sediment, and groundwater at the Site includes individual VOCs, PAHs, and inorganic compounds. Many of the inorganic and organic compounds detected in on-site media can be associated with MGP residues; however, some of these detected compounds may also occur in background concentrations associated with urban soil and groundwater.

The conclusions from the FRI report are summarized below according to each media.

- ***Urban Fill*** – The uppermost soils [from the ground surface to between 40 and 80 inches below the current ground surface (cgs)] are not impacted by former MGP operations. The uppermost soils at Starlight Park have been mapped as transported urban fill by the Natural Resources Conservation Service (NRCS). The urban fill soil was placed over the former MGP surface after the MGP ceased operating.

- ***Subsurface Soil*** – Areas of subsurface soils (i.e., below the urban fill) are impacted by the former MGP operations. VOCs, PAHs and metals were detected in subsurface-soil samples at concentrations that exceed the Recommended Soil Cleanup Objectives (RSCOs) [NYSDEC Technical Administrative Guidance Memorandum (TAGM) 4046, 1994]. The samples exhibiting the highest PAH concentrations and the greatest number of individual PAHs that exceed RSCO criteria were collected from on-site subsurface soils containing dense nonaqueous phase liquid (DNAPL) tar. The DNAPL tar is limited to discrete areas within the former MGP boundary, at depths between 8 and 20.5 feet below the cgs.

- ***Groundwater*** – Groundwater samples collected from on-site wells located in areas of MGP-impacted subsurface soils and along the hydraulically downgradient Site boundary contained concentrations of VOCs and PAHs above the New York State Ambient Water Quality Standards (AWQS). The DNAPL tar may represent a continuing source for VOC and PAH groundwater contamination. Cyanide was detected at a concentration above AWQS in one on-site well located in an area of impacted subsurface soil. Cyanide was not detected in groundwater samples collected from monitoring wells located along the hydraulically downgradient Site boundary.

- ***Surface Water*** – Surface water samples were not collected from the Bronx River as part of the FRI. However, based on the groundwater quality data from the monitoring wells located along the hydraulically downgradient site boundary, it was concluded that MGP-related VOC or PAH concentrations are not likely to be present in surface water at concentrations that would have a significant adverse effect on the surface water quality of the Bronx River.

- ***Sediment*** – Sediments in the Bronx River adjacent to the Site are not impacted by former MGP operations. VOCs, PAHs, and cyanide were not detected at concentrations above applicable sediment screening criteria. Metals were detected in sediment samples above the screening criteria; however, the data suggest that these are at background concentrations and are not the result of MGP influences.

- ***MGP Structures*** – Several remnant MGP structures are present beneath the surface of the Site. The rims of the two subsurface water-seal holders were encountered at a depth starting approximately 6 ft below the cgs, and the holder bottoms were encountered at a depth of 15 feet below the cgs. The slab of the former above-grade holder was uncovered at a depth of approximately 4.5 feet below the cgs. The floors of several of the former MGP buildings were encountered between 3 and 5 feet below the cgs.

The FRI report concluded that subsurface soils and groundwater within the park are impacted by former MGP operations, and remediation is necessary. This Proposed Remedial Approach is focused on the MGP-impacted areas that have been identified within Starlight Park. Based on comments from the NYSDEC and the community stakeholders, a supplemental investigation will be conducted on the Bronx River concurrent with remedial work at the park. A decision regarding future actions relevant to the river system will be made based on the outcome of the supplemental investigation.

1.3 Consideration of Park Redevelopment

The plan for renovation of Starlight Park by the NYDOT includes the installation of a subsurface storm drainage system for the Sheridan Expressway and separate drain systems for the park. Also the plans call for a change in the ground surface elevation from the existing site grade. According to the plans provided by the NYDOT, there will be areas of the park that will have final grades anywhere from 1 to 3 feet below the existing grade. For purposes of clarity the future grade of the park will be referred to as the "redevelopment grade." Future modifications by the Parks Department to the redevelopment grade or proposed park design may alter the scope of work proposed in the RAP. The redevelopment grade is shown on Figures 3 and 4.

In addition, the park design called for the installation of a storm drain from the newly reconstructed Sheridan Expressway through the center of the former MGP. In order to facilitate ongoing construction activities for the Sheridan Expressway and not interfere with the remedial plans for the Site, the NYDOT indicated that they will reroute the proposed Sheridan Expressway storm drain system away from the area of the proposed MGP remediation.

2. Proposed Remedial Action Objectives

The proposed Remedial Action Objectives for the Site are:

- Eliminate, to the extent practicable, the potential human health exposure of Starlight Park visitors and maintenance/construction workers to MGP-related contaminants
- Eliminate, to the extent practicable, potential impacts to the environment from MGP-related contaminants
- To the extent practicable, excavate and remove identified DNAPL and MGP-impacted soil that may act as a continuing source of groundwater contamination

The primary points of exposure and contaminant source areas identified in the FRI are subsurface soils, at depths of approximately 8 to 20.5 feet below the cgs. For the purposes of the RAP, continuing sources are defined as zones of subsurface soil that contain visible DNAPL tar, exhibit concentrations of total PAHs greater than 500 parts per million (ppm), or have concentrations of total benzene, toluene, ethylbenzene and xylene (BTEX) greater than 10 ppm. These 500/10 criteria were established by the NYSDEC and are consistent with TAGM 4046. Based on these considerations the following remedial actions are proposed:

- Remove all visible tar and MGP structures encountered during the excavation
- Remove, through excavation, all soils having total PAHs greater than 500 ppm or having total BTEX compounds greater than 10 ppm
- Transport all contaminated soil off site for thermal treatment at a licensed treatment facility
- Remove all piping within the limits of the excavation. Piping which extends beyond the limits of the excavation will be cut, drained and capped. The NYSDEC will be consulted to determine if piping greater than 6 inches in diameter that extends beyond the limits of the excavation should be further investigated.

- Following excavation, maintain a minimum 2-foot layer of urban soil or urban soil and clean fill between the redevelopment grade and the MGP horizon within the footprint of the former MGP.

It is anticipated that groundwater quality will improve through natural processes as a result of the removal of the contaminant source areas. Therefore, active groundwater remediation is not proposed.

2.1 Key Components of the Proposed Remedial Action

To achieve the proposed Remedial Action Objectives, the following remedial components are identified.

- ***Excavation and Off-Site Treatment of MGP Tars and Soils*** – The preferred technology for remediation of the former MGP area will be the removal of tars and tar-impacted soils from the Site with subsequent treatment at an off-site thermal treatment facility. The removal will involve a controlled, engineered excavation, which will include a sidewall support system, removal of groundwater that enters the excavation, vapor control for volatile organic air emissions, and soil backfilling. The proposed vertical and horizontal limits of excavation are shown on Plate 1 and Figures 3 and 4. All soil within the vertical and horizontal limits of the excavation will be removed. Material removed within the excavation will include visible DNAPL tar; soils with a total PAH concentration greater than 500 ppm, or a total BTEX concentration greater than 10 ppm; and all MGP structures, including inactive piping. The 500 ppm total PAH and 10 ppm total BTEX criteria will be referred to as the soil cleanup criteria.

  The final lateral limits of the excavation will be determined by collecting subsurface-soil samples around the perimeter of the proposed excavation. These samples will be designated "pre-excavation documentation samples" and will serve to establish the limit of the excavation support system and to document the sidewall concentrations of soils outside the excavation zone. Excavation floor documentation samples will be collected once the excavations have been opened. The RAP will identify field-screening methods that can be used to determine the vertical limit of the excavation.

- ***Air Monitoring and Vapor/Odor Management Plan*** – A Community Air Monitoring Program will be established for the RAP in accordance with the *New York State Department of Health Generic Community Air Monitoring Plan* (June 2000) and will include: measurements of total VOCs and respirable suspended particulates, collection of time-averaged and real-time air quality data, and establishing thresholds for implementing vapor/odor management actions.

The control of volatile emissions from open excavations and impacted soil stockpile areas will be a major component of the remediation. A tall perimeter fence (similar in height to the fence presently at the park) may be as effective as a temporary covered structure in reducing the community's exposure to vapors, odors and particulates from the remediation. Other control measures will include vapor-suppressing foams to control dust, and tarpaulin covers for exposed surfaces. The RAP will evaluate these control measures and will consider the use of temporary structures as a technology option.

- ***Erosion and Sediment Control Plan*** – The RAP will include a general description of an erosion and sediment control plan that will illustrate how run-on and run-off will be controlled during the remediation. At a minimum, silt fencing will be installed along the perimeter of the Site abutting the Bronx River. Decontamination stations will include anti-tracking pads that will remove soil from all trucks/equipment wheels and bodies that are exiting the Site onto public streets.

- ***Excavation Support*** – Excavation areas estimated to extend more than a few feet below the water table will be supported along the perimeter with sheet-piles, or an equivalent bracing system. Where feasible, excavations above the water table will be appropriately side sloped to minimize the need for excavation support.

- ***Excavation Dewatering and Effluent Treatment*** - Due to the depth of the excavation (20 + feet) in some areas and the depth to groundwater (approximately 13 feet), lowering of the water table within the deeper excavations will be required. Groundwater extraction wells or large sumps will be installed to pump out the groundwater from within the excavation zone. Groundwater effluent from the dewatering system will be pumped to covered fractionation (frac) tanks located outside of the excavation area. The frac tanks will be sufficiently sized to contain the groundwater and to provide some measure of primary treatment (settling). Wastewater associated with other required decontamination activities on the Site will also be pumped into the frac tanks. Depending on the logistics, costs and permit requirements, the wastewater in the frac tanks will be either transported off-site to a licensed treatment/disposal facility, or treated on-site to appropriate standards before local discharge to the city sewer or the river.

- ***Documentation Sampling*** – As mentioned above, soil samples will be collected from the floor of excavated areas on a grid-basis and analyzed for BTEX and PAH compounds to document that the cleanup criteria have been met. Prior to the final design of the sidewall support system, a set of borings with soil samples and analysis will be performed to document the lateral conditions. Analysis will also be performed for BTEX and PAHs in the sidewall samples. The plan for this testing is

included in the Supplemental Focused Remedial Investigation Work Plan (provided as a separate submittal).

- ***Use of Urban Fill as Backfill*** – As identified in the FRI report, the upper 6 feet of soil at the Site is not impacted by former MGP operations. Analytical data collected from these soils indicate that analytes present in the urban fill are below the above-mentioned soil cleanup criteria. As such the urban fill soils that need to be removed in order to perform the deeper excavation, will be stockpiled and reused as backfill for the excavation. Additional clean backfill will be imported to the Site as required to complete the backfilling of the excavation.

- ***Excavated Material Management*** – Depending on the means and methods proposed by the remediation contractor, soil from the excavation may be directly loaded into trucks for transport to an off-site treatment facility. If the excavated soils contain large debris or require dewatering or need to be amended before transport, they may be temporarily stockpiled. MGP-impacted bulky waste (i.e., concrete, timbers, piping, etc.) will be separated from impacted soil upon excavation and transported for treatment/disposal as regulated waste to an approved facility. During the remediation, any impacted soil or other material stockpiled at the Site will be covered to prevent volatile emissions. Lined and covered roll-off bins will be made available to hold any special wastes encountered during excavation that may exhibit hazardous characteristics. These wastes will potentially require separate handling and treatment.

  All trucks containing excavation soils exiting the Site will first be covered to prevent wind erosion and minimize odors. Tanker trucks are normally used for hauling contaminated water. All truck undercarriages and wheels will be decontaminated before they leave the Site. All heavy equipment will be pressure washed before leaving the Site. Following decontamination, the trucks will proceed directly to the off-site treatment and disposal facility. Soils collected from the decontamination pads will be bulked with the impacted excavated material and will be sent off-site for disposal.

  On-site crushing of debris will be prohibited due to the potential for additional volatilization, creation of fugitive dust, and the potential for increased noise levels.

- ***Stormwater Runoff Control*** – Measures will be implemented to prevent stormwater from coming into contact with contaminated soils. Any stormwater entering the excavation zone will be collected by the dewatering system and treated prior to discharge/disposal. This will include all runoff from stockpiled materials collected from within the excavation zone.

- ***Site Security and Traffic Control*** - A temporary fence will be erected around the perimeter of the work and storage areas. At a minimum, it will be a 6-foot-high chain-link fence topped with barbed wire. All vehicles and/or equipment left in the work area will be secured at the end of each working day. Essential equipment that must run overnight and/or on non-working days, such as dewatering systems, will be designed and managed with appropriate automatic shutoffs and/or alarms to prevent unsafe operation.

  Traffic control personnel will direct the arrival or departure of construction vehicles, as needed. Truck traffic routes will be designed to minimize the use of neighborhood streets.

- ***Treatment and Disposal of Excavated MGP-Impacted Soil*** – Soil removed from the Site will be sent to a licensed facility for thermal treatment as nonhazardous soil. The remediation contractor will be required to have a backup facility available in the event the primary treatment facility cannot accept the volume of soils or has a work stoppage during the remediation of Starlight Park.

- ***Post-Remedial Groundwater Monitoring*** – The RAP will establish a long-term groundwater-monitoring program to evaluate post-remedial groundwater quality trends and potential natural attenuation processes.

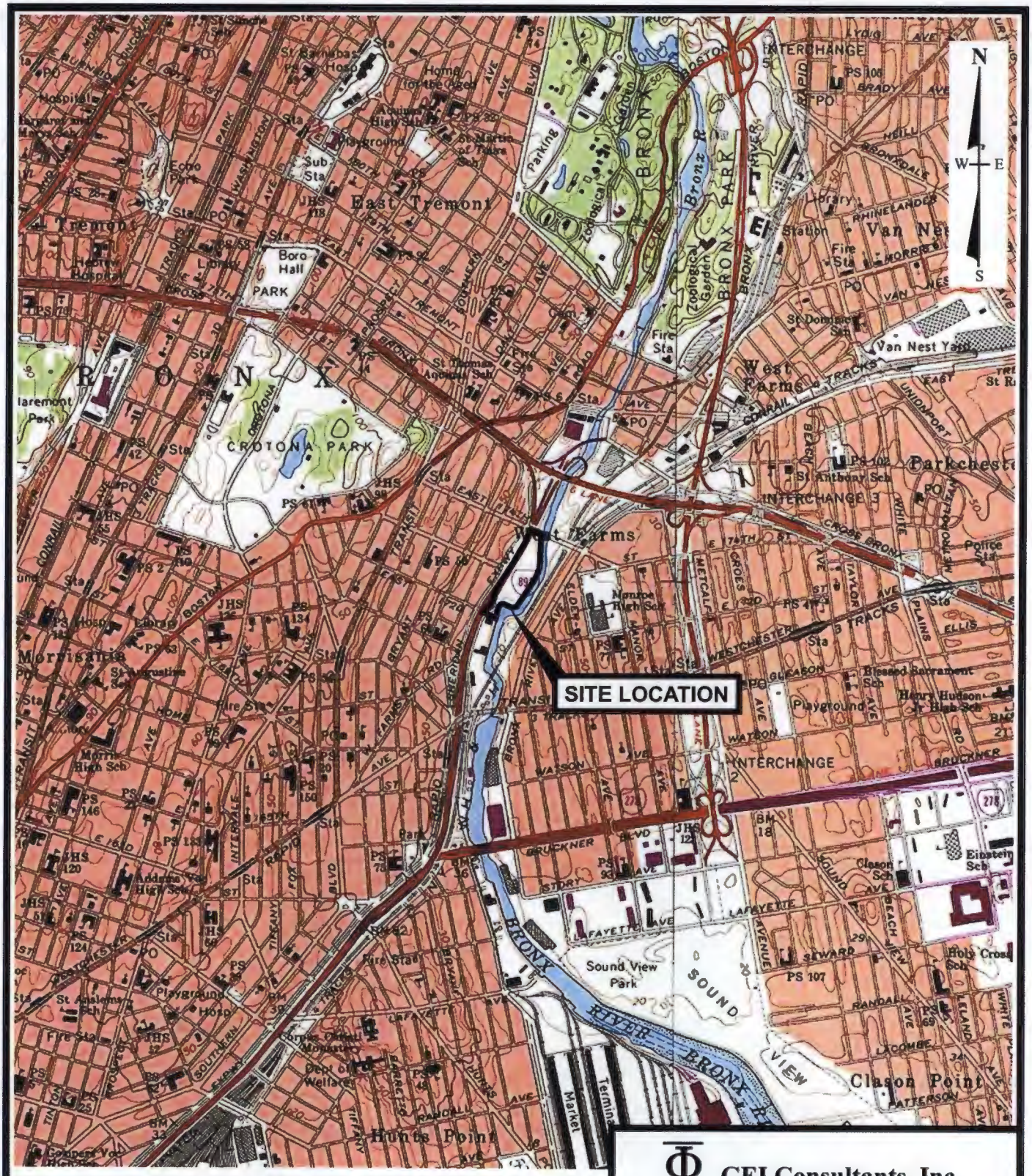
- ***Site Closure*** – Subsequent to the backfilling, the surface of the excavation areas will be prepared for grading and topsoil placement.

2.2 Contents of the Remedial Action Plan

Once Con Edison receives comments from the Parks Department and the community stakeholders to this Proposed Remedial Approach, a more detailed RAP will be developed and submitted to the state. The RAP will be written in accordance with the NYSDEC Voluntary Cleanup Program Guide (May 2002) and Con Edison's VCA. In general, the contents of the RAP will include:

- Summary of the Remedial Action
- Site Location and Description
- Summary of the Results of the FRI
- Summary of Remediation Goals
- Summary of The Evaluation of Remedial Alternatives, including a Cleanup Criteria Evaluation
- Summary of the Selected Remedy
- Description of Community Air Monitoring Plan

Figures



SOURCE: MAP CREATED WITH TOPO!™ ©2000 WILDFLOWER PRODUCTIONS (www.topo.com)

2000 1000 0 2000 4000

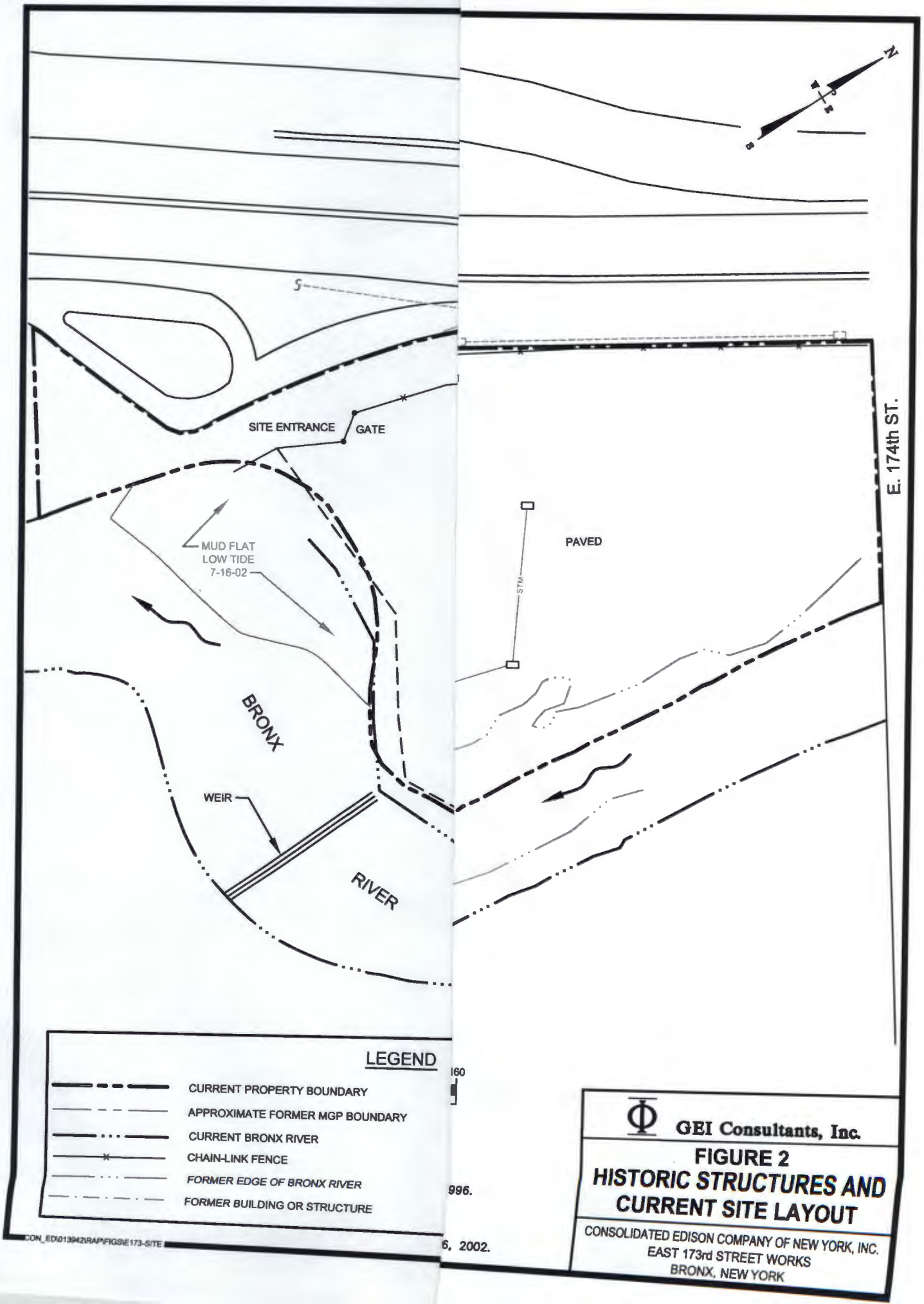
GRAPHIC SCALE IN FEET

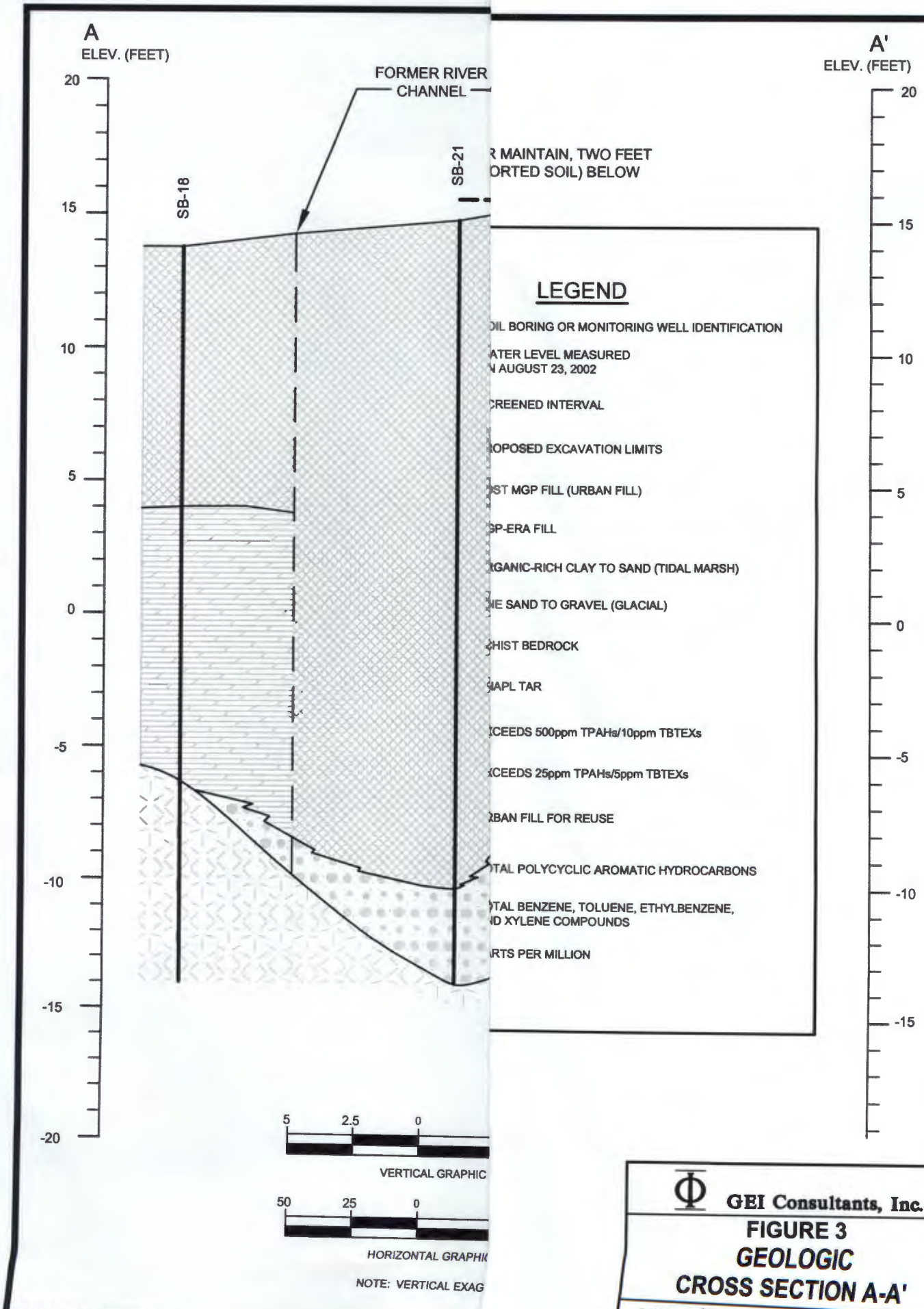
CON_ED\013942\RAP\FIGS\E173-LOC.CDR

GEI Consultants, Inc.

FIGURE 1
SITE LOCATION MAP

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
EAST 173rd STREET WORKS
BRONX, NEW YORK


N
S
SITE ENTRANCE
GATE
MUD FLAT
LOW TIDE
7-16-02
BRONX
WEIR
RIVER
PAVED
STM
E. 174th ST.
LEGEND
CURRENT PROPERTY BOUNDARY
APPROXIMATE FORMER MGP BOUNDARY
CURRENT BRONX RIVER
CHAIN-LINK FENCE
FORMER EDGE OF BRONX RIVER
FORMER BUILDING OR STRUCTURE
160
996.
6, 2002.
CON_ED\013942\RAP\FIGS\E173-SITE
GEI Consultants, Inc.
FIGURE 2
HISTORIC STRUCTURES AND CURRENT SITE LAYOUT
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
EAST 173rd STREET WORKS
BRONX, NEW YORK



GEI Consultants, Inc.

FIGURE 3

GEOLOGIC CROSS SECTION A-A'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
EAST 173rd STREET WORKS
BRONX, NEW YORK

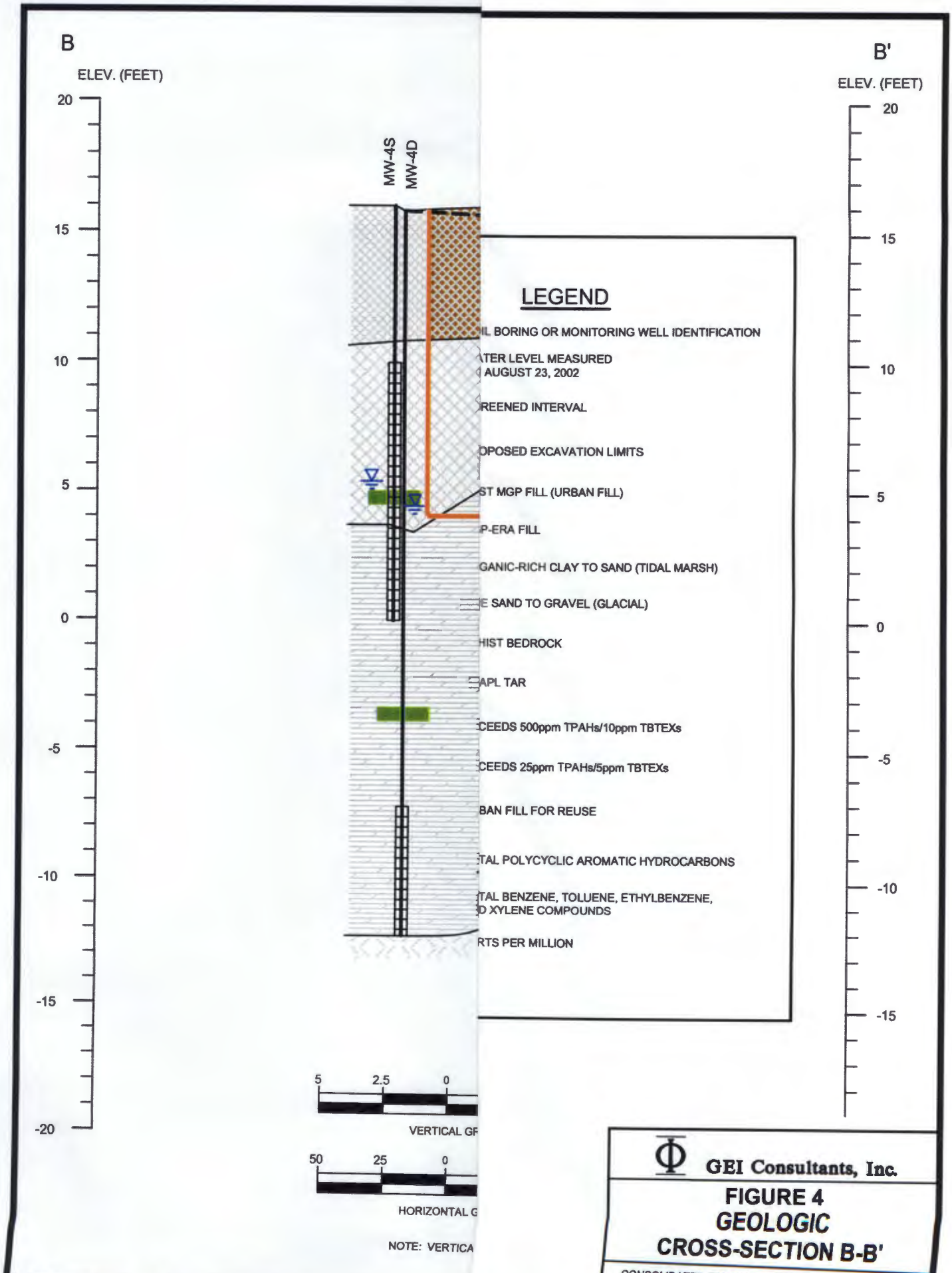


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FIGURE 4
GEOLOGIC
CROSS-SECTION B-B'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
EAST 173rd STREET WORKS
BRONX, NEW YORK

Plate