KEYSPAN

IRM Remedial Action Work Plan Interim Remedial Measures for the Hempstead Intersection Street Former Manufactured Gas Plant Site

Villages of Garden City & Hempstead
Long Island, New York

Prepared for:

KeySpan
175 East Old Country Road
Hicksville, New York 11801

Prepared by:

URS Corporation - New York
77 Goodell Street
Buffalo, New York 14203

November 2007

URS

REMEDIAL ACTION WORK PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET FORMER MGP SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

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This Remedial Action Work Plan (RAWP) describes Interim Remedial Measures (IRM) that KeySpan will be undertaking at the Hempstead Intersection Street Former Manufactured Gas Plant (MGP) Site, prior to implementing a site-wide remediation. The Interim Remedial Measures consist of three primary components listed below that will be implemented in the following sequence:

- Field delineation of MGP source material and installation of non-aqueous phase liquid (NAPL) recovery wells;
- NAPL recovery; and
- IRM soil excavation.

The field delineation of source material will include the taking of additional soil samples and soil borings to precisely define the area in which the Interim Remedial Measures (IRM) soil excavation will take place. The NAPL recovery component will be performed using new wells that will be installed during the field delineation and existing wells (both on-site and off-site wells) to expedite NAPL recovery and to increase the effectiveness of the future site-wide remedy proposed in a Feasibility Study/Remedial Action Plan document under review by the New York State Department of Environmental Conservation (NYSDEC).

The proposed IRM excavation areas were selected for the first phase of remediation for several reasons. These areas generally contain contaminated soil at relatively shallow depths, are located on property owned and controlled by KeySpan, and are above the water table so they can be readily excavated and backfilled. In addition, a primary consideration for the proposed IRM excavation areas is that the IRM work will be the final remediation for these areas and will not require any subsequent remediation in conjunction with the future site-wide deep-soil remedy as these areas are separate from the deep soil contamination areas. The implementation of the IRM will also support future site-wide remediation activities by providing additional areas for construction staging, soil stockpiling, and possible temporary vehicle parking when remediation has been completed in other areas. A temporary containment building will be constructed and moved as necessary to completely

enclose the active areas of excavation. The building will have an air handling/treatment system to mitigate potential air emissions from the work areas. A Community Air Monitoring Program to address air monitoring during IRM soil excavation activities will be developed and approved by the NYSDEC prior to the IRM-related excavation activities.

A Citizen Participation Plan for this work is on file with the NYSDEC and the public document repositories. The public document repositories are located at NYSDEC Regional Offices in Stony Brook, and the public libraries in the Villages of Hempstead and Garden City, New York.

LIST OF ACRONYMS

ACGIH	American Congress of Government Industrial Hygienists
ALJ	Administrative Law Judge
ANSI	American National Standards Institute
AQMP	Air-Quality Monitoring Program ASP - analytical service protocol
ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
AWQC	Ambient Water Quality Criteria
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene and xylenes
BTU	British thermal unit
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbons
C	Centigrade
CAMP	Community Air Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cf	cubic feet
CFR	Code of Federal Regulations
cm/sec	centimeter per second
COC	Chain-of-Custody
COPC	contaminants of potential concern
CPP	Citizen Participation Plan
CPR	cardiopulmonary resuscitation
CQAP	Construction Quality Assurance Plan
CRZ	Contamination Reduction Zone
cy	cubic yard
DAR	Division of Air Resources
DEC	Department of Environmental Conservation
DI	deionized
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DUSR	Data Usability Summary Report
EA	Human Health Exposure Assessment
ECL	Environmental Conservation Law
ECRP	Equipment Contamination Reduction Pad
ELAP	Environmental Laboratory Approval Program
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
*e*V	electron volts
EZ	Exclusion Zone
F	Fahrenheit
FD	field duplicate
FID	flame ionization detector
ft	feet
ft^3	cubic feet
FS/RAP	Feasibility Study/Remedial Action Plan
gal	gallon
gpm	gallons per minute

GC	gas chromatograph
GCS-DN	gas chromatograph station downwind
GCS-UP	gas chromatograph station upwind
GRI	Geosynthetics Research Institute
HASP	Health and Safety Plan
HCN	hydrogen cyanide
HDPE	high density polyethylene
HEPA	high efficiency particulate air
HSM	Health & Safety Manager
H_2S	hydrogen sulfide
IARC	International Agency for Research on Cancer
ID	identification
IDLH	immediately dangerous to life
IRM	Interim Remedial Measures
ISS	in situ solidification
Kg	kilogram
L	liter
L/day	liters per day
LCS	laboratory control samples
LGAC	liquid-phase granular activated carbon
LILCO	Long Island Lighting Co.
LIPA	Long Island Power Authority
LKD	lime kiln dust
LNAPL	light non-aqueous phase liquid
MD	matrix duplicate
MDL	minimum detection limit
mg	milligram
mg/kg	milligram per kilogram
mg/L	milligram per liter
MGP	manufactured gas plant
MMBTU	million British thermal units
MNA	monitored natural attenuation
MS/MSD	matrix spike/matrix spike duplicate
MS/MSD/MD	matrix spike/matrix spike duplicate/matrix duplicate
MSB	matrix spike blank
MSDS	material safety data sheet
MW	monitoring well
NAPL	non-aqueous phase liquid
NCDH	Nassau County Department of Health
NCP	National Contingency Plan
ND	not detected
NEIC	National Enforcement Investigations Center
NIOSH	National Institute for Occupational Safety and Health
NOI	Notice of Intent
NOT	Notice of Termination
NS	no standard
NYCRR	New York Code Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation

NYSDOTSS	New York State Department of Transportation Standard Specifications
O M & M	operation, maintenance, and monitoring
OSHA	Occupational Safety and Health Act or Administration
PAHs	polycyclic aromatic hydrocarbons
PC	personal computer
PCBs	polychlorinated biphenyls
PCRA	Personnel Contamination Reduction Area
PEC	Project Emergency Officer
PEL	permissible exposure limits
PHSC	Project Health and Safety Coordinator
PID	photoionization detector
POTW	Public Owned Treatment Works
PM	Project Manager
ppb	part per billion
PPE	personal protective equipment
ppm	parts per million
ppbv	parts per billion on a volume basis
PQO	project quality objectives
PSA	preliminary site assessment
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
QC	quality control
O&M	operation and maintenance
RAO	remedial action objective
RAP	Remedial Action Plan
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
ROW	right-of-way
RPD	relative percent difference
RSCO	recommended soil cleanup objective
SAP	Sampling and Analysis Plan
SCGs	Standards, Criteria, and Guidance
SB	soil boring
SGC	short-term guideline concentrations
sf	square feet
SHSO	Site Health & Safety Officer
Site	Hempstead Intersection Street Former MGP site
SPL	sound pressure level
SSO	Site Safety Officer
STEL	short-term exposure limits
SVOCs	semi-volatile organic compounds
SW	solid waste
SZ	Support Zone
TAL	target analyte list
T & A	time and activity

TAGM	technical and administrative guidance memorandum
TCL	target compound list
TCLP	toxicity characteristic leachate procedure
TLVs	threshold limit values
TOC	total organic carbon
TOGS	Technical and Operational Guidance Series
TPAHs	total polycyclic aromatic hydrocarbons
TVOCs	total volatile organic compounds
UFPO	Underground Facility Protection Organization
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
URS	URS Corporation – New York
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds
VOA	volatile organic analysis
WBGT	wet bulb globe temperature

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) describes proposed Interim Remedial Measures (IRM) for the Hempstead Intersection Street Former Manufactured Gas Plant (MGP) Site located in the Villages of Hempstead and Garden City, in the Town of Hempstead, Nassau County, Long Island, New York.

This Plan has been prepared by URS Corporation – New York (URS) for KeySpan, which is the current owner of a portion of the project site (as defined below), and a successor company to the utilities that operated the MGP.

This RAWP was completed in accordance with the Order on Consent (#D1-0001-98-11) with the New York State Department of Environmental Conservation (NYSDEC). This RAWP defines the objectives, scope and means of implementation of the IRM. The IRM focuses on field delineation of MGP source material, the recovery of non-aqueous phase liquid (NAPL), and the removal of shallow source material.

This RAWP is accompanied by Drawings and Appendices that help to define and provide greater detail on the proposed IRM such that KeySpan can obtain NYSDEC approval to implement the IRM and solicit bids from remediation contractors to implement the work.

1.1 Site Location and Description

The Hempstead Intersection Street Former MGP Site is located in the Villages of Hempstead and Garden City, Nassau County, New York. See Drawings 1 and 2 for location maps. The majority of the approximately 7.5-acre MGP Site is located within the Village of Garden City and is known as the current KeySpan property. A 0.8-acre parcel of the MGP Site adjacent to, and south of, the current KeySpan property, is within the Village of Hempstead. This parcel is currently used to store vehicles, and is known as the "Sold Property." The Sold Property was previously sold by the Long Island Lighting Company (LILCO – a KeySpan predecessor company) in the early 1980's to an automobile dealer who is the current property owner.

The term "Site" or "MGP Site" as used in this RAWP, includes both the KeySpan property and the Sold Property. The areas outside the MGP Site boundaries that contain source material are considered "off-site" properties. The Medical Office Building parking lot and areas south of the Sold Property generally comprise this latter "off-site" area.

The MGP Site is bordered to the north by Second Street and along the east by an inactive Long Island Railroad right-of-way (LIRR ROW). Property to the west of the MGP Site is owned by the Village of Garden City and contains a public parking lot, two public water supply wells and a recharge basin related to the two wells. The property to the southeast of the MGP Site is owned by Oswego Oil Service Corporation and is an active fuel oil storage and loading facility. The property to the south of the MGP Site is the parking lot for a Medical Office Building.

An active natural gas regulator station is located on the western portion of the KeySpan property. A second automobile dealership currently leases property in the upper northeastern corner of the KeySpan property.

The MGP Site and surrounding area are generally flat, sloping gently to the west and southwest. A perimeter fence secures the KeySpan and Sold Properties. KeySpan property access from the south is through the Sold Property and from the north through a gated fence. The northern two-thirds of the MGP Site, as well as the eastern portion, is unpaved ground covered with either vegetation or crushed stone. The southern third of the MGP Site is paved with asphalt. Limited grass, shrubs and trees serve as a buffer extending across the northern portion of the KeySpan property along Second Street.

The MGP property has multiple zoning classifications ranging from residential to commercial depending on the area and municipality. Properties immediately to the north of the MGP Site across Second Street are zoned for multi-family residential apartment housing. Properties immediately to the east of the MGP Site are zoned as general commercial. The property to the west of the MGP Site is designated parkland. Property to the south of the MGP Site is zoned business "C."

1.2 Site History

MGP operations began in the early 1900's in the southern portion of the Site and expanded north as the demand for gas increased. LILCO acquired the Site in the early 1930's. Following the availability of natural gas in the early 1950's, the Hempstead former MGP served as a peak/emergency facility to ensure gas supply until operations ceased in the mid 1950's. The on-site plant was subsequently demolished by LILCO. In 1998, LILCO merged with Brooklyn Union Gas forming KeySpan Corporation. Following this merger, all but the previously sold automobile dealer property (the Sold Property) became KeySpan property.

A "cut and plug" IRM Program was undertaken at the Site during the winter of 1999. The objective of that IRM was to locate underground piping associated with historic MGP operations so that each pipe could be cut, drained of any fluids and plugged in order to limit the potential for on-going release of MGP residuals from historic structures. That IRM was completed in Summer 2000.

This RAWP addresses a proposed IRM, which includes excavation of shallow source materials in designated areas and recovery of NAPL.

1.3 Waste Materials and Extent of Contamination

Contaminated media identified at the Site include soils, groundwater, and soil gas. Waste that will be encountered during this IRM will include MGP residuals such as coal tar, ash, and slag mixed with fill and/or native soils.

Areas of soil contamination were described in the Final Remedial Investigation (RI) Report based on field observations, and analytical results for total polycyclic aromatic hydrocarbons (PAHs), and total benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations. These locations are shown on Figure 1. Areas of dense NAPL (DNAPL) have been identified at the Site and downgradient areas as illustrated on Figure 2.

Several areas have been identified that contain elevated levels of contamination (i.e., "source material"), which were selected for removal (i.e., excavation) as part of an IRM prior to implementation of a site-wide remedial plan. "Site-Wide" remedy in this RAWP context refers to a future full-scale remediation that will encompass both the MGP Site

properties as well as off-site areas. The proposed IRM excavation areas generally contain contaminated soil at relatively shallow depths, are located on property owned by KeySpan, are above the water table, and can be readily excavated and backfilled. The proposed IRM excavation areas will be the final remediation for these areas and will not require any subsequent remediation in conjunction with the future site-wide deep-soil remedy because these areas are separate from the deep soil contamination areas. The implementation of the IRM excavations will also support future site-wide remediation activities by providing additional areas for construction staging, soil stockpiling, and possible temporary use for vehicle parking while other areas are remediated. Additionally, removal of NAPL as an IRM will support and enhance future site-wide remediation by reducing the amount of NAPL remaining in the soil to be remediated. The locations of remedial work to be performed in this IRM are shown on Drawing 3. Previous investigation locations and boring and/or test pit logs in areas of this IRM are well documented, available from KeySpan and not presented herewith for brevity.

Based on the results from the Remedial Investigation, the potential limits of "source material" were previously defined and the presence of tar-saturated soils were determined through RI field observations, and/or through analysis of soil where total PAHs was greater than 1,000 parts per million (ppm), and/or total BTEX was greater than 50 ppm. This material was defined as "source material" and is indicative of MGP-impacted soils with the greatest potential for affecting groundwater, soil vapor, and for potential direct contact pathways for a construction worker-exposure scenario. The source material delineation is illustrated on Figure 1.

1.4 Previous Investigations and Reports

The November 2006 Final Remedial Investigation Report summarizes all the investigations that were completed for the Site.

2.0 IRM OBJECTIVES AND SCOPE

2.1 IRM Objectives

The overall objective of this IRM is to initiate remediation for the Site by removing shallow source materials and recoverable NAPL without hindering the future site remediation work, or requiring any need to revisit the IRM excavation areas. This overall objective can be described in terms of the following goals and constraints:

- Protection of public health and the environment.
- The IRM will remove the shallow source materials and the recoverable NAPL in designated areas to support future site-wide remediation.
- The IRM methods should be effective.
- The IRM should be implementable given the known Site conditions, such as the current and the potential future Site use, access to the Site and adjacent properties, and presence of utilities.
- IRM activities should be cost-effective within the context of site-wide remediation. The IRM should be coordinated with the future site-wide remediation to avoid duplication of work and limit the costs for such items as mobilization/demobilization, relocation of utilities, and excavation.
- The implementation of the IRM should not preclude, hinder or limit further remediation at the Site.
- The IRM areas should be targeted for providing necessary space needed for future equipment/materials lay down and temporary parking during the future Site remediation work.

2.2 IRM Scope

This Section presents the scope of work to be implemented for this IRM.

2.2.1 IRM Delineation

An IRM delineation, including the following tasks, will be performed to help provide the basis for an efficient and effective IRM:

- **Site Survey** –A detailed survey, including the establishment of Site survey controls and topographic mapping, will be conducted at the MGP Site and off-site areas that are expected to be the subject of site-wide remediation. As part of this survey, URS will review with KeySpan the locations of known utilities within IRM investigation and/or construction areas. KeySpan will provide field mark-out of on-site utilities, that the URS survey will document. The locations of utilities outside the KeySpan property will be evaluated in conjunction with the IRM activities (drilling and well installation) for the following areas:
    - Medical Office Building parking lot
    - Intersection Street (section contiguous with the Site)
    - Long Island Railroad right-of-way (section contiguous with the Site)

  Utility locations at these areas will be evaluated using one or more of the following methods:

    - Inspection of public records and historic Sanborn Maps (on site and off site)
    - Geophysical surveying using electromagnetic techniques and ground-penetrating radar (on site and off site)
    - One-Call utility mark-out (in public right-of-way)

  The locations of underground utilities at other areas off the KeySpan property will be evaluated further prior to implementing the future full-scale remediation.

- **Delineation and Waste Characterization** - This program will provide advanced delineation of soil source material such that excavation and shoring limits can be determined, accurate soil volumes can be estimated, and post-excavation soil sampling related to soil source delineation can be eliminated. The intent of the soil characterization effort is to provide sufficient waste characterization data that is representative of the anticipated soil excavation volume. This waste characterization data will be used to obtain acceptance approval from the off-site waste treatment (i.e., thermal desorption) facility(ies) to minimize the need for temporary on-site stockpiling of excavated material.

Delineation and waste characterization of the shallow source material will be performed by means of soil borings, sampling, and analytical testing.

As part of the proposed IRM delineation, monitoring wells will be installed off of the MGP Site near the Oswego Oil Service Corporation (Oswego Oil) property. These wells will be used for investigating non-MGP NAPL impacts in this area, and soil samples will be collected for forensic analysis to determine if impacts to this area are MGP-related, or related to non-MGP operations. Additionally, if NAPL is not present in these wells, groundwater samples from these wells will be tested for Target Compound List/Target Analyte List (TCL/TAL) parameters. This data will be used to determine the extent of MGP-related impacts in relationship to the non-MGP related impacts.

An IRM Delineation Work Plan (DWP) has been prepared as Appendix A to this document. The IRM delineation is scheduled to start in 2007. The results of the IRM delineation will be evaluated and incorporated into the design of the IRM as appropriate.

For the IRM delineation and implementation, the actual limits of excavation will be based on a visual criteria as described below. This visual approach was approved via NYSDEC's November 19, 2007 letter responding to KeySpan's November 7, 2007 IRM Work Plan comment response letter. However, NYSDEC requested that post excavation sampling be performed in accordance with DER-10 to document the post remediation soil concentrations remaining after completing the remediation in these areas. Following is the visual criteria for determining the actual limits of excavation:

- Soils exhibiting a petroleum-like sheen will be excavated;
- Soils exhibiting coal tar staining (typically black or brown staining) with or without a naphthalene-like odor will be excavated if they exhibit a sheen when tested with a jar shake test.
- Soils exhibiting a coal tar odor only, or odor and minor staining and no sheens will not be excavated.
- Below a depth of 8 feet bgs, when the total aggregate vertical thickness of visible impacts of sheens and staining and/or residual NAPL in soils is less than 6 inches, the excavation in that horizontal direction will be terminated. This avoids "chasing" thin seams of residual impact that pose little threat to

groundwater, are well below excavation depths for future utility work, and would otherwise require excavation of significant volumes of clean overburden in order to chase these seams.

2.2.2 IRM Components

This IRM will include two major components:

- Installation of 24 new NAPL recovery wells. NAPL will be removed from these wells and from specified existing monitoring wells monthly (or more frequently depending on the quantity of NAPL produced and rate of NAPL recovery in the well). The NAPL will be appropriately disposed of off-site. The duration of NAPL recovery will be based on periodic evaluations of the effectiveness of the NAPL recovery. It is anticipated that NAPL monitoring and recovery will continue up to the start of the future site-wide remediation (depending on NAPL recovery rates).
- Excavation and off-site disposal of the shallow source material (generally expected to be approximately 8 feet below grade; though locally to depths of about 24 feet below grade) from areas in the central portion of the Site that are east of the Natural Gas Regulator Station. A temporary containment building will be constructed and moved as necessary to completely enclose the active areas of excavation. The building will have an air handling/treatment system to mitigate the potential impact of the excavation activities on the air quality of the surrounding areas. The excavated source materials will be appropriately disposed of off-site at an approved thermal desorption facility. Excavation areas will be restored to pre-existing grades with clean backfill, topsoil, and vegetation.

Section 4 of this RAWP details the IRM activities.

3.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITY

KeySpan and New York State regulatory agencies will coordinate together on the implementation of the IRM. KeySpan has the ultimate responsibility for implementing this RAWP for the project. NYSDEC and New York State Department of Health (NYSDOH) personnel will periodically visit the project site and provide regulatory oversight.

KeySpan will be responsible for ensuring that all on-site IRM construction operations are performed per the RAWP. KeySpan will manage all communication with regulatory agencies and with members of the surrounding community. The Citizen Participation Plan (CPP) for sharing project information with the community is available at NYSDEC offices and the three document public repositories for the Site.

The IRM Contractor will be selected by KeySpan to perform the following components of the IRM: delineation of IRM excavation areas, installation of the recovery wells, and excavation of the shallow source materials. Separate prime contractors will be used for these components. For simplicity, only a single "IRM Contractor" will be referred to in this RAWP.

Many of the details of the IRM construction (e.g., the size and design of the temporary containment building, the shoring of certain portions of the excavation) will be sized, proposed, designed, or otherwise developed by the IRM Contractor. All such details are specified herein to be "submitted" and/or "approved" prior to performance of the work. The review and approval of such details will be by KeySpan or its Construction QA personnel (described in the Construction Quality Assurance Plan contained in Appendix B).

Key personnel and their assigned responsibilities for implementation of the remedial design include:

NYSDEC: Amen M. Omorogbe, P.E.
Project Manager
NYSDEC – Div. of Environmental Remediation
625 Broadway
Albany, New York 12233-7013
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NYSDOH
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Or 1-800-458-1158 ext. 27880
E-mail: spm03@health.state.ny.us

KeySpan: Patrick Van Rossem
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Nassau County Department of Health:
Robert Weitzman, P.E.
NCDH
240 Old Country Rd.
Mineola, New York 11501
Phone: (516) 571-4931
E-mail: Robert.Weitzman@hhsnassaucountyny.us

Construction QA:

To be selected by KeySpan.

IRM Contractor:

To be selected by KeySpan after NYSDEC approval of the RAWP.

4.0 IRM DESIGN

4.1 General

The following sections detail the design and procedures for the IRM implementation following the completion of the IRM Delineation. The IRM includes three primary components: 1) delineation of IRM excavation areas and installation of new recovery wells, 2) product recovery, and 3) the IRM excavations with off-site disposal of source materials. The work defined in this section will be performed by the IRM Contractor prior to completing the IRM excavation areas except as otherwise noted.

The required IRM work is specified in this section of the RAWP with work limits shown on Figure 3 and on the attached drawings. All work will be performed in accordance with the requirements of this section, and with the appropriate provisions of the Appendices of this RAWP (whether or not they are specifically referenced in the following sections).

4.1.1 Mobilization

Preliminary work that will be performed by the IRM Contractor prior to soil excavation activities will include, at a minimum, the following:

- Establishment of surface water controls, traffic controls, and air monitoring systems.
- Construction of site support facilities, including the trailers, utilities, fencing and site control measures, and contamination reduction zone.
- Stake-out of existing utilities in work areas, and submittal of a Utility Protection Plan. Close coordination with KeySpan (or its designee) is imperative for this work item.
- Submittal of the other required plans and details required to perform the work specified in Sections 4.2 and 4.3.
- Most key IRM construction submittals will be combined into a master Construction Operations Plan (COP) as described below.

- Pre-clearing of all subsurface utilities within all areas of proposed well installation, excavation, and shoring structures. For utility clearance criteria, refer to the Sampling and Analysis Plan (SAP) that is contained in the DWP.

The IRM Contractor will provide temporary office trailers for its own use; and three other trailers for KeySpan including: one for KeySpan, one for KeySpan consultants, and one for NYSDEC/NYSDOH personnel. The KeySpan trailer will have a separate meeting room, and all trailers will have an office area with phone, electric, and high-speed internet service. KeySpan will approve the trailers, proposed utilities, and their locations. Monthly and annual rates will be obtained as these trailers may also be used during the RAP implementation

Construction Operations Plan: The COP will be submitted by the Contractor to KeySpan for review/approval shortly after the IRM construction contract is awarded, and NYSDEC approvals are required as noted below, before the IRM excavations can begin. To facilitate efficient construction scheduling and progress, the COP must be submitted within 3 weeks of contract execution and allow for a minimum of 3 weeks of KeySpan and 3 weeks NYSDEC review time. The COP must clearly illustrate the Contractor's proposed means, methods, sequencing, and any other information required by this RAWP and to complete the work. At a minimum, the COP shall describe or contain the following items:

- Resumes of all personnel proposed on site including health and safety training certificates and medical clearances.
- Community Air Monitoring Plan (CAMP) – A KeySpan approved consultant will be required to prepare the CAMP in accordance with the minimum requirements set forth in Section 5.0 of this RAWP.
- HASP - Contractor's HASP to be consistent with the RAWP HASP, and adequately address worker safety.
- Amendments – Any necessary amendments to the CAMP, HASP, Construction Quality Assurance Plan (CQAP), Solid and/or Liquid Waste Transportation Plan, and Contingency Plan.
- Detailed Construction Schedule.

- Disposal Facilities – Proposed disposal facilities for excavated soil based on the list provided in Section 4.3.9, any other debris, cleared vegetation, and miscellaneous construction debris, etc.
- Quality Control (QC) Procedures.
- Mobilization and Site Preparation – Include details about office trailers, utility hook-ups, decontamination facilities, staging areas, management of construction water, and a map of temporary facilities, truck access routes and ingress/egress points.
- Demolition Procedures – Necessary should surficial or subsurface structures be encountered. Include method to remove, downsize, and transport. An option for recycling concrete should be provided for crushing and placement on-site.
- Utility Protection Plan - Method to expose, protect and support utilities with special attention paid to KeySpan's Natural Gas Regulator Station, gas lines, and shoring during excavation around such features. In addition to this plan, the Contractor will provide an alternate per foot price option for removal of the 16 inch diameter natural gas piping in the A/B/C excavation areas based on an assumption that the gas piping could be decommissioned by KeySpan in advance of the work (an option price deduction shall also be provided for the avoided cost of working around the gas lines in the case of KeySpan selecting this option).
- Noise Mitigation Plan – Method to control and prevent excessive noise levels.
- Underground Storage Tank (UST) Closure Plan – Provide a work plan that describes the procedures that will be in place should a UST (and/or piping) be encountered. Petroleum products are not expected to be encountered during the IRM. However, the Contractor's work plan shall address procedures to characterize the waste, pump out large volumes of fluids/coal tar if large vessels are encountered, etc. At a minimum, the plan must address spill prevention, any exploratory excavations to identify the extent of the tank, tank cleaning, tank removal, transport/disposal, and must adhere to all applicable regulations.
- Excavation and Backfill Plan – Describe construction and sequencing including excavation, backfill, compaction, topsoil, and temporary containment building

and air handling system. Illustrate each movement of containment building and method to place and compact backfill in each excavation. Include temporary stockpiling for waste characterization and possible re-use of excavated soil that would be acceptable as backfill. Include special consideration for construction and coordination with affected owners adjacent to the Natural Gas Regulator Station and along the inactive LIRR ROW. Identify any existing fencing that will be removed, dismantled or replaced and method to coordinate with any overhead utilities on or near the site.

- Coordinate Access Agreement with LIRR – In conjunction with KeySpan so that the temporary containment building can be installed adjacent to or within LIRR property.
- Methods for bulking soils that are discovered to be too wet to transport in their natural state.
- Temporary Containment Building and Air Handling System – Include relevant specifications, plan and cross section, and site layout showing these facilities. Include design calculations stamped by New York State Professional Engineer (PE). Include any manufacturer recommended inspection and maintenance requirements for proper use and care of the facilities, including filter media change-outs.
- Excavation Shoring and Bracing Calculations – New York State PE-stamped design calculations to demonstrate sidewall support for each case where structural sidewall support or slope cutback is necessary.
- Stockpile Management Procedures – Method to manage and cover stockpiles that may occur outside of containment building.
- Backfill source in accordance with NYSDEC Part 375 residential standards including certifications, MSDS sheets and analytical data.
- List of proposed subcontractors.
- Erosion and Sedimentation Control Plan.
- List of proposed construction equipment and estimated volume of trucks per day.

- Site security plan and methods.

4.1.2 Control of Contaminated Materials

The Site will be controlled to reduce the possibility of contact with contaminants and the removal of contaminants by personnel or equipment leaving the Site. Work zones will be established on Site where prescribed operations occur. Access control points will be used to limit the movement of personnel and equipment between zones and onto the site. Work zones to be maintained during remedial operations are discussed below.

Exclusion Zone - The Exclusion Zone (EZ) is the active work area surrounding an excavation and any soil/sediment stockpile(s).

Contamination Reduction Zone - The Contamination Reduction Zone (CRZ) is to be located immediately outside the EZ and will be used as a primary decontamination area for equipment and personnel. The CRZ will be established at a minimum distance of three feet outside of the EZ. Orange barricade fencing will be used to delineate the CRZ perimeter.

An equipment decontamination pad, with a minimum size of 20 feet by 40 feet, will be constructed and maintained inside the CRZ. The equipment decontamination pad will be constructed as follows:

- The existing ground will be graded and compacted as required; medium sand (NYSDOTSS, Section 703-03 Mortar Sand) will be placed over the proposed area.
- 10-inch by 10-inch timbers, held in place by #5 rebar, will be placed around the perimeter and sand will be bermed around the inside of the timbers to protect an overlying polyethylene liner.
- A 30-mil high density polyethylene liner will be placed over the sand and timbers and secured by nailing wooden battens on the outside of the timbers. The liner will meet the requirements of GRI GM13.
- Two inches of medium sand will be placed over the liner.

- A sump will be constructed at the lowest area using a slotted PVC pipe and set in stone to collect water; remaining area within the timbers will be filled with coarse stone (NYSDOTSS Table 703-4, Size 3, including 0 to 0.7 percent passing No. 200 sieve).
- Earthen or stone ramps will be constructed to allow equipment to drive onto the pad.

A high-pressure washer will be used in this area to clean vehicles and equipment of any contaminated soil that may be adhering to them. A submersible pump will be placed in the sump to transfer (via hose) any collected water to a frac tank. The equipment decontamination pad will be covered with polyethylene sheeting when not in use. The sheeting will be secured with sandbags. At the completion of this work, sand, stone and sediment inside the pad will be sampled, analyzed and properly disposed at a permitted facility.

The personnel contamination reduction area will consist of a portable enclosure positioned near the vehicle parking area and construction office trailers. All personnel will pass through the contamination reduction area when leaving the work zone. It will be a two-stage area constructed on a single sheet of polyethylene that can withstand the expected overlying features and foot traffic. Stage 1 will contain a boot washtub with solution of detergent, a second boot washtub with rinse water and a long-handle brush. Stage 2 will contain a hand washtub with solution of detergent, and a second washtub with rinse water and towels. Polyethylene bags will be available for disposal of Tyvek® suits, gloves, paper hand towels, etc.

Support Zone - The support zone will consist of all site areas that are outside the EZ and CRZ. The support zone will accommodate construction office trailers, a temporary water treatment system, contractor lay down area, vehicle parking, access road, and ancillary support facilities.

4.2 Installation and Operation of NAPL Recovery Wells

4.2.1 Scope

The goal of the NAPL recovery is to reduce the recoverable NAPL volume present and further reduce any potential for migration. Removal of NAPL will support future site-wide source control remediation, however, it is not critical to the success of the site-wide remedy to remove all recoverable NAPL.

The IRM includes the installation of 24 new product recovery wells within areas targeted for possible NAPL recovery (along with existing wells identified on Figure 3) to collect recoverable NAPL. The IRM Contractor will perform well installation. The wells will be operated subsequently by another KeySpan contractor.

Off-site Wells: To minimize community and logistical concerns, the following sequence of activities for the installation of NAPL recovery wells and any potential appurtenances in the Medical Office Building parking lot will be observed:

- In order to optimize proposed well locations and depths, the NAPL recovery wells will be installed based on inspection of split-spoon samples collected prior to installing the wells and by using a phased approach, with approximately one-half of the wells installed during an initial phase. This would be followed by a brief assessment period during which the NAPL yield would be evaluated. Afterwards, some of the remaining well installation locations may be adjusted based on soil boring data and NAPL yield.
- The need for subsurface NAPL recovery infrastructure such as transfer piping will be evaluated after NAPL recovery rates are determined.
- While there has not been an issue with the potential concern for vapor emissions during NAPL recovery operations, the work activities will be modified if vapor monitoring or HCN levels approach action levels at the exclusion zone boundary. If the work activities cannot be modified to reduce emissions below the action levels, off hours work would then be considered.

4.2.2 Well Locations

The proposed new recovery wells (designated IPR-XX) will be installed at the locations shown on the drawings, within the NAPL plume. Thirteen of the wells are proposed on the former MGP Site, and eleven wells are proposed south of the Site including the Medical Office Building parking lot. An access agreement is required for any work on off-site properties including the Sold Property and the Medical Office Building, to allow the well installation. The terms of the agreements will be provided separately to the IRM Contractor.

Some of the recovery wells may be installed along or within roadways. In such cases, the IRM Contractor will obtain a permit from the relevant authority or agency for installation of the proposed recovery wells and any other work in those locations.

Existing utilities and facilities may affect the planned locations of proposed wells. Therefore, a detailed utility search will be performed and any revised well locations from the established drawings will require KeySpan's approval.

4.2.3 Well Construction

A detail of the proposed recovery wells is shown on Drawing 6. The recovery wells will be installed using hollow-stem augers in the same general manner as the monitoring wells installed during the IRM Delineation; that procedure is detailed in the SAP that is included as an Attachment to the IRM DWP (Appendix A).

The wells will be constructed as follows:

- The wells will have a 6-inch diameter PVC riser and well screen.
- It is expected that the water table will be at a depth of about 30 feet. The bottom of each well screen will extend a minimum of 10 feet into the water table. The screen will span the zone of soil where NAPL is encountered plus an additional 5 feet below that zone. Below the screen there will be a solid sump pipe 5 feet long. Actual screen lengths and well depths will be determined in the field by analyzing the split-spoon samples recorded at the time of well installation. Any significant discrepancy in elevation found in the field will require coordination

with KeySpan to establish the required well depth. Approximate well depths and screen lengths are included on the table provided on Drawing 3.

- The screen slot size and sand pack is based on review of existing site soils data and may be revised based on observations made during the IRM delineation drilling program. A maximum slot size of 0.020 inch will be typically used. A 0.010 inch slot size will be considered if finer grained soils are observed during drilling.
- Each well will be accessed through a flush-mounted road box to be installed at each well.
- If it is determined that the potential recovery of NAPL from a well(s) warrants the installation of a dedicated product recovery pump, the flush mounted road box will be removed and the wellhead reconstructed with a subsurface, pre-cast concrete chamber, approximately 4-foot square by 4-foot deep, complete with a flush-mounted, water-tight, lockable manhole cover designed to accommodate H-20 loading. In such cases, the well would then be equipped with a Blackhawk Technology Company pump such as Anchor Electric Piston Pump, Model 101E, or equal.

4.2.4 Waste Management

Cuttings and contaminated waste generated during well installation will be temporarily containerized prior to proper characterization and off-site disposal based on KeySpan review.

4.2.5 Well Operation

After installation, the product recovery wells (the newly-installed recovery wells and existing monitoring wells that will be used to recover product) will be operated by KeySpan using a separate contractor. Initially, NAPL is planned to be removed from the wells on a regular basis (e.g., once per month). However, the frequency of NAPL recovery operations will be adjusted based on the observed rate of NAPL recovery in the wells. NAPL will be removed from the new wells either via a portable pump brought to each well location (or hand-bailed) or by using the dedicated piston pumps described above. The collected NAPL will be stored in a portable container, such as a 55-gallon drum, temporary tank, or frac tank.

All liquid (i.e., NAPL and water) collected during each NAPL recovery event will be containerized for proper off-site disposal in accordance with Sections 4.3.8 and 4.3.9.

4.3 Shallow Source Material Excavation and Off-Site Disposal

4.3.1 Scope

Another component of the IRM is the excavation of the shallow source material located in the central portion of the MGP Site. The excavation component of the IRM is comprised of several separate elements, as follows:

- Surface clearing of any woody vegetation in areas to be excavated. Disposal of the cleared material off-site.
- Identifying and clearing utilities, including planning for utility protection, support, etc.
- Erection, and movement as needed, of a temporary containment building over all areas to be excavated.
- Installation of an air handling system to provide a safe working atmosphere within the temporary building and to control odors and vapors from entering the surrounding area.
- Removal and/or protection of existing monitoring wells. After the IRM field delineation work is completed then a refined delineation of the required excavation limits will be established and the disposition of any existing wells within the anticipated excavation areas will be provided to the prospective bidders.
- Installation of a shoring system for the easternmost and westernmost limits of excavation and for areas of deepest excavations (i.e., those that exceed about 8 feet).
- Excavation of shallow source materials to the limits shown on the drawings, as refined by the IRM delineation results, in accordance with the visual criteria identified in Section 2.2.1.

- Segregation of excavated material based on visual observation (i.e., material that can be reused as backfill and material requiring off-site treatment and disposal).
- If necessary, collection and laboratory analysis of post-excavation samples for waste characterization that the waste disposal facility may require. Perform post-excavation sampling in accordance with DER-10 to document the post-remediation soil concentrations remaining after final excavation limits are reached.
- Temporary stockpiling of the excavated source materials, if necessary, within the temporary building and covering such stockpiles if the building is moved prior to stockpile removal
- Loading of the excavated source materials into trucks and transportation of the excavated source materials to, and disposal at, one of the disposal facilities identified in this RAWP.
- Backfill and restoration of the excavation areas.
- Demobilization from the Site.

Each of these elements is discussed in the following sections.

4.3.2 Excavation Limits

The limits of excavation proposed for this IRM have been preliminarily established as shown on Drawing No. 3 by data presented in the RI, and will be refined by the data which will be obtained in the IRM delineation. The extent of excavation (vertical and horizontal) will be further refined in the field during excavation, based on visual evidence (except at the edges of the excavation that are braced, as described in Section 4.3.4). Post-excavation samples may be obtained as described in Section 4.3.7 to characterize the soil for the waste disposal facility, but only if the excavated soil does not appear to be represented by the soil samples tested during the IRM delineation.

4.3.3 Protection of Utilities

Existing utilities in the excavation areas are shown on Drawing 4, based on information from KeySpan's records. The locations are approximate; other utilities that

could be present are not shown. The IRM Contractor will be responsible for locating and protecting all utilities during all IRM work. The IRM Contractor will exercise all reasonable care during excavation to protect the utilities, equipment, and workers. To this end, the IRM Contractor will develop a Utility Protection Plan for KeySpan's review and approval. The Plan will detail the means and methods that the IRM Contractor will employ to protect the utilities shown on Drawing 4, and to protect any others that may be found.

4.3.4 Shored Excavation

As shown on Drawing No. 6, the excavation will need to be shored in several locations: along the western edge of excavation Area A, which abuts the Natural Gas Regulator Station; along the eastern edge of Areas E and F, which abuts the inactive LIRR ROW; and in locations in which the depth of excavation becomes significantly deeper than about 8 feet (i.e., in Areas C and E). The IRM Contractor may propose to use sheeting or other shoring, supplemented by cribbing support for example, to protect utilities within the excavation areas.

At none of the shored boundary locations will the source material be excavated with a sloped sidewall. Shored areas will be excavated vertically adjacent to the shoring. In the areas of deeper excavation (e.g., 16 to 24-foot depths), the shoring is required to minimize the volume of over-excavation that would otherwise occur with an open cut.

The selection and design of the method(s) of shoring will be determined and proposed by the IRM Contractor. As per standard practice, the shoring will be designed and stamped by a New York State licensed professional engineer working for the IRM Contractor. KeySpan will review the proposed shoring method only for general conformance with the project requirements, and will rely on the IRM Contractor's expertise for the shoring. Logs and location maps for previous site investigations will be provided by KeySpan to contractors bidding on the IRM work, to aide in shoring design.

4.3.5 Temporary Containment Building

Because volatile organic compounds (VOCs) and odors will be released during excavation, a temporary containment building of a "Sprung Structure" type (or equal) will be installed over each excavation area prior to start-up of excavation operations in that area.

The building will have an air handling system to prevent the discharge of odors and VOCs to the surrounding community.

The selection and design of the building, its air handling system, and the sequence of excavation operations will be determined by the IRM Contractor, and approved by KeySpan. To expedite construction, the building will be moved via temporary means between excavation areas after an excavation area has been satisfactorily backfilled to completion.

The area in which the building is to be erected will be cleared of woody vegetation. The cleared vegetation will be stockpiled separately in a clean area and disposed off-site at a location selected by the IRM Contractor and approved by KeySpan.

All excavated source material will be loaded onto waste hauling trucks. Waste hauling trucks will be loaded inside of the building, and will enter and exit through one or both ends of the building. After excavation of an area is completed and the area completely backfilled, the building will be moved to cover the next excavation area. The IRM Contractor will propose the sequence of excavation.

The building is expected to be located partially on the unused LIRR ROW (pending access agreement) and in the area of the Natural Gas Regulator Station, as necessary to cover the shored edges of the excavations that abut those areas (see Section 4.3.4). The IRM Contractor will coordinate with KeySpan to determine if the existing fence on the east side of the Natural Gas Regulator Station may be temporarily dismantled to accommodate the temporary building encroachment; or if the temporary building and excavation must be offset. About 5 to 10 feet of offset from the fence may be necessary.

The temporary building will completely cover any active excavation area. For those proposed excavation areas that are larger than the proposed building, the source material will be excavated and backfilled in stages, with the building covering that stage of excavation and backfill, and then moved as needed from stage to stage.

4.3.5.1 Design Standards

The IRM Contractor will be responsible for ensuring that the design of the building and air handling system are in conformance with all applicable codes and regulations. This will support building permit acquisition by the Contractor following approval by NYSDEC.

4.3.5.2 Air Handling System

The air handling system of the temporary building will be designed to accomplish two primary objectives:

- To maintain a safe working atmosphere within the building by pulling in fresh air and by removing soot, dust, carbon monoxide and other contaminants. The requirements for work-zone air quality specified in the IRM Contractor's HASP will be enforced within the building. The volume of air within the building will be turned over approximately 4 to 5 times every hour.
- To clean the exhaust from the air handling system of dust, VOCs and odors. The air handling system will be equipped, at a minimum, with carbon filters and inline particulate filters which will remove dust and thereby minimize the potential for "blinding" of the carbon units. The exhaust stack of the system will discharge at least 10 feet above the ground and be directed away from all personnel and/or equipment. The performance of the filters on the air handling system will be monitored relative to air quality at the site perimeter.

In addition to the air handling system, the IRM Contractor may also be required to use odor suppressants and foams to mitigate odors and VOC concentrations, vent vehicle exhaust gases directly out of the temporary building with hoses, and put workers in various types of respiratory protection. These measures must be readily available and implemented without delaying the work. Monitoring of air within the structure, as well as these and other mitigation measures will be required to be addressed in the IRM Contractor's HASP.

4.3.6 Excavation

Source material will be excavated within the temporary building within the pre-defined limits of IRM excavation. All excavation equipment will be kept within the building during the work and will be decontaminated (steam cleaned) outside of the building within the CRZ.

Excavation sidewalls will be sloped to facilitate visual confirmation of source material limits except, as noted in Section 4.3.4, along the easternmost and westernmost limits of the IRM excavation work zone and in the (preliminary identified) areas of deeper

excavation that will be shored. All excavations will be in accordance with all applicable rules and regulations including OSHA standards (29 CFR 1926 Subpart P).

The excavation will be performed to the proposed limits shown on the drawings, unless there is further visual evidence of source material (as defined in Section 2.2.1) requiring removal on the exposed/unshored sidewalls or the floor of the excavation.

Source materials will typically be loaded directly onto lined trucks for transportation and disposal. Temporary stockpiling/staging such materials may be required, however, in the event any waste characterization sampling is required or haul trucks temporarily cannot accommodate the excavation rate. The soils to be excavated will be above the water table so no drainage from the excavated and stockpiled soil is anticipated. Staging the source materials for further sampling should be minimal because extensive, and possibly complete, waste characterization analyses for the anticipated excavation volume will be performed during the IRM delineation phase of the project. If the IRM Contractor is required to construct a staging area, however, it will be constructed within the building and either moved or covered when the building is moved. Any temporary stockpiles of excavated materials placed outside of the temporary building will be covered to minimize any fugitive dust emissions and the release of VOC vapors.

Polyethylene sheeting or other suitable material will be placed between the excavation and the truck to retain any spilled material. If necessary to maintain an efficient and clear pathway with no contamination impact to personnel, such spillage will be placed back into the excavation following completion of loading of each truck.

Groundwater is not expected to be present in significant quantity during excavation, based on documented soil types and hydrogeologic conditions. The Contractor should propose contingency methods for reducing moisture in removed soils in case this becomes necessary. Stormwater will be prevented from entering the excavations by the temporary enclosure, shoring, regrading, and by surface water diversion berms or ditches that the IRM Contractor will construct to divert runoff away from the excavation.

4.3.7 Established Limits of Source Material

The horizontal and vertical limits of IRM excavation have been preliminarily determined by several rounds of sampling and investigation, and will be further delineated by the drilling program to be implemented as part of the IRM delineation. The NYSDEC accepted visual and field screening methods for determining the limits of source material removal. The visual criteria to be applied are defined in Section 2.2.1

If visual inspection of proposed excavation limits indicates remaining source material above the visual criteria for the excavation sidewall (except at shored areas) or floor/bottom, then the portion of the sidewall or floor represented by the visual confirmation of source material will be excavated an additional one foot, and subsequently reinspected.

4.3.8 Source Material Transportation

Loading and transportation of the source material is described and specified in the Solid and/or Liquid Waste Transportation Plan contained in Appendix C.

4.3.9 Off-Site Treatment and Disposal

Excavated source materials will be transported to an approved facility. The following thermal treatment facilities have been identified for this project:

- Environmental Soil Management (ESMI) of New Jersey
  75 Crows Mill Road
  Keasbey, NJ 08832
  Phone: (732) 738-6000
  NJDEP # 1225001522

- Clean Earth Philadelphia
  3201 South 61st Street
  Philadelphia, PA 19153-3592
  Phone: (215) 724-5520
  Permit # 301220

- Clean Earth of Southeast Pennsylvania
  7 Steel Road East
  Morrisville, PA 19067
  Phone (215) 428-1700
  Permit # 301254

- Clean Earth of Delaware
  94 Pyles Lane
  New Castle, DE 19720
  Phone: (302) 739-9403
  Permit # SW 95/07

- Casie Protank
  3209 North Mill Road
  Vineland, NJ 08360
  Phone (856) 696-4401
  Permit # Class B CBG030002 (former # 0614001450)

4.3.10 Site Restoration

Areas disturbed by IRM activities including those outside of the excavation areas will be restored to pre-existing grades and conditions. Pre-existing surface water flow patterns will be re-established. Any fences, roads, sidewalks, or other non-KeySpan infrastructure that have been disturbed by the IRM Contractor will be restored by the IRM Contractor in accordance with the design and construction standards of the relevant authority or agency. Should any disturbance of the fence around the Natural Gas Regulator Station occur, the fence will be restored as soon as possible after the disturbance is completed.

After a record survey of the excavation vertical and horizontal limits, the excavation areas will be backfilled in one-foot lifts with clean, compacted soil that is of a granular non-cohesive nature, and returned to pre-existing grades. Backfill placed less than 8 feet below grade will be compacted to 95 percent of its maximum dry density as determined by ASTM D698. The backfill, and the compaction equipment and methodology, will be submitted by the Contractor for KeySpan approval.

Borrow soil for backfilling will be considered “clean” if it meets the NYSDEC Part 375 regulations consistent with the intended end use of the Site. For estimating purposes the Contractor should assume the backfill needs to meet Part 375 residential backfill criteria.

The upper 6 inches of the backfilled excavation areas will be covered with topsoil and vegetated in accordance with the New York State Standards for Permanent Critical Area Plantings (contained in the New York State Standards for Soil Erosion and Sediment Control). If the season is not appropriate for seeding, as defined in those Standards, the

topsoil will be stabilized in accordance with the Standards for Temporary Critical Area Plantings.

4.3.11 Noise

The Contractor is responsible for minimizing the level of noise created by the Site work and the air handling system for the surrounding community, and to prevent any unsafe work atmosphere due to noise. The IRM Contractor will be required to attenuate the noise via temporary foam panels, enclosures, or other means as necessary to minimize community impact.

The bulk of the remedial excavation work will be performed within the temporary structure that will dampen sound. The Contractor's COP will be required to address general noise mitigation. Any pertinent noise ordinances are applicable including the Village of Garden City and Hempstead noise ordinances.. To ensure minimal noise levels, the Contractor's equipment shall be functioning properly to reduce noise levels and idling of trucks shall be minimized.

4.4 Permits

The following is a minimum list of the permits required for the work described in this RAWP:

- **Building Permits**: This would be required for the temporary containment building, from the Village of Garden City (and Village of Hempstead if IRM excavation Area F "moves" to the village line). Both villages indicated that permits should be obtainable within 3 weeks of the villages receiving suitable and complete construction plans and permit application from the Contractor. The Contractor is responsible for obtaining these permits in a timely manner to support the schedule.
- **Street Opening and Sidewalk Permit**s: For well installation, the Contractor will obtain these.
- **Utilities Permit:** Electrical permit obtained by the Contractor for bringing electrical on-site/tap-in. A plumbing permit is not expected to be required since it is not expected that the Contractor needs to tap in to a public water supply.

- **DPW Permit for Traffic Control:** Any work that requires traffic control like well installation in/along roads would require the Contractor to obtain such permit from the local Department of Public Works.
- **NYSDEC Solid Waste Haulers Permit:** All trucks used to move soil from the site will be required to have the permit number on the side of the trucks. The Contractor will obtain such permits.

  Additionally, waste profile sheets shall be approved by the disposal facility and the local/state Regulatory authority. Copies of the approved waste profile sheets must be on file prior to shipping any wastes. The profile number should be included on each manifest/bill of lading.

4.5 Documentation of Site Activities

KeySpan's proposed approach to inspection, sampling, testing, and record keeping is detailed in the Construction Quality Assurance Plan in Appendix B.

5.0 COMMUNITY AIR MONITORING PLAN (CAMP)

5.1 Overview

Community air monitoring will be performed to provide direct measurement of total volatile organic compounds (TVOCs), respirable particulate (PM-10), hydrogen cyanide (HCN), and hydrogen sulfide (H_2S) that may be observed during IRM activities at the Site. Real-time air monitoring data will be used to guide actions that may be required to reduce air emissions to acceptable levels.

Two separate Community Air Monitoring Plans (CAMPs) will be implemented as described below:

- Community air monitoring during drilling and well installation, soil and groundwater sampling, and NAPL collection activities. Appendix E provides details of the CAMP for these activities.
- Community air monitoring during IRM soil excavation activities. A CAMP for these activities will be developed that meets the requirements specified in NYSDEC *Draft DER-10 Technical Guidance for Site Investigation and Remediation* (NYSDEC 2002) and follows procedures and specifications that have been used by KeySpan at other MGP remediation sites on Long Island, New York. The CAMP will incorporate an integrated real-time monitoring system for TVOCs and respirable particulate matter using fixed stations located at the Site perimeter, meteorological monitoring, and background sampling. Walk-around perimeter monitoring will also be performed for TVOCs, particulate, HCN, and H_2S. The CAMP will be prepared by a KeySpan consultant and provided in the COP.

5.2 Work Zone Air Monitoring

Air quality within the work zone will be implemented by the IRM Contractor to ensure worker health and safety in accordance with the requirements of 29 CFR Part 1910.120. Details of the monitoring program will be included in a separate project HASP that will be prepared by the IRM Contractor and submitted to KeySpan for approval.

6.0 REFERENCES

American Society of Testing and Materials, s*tandard specifications*, various dates.

Geosynthetic Research Institute, *Standard Specifications, Drexel University*, various dates.

New York State Department of Environmental Conservation, *Draft DER-10 Technical Guidance for Site Investigation and Remediation,* December 2002.

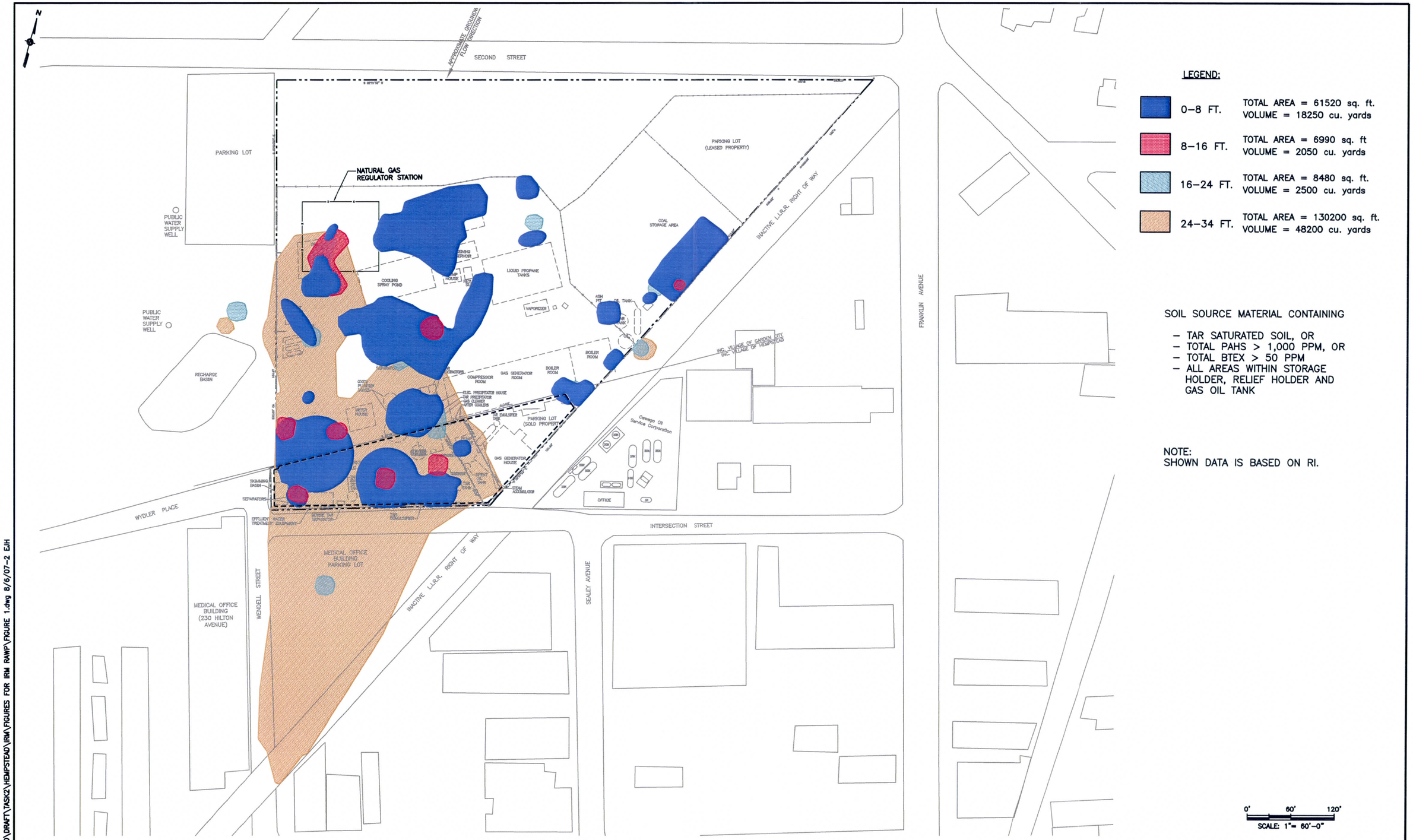
New York State Department of Environmental Conservation, *New York State Standards and Specifications for Erosion and Sediment Control, Division of Water,* August 2005.

New York State Department of Transportation Standard Specifications, 2006 with update*s*.

Paulus, Sokolowski and Sartor Engineering, PC, *Final Remedial Investigation Report,* March 2006, Amended November 2006.

U.S. Department of Labor, *Occupational Safety and Health Administration, Code of Federal Regulations.*

FIGURES



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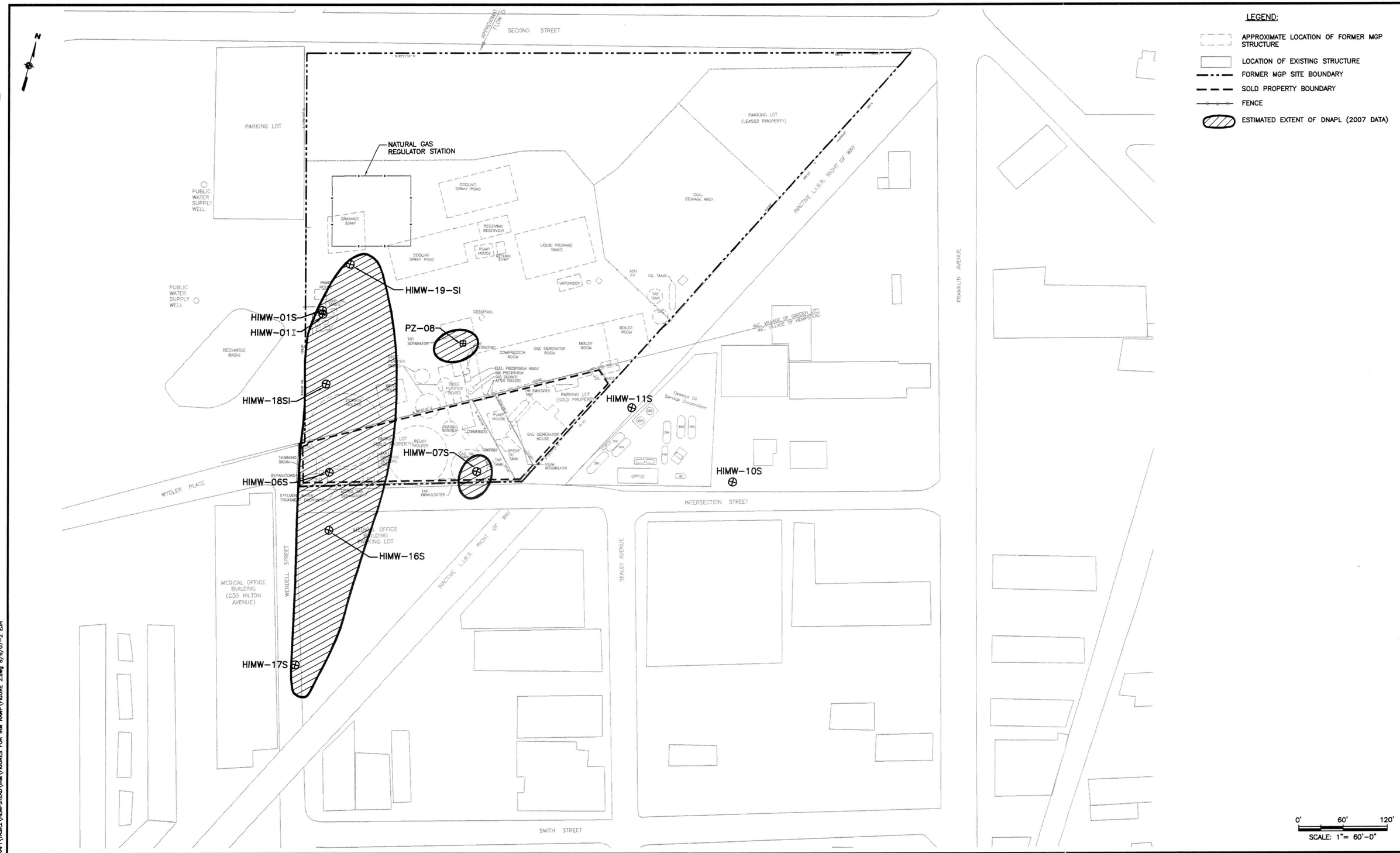
URS Corporation	KEYSPAN CORPORATION HEMPSTEAD INTERSECTION STREET FORMER MGP SITE GARDEN CITY/HEMPSTEAD, NY	SOURCE MATERIAL LOCATION MAP	FIGURE 1



URS Corporation

KEYSPAN CORPORATION
HEMPSTEAD INTERSECTION STREET
FORMER MGP SITE
GARDEN CITY/HEMPSTEAD, NY

DNAPL PLUME LOCATION MAP

FIGURE 2

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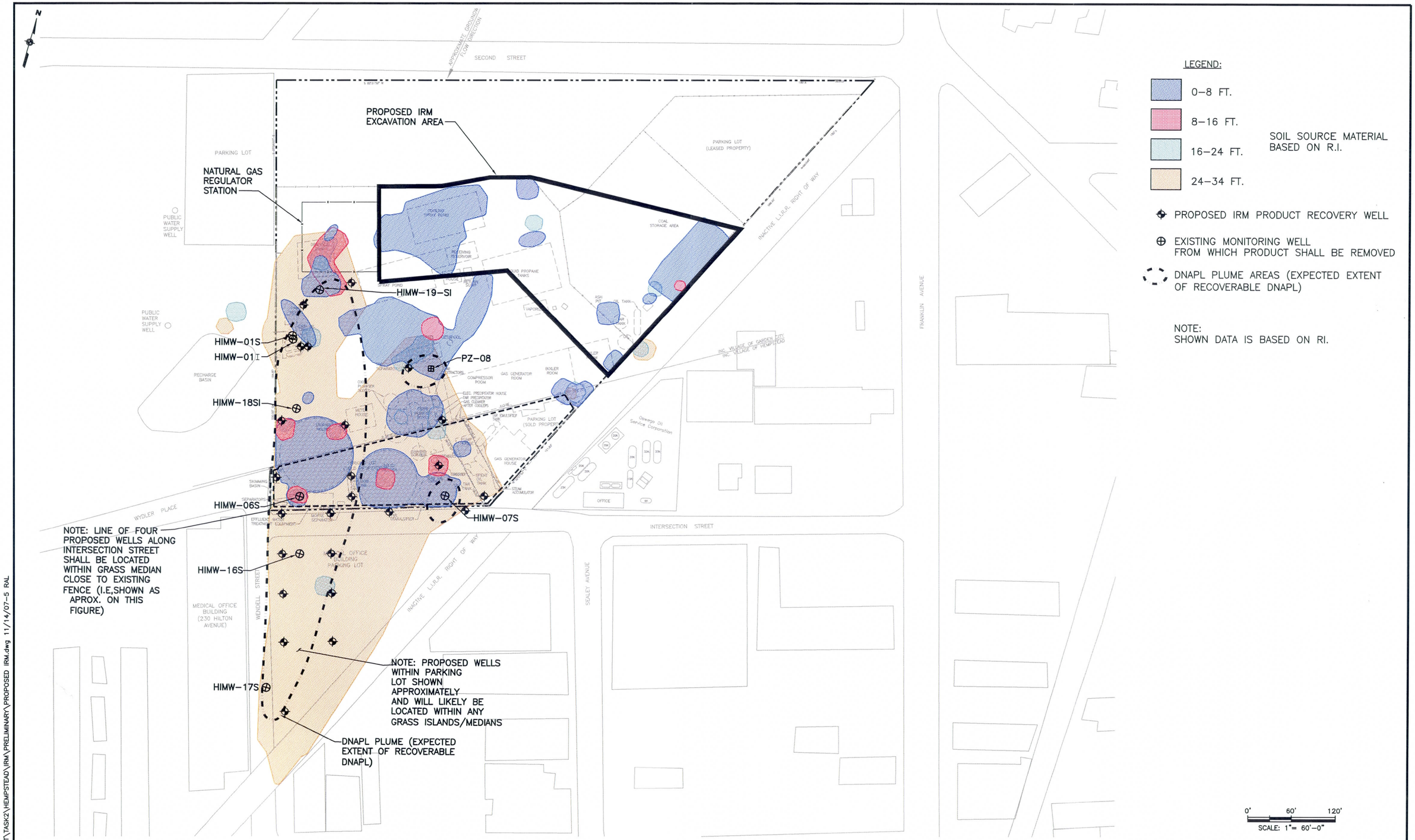

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URS Corporation	KEYSPAN CORPORATION HEMPSTEAD INTERSECTION STREET FORMER MGP SITE GARDEN CITY/HEMPSTEAD, NY	PROPOSED IRM LOCATION MAP	FIGURE 3

DRAWINGS

INTERIM REMEDIAL MEASURES

FOR

THE HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE

VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

PREPARED BY:

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New York
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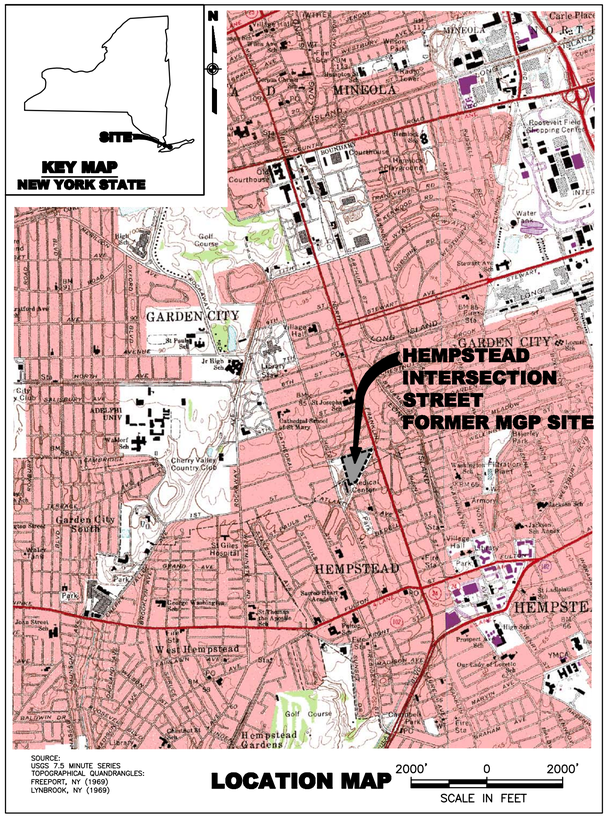
PREPARED FOR:

KEYSPAN

175 EAST OLD COUNTRY ROAD
HICKSVILLE, NEW YORK 11801

NOVEMBER 2007



LEGEND - EXISTING

GAS	GAS PIPE
W	WATER LINE
SAN	SANITARY LINE
72	EXISTING GROUND SURFACE CONTOUR (FT)
72	INFERRED EXISTING GROUND SURFACE CONTOUR (FT)
	APPROXIMATE LOCATION OF FORMER MGP STRUCTURE
	LOCATION OF EXISTING STRUCTURE
	FORMER MGP SITE BOUNDARY
	SOLD PROPERTY BOUNDARY
FENCE	FENCE
PZ-08	PIEZOMETER TARGETED FOR FUTURE PRODUCT RECOVERY
HIMW-10D	MONITORING WELL TARGETED FOR FUTURE PRODUCT RECOVERY

LEGEND - PROPOSED

	EXCAVATE TO APPROX. 8 FEET
	EXCAVATE TO APPROX. 16 FEET
	EXCAVATE TO APPROX. 24 FEET
IPR-1	IRM PRODUCT RECOVERY WELL
	TEMPORARY SHEET PILE OR OTHER SHORING

GENERAL NOTES

1. SOURCE BASE MAP IS FINAL REMEDIAL INVESTIGATION REPORT DATED MARCH 2006 BY PAULUS, SOKOLOWSKI AND SARTOR ENGINEERING, PC. REFERENCE RI FIGURE 1-4. BASE MAP, EXISTING FEATURES AND TOPOGRAPHY IN RI WAS PREPARED BY DVIRKA AND BARTOLUCCI CONSULTING ENGINEERS, A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.
2. BASE MAP SITE SURVEY DATA IS THAT PROVIDED BY KEYSPAN ENERGY SURVEY DIVISION.
3. PRIOR TO IRM CONSTRUCTION, KEYSPAN WILL PROVIDE REVISED DRAWINGS THAT INCLUDE UPDATED TOPOGRAPHIC MAPPING, UTILITY LOCATIONS, APPLICABLE HORIZONTAL COORDINATE SYSTEM REFERENCE, VERTICAL DATUM REFERENCE, ON-SITE SURVEY CONTROL, EXCAVATION LIMITS, AND PRODUCT RECOVERY WELL LOCATIONS/DEPTHS.
4. SHOWN LOCATIONS OF ALL UNDERGROUND UTILITIES SHALL BE CONSIDERED APPROXIMATE.
5. ALL MONITORING WELLS WITHIN THE EXCAVATION AREAS SHALL BE REMOVED OR OTHERWISE DECOMMISSIONED.
6. ALL MONITORING WELLS TO BE DECOMMISSIONED SHALL BE DONE SO IN ACCORDANCE WITH NYSDEC PROCEDURES (NYSDEC, 1996).

ABBREVIATIONS

FT	FEET
INC.	INCORPORATED
IRM	INTERIM REMEDIAL MEASURES
k	1,000
L.I.R.R.	LONG ISLAND RAILROAD
MGP	MANUFACTURED GAS PLANT
NAPL	NON-AQUEOUS PHASE LIQUID
PSI	POUNDS PER SQUARE INCH
TYP.	TYPICAL

INDEX OF DRAWINGS

REVISIONS

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

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THE HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE
INTERIM REMEDIAL MEASURES

INDEX OF DRAWINGS, LOCATION MAP, LEGEND AND NOTES

Scale: AS SHOWN | Date: NOV. 2007 | DWG. 1

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NOTES:

1. FOR EXISTING UTILITIES, REFER TO DWG. 4.
2. FOR LOCATIONS AND LOGS OF PREVIOUS SITE INVESTIGATIONS, KEYSPAN WILL PROVIDE THIS INFORMATION.

SECOND STREET
VILLAGE OF GARDEN CITY PARKING LOT
PUBLIC WATER SUPPLY WELL
PUBLIC WATER SUPPLY WELL
RECHARGE BASIN
PARKING LOT
COOLING SPRAY POND
DRAINAGE SUMP
RECEIVING RESERVOIR
PUMP HOUSE
RETORT SETTLING TANK
COOLING SPRAY POND
KEYSPAN FORMER MGP PROPERTY
KEYSPAN PROPERTY
LIQUID PROPANE TANKS
COAL STORAGE AREA
VAPORIZER
ASH PIT
OIL TANK
TAR TANK
L.I.R.R. RIGHT OF WAY
FRANKLIN AVENUE
INC. VILLAGE OF GARDEN CITY
INC. VILLAGE OF HEMPSTEAD
PUMP HOUSE
DRIP OIL TANKS
CESSPOOL
SEPARATOR
GAS EXTRACTORS
COMPRESSOR ROOM
GAS GENERATOR ROOM
BOILER ROOM
BOILER ROOM
OXIDE PURIFIER BOXES
ELEC. PRECIPITATOR HOUSE
TAR PRECIPITATOR
GAS CLEANER
WATER COOLERS
METER HOUSE
OXIDE PURIFIER BOXES
TAR EMULSIFIER
STORAGE HOLDER
PUMP
DRAWING CONDENSER
CONDENSERS
GAS GENERATOR HOUSE
OIL SERVICE FACILITY
SOLID PORTION OF FORMER MGP PROPERTY
RELIEF HOLDER
SOLD PROPERTY
CONDENSER
SPENT OIL TANK
TAR TANK
STEAM ACCUMULATOR
TAR EMULSION TANK
GAS OIL TANK
SKIMMING BASIN
SEPARATORS
OFFICE
WYDLER PLACE
EFFLUENT WATER TREATMENT EQUIPMENT
MORSE TAR SEPARATOR
TAR DEMULSIFIER
INTERSECTION STREET
MEDICAL BUILDING PARKING LOT
L.I.R.R. RIGHT OF WAY
WENDELL STREET
SEALEY AVENUE

60' 0 60'
SCALE IN FEET

WARNING
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NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

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THE HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE
INTERIM REMEDIAL MEASURES

EXISTING CONDITIONS

Scale: AS SHOWN | Date: NOV, 2007 | DWG. 2

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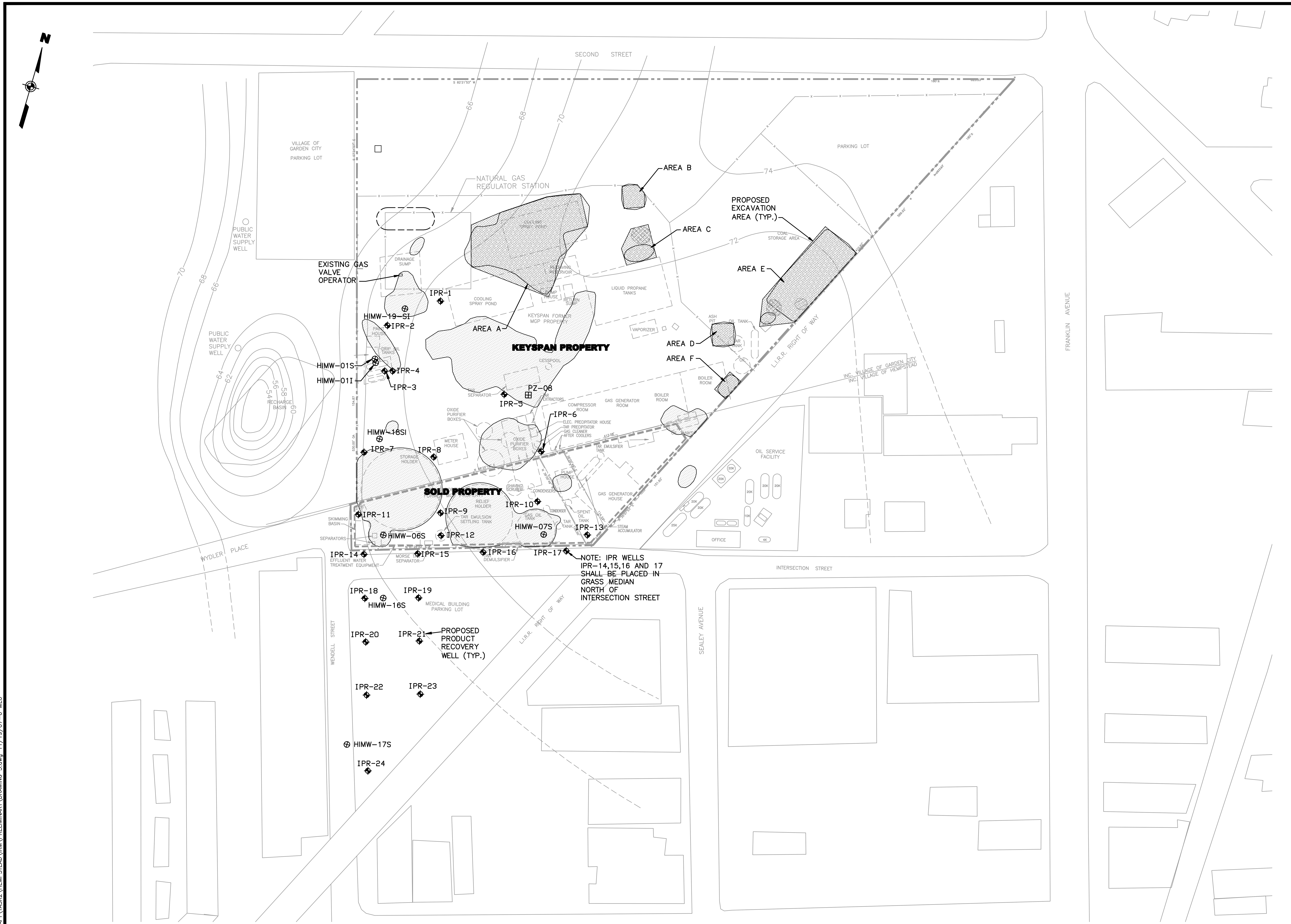

NOTES:

1. FOR LAYOUT COORDINATES OF REMEDIAL WORK ITEMS, REFER TO DWG. 5.
2. FOR INFORMATION ON UTILITIES, REFER TO DWG. 4.
3. THE SHOWN EXCAVATION LIMITS ARE PRELIMINARY AND ARE SUBJECT TO CHANGE, BASED ON A PLANNED PRE-CONSTRUCTION IRM DELINEATION AND VISUAL EVIDENCE OF CONTAMINATION DURING THE EXCAVATION WORK.
4. THE SHOWN QUANTITY OF PROPOSED WELLS, PROPOSED SCREEN INTERVAL, AND LOCATIONS OF PROPOSED WELLS ARE PRELIMINARY AND SUBJECT TO CHANGE PENDING SUBSURFACE CONDITION ENCOUNTERED DURING THE PLANNED IRM DELINEATION PROGRAM

EXCAVATE TO APPROX. 8 FEET

EXCAVATE TO APPROX. 16 FEET

EXCAVATE TO APPROX. 24 FEET

IPR-1 PROPOSED IRM PRODUCT RECOVERY WELL

Product Recovery Well #	Proposed Minimum Screen Interval/Depth (Feet)
IPR-1	15 ' to 40'
IPR-2	25' to 85'
IPR-3	15' to 40'
IPR-4	55' to 85'
IPR-5	20' to 60'
IPR-6	10' to 60'
IPR-7,IPR-8	10' to 40'
IPR 8 may move to near IPR-6 if NAPL is found in IPR-6, but not found in IPR-8	
IPR-9	10 ' to 60'
IPR-10	15 ' to 40'
IPR-11	15' to 40'
IPR-12	10' to 40'
IPR-13	15' to 40'
IPR-14	15' to 40'
IPR-15	10' to 40'
IPR-16	10 ' to 60'
IPR-17	10' to 40'
IPR-18, IPR-19	20' to 45'; 70'-80'
IPR-20, IPR-21	10 ' to 40'
IPR-22, IPR-23	25' to 40'
IPR-24	10' to 40'

NOTE: FOR PROPOSED WELL DETAIL, REFER TO DRAWING NO.6

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

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THE HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE
INTERIM REMEDIAL MEASURES

LIMITS OF IRM REMEDIAL WORK

Scale: AS SHOWN | Date: NOV. 2007 | DWG. 3

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NOTES:

1. THE CONTRACTOR SHALL VERIFY AND PROTECT ALL EXISTING UTILITIES WITHIN THE REMEDIATION LIMITS.
2. FOR EQUIPMENT LAYDOWN AREAS AND SITE ACCESS, COORDINATE WITH KEYSPAN.
3. SHOWN LOCATIONS OF UTILITIES SHALL BE CONSIDERED APPROXIMATE, AND BE VERIFIED BY THE CONTRACTOR.
4. ALL EXISTING SITE UTILITIES ARE NOT NECESSARILY SHOWN.
5. SOME SHOWN UTILITIES MAY HAVE ALREADY BEEN DEMOLISHED AND/OR REMOVED.

EXCAVATE TO APPROX. 8 FEET

EXCAVATE TO APPROX. 16 FEET

EXCAVATE TO APPROX. 24 FEET

IPR-1 PROPOSED IRM PRODUCT RECOVERY WELL

PROPOSED TEMPORARY SHEET PILE OR OTHER SHORING

SECOND STREET

KEYSPAN PROPERTY

SOLD PROPERTY

AREA A

AREA B

AREA C

AREA D

AREA E

AREA F

EXISTING GAS VALVE OPERATOR

NATURAL GAS REGULATOR STATION

PUBLIC WATER SUPPLY WELL

PUBLIC WATER SUPPLY WELL

VILLAGE GARDEN CO PARKING LOT

PARKING LOT

COOLING SPRAY POND

COOLING SPRAY POND

DRAINAGE SUMP

KEYSPAN FORMER MANUFACTURED GAS PLANT

LIQUID PROPANE TANKS

COAL STORAGE AREA

ASH PIT

OIL TANK

OIL TANK

VAPORIZER

DRIP OIL TANKS

SEPARATOR

COMPRESSOR ROOM

GAS GENERATOR ROOM

BOILER ROOM

BOILER ROOM

CHARGER BOXES

METER HOUSE

OXIDE PURIFIER BOXES

ELEC. PRECIPITATOR HOUSE
TAR PRECIPITATOR
GAS CLEANER
AFTER COOLERS

TAR EMULSIFIER TANK

STORAGE HOLDER

RELIEF HOLDER

TAR EMULSION SETTLING TANK

CONDENSER

GAS GENERATOR HOUSE

SPENT OIL TANK

TAR TANK

STEAM ACCUMULATOR

OIL SERVICE FACILITY

OFFICE

SKIMMING BASIN

SEPARATOR

EFFLUENT WATER TREATMENT

MONITORING WELL

MEDICAL BUILDING PARKING LOT

RECHARGE BASIN

L.I.R.R. RIGHT OF WAY

L.I.R.R. RIGHT OF WAY

FRANKLIN AVENUE

INC. VILLAGE OF GARDEN CITY
INC. VILLAGE OF HEMPSTEAD

WYDLER PLACE

INTERSECTION STREET

WENDELL STREET

SEALEY AVENUE

HIMW-19-SI
IPR-2
IPR-1
HIMW-01S
HIMW-01I
IPR-4
IPR-3
PZ-08
IPR-5
IPR-6
HIMW-18SI
IPR-7
IPR-8
IPR-10
IPR-11
IPR-9
HIMW-06S
IPR-12
HIMW-07S
IPR-13
IPR-14
IPR-15
IPR-16
IPR-17
IPR-18
IPR-19
HIMW-16S
IPR-20
IPR-21
IPR-22
IPR-23
HIMW-17S
IPR-24

NOTE: IPR WELLS IPR-14,15,16 AND 17 SHALL BE PLACED IN GRASS MEDIAN NORTH OF INTERSECTION STREET

60' 0 60'
SCALE IN FEET

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

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THE HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE
INTERIM REMEDIAL MEASURES

UTILITIES AND ACCESS CONTROL

Scale: AS SHOWN | Date: NOV. 2007 | DWG. 4

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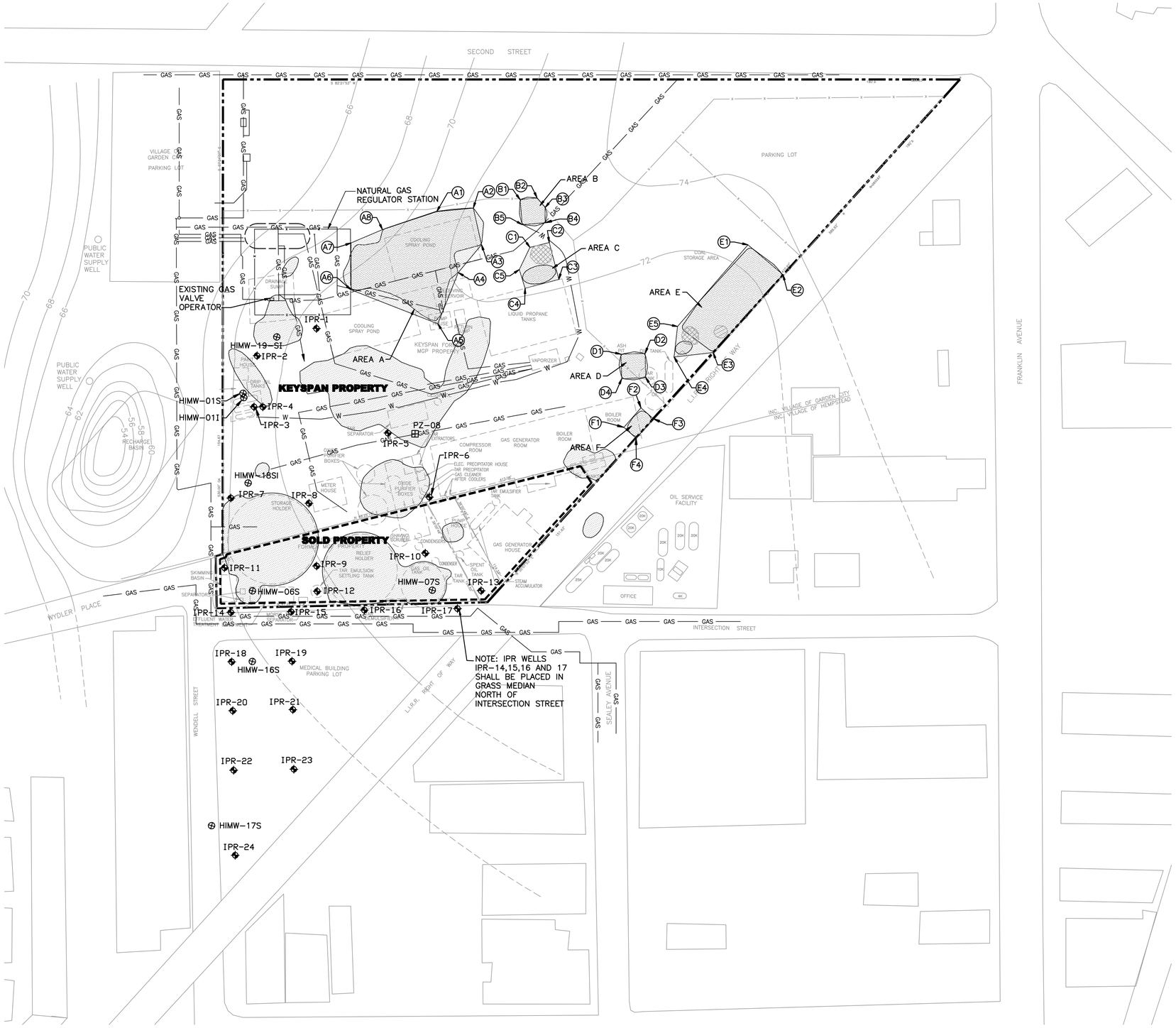

PRODUCT RECOVERY WELL LAYOUT		
POINT	NORTHING (FEET)	EASTING (FEET)
IPR-1	855.44	704.53
IPR-2	807.62	649.45
IPR-3	751.86	662.21
IPR-4	754.68	671.6
IPR-5	765.83	813.83
IPR-6	710.33	878.27
IPR-7	647.04	665.93
IPR-8	665.89	751.27
IPR-9	601.14	779.07
IPR-10	649.02	891.46
IPR-11	570.42	680.97
IPR-12	574.25	787.65
IPR-13	626.35	962.97
IPR-14	524.69	701.7
IPR-15	544.21	766.1
IPR-16	568.94	843.98
IPR-17	599.74	943.28
IPR-18	472.03	718.16
IPR-19	491.56	782.56
IPR-20	419.99	734.64
IPR-21	440.01	798.67
IPR-22	356.55	754.26
IPR-23	376.52	818.43
IPR-24	266.08	782.55

EXCAVATION AREA LAYOUT		
POINT	NORTHING (FEET)	EASTING (FEET)
A1	1018.12	796.64
A2	1033.46	834.74
A3	996.85	854.99
A4	959.77	838.81
A5	898.48	832.92
A6	907.53	729.48
A7	957.73	714.73
A8	981.95	744.19
B1	1057.15	882.12
B2	1064.46	899.76
B3	1056.53	911.42
B4	1040.29	916.25
B5	1031.10	892.37
C1	1009.11	907.66
C2	1020.32	926.86
C3	983.96	948.56
C4	963.88	915.33
C5	982.04	903.28
D1	923.36	1038.50
D2	931.88	1064.28
D3	906.08	1072.44
D4	897.30	1047.12
E1	1080.24	1140.33
E2	1059.28	1187.28
E3	953.94	1136.86
E4	936.96	1096.40
E5	970.70	1090.57
F1	846.02	1064.59
F2	872.22	1076.89
F3	864.41	1093.53
F4	838.21	1081.23

NOTES:

1. THE SHOWN EXCAVATION LIMITS ARE PRELIMINARY AND ARE SUBJECT TO CHANGE, BASED ON A PLANNED PRE-CONSTRUCTION IRM DELINEATION AND VISUAL EVIDENCE OF CONTAMINATION DURING THE EXCAVATION WORK.
2. FOR LOCATION AND COORDINATES OF SHORING, REFER TO DRAWING NO. 6

EXCAVATE TO APPROX. 8 FEET

EXCAVATE TO APPROX. 16 FEET

EXCAVATE TO APPROX. 24 FEET

IPR-1 PROPOSED IRM PRODUCT RECOVERY WELL

PROPOSED TEMPORARY SHEET PILE OR OTHER SHORING

60' 0 60'
SCALE IN FEET

NO.	MADE BY	APPROVED BY	DATE	DESCRIPTION

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THE HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE
INTERIM REMEDIAL MEASURES

PROJECT LAYOUT

Scale: AS SHOWN | Date: NOV. 2007 | DWG. 5

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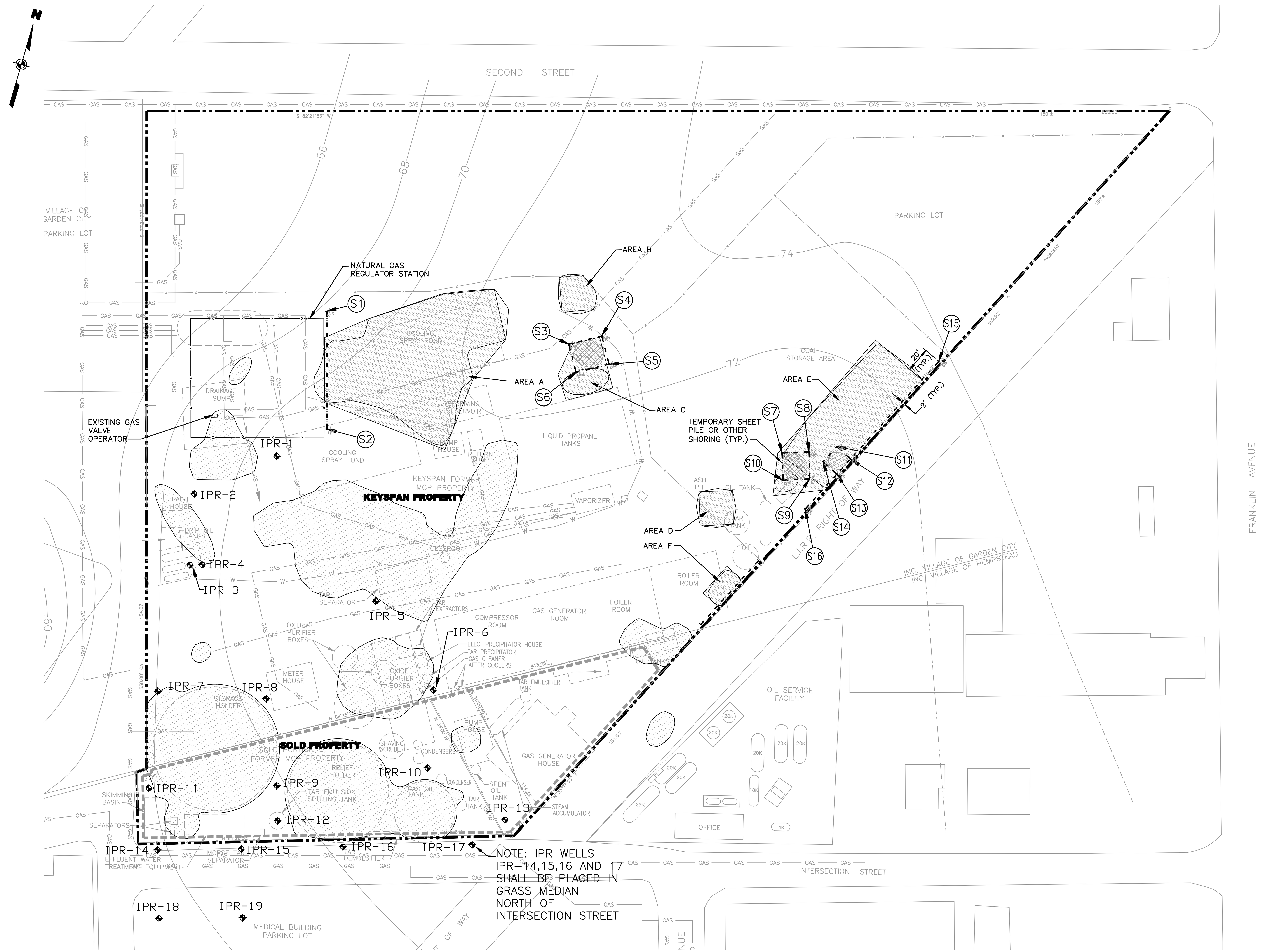
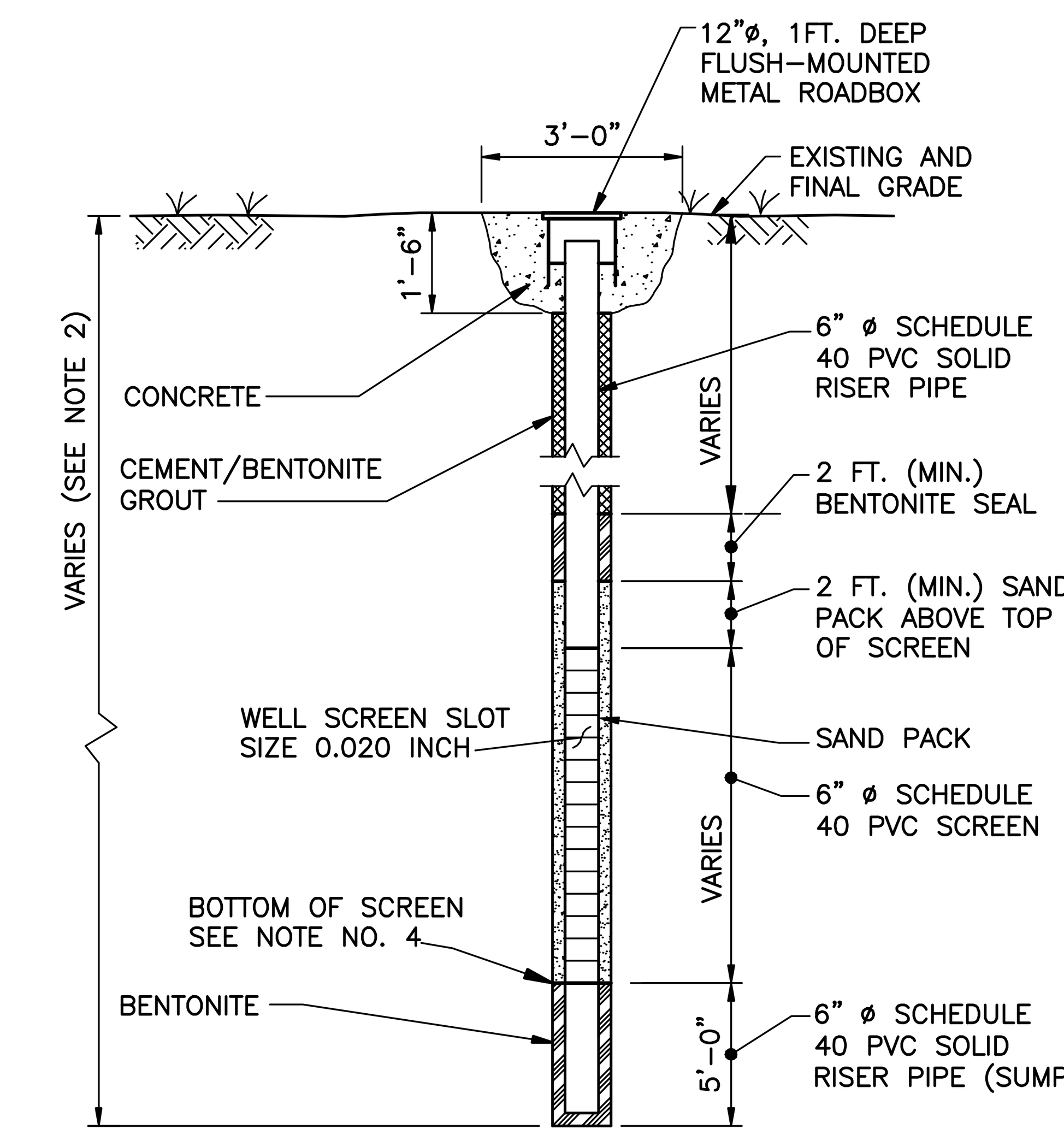


N
SECOND STREET
VILLAGE OF GARDEN CITY PARKING LOT
PARKING LOT
NATURAL GAS REGULATOR STATION
AREA A
AREA B
AREA C
AREA D
AREA E
AREA F
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
20' (TYP.)
2' (TYP.)
TEMPORARY SHEET PILE OR OTHER SHORING (TYP.)
EXISTING GAS VALVE OPERATOR
COOLING SPRAY POND
RECEIVING RESERVOIR
DRAINAGE SUMPS
PUMP HOUSE
LIQUID PROPANE TANKS
COAL STORAGE AREA
KEYSPAN FORMER MGP PROPERTY
KEYSPAN PROPERTY
VAPORIZER
CESSPOOL
ASH PIT
OIL TANK
BOILER ROOM
TAR SEPARATOR
TAR EXTRACTORS
COMPRESSOR ROOM
GAS GENERATOR ROOM
OXIDE PURIFIER BOXES
METER HOUSE
ELEC. PRECIPITATOR HOUSE
TAR PRECIPITATOR
GAS CLEANER
AFTER COOLERS
TAR EMULSIFIER TANK
STORAGE HOLDER
SOLD PROPERTY
FORMER MGP PROPERTY
RELIEF HOLDER
TAR EMULSION SETTLING TANK
CONDENSERS
CONDENSER
GAS OIL TANK
SPENT OIL TANK
TAR TANK
STEAM ACCUMULATOR
GAS GENERATOR HOUSE
PUMP HOUSE
SKIMMING BASIN
SEPARATORS
EFFLUENT WATER TREATMENT EQUIPMENT
TAR DEMULSIFIER
OIL SERVICE FACILITY
OFFICE
INC. VILLAGE OF GARDEN CITY
INC. VILLAGE OF HEMPSTEAD
L.I.R.R. RIGHT OF WAY
FRANKLIN AVENUE
INTERSECTION STREET
MEDICAL BUILDING PARKING LOT
IPR-1
IPR-2
IPR-3
IPR-4
IPR-5
IPR-6
IPR-7
IPR-8
IPR-9
IPR-10
IPR-11
IPR-12
IPR-13
IPR-14
IPR-15
IPR-16
IPR-17
IPR-18
IPR-19
NOTE: IPR WELLS IPR-14,15,16 AND 17 SHALL BE PLACED IN GRASS MEDIAN NORTH OF INTERSECTION STREET
66
68
70
72
74

GENERAL NOTES:

1. THE SHOWN EXCAVATION AREA DIMENSIONS AND EXCAVATION DEPTHS SHALL BE CONSIDERED MINIMUM VALUES, PENDING FIELD CONFIRMATION, AND DO NOT REFLECT ANY SIDESLOPE CUTBACK.



12"ø, 1FT. DEEP FLUSH-MOUNTED METAL ROADBOX
3'-0"
EXISTING AND FINAL GRADE
1'-6"
CONCRETE
CEMENT/BENTONITE GROUT
6" ø SCHEDULE 40 PVC SOLID RISER PIPE
VARIES (SEE NOTE 2)
VARIES
2 FT. (MIN.) BENTONITE SEAL
2 FT. (MIN.) SAND PACK ABOVE TOP OF SCREEN
WELL SCREEN SLOT SIZE 0.020 INCH
SAND PACK
6" ø SCHEDULE 40 PVC SCREEN
BOTTOM OF SCREEN SEE NOTE NO. 4
BENTONITE
5'-0"
6" ø SCHEDULE 40 PVC SOLID RISER PIPE (SUMP)

RECOVERY WELL NOTES:

1. WELL SAND PACK WILL BE SPECIFIED AFTER THE IRM FIELD DELINEATION WORK IS COMPLETED.
2. FOR SCREEN DEPTH (AND WELL DEPTH) REFER TO TABLE ON DRAWING NO.3
3. IF DEDICATED PUMP IS REQUIRED, REPLACE ROAD BOX WITH 4'x4'x4' CONCRETE MANHOLE AND BLACKHAWK ELECTRIC OR PNEUMATIC PISTON PUMP, MODEL TO BE SPECIFIED BY KEYSPAN. INCLUDE 2"DIA. SCH. 40 PVC DISCHARGE PIPE AND RELIEF VALVE.
4. WELL SCREEN SHALL BE EXTENDED TO 5 FEET BENEATH NAPL ZONE ENCOUNTERED IN FIELD

PRODUCT RECOVERY WELL DETAIL

NOT TO SCALE

SHORING LAYOUT

SHORING POINT	NORTHING (FEET)	EASTING (FEET)
S1	978.32	710.19
S2	887.62	737.33
S3	1007.88	904.67
S4	1021.66	928.26
S5	1001.49	940.30
S6	987.72	916.70
S7	972.12	1093.86
S8	978.94	1114.48
S9	958.30	1121.00
S10	951.27	1100.75
S11	989.32	1134.57
S12	982.91	1147.98
S13	967.99	1141.33
S14	974.60	1127.52
S15	1078.21	1194.06
S16	934.02	1124.35

EXCAVATE TO APPROX. 8 FEET

EXCAVATE TO APPROX. 16 FEET

EXCAVATE TO APPROX. 24 FEET

40' 0 40'

SCALE IN FEET

WARNING

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THE HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE INTERIM REMEDIAL MEASURES

EXCAVATION PLAN

Scale: AS SHOWN | Date: NOV. 2007 | DWG. 6

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APPENDIX A

IRM DELINEATION WORK PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET
FORMER MANUFACTURED GAS PLANT SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

Prepared for:

KeySpan Corporation
175 East Old Country Road
Hicksville, NY 11801

Prepared by:

URS Corporation – New York
77 Goodell Street
Buffalo, New York 14203

November 2007

TABLE OF CONTENTS

FIGURES
(Following Tables)

TABLES
(Following Figures)

ATTACHMENTS

LIST OF ACRONYMS

ACGIH	American Congress of Government Industrial Hygienists
ALJ	Administrative Law Judge
ANSI	American National Standards Institute
AQMP	Air-Quality Monitoring Program ASP - analytical service protocol
ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
AWQC	Ambient Water Quality Criteria
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene and xylenes
BTU	British thermal unit
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbons
C	Centigrade
CAMP	Community Air Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cf	cubic feet
CFR	Code of Federal Regulations
cm/sec	centimeter per second
COC	Chain-of-Custody
COPC	contaminants of potential concern
CPP	Citizen Participation Plan
CPR	cardiopulmonary resuscitation
CQAP	Construction Quality Assurance Plan
CRZ	Contamination Reduction Zone
cy	cubic yard
DAR	Division of Air Resources
DEC	Department of Environmental Conservation
DI	deionized
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DUSR	Data Usability Summary Report
EA	Human Health Exposure Assessment
ECL	Environmental Conservation Law
ECRP	Equipment Contamination Reduction Pad
ELAP	Environmental Laboratory Approval Program
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
*e*V	electron volts
EZ	Exclusion Zone
F	Fahrenheit
FD	field duplicate
FID	flame ionization detector
ft	feet
ft^3	cubic feet
FS/RAP	Feasibility Study/Remedial Action Plan
gal	gallon

gpm	gallons per minute
GC	gas chromatograph
GCS-DN	gas chromatograph station downwind
GCS-UP	gas chromatograph station upwind
HASP	Health and Safety Plan
HDPE	high density polyethylene
HEPA	high efficiency particulate air
HSM	Health & Safety Manager
IARC	International Agency for Research on Cancer
ID	identification
IDLH	immediately dangerous to life
IRM	Interim Remedial Measures
ISS	in situ stabilization
Kg	kilogram
L	liter
L/day	liters per day
LCS	laboratory control samples
LGAC	liquid-phase granular activated carbon
LILCO	Long Island Lighting Co.
LIPA	Long Island Power Authority
LKD	lime kiln dust
LNAPL	light non-aqueous phase liquid
MD	matrix duplicate
MDL	minimum detection limit
mg	milligram
mg/kg	milligram per kilogram
mg/L	milligram per liter
MGP	manufactured gas plant
MMBTU	million British thermal units
MNA	monitored natural attenuation
MS/MSD	matrix spike/matrix spike duplicate
MS/MSD/MD	matrix spike/matrix spike duplicate/matrix duplicate
MSB	matrix spike blank
MSDS	material safety data sheet
MW	monitoring well
NAPL	non-aqueous phase liquid
NCDH	Nassau County Department of Health
NCP	National Contingency Plan
ND	not detected
NEIC	National Enforcement Investigations Center
NIOSH	National Institute for Occupational Safety and Health
NOI	Notice of Intent
NOT	Notice of Termination
NS	no standard
NYCRR	New York Code Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
O M & M	operation, maintenance, and monitoring

OSHA	Occupational Safety and Health Act or Administration
PAHs	polycyclic aromatic hydrocarbons
PC	personal computer
PCBs	polychlorinated biphenyls
PCRA	Personnel Contamination Reduction Area
PEC	Project Emergency Officer
PEL	permissible exposure limits
PHSC	Project Health and Safety Coordinator
PID	photoionization detector
POTW	Public Owned Treatment Works
PM	Project Manager
ppb	part per billion
PPE	personal protective equipment
ppm	parts per million
ppbv	parts per billion on a volume basis
PQO	project quality objectives
PSA	preliminary site assessment
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
QC	quality control
O&M	operation and maintenance
RAO	remedial action objective
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
ROW	right-of-way
RPD	relative percent difference
RSCO	recommended soil cleanup objective
SAP	Sampling and Analysis Plan
SCGs	Standards, Criteria, and Guidance
SB	soil boring
SGC	short-term guideline concentrations
sf	square feet
SHSO	Site Health & Safety Officer
Site	Hempstead Intersection Street Former MGP site
SPL	sound pressure level
SSO	Site Safety Officer
STEL	short-term exposure limits
SVOCs	semivolatile organic compounds
SW	solid waste
SZ	Support Zone
T & A	time and activity
TAGM	technical and administrative guidance memorandum
TCL	target compound list
TCLP	toxicity characteristic leachate procedure
TLVs	threshold limit values

TOC	total organic carbon
TOGS	Technical and Operational Guidance Series
TPAHs	total polycyclic aromatic hydrocarbons
UFPO	Underground Facility Protection Organization
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
URS	URS Corporation
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds
VOA	volatile organic analysis
WBGT	wet bulb globe temperature

EXECUTIVE SUMMARY

This Interim Remedial Measures (IRM) Delineation Work Plan (DWP) was prepared by URS Corporation (URS) for the KeySpan Hempstead Intersection Street Former Manufactured Gas Plant (MGP) Site located in the Villages of Hempstead and Garden City, in the Town of Hempstead, Nassau County, Long Island, New York. The DWP defines the objectives, scope and means for implementing a pre-construction soil and non-aqueous phase liquid (NAPL) delineation program in support of IRM that will be performed prior to implementing a site-wide remediation. The IRM focuses on the removal of shallow contaminated soils and recoverable NAPL.

This DWP describes soil sampling and analysis and well installation activities that will be performed prior to IRM construction. The soil sampling data will support delineation of source material limits, as well as provide contaminated soil characterization data required by the waste disposal facility. Groundwater monitoring wells will be installed to investigate non-MGP NAPL impacts east of the Site and forensic analysis of soil samples from this area will be used to determine if contamination is MGP-related or related to non-MGP operations.

Included as appendices to this DWP are a Sampling and Analysis Plan (SAP), a Quality Assurance Project Plan (QAPP), and a Health and Safety Plan (HASP). Because of their large volume, the QAPP and HASP are not bound with this document. Instead, they are provided in an electronic format.

1.0 INTRODUCTION

This Interim Remedial Measures (IRM) Delineation Work Plan (DWP) that has been prepared by URS Corporation (URS) for the KeySpan Hempstead Intersection Street Former Manufactured Gas Plant (MGP) site located in the Villages of Hempstead and Garden City, in the Town of Hempstead, Nassau County, Long Island, New York. The DWP defines the objectives, scope and means for implementing a pre-construction soil, groundwater, and non-aqueous-phase liquid (NAPL) sampling program in support of an IRM that focuses on the removal of the shallow contaminated soils and removal of recoverable NAPL prior to a future site-wide remediation of MGP-related source material.

This DWP describes field activities that will be conducted prior to commencing the soil removal and NAPL recovery IRM activities. It also identifies objectives and rationale of the site delineation, delineation point locations, analytical program, and project schedule.

Included as attachments to this DWP are a Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), and Health and Safety Plan (HASP). The SAP describes procedures to be followed for all field investigation activities. The QAPP describes sampling and laboratory procedures/protocols to be used. The HASP describes health and safety protocol that covers URS personnel and subcontractors. The SAP, QAPP, and HASP are intended to apply to all site activities covered by this DWP, as well as future site investigations. These documents will be amended, as needed, to address any additional site activities that are different than those described in the current versions of these documents.

1.1 Site Location and Description

The Hempstead Intersection Street Former MGP site is located in the Villages of Hempstead and Garden City, Nassau County, New York. See Figures 1 and 2 for location maps. The majority of the approximately 7.5-acre MGP site is located within the Village of Garden City and is known as the current KeySpan Property. A 0.8-acre parcel of the MGP site adjacent to and south of the current KeySpan Property, located within the Village of Hempstead, is currently used to store vehicles and is referred to as the "Sold Property." The Sold Property was previously sold by the Long Island Lighting Company (LILCO – a

KeySpan predecessor company) in the early 1980's to an automobile dealer who is the current property owner.

A Medical Office Building parking lot to the south of the Sold Property is the primary area outside the MGP property boundaries that contains source material.

The MGP site is bordered to the north by Second Street and along the east by an inactive Long Island Railroad right-of-way (LIRR ROW). Property to the west of the MGP site is owned by the Village of Garden City and contains a public parking lot, two public water supply wells and a recharge basin related to the two wells. The property to the southeast of the MGP site is owned by Oswego Oil Service Corporation and is an active fuel oil storage and loading facility. The property to the south of the MGP site is the parking lot for the medical office building.

An active gas regulator station is located on the western portion of the KeySpan Property. A second automobile dealership currently leases property in the upper northeastern corner of the KeySpan Property.

The MGP site and surrounding area are generally flat, sloping gently to the west and southwest. A perimeter fence secures the KeySpan and Sold Properties. KeySpan Property access from the south is through the Sold Property from Intersection Street, and from the north through a gated fence. The northern two-thirds of the MGP site, as well as the eastern portion, is unpaved ground covered with either vegetation or crushed stone. The southern third of the MGP site is paved with asphalt. Limited grass, shrubs and trees serve as a buffer extending across the northern portion of the KeySpan Property along Second Street.

The MGP property has multiple zoning classifications ranging from residential to commercial depending on the area and municipality. Properties immediately to the north of the MGP Site across Second Street are zoned for multi-family residential apartment housing. Properties immediately to the east of the MGP site are zoned as general commercial. The property to the west of the MGP site is designated parkland. Property to the south of the MGP site is zoned business "C."

1.2 Site History

MGP operations began in the early 1900's in the southern portion of the MGP site and expanded north as the demand for gas increased. LILCO acquired the MGP site in the early 1930's. Following the availability of natural gas in the early 1950's, the Hempstead former MGP served as a peak/emergency facility to ensure gas supply until operations ceased in the mid 1950's. The on-site plant was subsequently demolished by LILCO. In 1998, LILCO merged with Brooklyn Union Gas forming KeySpan Corporation. Following this merger, all but the previously sold automobile dealer property (the Sold Property) became KeySpan property.

A "cut and plug" IRM Program was undertaken at the MGP site during the winter of 1999. The object of that IRM was to locate underground piping associated with historic MGP operations so that each pipe could be cut, drained of any fluids and plugged in order to limit the potential for any off-site migration of MGP-related constituents. The IRM was completed in Summer 2000.

This DWP addresses delineation activities to be performed prior to implementing the proposed IRM, which includes excavation of shallow source materials and recovery of NAPL.

1.3 Previous Investigations and Reports

The November 2006 Final Remedial Investigation (RI) Report summarizes all the investigations that were completed for the site.

1.4 Site Geology

The previous investigations included numerous soil borings and test pits across the site and adjacent properties (see Figure 2). These investigations found that the site is underlain by varying amounts of topsoil and fill, which in turn is underlain by natural sand and gravel deposits.

The fill/topsoil unit is highly variable in character and thickness. It consists of brown to black sands, silts, and gravels with varying amounts of concrete, brick, coal, bluestone, clinker, vesicular slag, and wood. The unit ranges in thickness from

approximately 0.5 feet to 16 feet. The unit appears to be thickest in the central-western portion of the site within the area of the former drip oil tanks, and is up to 8 feet thick near the former tar separator.

The topsoil/fill unit is underlain by permeable yellow to light brown sand and gravel glacial outwash deposits. This unit, referred to as the Upper Glacial unit, is 60 to 70 feet thick. This unit also contains zones or lenses of silt and silty sand, which may limit the vertical movement of groundwater.

According to the RI, the glacial outwash sediments comprise the unconfined Upper Glacial aquifer in the site area (PSS, 2006). The average depth to the water table is about 30 feet. The sands, silts and clays of the Magothy formation underlie this unit. The interface of the Upper Glacial and the Magothy formation is characterized by a transition from glacial sand to a brown to gray layer of silty sand, silt, and/or silty clay. In the site area, the Magothy formation is at least 200 feet thick.

The previous investigations identified several areas of the site that have been impacted by past MGP operations. These areas will be addressed through a site-wide remedial program. However, some areas have warranted interim measures (i.e., IRMs).

As previously mentioned, a "cut and plug" IRM was undertaken at the site during the winter of 1999 to locate and cap underground piping associated with historic MGP operations. That IRM was completed in Summer 2000.

Several areas have been identified that contain elevated levels of contamination which warrant removal (i.e., excavation) prior to implementation of a site-wide remedial plan. These areas contain contaminated soil at relatively shallow depths, are located on property owned by KeySpan, are above the water table, and can be readily excavated and backfilled. Such a removal action in these areas would not be impacted (i.e., re-done) by the future site-wide deep-soil remedy since these areas are apart from the deep soil contamination areas. The implementation of this remedy as an IRM in these areas will also support site-wide remediation activities by providing additional clean areas for staging and stockpiling, as well as possible temporary use for vehicle parking.

IRM activities are scheduled for 2008 and will include the excavation of soils containing MGP residuals defined as "source material" in designated areas (i.e., Areas A through F shown in Figure 3) and the recovery of NAPL from existing wells and newly-installed product recovery wells.

1.5 Proposed Interim Remedial Measures

The IRM will include the excavation of soils containing visibly evident coal tar impacts in the proposed excavation areas situated in the north/central portion of the site. Based on information obtained through the previous investigations, most of the excavations will be performed to approximate depths of 8 feet below grade (bgs) with a few areas where excavations will extend to as much as about 24 feet bgs (see Figure 3).

The limits of the proposed excavation areas were preliminarily determined based on the presence of tar-saturated soils as determined through field observations during prior remedial investigations, and/or through analysis of soil where total polycyclic aromatic hydrocarbons (TPAHs) were greater than 1,000 parts per million (ppm), and/or total benzene, toluene, ethylbenzene, and xylenes (BTEX) was greater than 50 ppm. This material is indicative of MGP-impacted soils with the greatest potential for ongoing releases to groundwater through leaching or NAPL migration, for releases to soil vapor, and for potential direct contact risks under a worker-exposure scenario. For this IRM, the actual limits of excavation will be based on a visual standard. The soil removal IRM will be based on the following:

- Soils exhibiting a petroleum-like sheen will be removed.
- Soils exhibiting coal tar staining (typically black or brown staining) will be removed if they exhibit a sheen when tested with a jar shake test.
- Below an elevation of 8 feet bgs, when the total aggregate vertical thickness of visible impacts of sheens and staining and/or residual NAPL in soils is less than 6 inches, the excavation in the horizontal direction will be terminated.
- Soils exhibiting a coal tar odor only, or odor and minor staining and no sheen will not be excavated.

2.0 INVESTIGATION WORK PLAN OBJECTIVES AND RATIONALE

This DWP describes delineation activities that will be performed prior to IRM construction activities. For soil sampling activities, the collected data will support delineation of the limits of source material and provide waste characterization data required by the waste disposal facility.

The approximate current horizontal and vertical limits of contamination are based on the source material delineation information provided in the RI report. The data collected from this DWP implementation will refine these limits as described in Section 1.5.

URS contacted five available waste disposal companies identified by KeySpan to identify their requirements for acceptance of MGP-impacted wastes. Each company indicated that the collection and waste characterization analysis of representative samples from the areas targeted for excavation is an acceptable procedure and can constitute all or most of the waste characterization analyses that will need to be performed (i.e., no further analyses, such as during excavation, will be necessary providing that the pre-construction tests are performed on the soils that are representative of the wastes to be disposed). Therefore, one of the objectives of the DWP investigation is to collect and analyze a sufficient number of soil samples from the targeted excavation areas to obtain data sufficient for acceptance by a disposal company.

Another objective of the investigation is to determine if contamination in the vicinity of an offsite property (i.e., Oswego Oil) is unrelated to the MGP Site, is related to the MGP Site, or has commingled with MGP-related contaminants. To evaluate this possibility, monitoring wells will be installed and samples of soil, groundwater, and NAPL, (if present) will be collected and analyzed. The analytical results will be compared to Site data.

3.0 PROPOSED INVESTIGATION

Prior to implementing the IRM, this delineation will be performed to:

1. Better delineate the vertical and lateral extent of MGP source material impacts in excavation Areas A through F;

2. Characterize the materials within the proposed excavation areas for waste disposal purposes; and

3. Determine the presence and potential commingling of MGP contaminants with possible releases from an adjacent offsite oil storage facility.

These activities are summarized below and discussed in more detail in Section 4.

3.1 Delineation

To better delineate the horizontal and vertical extent of source material within the proposed excavation areas, borings will be advanced and subsurface soil samples will be collected and inspected to identify the limits of source material. The limits will be determined by the visual assessments discussed in Section 1.5.

3.2 Waste Characterization

Approximately 70 borings (preliminary estimate) will be advanced within the areas targeted for excavation. Soil samples collected from those areas will be analyzed to determine the appropriate disposal method of the excavated materials. Soil samples will be collected/tested throughout the duration of the boring program. The analytical parameters will be based on the requirements of the disposal facility. Since boring/sampling quantities are based on the soil excavation quantity, the final number of borings and samples required for waste characterization analysis will be known once the delineation is completed and the final excavation volume is determined.

3.3 Commingling Investigation

Three monitoring wells will be installed adjacent to the western boundary (i.e. upgradient) of the Oswego Oil facility. If necessary, additional wells may be installed

downgradient of the facility based on information from the upgradient wells. Soil samples collected during drilling will be inspected for evidence of NAPL contamination. One soil sample, representative of the zone of greatest apparent contamination, will be selected from each boring for chemical analysis.

It is anticipated that petroleum-impacted (light non-aqueous phase liquid (LNAPL)) soils will be present in the smear zone located at the water table. It is also anticipated that DNAPL may be present within the saturated soils. If present, representative samples of LNAPL and DNAPL will be collected from the well borings for forensic analysis to assess the probable material source.

A groundwater sample will be collected from each well that does not contain LNAPL or DNAPL.

3.4 Surveying

Prior to initiating drilling activities, a New York State-licensed surveyor will mark out the proposed soil boring and monitoring well locations. Any final soil boring and monitoring well locations that were relocated from or added to the initially-located locations will be surveyed at the conclusion of the investigation or approximated if sufficient reference is available on site from the surveyed borings. Also, following completion of well installation activities, the elevation of the well riser and protective casing will be surveyed by a New York State – licensed surveyor.

3.5 Community Air Monitoring Program

Community air monitoring will be performed during drilling and well installation, soil and groundwater sampling, and NAPL collection activities. The monitoring will be performed to provide direct measurement of total volatile organic compounds (TVOCs), respirable particulate (PM-10), hydrogen cyanide (HCN), and hydrogen sulfide (H_2S) that may be released during IRM activities at the Site. Real-time air monitoring data will be used to guide actions that may be required to reduce air emissions to acceptable levels. Appendix E provides details of a Community Air Monitoring Plan (CAMP) for these activities.

4.0 INVESTIGATION ACTIVITIES

All field activities will be coordinated and documented by URS. Drilling and well installation services will be provided by Fenley & Nicol Environmental, Inc. Standard laboratory analytical services will be performed by H2M Labs, Inc. of Melville, NY. Forensic fingerprint analytical services will be performed by META Environmental, Inc. of Watertown, MA, or a lab with similar MGP forensic analysis capabilities. Land surveying services will be provided by URS.

Field investigation activities and analyses will be performed in accordance with the applicable procedures and requirements presented in the SAP, QAPP, and HASP, including utility clearance activities.

4.1 Soil Borings

Soil boring, sampling and analyses will be performed prior to commencing IRM excavation activities within the respective IRM excavation areas. Approximately 70 borings will be advanced at locations shown in Figure 3. It is assumed that most of the borings will be advanced to depths of approximately 8 feet bgs with some borings advanced to depths of about 24 feet bgs. Based on previous investigations at the site, URS anticipates that borings will be advanced to approximate depths of 8 feet, 16 feet and 24 feet. However, it is noted that each boring will be advanced to the depth needed to delineate the vertical extent of visual MGP impacts in accordance with the criteria in Section 1.5.

The borings will typically be advanced using direct-push drilling technology, except as otherwise noted below. Each soil boring will be advanced while continuously collecting soil samples using a four-foot-long, acetate-lined Macro core sampler. Upon recovery, each soil sample will be visually inspected to identify the presence of tar or oil, sheens, and/or staining for comparison to the criteria in Section 1.5. The soil will also be screened with a photoionization detector (PID) for volatile organic vapors. The soil will also be screened for cyanide and hydrogen sulfide gases. Results will be documented on boring logs.

If, through field observations, the soil is determined to meet the definition of source material to be excavated as described in Section 1.5, then that area will be included within the defined area targeted for excavation, and an additional boring will be installed

approximately 10 feet beyond (outward of) the original perimeter. This activity will continue until the limits of visual MGP impacts meeting the established criteria have been delineated.

As the first step in delineating the proposed areas of excavation, the borings will be advanced around each proposed excavation area at a minimum spacing of 30 linear feet (based on New York State Department of Environmental Conservation (NYSDEC) DER-10 sampling frequency for sidewall samples). Using this minimum 30-foot spacing, Figure 3 shows the minimum number of borings that would be advanced in each of the proposed excavation areas. As mentioned above, additional borings will be advanced as needed until the limits have been delineated.

Physical obstructions, such as buried concrete foundations and underground services, may require relocating some of the boring locations or employing an alternate drilling method. Care will be taken to ensure the sampling is representative of the interval being sampled and relocated borings remain in close proximity of the original sampling point where feasible. At locations where refusal is encountered on buried concrete foundations or other obstructions, it will generally be the preference that a conventional drill rig will be mobilized to the site to complete those borings. All boreholes will be backfilled with low permeability material, such as cement/bentonite grout.

4.2 Well Installation and Monitoring

The primary purpose of the groundwater wells is to obtain data to delineate the extent of NAPL associated with the MGP site and to differentiate this NAPL from any non-MGP contamination. The groundwater monitoring wells will be installed adjacent to the Oswego Oil facility. Three wells are proposed for this area (Refer to Figure 3).

The well borings will be advanced using 4 ¼-inch inside-diameter hollow stem augers while continuously collecting split-spoon soil samples. Upon soil sample recovery, the soil samples will be inspected for evidence of contamination. The well borings will be advanced approximately 10 feet into the water table resulting in an approximate total well depth of 40 feet. Up to two soil samples will be retained from each boring for chemical analysis. If no apparent contamination is present, a soil sample will be collected from the interval above the zone of groundwater fluctuation. If apparent contamination is present, a

sample will be retained from the interval showing the greatest impacts and a second sample will be retained from the underlying "clean" soil.

The wells will be constructed using 20-foot-length of 2-inch-diameter polyvinyl chloride (PVC) 20-slot well screen and equivalent riser.

Following installation and development, the wells will be monitored for the presence of free product (NAPL) on a regular basis (e.g., monthly) during the IRM program. The NAPL product color will be noted.

Following installation, the wells will be developed following procedures presented in the SAP. If NAPL is present, representative samples will be collected for forensic hydrocarbon fingerprint analysis.

Groundwater samples will be collected from wells that do not contain NAPL.

4.3 Analyses

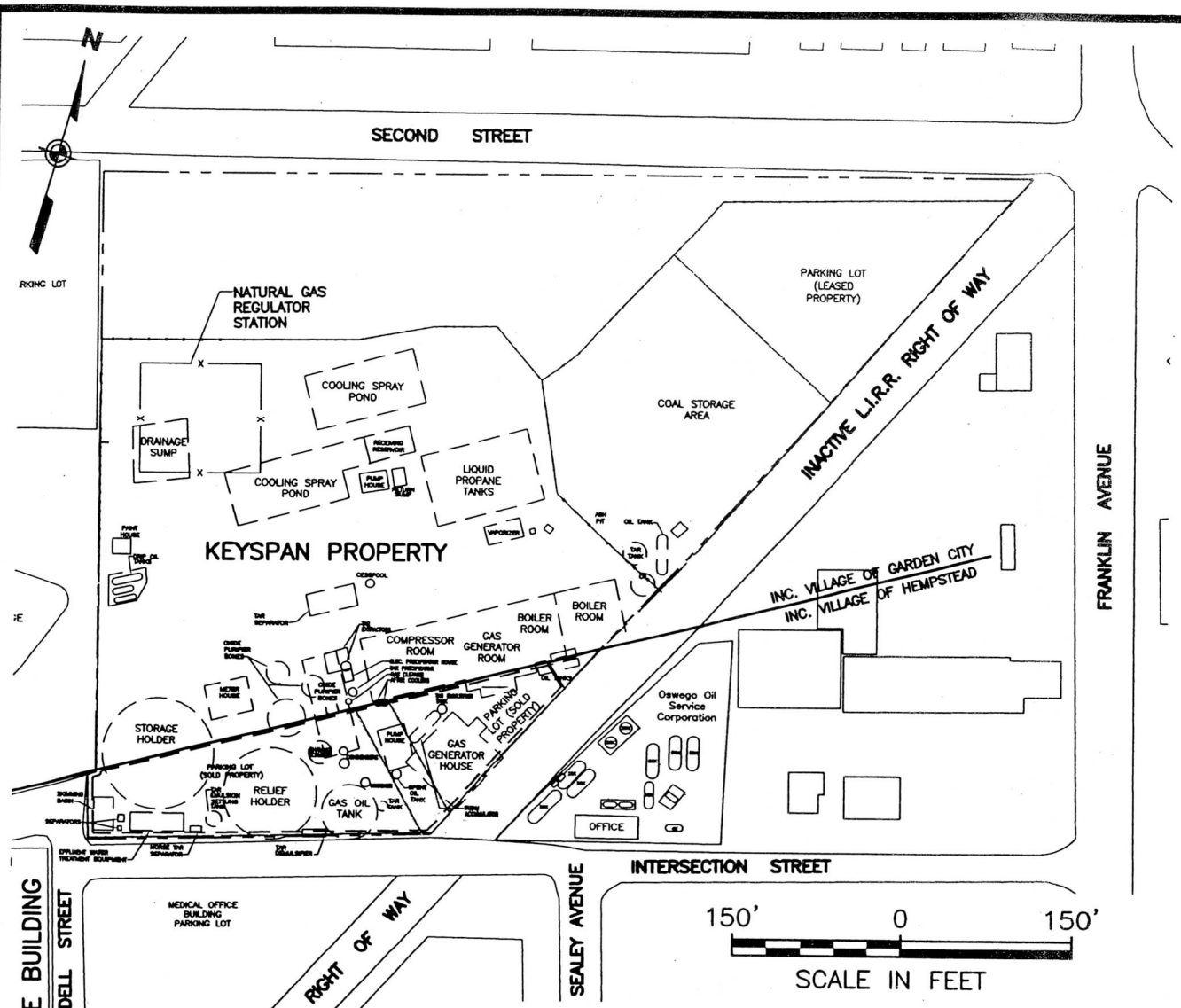
Soil and groundwater samples collected during the DWP investigation will be delivered to the laboratory on the same day as they are collected. The samples will be analyzed for the parameters presented in Table 1. LNAPL and DNAPL samples will be delivered by overnight courier to META Environmental, Inc. for forensic hydrocarbon analysis to determine if the NAPL is from a pyrogenic (i.e., combustion-related process such as coal gas manufacturing) or a petrogenic (i.e., refined petroleum product) source. The number of NAPL and soil samples to be collected from the monitoring wells will be determined based on field observations. If product is present in the monitoring wells, it will be analyzed and compared to known MGP source area NAPL (i.e., coal tar).

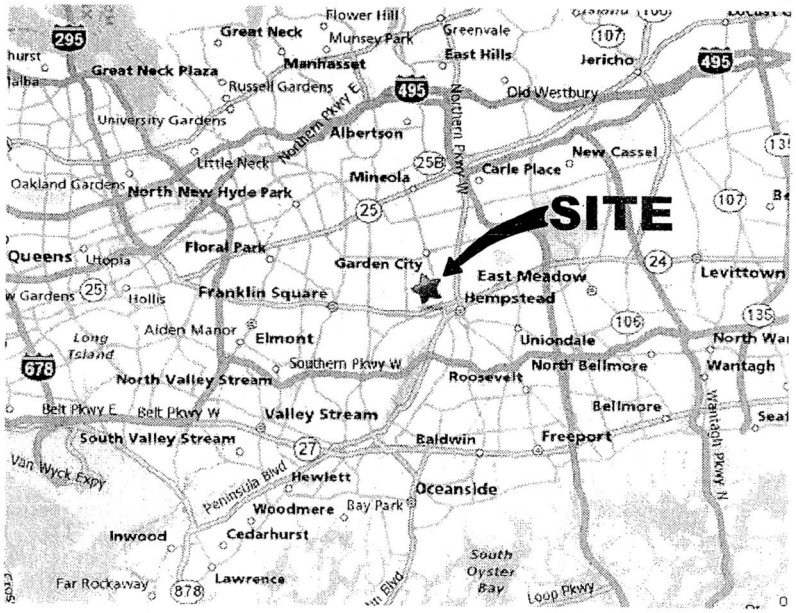
All analyses will be performed in accordance with the QAPP.

5.0 SCHEDULE

Item	Activity	Duration
1	Location survey	3 days
2	Direct-push drilling (and conventional drilling, if needed)	15 days
3	Well drilling and installation	5 days
4	Well development	3 days
5	Groundwater sampling	2 days

FIGURES





LOCATION MAP

LEGEND:

- APPROXIMATE LOCATION OF FORMER MGP STRUCTURE
- LOCATION OF EXISTING STRUCTURE
- FORMER MGP SITE BOUNDARY
- SOLD PROPERTY BOUNDARY
- FENCE

KEYSPAN
HEMPSTEAD INTERSECTION STREET
FORMER MGP SITE
GARDEN CITY/HEMPSTEAD, NY

URS

SITE LOCATION MAP

FIGURE 1

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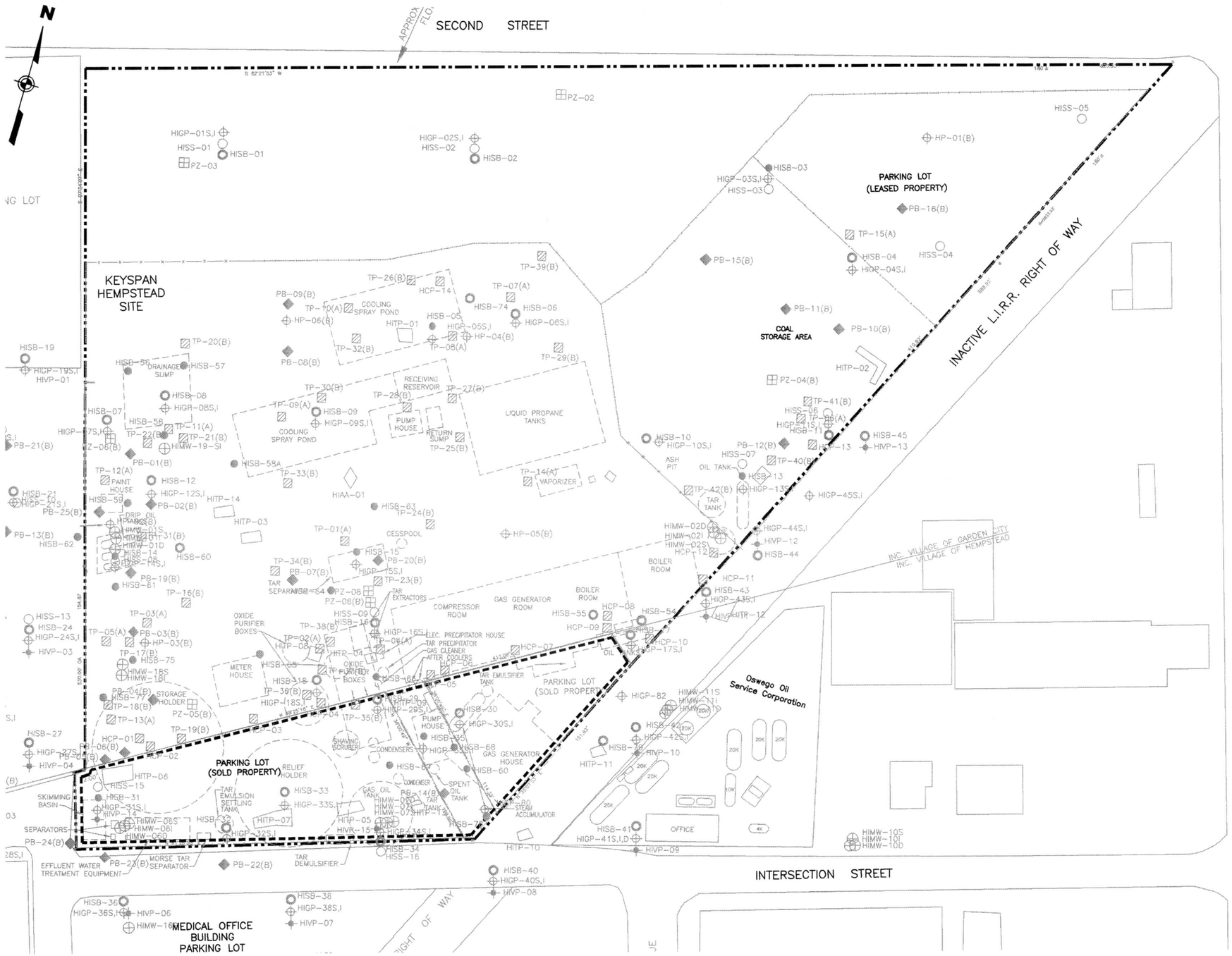
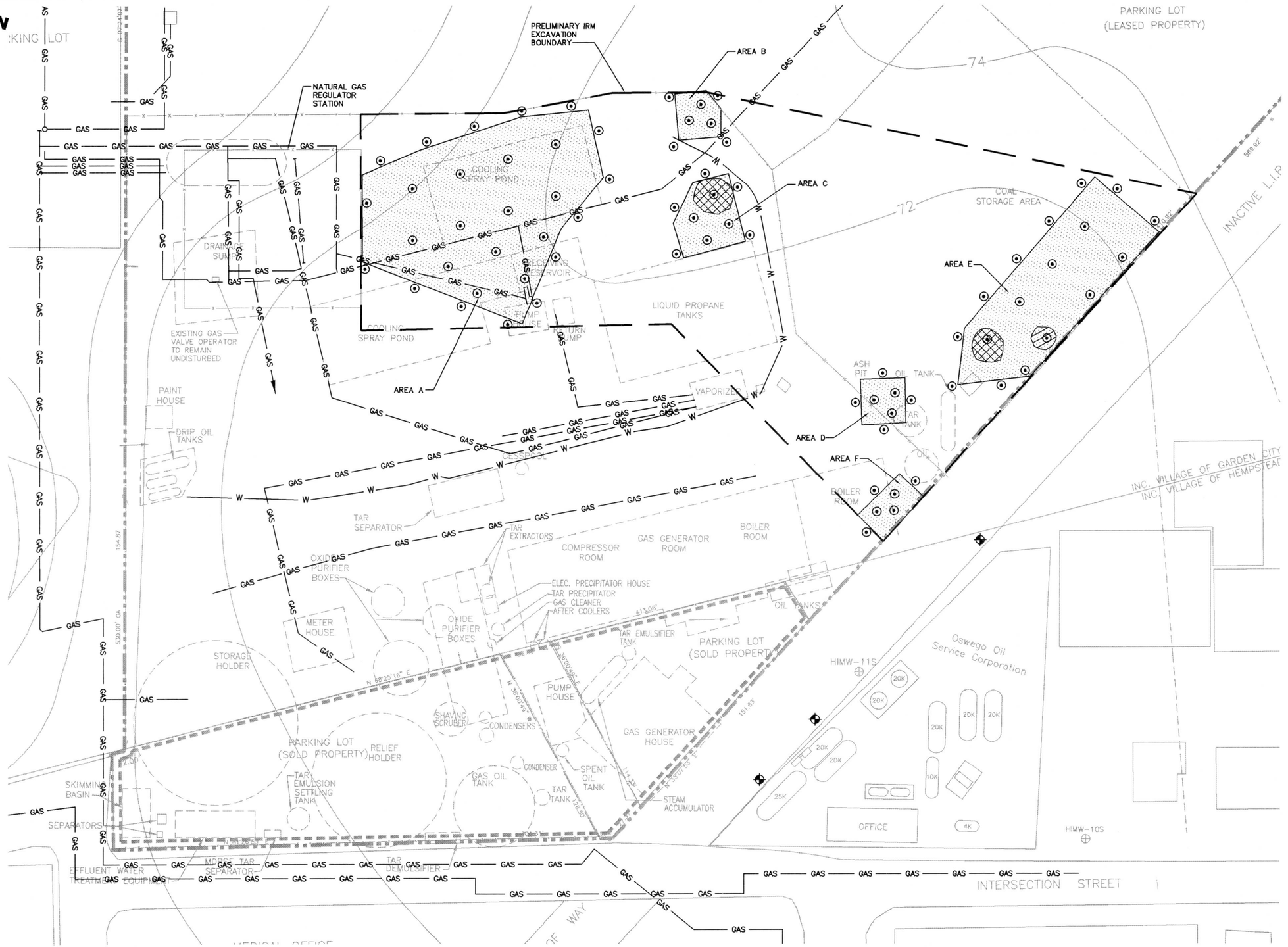


URS Corporation	KEYSPAN CORPORATION HEMPSTEAD INTERSECTION STREET FORMER MGP SITE GARDEN CITY/HEMPSTEAD, NY	PREVIOUS SITE INVESTIGATIONS	FIGURE 2

J:\11175065.0000\CAD\DRAFT\TASK2\HEMPSTEAD\RIM.DWP FIGURE 2.dwg 11/21/07-3 MLU



NOTES:

1. SHOWN LOCATIONS OF UTILITIES SHALL BE CONSIDERED APPROXIMATE, AND BE VERIFIED BY THE CONTRACTOR.
2. ALL EXISTING SITE UTILITIES ARE NOT NECESSARILY SHOWN.
3. SOME SHOWN UTILITIES MAY HAVE ALREADY BEEN DEMOLISHED AND/OR REMOVED.

LEGEND:

- PROPOSED GROUNDWATER MONITORING WELL
- EXISTING GROUNDWATER MONITORING WELL
- PROPOSED SOIL BORING
- GAS — EXISTING GAS LINE
- W — EXISTING WATER LINE
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURE
- LOCATION OF EXISTING STRUCTURE
- FORMER MGP SITE BOUNDARY
- SOLD PROPERTY BOUNDARY
- FENCE
- DEPTH OF EXCAVATION APPROXIMATELY 24 FT
- DEPTH OF EXCAVATION APPROXIMATELY 16 FT
- DEPTH OF EXCAVATION APPROXIMATELY 8 FT

J:\11175085.00000\CAD\DRAFT\TASK2\HEMPSTEAD\RIM\DWP FIGURE 3.dwg 11/28/07-S EJH

URS Corporation	**KEYSPAN CORPORATION** **HEMPSTEAD INTERSECTION STREET** **FORMER MGP SITE** **GARDEN CITY/HEMPSTEAD, NY**	**PROPOSED IRM INVESTIGATION MAP**	**FIGURE 3**

TABLES

TABLE 1

SUMMARY OF SAMPLES TO BE COLLECTED AND ANALYTICAL PARAMETERS

HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE

KEYSPAN

Parameter	Analytical Method[1,2]	Estimated Number of Samples	Field QC Samples				Total No. of Samples
			Field Duplicates	MS/MSD/ MD [3]	Rinsate Blanks	Trip Blanks	
I. Subsurface Soil Samples from Oswego Wells							
TCL VOCs	8260B	12	0	1/1	1	0	15
TCL SVOCs	8270C	12	0	1/1	1	0	15
Pesticides	8081B	12	0	1/1	1	0	15
PCBs (as Aroclors)	8082	12	0	1/1	1	0	15
TAL Metals	6010B/7471A	12	0	1/1	1	0	15
Total Sulfide	9031	12	0	1/1	1	0	15
Total Cyanide	9014	12	0	1/1	1	0	15
II. Groundwater Samples from Oswego Wells							
TCL VOCs	8260B	6	0	1/1	1	1	10
TCL SVOCs	8270C	6	0	1/1	1	0	9
Pesticides	8081B	6	0	1/1	1	0	9
PCBs (as Aroclors)	8082	6	0	1/1	1	0	9
TAL Metals	6010B/7471A	6	0	1/1	1	0	9
Total Sulfide	9030B	6	0	1/1	1	0	9
III. Product (NAPL) Samples							
Fuel Forensic Analysis	8100 (mod.)/8270C (mod.)	4	0	0	0	0	4
IV. Waste Characterization from Delineation Borings							
TCLP VOCs	1311/8260B	16	1	0	0	0	17
TCLP SVOCs	1311/8270C	16	1	0	0	0	17
TCLP Pesticides	1311/8081B	16	1	0	0	0	17
Total PCBs (as Aroclors)	8082	16	1	0	0	0	17
TCLP Metals [4]	1311/6010B/7471A	16	1	0	0	0	17
Total Sulfur	ASTM D129	16	1	0	0	0	17
Ignitability	1010	16	1	0	0	0	17
Reactivity	Chapter 7, Section 7.3	16	1	0	0	0	17
Corrosivity	9040B	16	1	0	0	0	17
TPH - DRO	8015 mod.	69	0	3/3	3	0	78
TCL VOCs	8260B	69	0	3/3	3	0	78
TCL SVOCs	8270C	69	0	3/3	3	0	78

Notes:

1. NYSDEC Analytical Services Protocol (ASP), July 2005 Edition.
2. Target analyte list (TAL) metals as listed in USEPA CLP Statement of Work ILM04.0/5.0.
3. MS/MSD samples will be collected for VOC, SVOC, Pesticide and PCB analyses. MS/MD samples will be collected for metals, cyanide, and sulfide analyses.
4. TCLP Metals include As, Ba, Cd, Cr, Cu, Hg, Ni, Pb, Se, Ag, Zn.

PCBs - Polychlorinated biphenyls
MS/MSD/MD - Matrix spike/matrix spike duplicate/matrix duplicate
NAPL - Non-Aqueous Phase Liquid
DRO - Diesel Range Organics

ATTACHMENT A-1
SAMPLING AND ANALYSIS PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET
FORMER MANUFACTURED GAS PLANT SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

Prepared for:

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November 2007

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SAMPLING AND ANALYSIS PLAN

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1.0 INTRODUCTION

URS Corporation (URS) prepared this Sampling and Analysis Plan (SAP) for KeySpan for the Hempstead Intersection Street Former Manufactured Gas Plant (MGP) site (Site) located in the Villages of Hempstead and Garden City, in the Town of Hempstead, Nassau County, Long Island, New York. This SAP was prepared as an attachment to the Interim Remedial Measures (IRM) Delineation Work Plan (DWP) which defines the objectives, scope and means of implementation of the IRM including the removal of the MGP-impacted soils from six areas on the Hempstead site (Areas A through F, see Figure 1) and NAPL recovery. This SAP provides a description of procedures to be followed during field delineation activities.

1.1 Scope of Work

The DWP field activities will include advancing at approximately 70 soil borings and installing 3 monitoring wells at locations shown in Figure 1. Soil, groundwater, and NAPL samples collected during the investigation will be analyzed for the parameters listed in Table 1.

2.0 SITE INVESTIGATION PROCEDURES

The following subsections describe the specific procedures that will be followed during site activities.

2.1 Utility Clearance

Proposed soil boring and monitoring well locations will be identified and marked with paint or flagging prior to installation. Utilities in public right-of-way areas will be cleared through the Underground Facilities Protective Organization (UFPO) 1-800-962-7962. Private utility locating services will also be used including geophysical means.

Vehicle access routes to drilling and boring locations will be determined and cleared by the URS field representative prior to any field activities. The driller will be responsible for acquiring any needed drilling permits.

Prior to drilling, each proposed soil boring will be manually cleared to a depth of 5 feet, using either a hand-auger and/or an air-knife/soil vacuum.

2.2 Drilling

Borings will be advanced in the subsurface using direct-push drilling (e.g., Geoprobe), or air hammer where the direct-push method encounters obstructions, and hollow stem augers for monitoring well borings.

2.2.1 Direct-Push Drilling Procedures

Summary: A standard method of subsurface drilling which enables the recovery of representative subsurface samples for identification and laboratory testing.

Discrete samplers will be used to collect samples obtained with a direct push (Geoprobe™) drill rig. These samplers have an open tube design and measure approximately 2 inches in diameter (outer) by 44 inches long. The samplers will be fitted with a removable cutting shoe. The sampler will be advanced to the desired depth. Each of the samplers will be fitted with a new acetate liner prior to collection of a sample. The acetate liner will be split open to collect the soil and screened with a photoionization detector (PID) and for HCN and H_2S and the readings recorded. Soil samples from zero to 5 feet below ground will be collected manually during clearing of the boreholes, using either a hand-auger and/or an air-knife/soil vacuum. Soil samples collected below 5 feet will be sampled via the direct push method and, where obstructions occur, by alternate (e.g., air hammer) drilling methods.

The length of sample recovery, percent recovery, descriptions (see Section 2.4), and soil description, including any staining and odors, will be recorded on the boring log. A copy of a field boring log sheet is provided in Attachment A-1-1.

All acetate liners will be discarded after use. Upon completion of sampling at each location, all sampling equipment will be decontaminated. Quality assurance samples, including duplicate samples and equipment rinsate blanks will be collected as necessary in accordance with the procedures described in the Quality Assurance Project Plan (QAPP).

2.2.2 Hollow-Stem Auger Drilling Procedures

Summary: A standard method of subsurface drilling which enables the recovery of representative subsurface samples for identification and laboratory testing. During the investigation, some soil borings will be advanced and completed as flush-mount monitoring wells. The final location of each soil boring/well will be based upon field conditions.

Based on previous investigations at the Site, groundwater occurs at a depth of approximately 30 feet. At each monitoring well location, a boring will be advanced with the well screen spanning the water table.

Procedure:

1. Hollow stem augers (HSAs), drill rods, and the drill rig will be thoroughly decontaminated using a high-pressure steam cleaner prior to advancing boreholes. All down-hole equipment will be decontaminated prior to exiting the site.

2. The drill rig will be inspected for oil leaks and any leaks reported prior to starting drilling operations.

3. Advance the boring by rotating and advancing the 4¼-inch inside diameter (I.D.) HSAs to the desired depth. The borings will be advanced incrementally to permit continuous subsurface soil sampling.

4. Collect a split-spoon sample at intervals stipulated by the project geologist or hydrogeologist.

Note: If a confining clay layer is present, drilling will be temporarily suspended. Drilling through confining layers will only occur upon receipt of approval from KeySpan.

Note: Seal all boreholes with cement/bentonite grout or granular bentonite chips. The grout mixture proportions will consist of 94 pounds Type I Portland cement, 4 pounds powdered bentonite, and 8 gallons clean water.

Reference: American Society for Testing and Materials (ASTM) Standard Practice for Soil Investigation and Sampling by Auger Borings D1452, and Standard Method for Penetration Test and Split Barrel Sampling of Soils D1586.

2.3 Split-Spoon Sampling Procedures

Summary: Split-spoon sampling is a standard method of soil sampling to obtain representative samples for identification and laboratory testing, as well as to serve as a measure

of resistance of soil to sampler penetration. Split-spoon samples will be collected continuously through the entire boring.

Procedure:

1) Measure the sampling equipment lengths to ensure that they conform to specifications. Confirm the weight of the hammer (140 pounds).

2) Clean out the HSAs to the bottom depth prior to sampling. Select additional components as required (i.e., leaf spring core retainer for clays or a sand trap for non-cohesive sands).

3) Lower the decontaminated two-inch outside diameter (O.D.) split-spoon to the bottom of the HSAs and check the depth against length of the rods and the split-spoon.

4) Attach the drive head and hammer to the drill rods without the weight of the hammer resting on the rods.

5) Lower the weight and allow the split-spoon to settle up to 6 inches below the bottom of the HSAs. If it settles more, consider use of another type of sampler.

6) Mark four 6-inch intervals on the drill rods relative to a drive reference point on the rig. With the split-spoon resting on the bottom of the hole, drive the split-spoon with the 140-pound hammer falling freely over its 30-inch fall until 24 inches have been penetrated or 50 blows applied.

7) Record the number of blows required to drive the split-spoon 6 inches into the overburden. Determine the "N" value by adding the blows for the 6-to 12-inch and 12-to 18-inch interval of each sample attempt.

8) After penetration is complete, remove the split-spoon.

9) Open the split-spoon to determine the percent recovery, and describe the soil.

10) Split the sample lengthwise and screen the soil for volatile organic vapors, HCN, and H_2S, and record the readings.

11) Document all properties and sample locations in the field notebook, and later on the Boring Log form (Attachment A-1-1).

Reference: ASTM Standard Method for Penetration Test and Split Barrel Sampling of Soils D1586, and Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) D2488.

2.4 Jar Shake Test

Summary: This SOP describes methods to conduct a jar shake test. The jar shake test is a field screening test for the visual detection of sheens (and possibly NAPL) in soils that may not be readily observable through direct observation of the soil sample as collected. The test provides field personnel with real-time information that may be used in making field decisions regarding the presence of coal tar-related contamination.

The jar shake test is useful because it enhances the accuracy of the qualitative assessment of the degree of soil contamination by coal tar and the potential for impacts to groundwater. Many former MGP sites have coal tar impacts to soil ranging from a naphthalene-like odor, soil staining (black or dark brown), to residual or full saturation with NAPL (i.e., coal tar). The test provides a qualitative assessment of soil contamination. It is intended to be applied to coal tar-impacted soils that exhibit staining (black or brown) but have no directly observable sheens or NAPL. Soils which are tested using this procedure and which have a positive result (i.e., sheens observed on the water surface) are qualitatively interpreted as having a potential for impacts to groundwater through leaching.

Method: Equipment and materials used to perform a jar shake test include:

- Clean laboratory grade glass sample containers with caps (e.g., 4-ounce soil jars);
- Clean Teflon® or stainless steel utensils to collect soil samples;
- Personal Protective Equipment (PPE) as required by the HASP;
- Decontamination supplies (as needed)

Performing the jar shake test for soil samples involves the following procedures.

- Collect a soil sample in accordance with work plan;
- Place the soil into the glass sample container. The quantity of soil should fill the container slightly less than half full. Do not add large pebbles or cobbles. Record visual and olfactory observation of the soil sample as collected in the field book or jar shake test data sheet;
- Add distilled or de-ionized water to the sample jar until the water level in the jar is at approximately ¾-full, leaving room for agitation of the soil sample with the water;
- Cap the glass sample container and shake the soil and water mixture for at least one minute or until the soil becomes de-segregated and a slurry is formed;
- Allow the sample to sit in a shaded area for approximately five minutes to allow solids to settle, making observation of the water surface clearer;
- Hold the glass sample container against a white background in natural light. Carefully examine the walls and the bottom of the glass sample container for black, brown or amber smearing on the glass and on the surface of the water – these will be indications that there is residual NAPL in the soil sample;
- Open the jar lid and observe the water surface for the presence of sheens. Be careful to distinguish between "petroleum-like" sheens which remain continuous when disturbed, and bacteria or iron-related sheens that break up when disturbed;
- Screen the soil with a PID and for HCN and H_2S and record the readings;
- Record all appropriate data (e.g., sample identification number, sampling depth, time, result of test, remarks such as description of sample, etc.) in the field log book or on a jar shake test data sheet (see form in Attachment A-1-1); and
- Properly dispose of soil sample and sampling waste.

If these procedures are followed consistently, the jar shake test should be reliable and accurate. Pre-testing with a soil sample that exhibits a sheen before the test and possibly residual NAPL is recommended to pre-determine visual characteristics of residual NAPL indicators and soil sheens on the water surface from a known positive result sample.

2.5 Soil Sample Descriptions

It is important that descriptive qualifiers are consistently used to characterize degree and nature of contaminant impacts and visual-manual soil classification. The following presents some examples of descriptive qualifiers.

- All soils are to be logged using the Unified Soil Classification System (ASTM D 2488 field descriptions).
- PID used to screen all soil samples (Jar Headspace method) – maximum readings should be recorded and included on the logs. PID to be calibrated daily at a minimum.
- Moisture terms are: Dry, Moist, and Wet.
- Color terms - use geotechnical color charts - colors may be combined (e.g., red-brown). Color terms should be used to describe the "natural color" of the sample as opposed to staining caused by contamination (see below).
- Log of each sample interval should be prepared as follows:
    - [Coarse Grained Example] NARROWLY GRADED SAND (SP); mostly fine sand; <5% fines; red-brown, moist, environmental/depositional/geologic descriptions;
    - [Fine Grained Example] SANDY SILT (ML); heterogeneous till structure, nonplastic, ~30% fine to coarse, subangular sand; ~10% subangular fine gravel, max. size ~ 10 mm; brown; environmental/depositional/geologic descriptions;

- Representativeness – Soil logs should include particular notes if the field representative believes that there is a possibility the soil sample being described is not representative of the interval sampled; and

- Intervals for Description – if using a 2-ft (split-spoon) or 4-ft (Macro-core) long sampler – the field description should not necessarily be for the entire sample interval. It is important to look for, identify, and describe small-scale units and changes within each sample interval.

Visible Contamination Descriptors

- Sheen - iridescent petroleum-like sheen. Not to be used to describe a "bacterial sheen" which can be distinguished by its tendency to break up on the water surface at angles whereas petroleum sheen will be continuous and will not break up. A field test for sheen is to put a soil sample in a jar of water and shake the sample (jar shake test), then observe the presence/absence of sheen on the surface of the water in the.

- Stained - used with color (i.e., black or brown stained) to indicate that the soil matrix is stained a color other than the natural (unimpacted) color of the soil.

- Coated - soil grains are coated with tar/free product – there is not sufficient free-phase material present to saturate the pore spaces.

- Blebs - observed discrete sphericals of tar/free product - but for the most part the soil matrix was not visibly contaminated or saturated. Typically this is residual product.

- Saturated - the entirety of the pore space for a sample is saturated with the tar/free product. Care should be taken to ensure that you are not observing water saturating the pore spaces if you use this term. Depending on viscosity, tar/free-phase saturated materials may freely drain from a soil sample.

- Oil. - Used to characterize free and/or residual product that exhibits a distinct fuel oil or diesel fuel like odor; distinctly different from MGP-related odors/impacts.

- Tar. - Used to describe free and/or residual product that exhibits a distinct "coal tar" type odor (e.g., naphthalene-like odor). Colors of product can be brown, black, reddish-brown, or gold.

- Solid Tar. - Used to describe product that is solid or semi-solid phase. The magnitude of the observed solid tar should be described (e.g. discrete granules or a solid layer).

- Purifier Material. - Purifier material is commonly brown/rust or blue/green wood chips or granular material. It is typically associated with a distinctive sulfur-like odor. Other colors may be present.

Olfactory Descriptors

- Use terms such as " tar-like odor" or "naphthalene-like odor" or "fuel oil-like odor" that provide a qualitative description (opinion) as to the possible source of the odor. Naphthalene-like odor is similar to a mothball odor.

- Use modifiers such as strong, moderate, faint to indicate intensity of the observed odor.

DNAPL/LNAPL

- A jar shake test should be performed to identify and determine whether observed tar/free-phase product is either denser or lighter than water. In addition, MGP residues can include both light and dense phases - this test can help determine if both light and dense phase materials are present at a particular location. A jar shake test can be used to provide a qualitative indication of the presence of NAPL in a soil or water sample.

Viscosity of Free-Phase Product

If free-phase product/tar is present a qualitative description of viscosity should be made. Use descriptors such as:

- Highly viscous (e.g., taffy-like)
- Viscous (e.g., No. 6 fuel oil or bunker crude-like)
- Low viscosity (e.g., No. 2 fuel oil-like)

2.5.1 Soil Sample Collection for Laboratory Analysis

Select soil samples will be retained for chemical analysis by the analytical laboratory at the locations and frequency as described in the DWP.

2.6 Monitoring Well Installation and Sampling Procedures

2.6.1 Monitoring Well Installation

Summary: A method for construction of groundwater monitoring within unconsolidated material which enables monitoring of groundwater elevation and acquisition of groundwater samples for laboratory testing. During the investigation, 2-inch ID polyvinyl chloride (PVC) monitoring wells are proposed for installation.

Upon the completion of each well boring, 2-inch I.D. schedule 40 PVC monitoring wells will be set through the augers. Screens will be approximately 20 feet in length with 0.020-inch machined slots. The bottom of the screen will be fitted with a two-foot long sump.

Procedure:

1) Advance the subsurface boring to the desired depth by means of HSA drilling.

2) Remove the center plug from the HSAs and verify borehole depth using a weighted measuring tape.

3) Add washed and graded medium sand as needed to the bottom of the borehole.

4) Insert the well screen fitted with a plug and riser pipe into borehole through the HSAs. Cap the riser to prevent well construction materials from entering the well.

5) Add a Number 2 graded sand to the screen section of the well while slowly removing the augers. The sand pack should extend from one foot below the bottom of the well sump to a point approximately three feet above the top of the screened material. Measure with a weighted tape.

6) Slowly add bentonite pellets to seal the borehole as the augers are slowly removed. The bentonite seal should be at least two feet thick. If the bentonite seal is placed above the groundwater level within the borehole, add water to the borehole to hydrate the bentonite pellets. Allow the pellets to hydrate for at least 30 minutes. Measure with a weighted tape.

   Note: The rate of removal of the auger from the borehole should closely follow the rate that the sand pack and bentonite pellets fill the borehole.

7) The flush-mount well risers will be cut off just below the ground surface.

8) Backfill to 6 inches below the top of the well riser with concrete.

9) Install a protective casing (road box) over the well riser pipe and set it into the concrete backfill.

10) Lock the protective casing cover.

11) Document well construction in the field notebook and later on a Monitoring Well Construction Detail Diagram (Attachment A-1-1).

    Reference: ASTM Standard Practice for Design and Installation of Groundwater Monitoring Wells in Aquifers D5092.

2.6.2 Monitoring Well Development Procedures

Summary: At least 48 hours following completion of drilling and well installation, each monitoring well will be developed by pumping until the discharged water is relatively sediment free and the indicator parameters (pH, temperature, dissolved oxygen, specific conductivity, and turbidity) have reached steady state. Developing the well not only removes any sediment but also may improve the hydraulic properties of the formation. The effectiveness of the development measures will be closely monitored in order to keep the volume of discharged water to the minimum necessary to obtain sediment-free samples. A portable turbidimeter will be used to monitor effectiveness of development. A turbidity reading of < 50 Nephelometric Turbidity Units (NTU) and steady state pH, temperature, and specific conductivity readings will be used as a guide for discontinuing well development. The monitoring wells will be developed as described below. Development water will be containerized for off-site disposal.

Procedure:

1) An appropriate well development method should be selected, depending on water level depth, well productivity, and sediment content of water. Well development options include surging while manual pumping and powered suction-lift or hydrolift pumping.

2) Equipment should be assembled, decontaminated (if necessary), and installed in the well. Care should be taken not to introduce contaminants to the equipment during installation.

3) Well development should proceed by repeated surging and removal of water from the well until the discharged water is relatively sediment-free. Effectiveness of development should be monitored at regular intervals using a portable turbidimeter. The volume of water removed, and turbidity, pH, temperature, and conductivity measurements will be recorded on a Well Development/Purging Log Form (Attachment A-1-1).

4) Well development will be discontinued when the turbidity of the discharged water is below 50 NTU.

Reference: ASTM Standard Practice for Design and Installation of Groundwater Monitoring Wells in Aquifers D5092.

2.6.3 Water Level Monitoring Procedures

Summary: Determination of groundwater depths in monitoring wells is necessary to calculate required purge volumes prior to groundwater sampling and to make potentiometric surface maps. Water levels in monitoring wells scheduled to be sampled during the field work will be measured using an electronic interface probe/water level indicator. During each monitoring event, water levels to be used to generate potentiometric surface contour maps will be collected from all site wells.

Water level measurement procedures are presented below.

Procedure:

1) Clean the water level probe and the lower portion of cable following standard decontamination procedures and test water level meter to ensure that the batteries are charged.

2) Lower the probe slowly into the monitoring well until the solid audible alarm indicates water.

3) Read the depth to the nearest hundredth of a foot from the graduated cable using the V-notch on the riser pipe as a reference.

4) Repeat the measurement for confirmation and record the water level.

5) Lower the probe slowly to the bottom of the monitoring well. If the solid audible alarm becomes intermittent, this indicates the presence of DNAPL. Record the depth to the top of the DNAPL and record the bottom depth of the well.

6) Remove the probe from the well slowly, drying the cable and probe with a clean paper towel.

7) Replace the well cap and lock protective cap in place.

8) Decontaminate the water level meter if additional measurements are to be taken.

Each new and existing well will also be checked for the presence of DNAPL using the electronic interface probe/water level indicator. Alternately, if the interface probe cannot detect the DNAPL due to its viscosity, a weighted cotton string will be lowered to the bottom of the well and the bottom portion of the string stained by DNAPL will be measured to determine the DNAPL thickness.

2.6.4 Groundwater Sampling Procedures

Summary: The following groundwater sampling procedures will be used for new monitoring wells after purging has been conducted:

Procedures

1) After well purging is completed, a sample will be collected into the appropriate laboratory supplied containers.

2) Direct water flow toward the inside wall of the sample container to minimize volatilization. Fill volatile sample containers so no headspace (air bubbles) is present. If containers are pre-preserved, do not overfill sample containers. Note if effervescence is observed.

3) All sample bottles will be labeled in the field using a waterproof permanent marker.

4) Samples will be collected into sample bottles (containing required preservatives) and placed on ice in coolers for processing (preservation and packing) prior to shipment to the analytical laboratory. A chain-of-custody

record will be initiated. The analytical laboratory will certify that the sample bottles are analyte-free prior to shipping.

5) Remove dedicated/disposable HDPE tubing and foot-valve.

6) Well sampling data are to be recorded in the field notebook and on the Well Purging Log.

7) Groundwater samples will be placed on ice and shipped overnight to the laboratory under COC control for the parameters indicated in Table 1. The volume of sample required, bottle type and required QA/QC may be found in Tables 1 and 2. Samples will be shipped the same day as collection.

Any observations of sheen, blebs, free-phase product/tar, staining or coating of the sampling equipment, odor, etc. that made during sampling of groundwater are to be included in the groundwater sample collection log.

2.6.5 Sample Labeling

Summary: In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, the following procedures will be used.

Procedure: Each will have the following information placed on the laboratory supplied sample label:

- Site name
- Sample identification
- Project number
- Date/time
- Sampler's initials

- Analysis required

The following terminology shall be used to identify samples:

SITE ID-SG-xx

Where Site ID is the site identification number, SG is the type of sample (e.g., SG for soil gas) and xx is the ascending numerical number assigned to the sample.

Field duplicate samples will be assigned a unique identification alphanumeric code that specifies the data of collection, the letters FD (for field duplicate) and an ascending number that records the number of duplicate samples collected that day. For example, the first field duplicate collected on February 22, 2007 would be assigned the following sample number using the code shown below:

YYYYMMDD-FD-1 = 20070222-FD-1

Subsequent duplicates collected on the same day would be assigned FD-2, FD-3 etc. Field sampling crew will record the duplicate sample information on the appropriate Sampling Field Data Sheets and also in the field book.

2.6.6 Measurement of NAPL in Groundwater Monitoring Wells

The presence of NAPL in groundwater monitoring wells is relatively common at former MGP sites and can take the form of an LNAPL or DNAPL. An LNAPL by its nature has a specific gravity less than that of water and will float on the water surface. A DNAPL has a specific gravity greater than that of water and will sink to the bottom of a well. Due to the chemical nature and viscosity variations in coal tar-related NAPLs that can occur on a given site, no one measurement method is accurate in all cases and dual measurement methods should be employed for consistency and accuracy of field measurements.

For LNAPL, an oil-water interface probe can often be used successfully to measure product thickness in a monitoring well. However, the degree of weathering and viscosity can affect the accuracy of the indicator alarm sounding at the product/water interface (i.e., the lower surface of the LNAPL, after the probe has passed through the LNAPL). Therefore, a backup measurement of LNAPL will be performed using a weighted, disposable clear bailer of a length sufficient to capture the LNAPL thickness interval. A weighted wide-mouth NAPL bailer generally works best for this. Upon removal of the bailer, the LNAPL thickness is measured by placing a ruler or tape measure along the side of the bailer with the bailer in the upright (i.e., vertical) position and recording the LNAPL thickness.

For DNAPL, use of an oil-water interface probe is not recommended, as coal tar easily fouls the sensors, requiring careful cleaning, and often provides inaccurate results. DNAPL measurements should be performed with a weighted cotton string or a weighted steel measuring tape.

For the weighted cotton string method, a weight (e.g., steel washers or a steel bolt) is attached to a length of new cotton string that is at least 5 feet longer than the total well depth. Sufficient weight should be used so that the weighted string sinks in the well without resistance or buoyancy so that the person performing the measurement can easily discern when the weight has touched the bottom of the well and the string remains taught. The weighted string is held in place in the well for at least 30 seconds, then slowly withdrawn. The coal tar will absorb onto the cotton string and its length is measured against a ruler or tape measure.

For the weighted steel tape method, sufficient weight is applied so that the steel tape remains taught during insertion in the well and the point at which the weight touches the bottom of the well can be discerned with little to no slack in the tape. Once the weighted tape reaches the bottom of the well, it is withdrawn slowly to minimize turbulence or shearing of the DNAPL on the tape. The DNAPL thickness is directly read on the steel tape, adjusting for the length of the weight below the end of the tape as needed. As a backup measurement, a weighted, clear, disposable wide-mouth bailer should be used.

3.0 FIELD DOCUMENTATION

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, purge forms and notebooks used during field activities will be submitted as part of the final report.

The field sampling team will maintain a sample log sheet summarizing the following data:

1. Sample Identification
2. Date and time of sample collection
3. Sampling depth
4. Identity of samplers
5. Sampling methods and devices
6. Water level and NAPL thickness measurements in wells
7. Chain of custody and shipping information

Each subsurface boring will be logged in a bound field notebook during drilling by the supervising geologist. Field notes will include descriptions of subsurface materials encountered during drilling, depth to groundwater, NAPL thickness, sample numbers, and types of samples recovered from the borehole. Additionally, the geologist will note time and material expenditures for later verification of contractor invoices.

Upon completion of daily drilling activities, the geologist will complete the daily drilling record form and initiate chain-of-custody on any samples recovered for chemical laboratory testing. Following completion of the drilling program, the geologist will transfer field notes onto standard forms for the investigation report.

On a weekly basis the project geologist will submit a summary report to the project manager containing at a minimum the following: (1) a summary of the daily drilling records; (2) progress report on field activities; and (3) a record of site visitors.

The supervising geologist will log the time and material expenditures for later verification of contractor invoices. Upon completion of daily drilling activities, the geologist will complete the Daily Drilling Record form. Following completion of the program, the geologist will transfer field notes onto standard forms for the investigation report.

The proper completion of the following forms/logs will be considered correct procedure for documentation during the drilling program:

1) Field Log Book - weather-proof hand-bound field book

2) Daily Drilling Records (Attachment A-1-1)

3) Boring Logs (Attachment A-1-1)

4) Monitoring Well Construction Detail Diagrams (Attachment A-1-1)

4.0 SURVEYING AND MAPPING

Project surveying will provide data necessary to create an accurate topographic map for the site and to site soil boring and new monitoring well locations on a site base map. All surveying will be performed under the supervision of a New York State licensed land surveyor.

Vertical control and horizontal datum for this project will be based on established standards unless otherwise directed by KeySpan.

Prior to initiating drilling activities, a New York State-licensed surveyor will mark out the proposed soil boring and monitoring well locations. Any final soil boring and monitoring well locations that were relocated from or added to the initially located locations will be surveyed at the conclusion of the investigation or approximated if sufficient reference is already available on site from the surveyed borings.

At the completion of well installation activities, a New York State-licensed surveyor will survey the final well locations and elevations of the well risers and protective casing.

As part of the IRM, a topographic survey of the entire KeySpan site (approximately 19 acres) will be completed by a New York State-licensed land surveyor. The topographic survey will be sufficient to generate base mapping with a one-foot contour interval. The level of detail will include, but not be limited to existing paved areas (including parking areas, roads, sidewalks, curbs, etc.), all building locations, foundations, walls, fences, trees and bushes. The survey will include locations and elevations of all utility structures (manholes, catch basins, telephone poles, fire hydrants, etc.) visibly evident at the time of the survey.

5.0 SAMPLE SHIPPING

Summary: Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in this study follow the chain-of-custody guidelines outlined in NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure:

1) The chain-of-custody (COC) record should be completely filled out with all relevant information.

2) The original COC goes with the samples. It should be placed in a Ziplock bag and placed inside the cooler/box containing the samples. The sampler should retain a copy of the COC.

3) Soil samples should be shipped on ice in the laboratory supplied coolers.

4) Place the lab address on top of sample box/cooler. Affix numbered custody seals across box lid flaps and cooler lid. Cover seals with wide, clear tape.

5) Ship samples via overnight carrier the same day that they are collected.

It is noted that the subcontract laboratory, H2M labs, Inc., will be performing soil analyses. URS will coordinate with H2M for the collection and delivery of the samples to their laboratory in Melville, New York on the day of sample collection.

6.0 FIELD SAMPLING INSTRUMENTATION

URS-owned and rented field sampling equipment will require no maintenance beyond decontamination between sampling locations. Calibration procedures for electronic instruments can be found in the equipment operating manuals. Calibration and maintenance procedures for the common instrumentation that will be used during field investigations are discussed in the equipment operating manuals. A copy of the manufacturer's operating manual for each instrument will be kept with the instrument or the operator. All field sampling equipment will be calibrated as recommended by the manufacturer. The calibration procedures and results will be recorded in the field notebook.

6.1 Preventative Maintenance

In case of an emergency, the equipment rental vendor, other URS offices, and/or the instrument manufacturer will be contacted. Instrumentation rental vendors, which provide overnight UPS/Federal Express service, are listed below.

Vendor:

- Pine Environmental Services, Inc.: Mattydale, NY: 1-877-903-7463
- Ashtead Technology Rentals, Rochester, NY: 1-800-242-3910

7.0 SAMPLING EQUIPMENT DECONTAMINATION PROCEDURES

Summary: To assure that no outside contamination will be introduced into the samples/data, thereby invalidating the samples/data, the following cleaning protocols will apply for all equipment used to collect samples/data during the field investigations.

Procedures:

1) Thoroughly clean equipment with laboratory-grade soap and water, until all visible contamination is gone.

2) Rinse with water, until all visible evidence of soap is removed.

3) For stainless steel trowels and bowls used for surface soil sampling, rinse equipment with nitric acid, then rinse with deionized water, and then rinse with methanol.

4) Rinse several times with deionized water.

5) Air dry before using.

6) If equipment will not be used immediately, wrap in aluminum foil.

All down-hole drilling equipment will be steam cleaned on a portable decontamination pad. Decontamination materials will be collected and placed in 55-gallon drums.

8.0 INVESTIGATION-DERIVED WASTE CHARACTERIZATION AND DISPOSAL

All soil cuttings, decontamination water, and development water will be contained in 55-gallon drums and temporarily staged at an approved location.

URS will collect representative samples of the investigation-derived wastes (IDW) for proper waste characterization (as determined by the disposal facility).

The IDW subcontractor will be responsible for removing all containers of IDW from the work site as needed. All waste will be disposed of at a permitted off-site disposal facility.

9.0 ANALYSIS

The following organic compounds, inorganic analytes, and disposal parameters will be included in this program:

- Target Compound List Volatile Organic Compounds (SW 8260B)
- Target Compound List Semi-Volatile Organic Compounds (SW 8270C)
- Polychlorinated Biphenyls (SW 8082)
- Pesticides (SW 8081B)
- Total Petroleum Hydrocarbons (Diesel Range Organics) (SW 8270C)
- Total Metals (SW 6010B)
- Mercury (SW 7471A)
- Total Cyanide (SW 9013)
- Toxicity Characteristic Leaching Procedure Metals (SW 1311/6010B)
- Toxicity Characteristic Leaching Procedure Pesticides (SW 1311/8081A)
- Toxicity Characteristic Leaching Procedure Herbicides (SW 1311/8151A)
- Ignitability
- Corrosivity
- Reactive Cyanide
- Reactive Sulfide
- Percent Sulfur
- Alkylated PAHs by GC/MS-SIM (SW 8270 mod)

TABLES

TABLE 1

SUMMARY OF SAMPLES TO BE COLLECTED AND ANALYTICAL PARAMETERS

HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURED GAS PLANT SITE

KEYSPAN

Parameter	Analytical Method[1,2]	Estimated Number of Samples	Field QC Samples				Total No. of Samples
			Field Duplicates	MS/MSD/ MD [3]	Rinsate Blanks	Trip Blanks	
I. Subsurface Soil Samples from Oswego Wells							
TCL VOCs	8260B	12	0	1/1	1	0	15
TCL SVOCs	8270C	12	0	1/1	1	0	15
Pesticides	8081B	12	0	1/1	1	0	15
PCBs (as Aroclors)	8082	12	0	1/1	1	0	15
TAL Metals	6010B/7471A	12	0	1/1	1	0	15
Total Sulfide	9031	12	0	1/1	1	0	15
Total Cyanide	9014	12	0	1/1	1	0	15
II. Groundwater Samples from Oswego Wells							
TCL VOCs	8260B	6	0	1/1	1	1	10
TCL SVOCs	8270C	6	0	1/1	1	0	9
Pesticides	8081B	6	0	1/1	1	0	9
PCBs (as Aroclors)	8082	6	0	1/1	1	0	9
TAL Metals	6010B/7471A	6	0	1/1	1	0	9
Total Sulfide	9030B	6	0	1/1	1	0	9
III. Product (NAPL) Samples							
Fuel Forensic Analysis	8100 (mod.)/8270C (mod.)	4	0	0	0	0	4
IV. Waste Characterization from Delineation Borings							
TCLP VOCs	1311/8260B	16	1	0	0	0	17
TCLP SVOCs	1311/8270C	16	1	0	0	0	17
TCLP Pesticides	1311/8081B	16	1	0	0	0	17
Total PCBs (as Aroclors)	8082	16	1	0	0	0	17
TCLP Metals [4]	1311/6010B/7471A	16	1	0	0	0	17
Total Sulfur	ASTM D129	16	1	0	0	0	17
Ignitability	1010	16	1	0	0	0	17
Reactivity	Chapter 7, Section 7.3	16	1	0	0	0	17
Corrosivity	9040B	16	1	0	0	0	17
TPH - DRO	8015 mod.	69	0	3/3	3	0	78
TCL VOCs	8260B	69	0	3/3	3	0	78
TCL SVOCs	8270C	69	0	3/3	3	0	78

Notes:

1. NYSDEC Analytical Services Protocol (ASP), July 2005 Edition.
2. Target analyte list (TAL) metals as listed in USEPA CLP Statement of Work ILM04.0/5.0.
3. MS/MSD samples will be collected for VOC, SVOC, Pesticide and PCB analyses. MS/MD samples will be collected for metals, cyanide, and sulfide analyses.
4. TCLP Metals include As, Ba, Cd, Cr, Cu, Hg, Ni, Pb, Se, Ag, Zn.

PCBs - Polychlorinated biphenyls
MS/MSD/MD - Matrix spike/matrix spike duplicate/matrix duplicate
NAPL - Non-Aqueous Phase Liquid
DRO - Diesel Range Organics

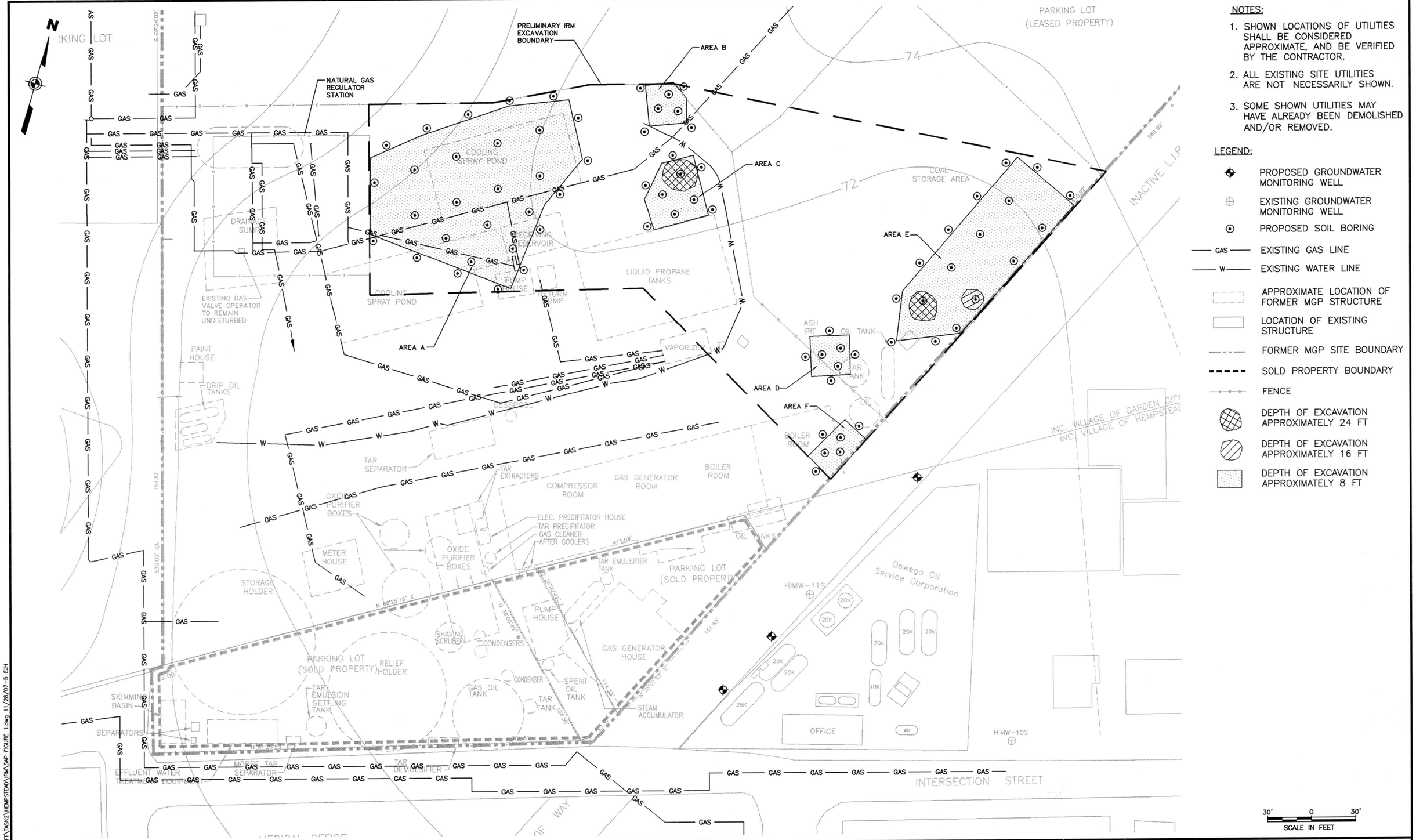
TABLE 2
SAMPLE CONTAINER, PRESERVATION, AND HOLDING TIME REQUIREMENTS
HEMPSTEAD INTERSECTION STREET FORMER MANUFACTURING GAS PLANT SITE
KEYSPAN

Analytical Method/Parameter	Container Size/Type*	Number of Containers to Be Collected	Preservation	Maximum Holding Time (from VTSR)
Groundwater Samples from Oswego Wells				
TCL VOCs	40 mL glass vial	3	HCl to pH<2, 4 °C	Analysis: 10 days (7 days if not preserved to pH<2)
TCL SVOCs	1L amber glass	2	4 °C	Extraction: 5 days Analysis: 40 days
Pesticides	1L amber glass	2	4 °C	Extraction: 5 days Analysis: 40 days
PCBs (as Aroclors)	1L amber glass	2	4 °C	Extraction: 5 days Analysis: 40 days
TAL Metals	1L plastic	1	HNO_3 to pH<2, 4 °C	Analysis: 180 days (26 days for Hg)
Subsurface Soil Samples from Oswego Wells				
TCL VOCs	2 oz. glass jar	2	4 °C	Analysis: 7 days
TCL SVOCs	4 oz. glass jar	1	4 °C	Extraction: 5 days Analysis: 40 days
Pesticides			4 °C	Extraction: 5 days Analysis: 40 days
PCBs (as Aroclors)	4 oz. glass jar	1	4 °C	Extraction: 5 days Analysis: 40 days
TAL Metals	4 oz. glass jar	1	4 °C	Analysis: 180 days (26 days for Hg)
Total Cyanide	4 oz. glass jar	1	4 °C	Analysis: 12 days
Total Sulfide	4 oz. glass jar	1	4 °C	Analysis: 5 days
Waste Characterization from Delineation Borings				
TCLP VOCs	2 oz. glass jar	2	4 °C	Extraction: 5 days Analysis: 7 days
TCLP SVOCs			4 °C	Extraction: 5 days Analysis: 40 days
TCLP Pesticides			4 °C	Extraction: 5 days Analysis: 40 days
Total PCBs (as Aroclors)			4 °C	Extraction: 5 days Analysis: 40 days
TCLP Metals	4 oz. glass jar	2	4 °C	Extraction: 180 days (Hg-5 days) Analysis: 180 days (Hg - 26 days)
Total Sulfur			4 °C	Analysis: 5 days
Ignitability			4 °C	Analysis: upon receipt
Reactivity			4 °C	Analysis: 12 days
Corrosivity	4 oz. glass jar	2	4 °C	Analysis: 12 days
TPH - DRO	2 oz. glass jar	1	4 °C	Extraction: 5 days Analysis: 40 days
TCL VOCs	2 oz. glass jar	2	4 °C	Analysis: 7 days
TCL SVOCs	2 oz. glass jar	1	4 °C	Extraction: 5 days Analysis: 40 days
Product (NAPL) Samples				
Fuel Forensic Analysis	40 mL glass vial	2	4 °C	Extraction: 5 days Analysis: 40 days

*Number and size of containers may vary based on laboratory sample volume requirements.

VTSR - Validated time of sample receipt

FIGURE



NOTES:

1. SHOWN LOCATIONS OF UTILITIES SHALL BE CONSIDERED APPROXIMATE, AND BE VERIFIED BY THE CONTRACTOR.
2. ALL EXISTING SITE UTILITIES ARE NOT NECESSARILY SHOWN.
3. SOME SHOWN UTILITIES MAY HAVE ALREADY BEEN DEMOLISHED AND/OR REMOVED.

LEGEND:

- PROPOSED GROUNDWATER MONITORING WELL
- EXISTING GROUNDWATER MONITORING WELL
- PROPOSED SOIL BORING
- GAS — EXISTING GAS LINE
- W — EXISTING WATER LINE
- APPROXIMATE LOCATION OF FORMER MGP STRUCTURE
- LOCATION OF EXISTING STRUCTURE
- FORMER MGP SITE BOUNDARY
- SOLD PROPERTY BOUNDARY
- FENCE
- DEPTH OF EXCAVATION APPROXIMATELY 24 FT
- DEPTH OF EXCAVATION APPROXIMATELY 16 FT
- DEPTH OF EXCAVATION APPROXIMATELY 8 FT

URS Corporation	**KEYSPAN CORPORATION** **HEMPSTEAD INTERSECTION STREET** **FORMER MGP SITE** **GARDEN CITY/HEMPSTEAD, NY**	**PROPOSED IRM INVESTIGATION MAP**	**FIGURE 1**

J:\11175065.00000\CAD\DRAFT\TASK2\HEMPSTEAD\IRM\SAP FIGURE 1.dwg 11/28/07-5 EJH

ATTACHMENT A-1-1

FIELD ACTIVITY FORMS

FIGURE 1
SOIL JAR SHAKE TEST FOR SHEENS
RESULTS SHEET

SITE: _____ ENVIRONMENTAL CONSULTING FIRM: _____

DATE: _____ FIELD PERSONNEL: _____

#	Sample ID Number	Depth	Time	Result of Test (Sheen or No Sheen)	Remarks / Visual & Olfactory of Soil Sample
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

DAILY DRILLING RECORD

URS Corporation

PROJECT TITLE: _____ DATE: _____

CLIENT: _____ CONTRACTOR: _____

FROM	TO	PRODUCTIVE HOURS	ACTIVITIES/COMMENTS
TOTAL PRODUCTIVE HOURS			LEVEL B / LEVEL C / LEVEL D (CIRCLE ONE SELCTION)

LABOR:		MATERIALS / SUPPLIES:	
UNITS		UNITS	

WEATHER:

_____ URS ONSITE COORDINATOR	_____ CONTRACTOR REPRESENTATIVE

URS

DAILY INSTRUMENT CALIBRATION CHECK SHEET

DATE	INSTRUMENT	BATTERY CHECK OK?	ZERO ADJUST OK?	CALIBRATION GAS (PPM)	READING (PPM)	CALIBRATED BY

URS Corporation	TEST BORING LOG
	BORING NO:
PROJECT:	SHEET: 1 of
CLIENT:	JOB NO.:
BORING CONTRACTOR:	BORING LOCATION:
GROUNDWATER:	GROUND ELEVATION:
	DATE STARTED:
	DATE FINISHED:
	DRILLER:
	GEOLOGIST:
* POCKET PENETROMETER READING	REVIEWED BY:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.				
				WT.				
				FALL				

	SAMPLE					DESCRIPTION				REMARKS
DEPTH FEET	STRATA SYMBOL	"S" NO.	"N" NO.	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	MOISTURE PID
5										
10										
15										
20										
25										
30										

COMMENTS:	PROJECT NO.
	BORING NO.

URS Corporation									TEST BORING LOG
									BORING NO:
PROJECT:									SHEET: 2 of
CLIENT:									JOB NO.:
BORING CONTRACTOR:									BORING LOCATION:
GROUNDWATER:					CAS.	SAMPLER	CORE	TUBE	GROUND ELEVATION:
DATE	TIME	LEVEL	TYPE	TYPE					DATE STARTED:
				DIA.					DATE FINISHED:
				WT.					DRILLER:
				FALL					GEOLOGIST:
				* POCKET PENETROMETER READING					REVIEWED BY:

	SAMPLE						DESCRIPTION				
DEPTH FEET	STRATA SYMBOL	"S" NO.	"N" NO.	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS
40										
45										
50										
55										
60										
65										

COMMENTS:	PROJECT NO.
	BORING NO.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: _____

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=		3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=		4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=		5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											

COMMENTS:

WELL PURGING LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: _____

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

			WELL ID.	GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	_____	1"	
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	_____	2"	
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	_____	3"	
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	_____	4"	
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	_____	5"	
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	_____	6"	
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	_____	8"	

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	INITIAL										INSTRUMENT
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
TURBIDITY (NTU)											
DISSOLVED OXYGEN											
WATER LEVEL											
TIME											

COMMENTS:

DRILLING SUMMARY

Geologist:

Drilling Company:

Driller:

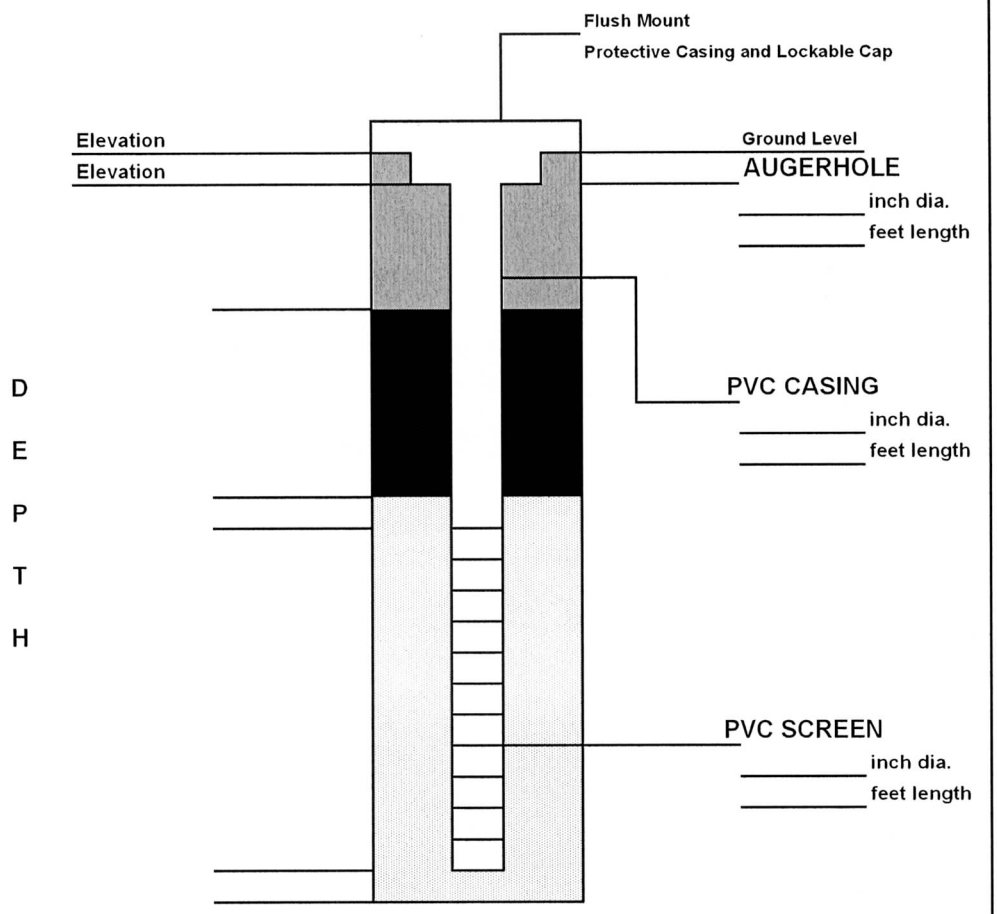
Rig Make/Model:

Date:

GEOLOGIC LOG

Depth(ft.)	Description

WELL DESIGN



CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 4" PVC	Type: #2 Sand Setting:
Monitor: 4" PVC	**Slot Size:** .020"	*SEAL MATERIAL*
		Type: Bentonite Setting:

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client:	Location:	Project No.:
URS Corporation	MONITORING WELL CONSTRUCTION DETAILS	Well Number:

Summa Canister Sampling Field Data Sheet

Site:

Samplers:

Date:

Sample #					
Location					
Summa Canister ID					
Flow Controller ID					
Additional Tubing Added	NO/ YES - How much	NO/ YES - How much	NO/ YES - How much	NO/ YES - How much	NO/ YES - How much
Purge Time (Start)					
Purge Time (Stop)					
Total Purge Time (min)					
Purge Volume					
PID Test of Purge Air					
Initial Tracer Gas Results					
Pressure Gauge - before sampling					
Sample Time (Start)					
Sample Time (Stop)					
Total Sample Time (min)					
Pressure Gauge - after sampling					
Sample Volume					
Canister Pressure Went To Ambient Pressure?	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Final Tracer Gas Results					
Associated Ambient Air Sample Number					
Weather 24 hours before and during sampling					
General Comments:					

CHAIN OF CUSTODY RECORD

URS

PROJECT NO. | SITE NAME

SAMPLERS (PRINT/SIGNATURE)

LAB _____

COOLER _____ of _____

PAGE _____ of _____

DELIVERY SERVICE: _____ AIRBILL NO.: _____

TESTS

BOTTLE TYPE AND PRESERVATIVE

LOCATION IDENTIFIER	DATE	TIME	COMP/ GRAB	SAMPLE ID	MATRIX	TOTAL NO.# OF CONTAINERS								REMARKS	SAMPLE TYPE	BEGINNING DEPTH (IN FEET)	ENDING DEPTH (IN FEET)	FIELD LOT NO. # (ERPIMS)

MATRIX CODES

AA - AMBIENT AIR
SE - SEDIMENT
SH - HAZARDOUS SOLID WASTE
SL - SLUDGE
WP - DRINKING WATER
WW - WASTE WATER
WG - GROUND WATER
SO - SOIL
DC - DRILL CUTTINGS
WL - LEACHATE
GS - SOIL GAS
WC - DRILLING WATER
WO - OCEAN WATER
WS - SURFACE WATER
WQ - WATER FIELD QC
LH - HAZARDOUS LIQUID WASTE
LF - FLOATING/FREE PRODUCT ON GW TABLE

SAMPLE TYPE CODES

TB# - TRIP BLANK
SD# - MATRIX SPIKE DUPLICATE
RB# - RINSE BLANK
FR# - FIELD REPLICATE
N# - NORMAL ENVIRONMENTAL SAMPLE
MS# - MATRIX SPIKE
(# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME	SPECIAL INSTRUCTIONS
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY (SIGNATURE)	DATE	TIME	

Distribution: Original accompanies shipment, copy to coordinator field files

URSF-075C/1 OF 1/CofCR/GCM

ATTACHMENT A-2
QUALITY ASSURANCE PROJECT PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET
FORMER MANUFACTURED GAS PLANT SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

Prepared for:

KeySpan Corporation
175 East Old Country Road
Hicksville, NY 1801

(PROVIDED ONLY IN ELECTRONIC FORMAT)

Prepared by:

URS Corporation – New York
77 Goodell Street
Buffalo, New York 14203

November 2007

ATTACHMENT A-3
HEALTH AND SAFETY PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET
FORMER MANUFACTURED GAS PLANT SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

Prepared for:

KeySpan Corporation
175 East Old Country Road
Hicksville, NY 11801

(PROVIDED ONLY IN ELECTRONIC FORMAT)

Prepared by:

URS Corporation – New York
77 Goodell Street
Buffalo, New York 14203

November 2007

APPENDIX B
CONSTRUCTION QUALITY ASSURANCE PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET FORMER MGP SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

Prepared for:

KeySpan Corporation
175 East Old Country Rd.
Hicksville, NY 11801

Prepared by:

URS Corporation
77 Goodell Street
Buffalo, New York 14203

November 2007

APPENDIX B
CONSTRUCTION QUALITY ASSURANCE PLAN

TABLE OF CONTENTS

LIST OF ACRONYMS AND ABBREVIATIONS

CQAP	Construction Quality Assurance Plan
IRM	Interim Remedial Measures
MGP	Manufactured Gas Plant
QAPP	Quality Assurance Project Plan
QA	Quality Assurance
QC	Quality Control
RAWP	Remedial Action Work Plan
SAP	Sampling and Analysis Plan

B 1.0 INTRODUCTION

This Construction Quality Assurance Plan (CQAP) has been prepared for Interim Remedial Measures (IRM) that will be performed at the Hempstead Intersection Street Manufactured Gas Plant (MGP) Site. This CQAP supplements the IRM Remedial Action Work Plan (RAWP) and provides monitoring, inspection, testing, and documentation protocols and procedures.

The following information is provided:

1. **Responsibility and Authority** – The responsibility and authority of the key personnel involved in the project.

2. **Inspection and Testing Activities -** Inspections and tests that will be used to verify that construction activities meet or exceed all design criteria and federal, state, and local regulations and requirements.

3. **Documentation and Reporting** – Field documentation and reporting requirements.

B 2.0 RESPONSIBILITY AND AUTHORITY

B2.1 KeySpan

KeySpan is responsible for coordinating the project, including activities of a site consultant or construction manager, contractor(s) and subcontractor(s), in order to comply with the requirements of the RAWP and regulatory agencies. KeySpan is also responsible for completing and submitting documentation required by the RAWP, the CQAP, and the Quality Assurance Project Plan (QAPP) and has the authority to accept or reject the materials and workmanship of any subcontractors at the site.

KeySpan will implement measures to ensure that a functional quality control (QC) organization is active during the project and to provide support for the construction QC system in conducting inspections, tests and retesting (in the event of failure of any item of work). This includes oversight of subcontractors and compliance with contract provisions. Construction QC includes, but is not limited to, the inspections and tests required in the RAWP and approved submittals and will cover all project operations.

A site consultant or construction manager that is hired by Keyspan will manage field activities. KeySpan will coordinate the consultant/construction manager's activities and will be responsible for all decisions made by the consultant/construction manager.

B2.2 Construction Quality Assurance (QA) Officer

The Construction QA Officer will be an employee of the consultant/construction manager hired by KeySpan and will perform activities that are necessary to assure the quality of construction. He/she will be on-site as required during construction activities and will have the authority to take any action necessary to maintain compliance with the RAWP and approved submittals and to monitor construction quality.

Specific responsibilities of the Construction QA Officer include:

- Supporting KeySpan and the consultant's/construction manager's field staff.
- Evaluating construction activities and activities of the field staff.
- Verifying that remedial activities are performed in accordance with the RAWP, approved submittals, and with federal, state, and local regulations and requirements.
- Verifying that data are properly recorded, validated, reduced, summarized, and inspected.
- Evaluating sampling and monitoring activities.
- Educating the field staff on construction QC requirements and procedures.
- Scheduling and coordinating inspections.

B2.3 Site Project Coordinator (Consultant/Construction Manager)

The Site Project Coordinator will be an employee of the consultant/construction manager and will be on site during construction activities. He/she will have authority to take any action necessary to maintain compliance with the RAWP and approved submittals and to maintain construction quality. The Site Project Coordinator will also manage the field staff discussed in this CQAP.

Specific responsibilities of the Site Project Coordinator include:

- Reviewing the RAWP for clarity and completeness so that the construction activities can be effectively implemented.
- Verifying that the contractor's work is in accordance with the RAWP, approved submittals, and this CQAP.

- Performing on-site inspection of the work in progress to assess compliance with the RAWP, approved submittals, and this CQAP.

- Scheduling and coordinating inspections.

- Reporting the results of all observations and tests as the work progresses and modifying materials and work to comply with the RAWP and approved submittals as noted below.

    1. Providing daily reports on field construction, material shipments, and inspection results.

    2. Review and interpretation of all data, drawings, and reports.

    3. Identification of all work that should be accepted, rejected, or uncovered for observation, or that may require special testing, inspection, or approval.

    4. Rejection of defective work and verification that corrective measures are implemented.

    5. Making observations and records that will aid in the preparation of a report on IRM activities.

- Inspecting each delivery of materials and/or equipment.

- Reporting to the Construction QA Officer the results of all inspections, including work that is not of acceptable quality or that fails to meet the requirements of the RAWP, approved submittals, and this CQAP.

- Verifying that testing equipment meets established requirements that the tests are conducted according to the proper standardized procedures.

- Confirming that testing equipment, personnel, and procedures do not change over time or making sure that any changes do not adversely impact the inspection process.

- Confirming that regular calibration of testing equipment occurs and is properly recorded.

- Confirming that waste characterization sampling and analysis are conducted and that the data are properly recorded and maintained.

- Confirming that waste treatment or disposal is performed in accordance with applicable federal, state, and local laws and regulations.

B2.4 Geologist/Engineer (Consultant/Construction Manager)

A qualified geologist or engineer will oversee all NAPL recovery well drilling and installation activities. He/she will log each boring and well construction. Recorded information will include location, time on site, personnel, equipment, methods, and material used, samples collected, sample recovery, lithology, contamination (if present), and any other observations that would be necessary to reconstruct field activities at a later date. Contaminants, if present, will be described in accordance with *Field Descriptions of Samples for Former Manufactured Gas Plant (MGP) Sites* (KeySpan, no date).

B2.5 Sampling Technician (Consultant/Construction Manager)

A Sampling Technician (supplemented by additional personnel if necessary) will be on site during construction. Specific responsibilities of the Sampling Technician include:

- Calibration, operation, and maintenance of air monitoring instrumentation in accordance with the RAWP and approved submittals.

- Collecting, packaging, and shipping of environmental samples in accordance with the RAWP, Sampling and Analysis Plan (SAP), and QAPP.

- Maintaining a master log of all samples collected and identifying all sample locations in a field notebook or site drawing.

- Preparing and logging manifests for transportation of any non-hazardous and hazardous materials.

- Informing the Site Project Coordinator when (if) the concentrations of air contaminants exceed action levels specified in the RAWP.

- Maintaining and organizing the consultant's/construction manager's field equipment and supply storage area.

B 3.0 FIELD QUALITY CONTROL INSPECTIONS, TESTING, AND SAMPLING REQUIREMENTS

The definable features of work are described in Section 4 of the RAWP. This section describes the anticipated inspection, testing, and sampling requirements associated with these definable features of work.

B3.1 Mobilization

Inspections will be performed to assure that site laydown areas, support facilities, surface water controls, and air monitoring systems are established in accordance with the RAWP and approved submittals. In addition, the stakeout of existing utilities in work areas and the maintenance of site security will be verified. There are no testing and sampling requirements associated with mobilization of the IRM contractor(s).

Each delivery of materials and/or equipment will be inspected relative to approved submittals. Approved materials and/or equipment will be stored at a designated area of the site. Equipment will be set-up and tested in accordance with the RAWP and approved submittals. This includes a temporary (sprung-type) structure and vapor management system that will be used during excavation of MGP contaminated soils.

B3.2 Installation of NAPL Recovery Wells

Continuous inspection will be performed during drilling and installation of the NAPL recovery wells. Recovered samples and each drill hole will be inspected to identify soil type, location of geologic boundaries, depth to the water table, and MGP contamination (if present) in accordance with *Field Descriptions of Samples for Former Manufactured Gas Plant (MGP) Sites* (Keyspan, no date). Each well construction will be observed to document the date of installation, materials used, casing and screen sizes and installation depths, and ground surface and well casing elevations.

B3.3 Shallow Soil Source Material Excavation and Off-Site Disposal

B3.3.1 Protection of Existing Utilities

The Site Project Coordinator will verify that all known utilities are marked prior to IRM activities and that the Utility Protection Plan is implemented. The protection of existing utilities, whether shown on the drawings or not, is the responsibility of the IRM Contractor.

B3.3.2 Installation of Shoring

Installation of shoring and bracing will be observed to verify compliance with the RAWP and approved submittals. The limits and depths of shoring and bracing installed and removed will be documented.

B3.3.3 Installation of Temporary Containment Buildings and Air Handling/Treatment System

Installation of the temporary (sprung-type) structure and air handling/treatment system will be observed to verify compliance with the RAWP and approved submittals. The structure and air handling system will be inspected upon initial set-up and after each move.

B3.3.4 Excavation of Tar-Contaminated Soils and Subgrade Structures

Excavation and removal of the MGP contaminated soil will be performed in accordance with the RAWP. Each excavation will be measured to verify and document the limits of work. Visual confirmation of properly documented excavation limits will be preformed in accordance with the SAP. The disposition of the excavated materials will be documented.

B3.3.5 Loading of Soil and Construction/Demolition Debris for Transportation

Inspections will be conducted to verify that soil and construction demolition debris is loaded within the temporary building for transportation to a designated stockpile area(s) or directly into haul trucks for transfer to a permitted treatment/disposal facility. In addition, the loading area will be inspected to verify that suitable cover material is in place and does not have any punctures or openings.

B3.4 Storm Water and Groundwater Management

Storm water and groundwater management procedures used by the contractor(s) will be observed to verify compliance with the RAWP and approved submittals.

B3.5 Site Restoration

Site restoration will be observed and recorded to verify compliance with the RAWP and approved submittals. The excavations will be backfilled with clean soil placed in compacted lifts of less than or equal to 12 inches thick. For the zero-to-8-foot depth zone, compaction will be to 95% of the maximum dry density as determined by the Standard Proctor Test (ASTM D 698). In-place density of compacted lifts will be measured in each excavation using ASTM D 2922. Beneath 8 feet deep, compaction effort will be by 2 passes of a suitable compactor.

The surface will be graded to match the surrounding ground surface and to promote positive drainage. The upper six inches of backfill will either consist of clean imported topsoil stabilized with seed and mulch, paved to match existing conditions, or it will be stabilized with gravel to match existing conditions. The topsoil will be inspected upon arrival and the source documented. No stockpiles will remain on-site at the end of the project.

B 4.0 DOCUMENTATION AND REPORTING REQUIREMENTS FOR CQAP ACTIVITIES

The value of the CQAP will be assured by proper documentation. The inspectors will use data sheets, field reports, log forms, schedules and checklists to document site work and verify compliance with the RAWP and approved submittals.

Documentation will involve, at a minimum, the following reports and information:

- Daily field construction reports
- Photographs
- Daily sampling logs
- Material disposition logs
- Variances to the RAWP and approved submittals

B4.1 Daily Field Construction Report

The Site Project Coordinator will prepare a Daily Field Construction Report that identifies the following:

- Work force and their labor hours
- Lost-time accidents
- Location and a description of work performed
- Equipment on the job site
- Equipment/materials received

- Submittal status
- Non-compliance notices received
- Apparent discrepancies in RAWP documents
- Visitors to the job site
- Weather conditions
- Other pertinent information.

B4.2 Photo Log

The photo log will be kept to document construction activities by still photos. The photo log may also be used to record activities recorded in the Daily Field Construction Report or an as-built sketch log.

B4.3 Daily Sampling Log

The daily sampling log is designed to document all sampling activities and how they correspond to the RAWP. All observations, field and/or laboratory tests will be recorded on a daily sampling log. Recorded field observations may take the form of notes, charts, sketches, or photographs. The Sampling Technician will complete the daily sampling log.

B4.4 Material Disposition Log

The material disposition log is designed to document the offsite disposition of all materials excavated during the remediation and how it corresponds to the RAWP. All observations, waste manifests and bills of lading will be recorded on the log.

B4.5 Variances to Work Plan

Required changes to the RAWP will be processed through the use of a variance log. Any amendments to the RAWP will require prior approval by Keyspan and the regulatory agencies.

B4.6 IRM Monitoring Report

At the completion of the project the consultant/construction manager will prepare an IRM Monitoring Report. This report will describe the implementation of the IRM in accordance with the RAWP and will include a summary of the Daily Field Construction Reports, Photographic Log, Sampling Log, Material Disposition Log, and approved Variances to the RAWP.

APPENDIX C
SOLID AND/OR LIQUID WASTE TRANSPORTATION PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET
FORMER MANUFACTURED GAS PLANT SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

Prepared for:

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November 2007

APPENDIX C
SOLID AND/OR LIQUID WASTE TRANSPORTATION PLAN
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C1.0 SCOPE OF WORK

This document identifies requirements for the transportation of solid and/or liquid non-hazardous and hazardous waste for KeySpan's Hempstead Intersection Street former MGP Site, Villages of Garden City and Hempstead, Long Island, New York. All transportation shall be performed in accordance with this section, the IRM Remedial Action Work Plan, and all applicable Federal, State, and Local Laws.

C2.0 WORK BY CONTRACTOR

The transporter shall provide all necessary supervision, training, permits, manifests (when required), labor, personal protection equipment, tools, equipment, consumable materials, and expendable materials, to transport solid and/or liquid wastes as detailed herein.

C3.0 GENERAL WORK CONDITIONS

C3.1 Compliance with Applicable Laws, Rules and Regulations

The transporter shall comply with the following laws, rules and regulations when transporting solid and/or liquid non-hazardous and hazardous wastes from the site:

- All applicable provisions of Title 6 New York Code Rules and Regulations (6 NYCRR) Part 364 "Waste Transporters Permit;"
- All applicable provisions of 6 NYCRR Part 372 "Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities;"
- All applicable provisions of New York State Department of Transportation, the New York State Department of Motor Vehicle, and/or any other applicable Federal, State, and Local Laws governing interstate and intrastate transportation; and
- All applicable provisions of Title 29 Code of Federal Regulations (29 CFR) Part 1910.120 "Hazardous Waste Operations Health & Emergency Response."

C3.2 Transporter Health and Safety

To ensure the health and safety of drivers, the following procedures shall be followed:

- The transporter shall either develop and implement a written Health and Safety Plan (HASP) for their drivers that addresses potential exposure to MGP residuals or shall follow the Contractor's HASP;

- Upon arriving at the site, drivers shall report their arrival to the KeySpan's field representative (Field Coordinator) and/or the Site's Health and Safety Officer (HSO);

- Drivers are restricted to the cab of their transport vehicle and the designated waiting areas. Drivers are not permitted access to the site without expressed permission from a representative of KeySpan;

- Drivers shall have, at a minimum, hard hats, safety glasses, safety shoes, and gloves available in their truck. In the event that a truck driver is required to leave the cab of their transport vehicle while on site, the safety equipment will be donned;

- Truck drivers will be required to obey rules posted on site and/or any site-specific Health and Safety Plan requirements for all employees. No children under 16 years of age are allowed on site and no passengers are allowed in the loading area; and

- Smoking, eating, and/or drinking is not permitted within the security fence (Contamination Reduction Zone and Exclusion Zone). Smoking, eating, and/or drinking are permitted only in designated areas.

C3.3 Transport Vehicles for Solid and Liquid Wastes

The transporter shall provide transport vehicles that meet the following specifications:

- The transporter will utilize tri-axle dump trucks, tandem dump trailers, and/or roll off containers to transport solid non-hazardous and hazardous wastes from the site. Any tri-axle dump truck, tandem dump trailer, and/or roll off container that is not constructed of sufficient metal, having watertight bodies and having watertight tailgates, which have a gasket between the box and tailgate, equipped

with positive locking devices and provisioned for controlled drainage of free liquids for dewatering is considered unacceptable and will be rejected. The Field Coordinator and/or the Site's HSO will determine acceptable tri-axle dump trucks, tandem dump trailers, and roll off containers. Any cost for rejected tri-axle dump trucks, tandem dump trailers, and roll off containers shall be born by the transporter. The NYSDEC on-site representative will bring it to the attention of the Field Coordinator if a transport vehicle is not to leave the site;

- The transporter will utilize vacuum trucks, tank trucks, and/or tank trailers to transport liquid non-hazardous and hazardous wastes from the site. Any vacuum truck, tank truck, and/or tank trailer that is not constructed of sufficient metal, having watertight tanks is considered unacceptable and will be rejected. The Field Coordinator and/or the Site's HSO will determine acceptable vacuum trucks, tank trucks, and/or tank trailers tri-axle dump trucks, tandem dump trailers, and roll off containers. Any cost for rejected vacuum trucks, tank trucks, and/or tank trailers shall be born by the transporter. The NYSDEC on-site representative will bring it to the attention of the Field Coordinator if a transport vehicle is not to leave the site; and

- All transport vehicles require working audible and visual backup signals.

C3.4 Loading of Transport Vehicles

The transporter shall adhere to the following procedures when loading solid non-hazardous and hazardous wastes into transport vehicles:

- Truck engines are not allowed to idle in residential or other areas where the exhaust and/or noise could be a considered excessive;

- Each transport vehicle shall be weighed before and after loading to ensure the highway weight restrictions are not exceeded. Weighing of transport vehicles

leaving the site shall occur at a nearby truck scale certified by the State of New York;

- When loading or when directed by the Field Coordinator or other on-site representative, the truck engine shall be shut off. Each transport vehicle may be restarted and driven away only after receiving the "all clear" direction from the loader operator, the Field Coordinator or other an on-site representative;

- All transport vehicles transporting hazardous solid waste shall have the driver line the entire box (to top of side boards) with 6-mil thick polyethylene sheets. If required by KeySpan, transport vehicles transporting non-hazardous solid waste may be lined as previously stated;

- No transport vehicle shall be loaded above the side boards and no material shall be spilled out of the transport vehicle.

- KeySpan remedial workers shall reposition the tarpaulin bars over the loads;

- Drivers shall cover each container with a tarpaulin cover inside the loading area. Drivers will not be allowed to walk over loads;

- All transportation vehicles shall be inspected prior to leaving the site by the Contractor to ensure no material adheres to the wheels, undercarriage, tailgates, covers or other areas of transport vehicles. The driver is responsible for determining that the transport vehicle has been properly decontaminated prior to leaving the temporary building and/or the site;

- Drivers who are transporting a United States Department of Transportation (DOT) hazardous material will be provided with appropriate DOT placards. Drivers are responsible for placing the placards on the transport vehicle;

- Drivers will be provided with appropriate shipping documents (e.g. hazardous waste manifest, straight bill-of-lading, etc.) signed by the Field Coordinator; and

- Under no circumstances shall a loaded transportation vehicle be parked overnight unless the Field Coordinator has given prior approval.

C3.5 Transportation of Solid and Liquid Waste

The transporter shall adhere to the following procedures when transporting solid and liquid non-hazardous and hazardous wastes:

- Drivers shall transport and deliver the material only to the disposal facilities approved by KeySpan.

- Drivers shall use only approved truck routes to transport material from the site to the expressways. En route, the driver shall use only Interstate or officially approved truck routes. To the maximum extent possible, no transport vehicles shall travel on any local streets or through residential areas. To the extent possible and in conformance with all applicable regulations, all vehicles shall be routed away from environmentally sensitive areas (e.g., parks, schools, historic sites, wetlands, etc.). For long distance hauling, all transport vehicles shall remain on primary highways;

- Drivers shall be responsible for transportation safety. All transport vehicles shall be properly maintained, be driven properly, follow all rules and regulations, and observe all speed limits, traffic signs, and notices. All transport vehicles shall be inspected before every trip by the driver to ensure that all doors, covers, etc. are secure and that no material can spill or otherwise be released or leak;

- Drivers shall be required to report any accidents to the KeySpan's Field Representative and/or the Site HSO and cooperate with any subsequent accident investigation;

- Drivers shall be required to slow down and be extra cautious during times of poor weather (e.g., rain, fog, and snow);

- Drivers shall be required to take extra care around blind corners (e.g., watch for construction equipment and pedestrians);

- The transport vehicle shall be washed clean before leaving the disposal facility and shall be maintained clean, sanitary condition by the driver at all times; and

- The driver shall submit a copy of the completed hazardous waste manifest or straight bill-of-lading for each shipment, a copy of all scale tickets from the site, and copies of all disposal facility scale tickets.

APPENDIX D
CONTINGENCY PLAN
INTERIM REMEDIAL MEASURES FOR THE
HEMPSTEAD INTERSECTION STREET
FORMER MANUFACTURED GAS PLANT SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

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November 2007

APPENDIX D

CONTINGENCY PLAN

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D1.0 CONTINGENCY PLAN

This Contingency Plan addresses potential emergencies that may arise as a result of operations during the IRM activities that will be completed at the Hempstead Intersection Street Former MGP site. This Plan supplements the IRM Remedial Action Work Plan.

The Site Health and Safety Officer (SHSO) shall be made aware of any emergencies and coordinate any response activities carried out at the MGP Site. The SHSO shall also serve as the overall Project Emergency Coordinator (PEC) and have the ultimate authority in specifying and facilitating any contingency action.

If the SHSO is not able to perform the duties of the PEC, he shall specify another senior individual to serve in this capacity. The alternate PEC shall become familiar with contingency plans developed by each contractor and subcontractor.

D1.1 Identifying the Hazards and Assessing the Risk

The objectives during any emergency shall be to protect human health and safety and then the environment. Possible hazards to human health or the environment that may result from any emergency situation shall be identified by the PEC. The PEC shall take into consideration both direct and indirect effects of the incident.

The PEC shall then assess the possible risks to human health or the environment that may result from the emergency (e.g., release, fire, explosion, or severe weather conditions). He shall make this assessment by the following:

- Identifying the materials involved in the incident;

- Consulting the appropriate occupational health guideline or material safety data sheets (MSDS) to determine the potential effects of exposure/release, and appropriate safety precautions; and

- Identifying the exposure and/or release pathways and the quantities of materials involved.

Based on this information the PEC shall determine the best course of action for dealing with the emergency, and possible follow-up requirements that may result from implementing those actions (e.g., equipment repair, material disposal, etc.).

If operating personnel cannot control the incident without incurring undue risk the PEC shall implement the Site Evacuation Procedures (Section D2.1). If off-site neighboring population is at risk the PEC shall implement the Off-Site Evacuation Procedures (Section D2.2). The PEC shall notify KeySpan's Project Manager and the appropriate government agencies and departments that a situation resulting in evacuation has occurred. Should emergency assistance in treating injuries or carrying out the evacuation be required, the PEC shall request assistance of the appropriate parties. The PEC will contact the local health department in cases when there are possible risks to human health from emergency situations such as fire, explosions or severe weather conditions.

D1.2 Conditions for Implementing a Contingency Plan

Some of the conditions under which the Contingency Plan would be implemented are as follows:

- Fire or explosion;

- Occurrence of a spill or material release;

- Severe weather conditions; or

- Physical or chemical injury to a worker.

D1.2.1 Fire and/or Explosion Conditions

Contingency procedures shall immediately be implemented upon notification that any of the following scenarios involving fire and/or explosion is imminent or has occurred:

- A fire that causes, or could cause, the release of toxic fumes;
- A fire that could possibly ignite nearby flammable materials or could cause heat-induced explosions;
- A fire that could possibly spread to off-site areas;
- A danger exists that an explosion could occur causing a safety or health hazard; or
- An explosion has occurred.

D1.2.2 Spill or Material Release Conditions

Any of the following scenarios involving a spill or material release, whether imminent or having already occurred, shall cause implementation of contingency procedures:

- A spill or material release that could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard;
- A spill or material release that could cause the release of toxic vapors or fumes into the atmosphere in concentrations higher than the OSHA Permissible Exposure Limits (PELs);
- A spill or material release that can be contained onsite where a potential exists for groundwater or surface water contamination; or

- A spill or material release that cannot be contained onsite, resulting in a potential for off-site soil contamination and/or groundwater or surface water pollution.

The PEC (or sub-contractor's emergency coordinator) shall immediately identify the character, source, amount, and extent of any release. Spills or material releases shall be reported immediately to the PEC. Initial identification shall be based on visual analysis of the material and location of the release. If the release material cannot be identified, samples shall be taken for analysis.

D1.2.3 Severe Weather Conditions

The following severe weather conditions, whether imminent or having occurred, may cause implementation of contingency procedures:

- A tornado has been sighted in the area;
- A tornado warning is in effect for the area;
- A lightning storm is underway in the area (e.g., storm center less than 5 miles away); or
- Other severe weather or weather induced conditions (e.g., hurricane or flood).

D1.2.4 Physical or Chemical Injury Conditions

The following worker injuries may cause implementation of the Contingency Plan:

- Major physical injuries;
- Chemical injuries; or
- Severe symptoms of chemical overexposure.

D1.3 Contingency Procedures

If any of the aforementioned conditions for implementing the Contingency Plan are met, the appropriate contingency procedure(s) as described in the following sections shall be performed.

D1.3.1 Contingency Procedures for Fire/Explosion

When fire or explosion appear imminent or have occurred, all normal activity in affected areas shall cease. The PEC shall make an assessment of the potential risk and severity of the situation to decide whether the emergency event shall or shall not be readily controllable with existing portable fire extinguishers or site equipment and materials at hand. Fire fighting shall not be done at the risk to site workers. Local fire departments shall be contacted in all situations in which fires and/or explosions have occurred. A list of emergency contacts and agencies requiring notification can be found in the Health and Safety Plan. The following steps shall be taken for localized fire:

- Contact local fire departments;
- Move all personnel to an upwind location at an appropriately safe distance away;
- Determine if fire is within on-site personnel capabilities to attempt initial fire fighting;
- Determine if smoke and/or fumes from fire are potentially impacting offsite areas;
- If the fire is not impacting offsite areas and is within on-site personnel capabilities, utilize most appropriate means of extinguishing fire (e.g., fire extinguishers, water, covering with soil, etc.); and

- Once fire is extinguished, containerize and properly dispose of any spilled material, runoff, or soil.

If the situation appears uncontrollable and poses a direct threat to human life, fire departments shall be contacted and the Evacuation Plan shall be implemented. If the chances of an impending explosion are high, the entire area within a 1,000-foot radius of the fire source shall be evacuated. The PEC shall alert personnel when all danger has passed, as determined by the chief fire fighter from the responding fire department. All equipment used in the emergency shall be cleaned and refurbished as soon as possible after the emergency has passed so that it will be ready for use in the event of any future emergency.

D1.3.2 Contingency Procedures for Spills or Material Releases

If a hazardous waste spill or material release or process upset resulting in probable vapor release is identified, the PEC shall immediately assess the magnitude and potential seriousness of the spill or release based upon the following:

- MSDS for the material spilled or released;
- Source of the release or spillage of hazardous material;
- An estimate of the quantity released and the rate at which it is being released;
- The direction in which the spill or air release is moving;
- Personnel who may be or may have been in contact with the material, or air release, and possible injury or sickness as a result;
- Potential for fire and/or explosion resulting from the situation; and
- Estimates of area under influence of the release.

If the spill or release is determined to be within the on-site emergency response capabilities, the PEC shall ensure implementation of the necessary remedial action. If the

accident is beyond the capabilities of the operating crew, all personnel not involved with emergency response activity shall be evacuated from the immediate area and the appropriate emergency response group(s) shall be contacted. Spills must be reported to the NYSDEC unless they meet all of the following:

- The spill is known to be less than five gallons; and
- The spill is contained and under the control of the spiller; and
- The spill has not and will not reach the State's water or any land; and
- The spill is cleaned up within two hours of discovery.

All reportable petroleum spills and most hazardous materials spills must be reported to the NYSDEC hotline (1-800-457-7362) within two hours of discovery.

D1.3.3 Contingency Procedures for Severe Weather

When a tornado is sighted in the area, when a tornado warning has been issued, or when a lightning storm occurs, such information shall be immediately relayed to the PEC. In the case of a tornado sighting, the PEC shall then institute emergency shutdown procedures, and all personnel shall be directed to proceed indoors after completing appropriate shutdown procedures. In the case of a tornado warning, or lightning storm, the PEC shall have operations stopped and direct all personnel to stand by for emergency procedures. Other types of weather or weather-induced conditions (e.g., hurricane or flooding) for which long range prediction is available may also require positive action as identified herein.

When the severe weather has passed, the PEC shall direct all contractors to inspect on-site equipment to ensure its readiness for operation prior to restarting operations.

If an inspection indicates a fire, explosion, or release has occurred as the result of a severe weather condition, the procedures for those respective events shall be followed.

D1.3.4 Contingency Procedures for Physical Injury to Workers

Regardless of the nature and degree of the injury, the PEC shall be appraised of all injuries requiring first aid of any kind. A report of the injury or incident shall be completed.

Upon notification that a worker has been injured, the PEC shall immediately determine the severity of the accident, and whether the victim can be safely moved from the incident site. Appropriate medical assistance shall be summoned immediately.

Minor injuries sustained by workers shall be treated onsite using materials from the first aid kits. Whenever possible, such treatment shall be administered by trained personnel in a "clean zone". Examples of minor injuries include small scrapes and blisters. Minor injuries would not be expected to trigger implementation of the Contingency Plan.

Major injuries sustained by workers will require professional medical attention at a hospital. The PEC shall immediately summon an ambulance and contact the hospital to which the injured worker will be transported. A listing of hospital contacts and the route to the hospital can be found in the HASP. The PEC shall notify the KeySpan project manager as soon as practical. The hospital and ambulance should be advised of the following:

- The nature of the injury;
- Whether the injured worker will be decontaminated prior to transport;
- When and where the injury was sustained; and
- The present condition of the injured worker (e.g., conscious, breathing).

D1.3.5 Contingency Procedures for Chemical Injury to Workers

Injuries involving hazardous chemicals or symptoms of severe chemical overexposure shall automatically trigger implementation of the Contingency Plan. Upon notification that a chemical injury has been sustained or severe symptoms of chemical exposure are being experienced, the PEC shall notify the hospital and ambulance of the occurrence. The PEC shall provide, to the extent possible, the following information:

- The nature of the injury (e.g., eyes contaminated);
- The chemical(s) involved;
- The present condition of the injured worker (e.g., conscious, breathing);
- Whether the injured worker will be decontaminated prior to transport; and
- When and where the injury was sustained.

Steps shall immediately be taken to remove the victim from the incident site using whatever PPE and safety equipment is necessary. Rescuers shall check for vital signs and, if possible, remove contaminated outer clothing. If the victim's eyes have been contaminated, personnel trained in administering first aid shall flush the victim's eyes with eyewash solution until the emergency response team arrives.

Details on the nature of the contaminant and methods for treating exposure or injury can be obtained from the MSDS or Occupational Health Guidelines that are maintained on-site with the HASP.

D2.0 EMERGENCY EVACUATION PROCEDURES

D2.1 Site Evacuation Procedures

If an emergency occurs that requires the evacuation of an area to ensure personnel safety, including (but not limited to) fire, explosion, severe weather or hazardous waste/material spills, or a significant release of vapors into the atmosphere, an air horn shall be sounded on the site by the nearest person aware of the event. The horn shall sound continuously for approximately 15 seconds, signaling that immediate evacuation of all personnel from the area is necessary as a result of some existing or impending danger. In areas where only two or three people are working side by side, and the need to evacuate can be communicated verbally by the nearest person aware of the event, the air horn will not be necessary.

All heavy equipment in the area shall be shut down. Under no circumstances shall incoming visitors (other than emergency response personnel) be allowed to enter any area where an emergency is occurring. Visitors or observers and all non-essential personnel present in the area of an emergency shall be instructed to evacuate the area immediately.

Contractor and subcontractor emergency coordinators and/or health and safety officers (as designated) will be responsible for ensuring that emergency response requirements specific to their own operations are carried out. These parties shall report their activities to the PEC. The PEC, however, has final authority regarding all emergency response activities.

All non-essential personnel shall evacuate the emergency areas and notify personnel in adjacent areas to evacuate also. The evacuated workers shall assemble at the primary assembly area at the site construction office trailer, where the PEC shall give directions for implementing necessary actions. In the event that the primary assembly area is involved, unapproachable, or unsafe due to the event, evacuated workers shall assemble at the alternate

assembly area at the Medical Office Building parking lot located south of Intersection Street and east of Wendell Street. The PEC shall phone for backup assistance.

Personnel are to avoid encountering smoke/gas plumes as practicable during evacuation and assembling.

The PEC shall take charge of all emergency response activities and dictate the procedures that will be followed until emergency personnel arrive. The PEC shall assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive.

After initiating emergency response procedures, the PEC shall assign appropriate personnel to check and attempt to ensure that access roads are not obstructed. If traffic control is necessary, as in the event of a fire or explosion, personnel who have been trained in these procedures and designated at the project safety meeting shall take over these duties until emergency units arrive.

The PEC shall remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation. The PEC shall have the authority to shut down any part or the entire project after an emergency until he deems it safe to continue operations. He shall dictate any changes in project safety practices, which are made necessary by the emergency that has occurred, or are required for preventing further emergencies.

D2.2 Off-Site Evacuation Procedures

If the PEC determines, through perimeter air monitoring, that unnecessary exposure or emissions resulting from project activities may pose a hazard to the community, he shall implement the Vapor Emission Response Plan, to be presented in the Community Air Monitoring Plan (CAMP). The PEC shall notify the appropriate agencies and departments (e.g., KeySpan Project Manager, NCDH, Garden City Police Department, Hempstead Police

Department, NYSDEC, and NYSDOH) of the need, or potential need, to institute off-site evacuation procedures. The PEC shall provide, at a minimum, the following information:

- His or her name and telephone number;
- Name and address of facility;
- Time and type of incident (e.g., release, fire, etc.);
- Name and quantity of materials or materials involved, to the extent this information is known;
- The extent of injuries, if any; and
- The possible hazards to human health or environment, and cleanup procedures.

APPENDIX E
COMMUNITY AIR MONITORING PLAN
INTERIM REMEDIAL MEASURES
HEMPSTEAD INTERSECTION STREET
FORMER MANUFACTURED GAS PLANT SITE
VILLAGES OF GARDEN CITY AND HEMPSTEAD, LONG ISLAND, NEW YORK

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APPENDIX E
COMMUNITY AIR MONITORING PLAN
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E1.0 INTRODUCTION

E1.1 Overview

This Community Air Monitoring Plan (CAMP) identifies an air monitoring program that will be implemented by KeySpan for the non-excavation aspects of an interim remedial measures (IRM) at the Hempstead Intersection Street former Manufactured Gas Plant (MGP) Site. This CAMP was developed in accordance with the CAMP guidelines provided in the New York State Department of Environmental Conservation (NYSDEC) *Draft DER-10 Technical Guidance for Site Investigation and Remediation* (December 2002). The purpose of this CAMP is to prevent and/or mitigate potential short-term emissions and off-site migration of Site related airborne contaminants that could be generated during the drilling and installation of wells, Geoprobe®-type soil sampling, groundwater sampling, and NAPL recovery activities.

Monitoring during the IRM will consist of (1) exclusion zone air monitoring to evaluate construction worker health and safety and (2) community air monitoring conducted upwind and downwind of each work location to determine the levels of total volatile organic compounds (TVOCs), particulate matter less than 10 micrometers in size (PM-10), and hydrogen cyanide (HCN) gas. Due to the potential for interference from sulfur compounds, hydrogen sulfide (H_2S) gas will also be monitored for comparison to the HCN gas levels detected. The monitoring data will be used to guide actions that may be required to reduce air emissions to acceptable levels.

Community air monitoring during drilling and well installation activities will be performed at upwind and downwind locations (on the exclusion zone boundaries) of each work area using portable data logging instruments (for TVOCs and particulate) placed on moveable tripods supplemented by periodic measurements taken with hand-held instruments (for HCN and H_2S). Community air monitoring performed during Geoprobe®-type soil sampling, groundwater sampling, and NAPL recovery activities will consist of periodic measurements taken with hand-held instruments at upwind and downwind locations (on the

exclusion zone boundaries) of each work area. Community air monitoring will only be conducted while work is occurring.

Real-time monitoring data will be used as an early warning system so that the Project Team can be advised if the levels of target compounds are approaching Action Levels. Under this scenario, the Project Team can then evaluate and implement appropriate site controls to maintain acceptable air levels, if necessary.

A separate CAMP will also be developed for IRM soil excavation and related activities such as temporary stockpiling of excavated soil, loading the excavated soil into trucks, hauling the excavated soil, decontamination of the excavation equipment, and backfilling the excavations. That CAMP will meet the guidelines provided in DER-10 and will follow procedures and specifications that have been used by KeySpan at other MGP remediation sites in Long Island, New York. The CAMP will incorporate an integrated real-time monitoring system for TVOCs and particulate using fixed stations located at the site perimeter, walk-around monitoring at the site perimeter, meteorological monitoring, and background sampling. The walk-around perimeter monitoring will be performed for TVOCs, particulate, HCN gas, and H_2S gas. Additional details of that CAMP will be provided in a Construction Operations Plan (COP) that will be issued to the NYSDEC and New York State Department of Health (NYSDOH) prior to performing the IRM soil excavation.

E1.2 Exclusion Zone Air Monitoring

Air quality within the Exclusion Zone will be monitored to ensure worker health and safety in accordance with the requirements of 29 CFR Part 1910.120. Details of the monitoring program are included in a Health and Safety Plan (HASP) that is attached in Appendix A of the IRM Remedial Action Work Plan.

E1.3 Community Air Monitoring

Community air monitoring will be conducted by KeySpan to provide direct measurement of TVOCs, particulate (PM-10), HCN, and H_2S that may be released during site activities. The air monitoring program has been prepared to address the following objectives:

- Provide an early warning system to alert the Project Team if levels of TVOCs, particulate, and HCN in ambient air are approaching Action Levels due to site conditions;
- Determine whether construction controls are effective in reducing the levels of TVOCs, particulate, and HCN to below Action Levels and make appropriate or necessary adjustments; and
- Develop a record of perimeter air monitoring results, equipment maintenance, calibration records, and other pertinent information.

E2.0 ACTION LEVELS AND INSTRUMENTATION

Community air monitoring requirements are summarized below:

- Drilling and well installation activities - TVOCs and particulate will be monitored on a continuous basis and HCN and H_2S will be monitored on a periodic basis. The data logging TVOCs and particulate monitors will be capable of calculating 15-minute average concentrations.

- Geoprobe®-type soil sampling, groundwater sampling, and NAPL recovery activities - TVOCs, particulate, HCN, and H_2S will be monitored on a periodic basis.

For all activities and work locations, upwind levels will be measured to establish background conditions. The equipment will be calibrated at least daily for the contaminants of concern. The 15-minute average concentrations and periodic measurements will be compared to the Action Levels listed below.

E2.1 Action Levels

The following target compounds and Action Levels were developed in accordance with the NYSDEC CAMP outlined in DER-10 and procedures used by KeySpan for community air monitoring at other MGP sites on Long Island, New York.

Target Compound	Action Level [(1) (2)]/Response
TVOCs (15-minute average levels – drilling and well installation) (periodic measurements – sampling and NAPL recovery)	3.5 ppmv action level (70% of the DER-10 TVOC action level) – modify work methods or implement measures to reduce VOCs, if necessary. 5.0 ppmv action level - halt work activities and continue monitoring. 5.0 ppmv above the upwind level
Particulate Matter (PM-10) (15-minute average levels – drilling and well installation) (periodic measurements – sampling and NAPL recovery)	100 μg/m^3 above the upwind level – modify work methods or implement dust suppression techniques, if necessary. 150 μg/m^3 above the upwind level –stop work and re-evaluate activities.
HCN (periodic measurements)	1.0 ppmv above the upwind level

(1) ppmv = parts per million (volume basis)

(2) μg/m^3 = micrograms per cubic meter

H_2S will be monitored to evaluate potential interference from sulfur compounds for any detected HCN. There is no action level for H_2S.

Upwind measurements will be used to establish background emissions from natural and anthropogenic sources. The background value will be added to the air monitoring limits

to compensate for the existing ambient conditions (i.e., TVOCs limit of 5 ppmv + 1.2 ppmv upwind = 6.2 ppmv Action Level).

E2.2 Instrumentation

E2.2.1 TVOCs

TVOCs monitoring will be performed using Rae Systems MiniRAE 2000 Portable Ionization detectors (or equivalent) as noted below.

- Drilling and well installation activities - each instrument will be placed on a portable tripod at the exclusion zone boundary and monitoring will be performed continuously at each station. The instrument alarms will be set at 3.5 ppmv (70 percent above the action level identified in DER-10). Four 15-minute average levels will be determined per hour and the average levels will be recorded a site logbook.

- Sampling and NAPL recovery activities – monitoring will be performed periodically (at least once per hour) at upwind and downwind locations. Monitoring results will be recorded in a site logbook.

E2.2.2 Particulate

Particulate monitoring will be performed using TSI DustTrak portable real-time aerosol monitors equipped with a PM-10 impactor and internal sampling pump as noted below.

- Drilling and well installation activities - each instrument will be placed on a portable tripod at the exclusion zone boundary and monitoring will be performed continuously at each station. The alarms will be set at 100 $\mu g/m^3$. Four 15-minute average levels will be determined per hour and the average levels will be recorded a site logbook.

- Sampling and NAPL recovery activities – monitoring will be performed periodically (at least once per hour) at upwind and downwind locations. Monitoring results will be recorded in a site logbook.

E2.2.3 HCN and H_2S

HCN and H_2S monitoring will be performed periodically (i.e. at least once per hour) at upwind and downwind locations using a MultiRAE PLUS PGM-50 Monitor (or equivalent) outfitted with HCN and H_2S sensors. All monitoring results will be documented in a site logbook. Monitoring frequency will increase if significant MGP related odors are present.

E3.0 CONTINGENCY PLAN

The purpose of this plan is to identify potential site control measures that may be implemented in response to elevated levels of target compounds or odor.

E3.1 TVOCs

If the ambient TVOCs level at the downwind perimeter of each work area (exclusion zone boundary) exceeds 3.5 ppmv above background, work activities will be altered or measures will be implemented to reduce the TVOC levels.

If the ambient TVOCs level at the downwind perimeter of each work area (exclusion zone boundary) exceeds 5 ppmv above background, work activities will be temporarily halted and monitoring continued. If the TVOCs level readily decreases (per instantaneous readings) below 5 ppmv above background, work activities will resume with continued monitoring.

If the TVOCs level at the downwind perimeter of the work area (exclusion zone boundary) persists at levels in excess of 5 ppmv over background but less than 25 ppmv, the following actions will be taken:

- Work activities will be halted;
- The source of vapors will be identified;
- Corrective action(s) will be taken; and
- Monitoring will be continued.

After these steps are taken, work activities will be resumed provided that the TVOCs level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less (but in no case less than 20

feet), is less than 5 ppmv over background for the 15-minute average or periodic measurement.

All activities will be shut down if the TVOCs level is above 25 ppmv at the perimeter of the work area (exclusion zone boundary).

E3.2 Particulate

If the downwind PM-10 particulate level is 100 μg/m^3 greater than background (upwind perimeter) or if airborne dust is observed leaving the work area, then work method changes will be made. If they do not work, then dust suppression techniques will be employed. Work will continue following corrective actions provided that downwind PM-10 particulate levels do not exceed 150 μg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of the work method changes and/or dust suppression techniques, downwind PM-10 particulate levels are greater than 150 μg/m^3 above the upwind level, work will be stopped and activities will be re-evaluated. Work will resume when there is a reduction of the downwind PM-10 particulate level to within 150 μg/m^3 of the upwind level and in preventing visible dust migration.

E3.3 HCN and H2S

In the event that HCN is detected, the following procedures will be implemented.

HCN Monitoring Plan

Response Level	Actions
> 1 ppmv above background using real-time meter	• Run detector tube • Continue monitoring with real-time meter • Continue work if detector tube for HCN reads < 1.25 ppmv
> 1.25 ppmv above background on detector tube	• Stop work and move (with continuous monitoring meter) at least 25 feet upwind from the work area or until the continuous monitoring meter registers < 1 ppmv • Run HCN detector tube upwind and downwind and re-evaluate activities
> 1 ppmv above background using real-time meter and <1.25 ppmv on detector tube	• Run detector tube for HCN and confirm <1.25 ppmv concentration • Continue monitoring with real-time meter • Recalibrate the real-time meter and continue to monitor
NOTE: NO AIR PURIFYING RESPIRATORY PROTECTION IS AVAILABLE FOR HCN GAS; The ACGIH Threshold Limit Value (TLV) for HCN is 4.7 ppmv.	

E3.4 Odor

If odors at the site are excessive or if a complaint is received, controls will be implemented or work will be halted to reduce odor-causing emissions. Once odors have been reduced, normal operations may resume.

E4.0 REFERENCES

New York State Department of Environmental Conservation, Division of Environmental Remediation, *Draft DER-10 Technical Guidance for Site Investigation and Remediation* (December 2002).